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# 2018 IEEE Thesaurus

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Version 1.0

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# 2018 IEEE Thesaurus

The IEEE Thesaurus is a controlled vocabulary of almost 10,100 descriptive engineering, technical and scientific terms, as well as IEEE-specific society terms [referred to as “descriptors” or “preferred terms”]. \* Each descriptor included in the thesaurus represents a single concept or unit of thought. The descriptors are considered the preferred terms for use in describing IEEE content. The scope of descriptors is based on the material presented in IEEE journals, conference papers, standards, and/or IEEE organizational material. A controlled vocabulary is a specific terminology used in a consistent and controlled fashion that results in better information searching and retrieval.

Thesaurus construction is based on the ANSI/NISO Z39.19-2005(2010) standard, *Guidelines for the Construction, Format, and Management of Monolingual Controlled Vocabulary*. The Thesaurus vocabulary uses American-based spellings with cross references to British variant spellings. The scope and structure of the IEEE Thesaurus reflects the engineering and scientific disciplines that comprise the Societies, Councils, and Communities of the IEEE in addition to the technologies IEEE serves.

IEEE has developed its controlled vocabulary through consultation with subject matter experts (specialists in a particular field) and specialists in information analysis. The IEEE Thesaurus thus provides a controlled vocabulary of subject headings to help people categorize or search for engineering and computing concepts, especially IEEE published content.

The IEEE Thesaurus also provides a conceptual map through the use of semantic relationships such as broader terms (BT), narrower terms (NT), 'used for' relationships (USE/UF), and related terms (RT). These semantic relationships identify theoretical connections between terms. *Italic text denotes Non-preferred terms.*  
**Bold text is used for preferred headings.**

Abbreviations used in the Thesaurus:

BT - Broader term  
NT - Narrower term  
RT - Related term  
USE- Use preferred term  
UF - Used for

\*Refer to ANSI/NISO NISO Z39.19-2005 (R2010) Sections 5 through 8 for detailed information on controlled vocabularies, display formats, usage and spelling, and selection criteria for descriptors (<http://www.niso.org/publications/ansiniso-z3919-2005-r2010-guidelines-construction-format-and-management-monolingual>)



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## 1/f noise

UF: 1f  
Pink noise  
BT: Noise

## 1f

USE: 1/f noise

## 2-D displays

USE: Two dimensional displays

## 2-d hole gas

USE: Two dimensional hole gas

## 2-D photonic crystals

USE: Photonic crystals

## 21CN

USE: Next generation networking

## 21st century networks

USE: Next generation networking

## 2D displays

USE: Two dimensional displays

## 2d hole gas

USE: Two dimensional hole gas

## 2D photonic crystals

USE: Photonic crystals

## 3-D displays

USE: Three-dimensional displays

## 3-D modeling

USE: Three-dimensional displays

## 3-D modelling

USE: Three-dimensional displays

## 3-D reconstruction

USE: Three-dimensional displays

## 3D displays

USE: Three-dimensional displays

## 3D modeling

USE: Three-dimensional displays

## 3D modelling

USE: Three-dimensional displays

## 3D printing

USE: Three-dimensional printing

## 3D reconstruction

USE: Three-dimensional displays

## 3G mobile communication

UF: 3rd generation mobile communication  
IMT-2000  
Third generation mobile communication

UMTS  
Universal mobile telecommunication service

BT: Mobile communication  
RT: 4G mobile communication  
Ambient networks  
Land mobile radio cellular

## systems

MIMO communication  
Multiaccess communication  
Next generation networking  
OFDM  
Radio access networks  
Spread spectrum

## communication

## computing

Telecommunication  
Time division synchronous code division multiple access

## 3GPP

UF: 3rd generation partnership project  
BT: Standards organizations

## 3GPP Standards

BT: Standards publications  
NT: Long Term Evolution

## 3rd generation mobile communication

USE: 3G mobile communication

## 3rd generation partnership project

USE: 3GPP

## 4G mobile communication

UF: 4th generation mobile communication  
BT: Mobile communication  
RT: 3G mobile communication  
5G mobile communication  
Land mobile radio cellular

## systems

Long Term Evolution  
Next generation networking



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communication	Radio access networks	802.16	USE:	IEEE 802.16 Standard
	Spread spectrum			
computing	Telecommunication	802.3	USE:	IEEE 802.3 Standard
	Time division synchronous			
code division multiple access		8K UHD	USE:	UHDTV
4K UHD	USE:	UHDTV		
4th generation mobile communication		9/11	USE:	Terrorism
	USE:	4G mobile communication		
5G		9/11 attack	USE:	Terrorism
	USE:	5G mobile communication		
5G mobile communication		911 attack	USE:	Terrorism
	UF:	5G		
systems		A/D	USE:	Analog-digital conversion
systems		A/D conversion	USE:	Analog-digital conversion
systems	BT:	A/D converter	USE:	Analog-digital conversion
	RT:			
systems		AAL	USE:	Ambient assisted living
5th generation mobile systems		Abdomen	BT:	Body regions
	USE:			
5th generation systems		Abrasive water jet cutting	USE:	Water jet cutting
	USE:			
5th generation wireless systems		Abrasives	BT:	Production materials
	USE:			
802.11		Absorption	BT:	Materials science and
	USE:	technology	RT:	Semiconductor detectors
802.11e		Abstract algebra	BT:	Algebra
	USE:		NT:	Galois fields
802.11g				Modules (abstract algebra)
	USE:			
802.11n		Abstracts	BT:	Writing
	USE:		RT:	Information retrieval
802.15				Information services
	USE:			

## AC generators



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UF: Alternating current  
generators  
BT: Generators  
RT: Pulse width modulation  
NT: Induction generators  
Synchronous generators

*AC light emitting diode lamps*  
USE: LED lamps

## AC machines

UF: Alternating current  
machines  
BT: Electric machines  
RT: AC-AC converters  
Pulse width modulation  
Sensorless control  
Windings  
NT: AC motors  
Induction machines  
Synchronous machines

## AC motors

UF: Alternating current motors  
BT: AC machines  
Motors  
RT: Pulse width modulation  
Pulse width modulation  
inverters  
Space vector pulse width  
modulation  
NT: Hysteresis motors  
Induction motors

## AC-AC converters

UF: AC-AC convertors  
AC-AC power conversion  
BT: Converters  
Power conversion  
RT: AC machines

## AC-AC convertors

USE: AC-AC converters

## AC-AC power conversion

USE: AC-AC converters

## AC-DC power converters

UF: AC-DC power converters  
AC/DC power converters  
Analog-to-digital converter  
Analog-to-digital convertor  
BT: Power conversion  
RT: Machine vector control

inverters  
Pulse width modulation  
Voltage multipliers  
Voltage-source converters  
NT: Rectifying circuits

## AC-DC power convertors

USE: AC-DC power converters

## AC-LED lamps

USE: LED lamps

## AC/DC power converters

USE: AC-DC power converters

## Accelerated aging

BT: Aging  
Materials testing

## Accelerated testing

USE: Life estimation

## Acceleration

BT: Mechanical factors  
RT: Accelerometers  
Gravity

## Acceleration measurement

USE: Accelerometers

## Accelerator architectures

BT: Computer architecture

## Accelerator beams

USE: Particle beams

## Accelerator magnets

BT: Magnetic devices  
Particle accelerators

## Accelerometers

UF: Acceleration measurement  
BT: Measurement  
RT: Acceleration

## Access control

BT: Security  
RT: Biometrics (access control)  
Building services  
Capability-based security  
Communication system

## security

Computer security  
Countermeasures  
(computer)



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	Identification of persons	BT:	Acoustics
	Smart cards	RT:	Acoustic measurements
NT:	Authorization		Biomedical acoustics
	Blacklisting	NT:	Acoustic communication
	Multi-factor authentication	(telecommunication)	
	Password		Acoustic imaging
			Acoustic testing
<i>Access point base station</i>			
USE:	Femtocell networks	<b>Acoustic arrays</b>	
<b>Access protocols</b>		BT:	Acoustic transducers
BT:	Protocols	RT:	Acoustic signal processing
RT:	CAPTCHAs		Array signal processing
NT:	Media Access Protocol		Sonar
<i>Access rights</i>		<b>Acoustic beams</b>	
USE:	Permission	BT:	Beams
<b>Accident prevention</b>		<b>Acoustic communication</b>	
BT:	Industry applications	(telecommunication)	
RT:	Explosion protection	BT:	Acoustic applications
	Preventive maintenance		Telecommunication
	Risk analysis	services	
	Safety devices	RT:	Mobile communication
NT:	Accidents		OFDM
			Wireless networks
<b>Accidents</b>		<b>Acoustic devices</b>	
BT:	Accident prevention	UF:	Ultrasonic devices
RT:	Domestic safety	BT:	Acoustics
	Electric shock	RT:	Piezoelectric devices
	Emergency services	NT:	Acoustic waveguides
	Explosions		Acoustoelectric devices
	Fires		Acoustooptic devices
	Hazardous areas		Bulk acoustic wave devices
	Occupational health		Film bulk acoustic
	Occupational safety	resonators	
	Oil pollution		Surface acoustic wave
	Product safety	devices	
	Risk analysis	<b>Acoustic diffraction</b>	
NT:	Aerospace accidents	BT:	Acoustic propagation
	Electrical accidents		
	Industrial accidents	<b>Acoustic distortion</b>	
	Marine accidents	BT:	Distortion
	Railway accidents	RT:	Acoustic noise
	Road accidents		Acoustic signal processing
			Loudspeakers
<b>Accreditation</b>			Nonlinear acoustics
BT:	Educational programs	<i>Acoustic distortion measurement</i>	
RT:	Training	USE:	Distortion measurement
<b>Accuracy</b>		<b>Acoustic emission</b>	
BT:	Mathematics	BT:	Acoustics
		RT:	Acoustic noise
<b>Acoustic applications</b>			
UF:	Ultrasonic applications		



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Acoustic testing  
Nondestructive testing

BT: Reflection  
RT: Acoustic scattering

## Acoustic imaging

BT: Acoustic applications  
RT: Acoustic testing  
Oceanographic techniques

## Acoustic refraction

BT: Acoustic waves

## Acoustic materials

UF: Acoustic metamaterials  
BT: Materials  
RT: Piezoelectric materials

## Acoustic scattering

BT: Scattering  
RT: Acoustic reflection  
Waves

## Acoustic measurements

BT: Measurement  
RT: Acoustic applications  
Acoustic testing  
Anechoic chambers  
Biomedical acoustics  
Frequency measurement  
Phase measurement  
Seismic measurements  
Wavelength measurement

## Acoustic sensors

BT: Sensors

## Acoustic signal detection

BT: Signal detection  
RT: Acoustic noise  
NT: Sonar detection

## Acoustic signal processing

UF: Audio enhancement  
BT: Signal processing  
RT: Acoustic arrays  
Acoustic distortion  
Acoustic transducers  
NT: Active noise reduction  
Speech processing

## Acoustic metamaterials

USE: Acoustic materials AND  
Metamaterials

## Acoustic noise

UF: Audible noise  
Audio restoration  
BT: Acoustics  
RT: Acoustic distortion  
Acoustic emission  
Acoustic signal detection  
Environmental factors  
Mechanical factors  
Vibrations  
NT: Background noise  
Noise cancellation  
Noise level  
Noise reduction  
Working environment noise

## Acoustic surface waves

USE: Surface acoustic waves

## Acoustic testing

BT: Acoustic applications  
Materials testing  
RT: Acoustic emission  
Acoustic imaging  
Acoustic measurements  
Photoacoustic effects

## Acoustic propagation

BT: Acoustics  
RT: Acoustic pulses  
Waves  
NT: Acoustic diffraction

## Acoustic transducers

BT: Transducers  
RT: Acoustic signal processing  
Array signal processing  
NT: Acoustic arrays

## Acoustic pulses

BT: Acoustics  
RT: Acoustic propagation

## Acoustic wave attenuation

USE: Acoustic waves AND  
Attenuation

## Acoustic waveguides

BT: Acoustic devices

## Acoustic reflection

## Acoustic waves

UF: Acoustic wave attenuation  
BT: Acoustics



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RT: Seismic waves  
 NT: Acoustic refraction  
 Acoustoelectric effects  
 Surface acoustic waves

## Acoustical engineering

BT: Engineering - general

## Acoustics

UF: Ultrasonics  
 BT: Physics  
 RT: Acoustoelectric effects  
 Fourier transforms  
 Magnetoacoustic effects  
 Phonons  
 Resonators  
 Vibrations  
 NT: Acoustic applications  
 Acoustic devices  
 Acoustic emission  
 Acoustic noise  
 Acoustic propagation  
 Acoustic pulses  
 Acoustic waves  
 Acoustooptic effects  
 Biomedical acoustics  
 Cepstral analysis  
 Music  
 Nonlinear acoustics  
 Psychoacoustics  
 Reverberation  
 Spectral shape  
 Underwater acoustics

## Acoustoelectric devices

UF: Electroacoustic devices  
 BT: Acoustic devices  
 RT: Acoustoelectric effects  
 Piezoelectric devices  
 Pulsed electroacoustic

methods

Surface acoustic wave

devices

## Acoustoelectric effects

UF: Electroacoustic effects  
 BT: Acoustic waves  
 Electric fields  
 RT: Acoustics  
 Acoustoelectric devices  
 Semiconductor materials  
 NT: Pulsed electroacoustic

methods

## Acoustomagnetic effects

USE: Magnetoacoustic effects

## Acoustooptic devices

BT: Acoustic devices  
 RT: Acoustooptic effects

## Acoustooptic effects

BT: Acoustics  
 RT: Acoustooptic devices  
 NT: Piezooptic effects

## Acquired immune deficiency syndrome

UF: AIDS  
 Acquired immunodeficiency  
 syndrome  
 BT: Diseases

## Acquired immunodeficiency syndrome

USE: Acquired immune  
 deficiency syndrome

## Actinium

BT: Chemical elements

## Action potentials

UF: Bioelectric potentials  
 BT: Physiology  
 RT: Axons  
 Neurons  
 White matter

## Activated sludge process

USE: Sludge treatment

## Activation analysis

BT: Chemical analysis

## Active appearance model

BT: Computer vision

## Active circuits

BT: Circuits  
 NT: Active inductors  
 Gyrators  
 Operational amplifiers

## Active contours

BT: Motion analysis

## Active disturbance rejection control

USE: Robust control

## Active filters

BT: Filters  
 NT: Band-pass filters





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## Active inductors

BT: Active circuits  
Inductors  
RT: Gytrators  
Integrated circuits  
MOSFET circuits

## Active matrix addressing

BT: Active matrix technology

## Active matrix liquid crystal displays

UF: AMLCDs  
Active-matrix liquid-crystal displays  
BT: Active matrix technology  
Liquid crystal displays

## Active matrix organic LEDs

USE: Active matrix organic light emitting diodes

## Active matrix organic light emitting diodes

UF: AMOLEDs  
Active matrix organic LEDs  
Active matrix organic light-emitting diodes  
BT: Active matrix technology  
Organic light emitting diodes

## Active matrix organic light-emitting diodes

USE: Active matrix organic light emitting diodes

## Active matrix technology

UF: Active-matrix  
BT: Displays  
NT: Active matrix addressing  
Active matrix liquid crystal displays  
Active matrix organic light emitting diodes  
Thin film transistors

## Active noise reduction

BT: Acoustic signal processing  
Noise reduction  
NT: Echo cancellers

## Active pixel sensors

BT: Image sensors

## Active RFID tags

BT: RFID tags

## Active shape model

BT: Image processing  
Pattern recognition

## Active-matrix

USE: Active matrix technology

## Active-matrix liquid-crystal displays

USE: Active matrix liquid crystal displays

## Activities

USE: IEEE activities

## Activity recognition

BT: Cognition  
Pattern recognition  
Sensor systems  
RT: Computer vision

## Actuators

UF: Dielectric electroactive polymer actuators  
Electroactive polymer actuators  
Electrostrictive polymer actuators  
Ionomeric polymer-metal composite actuators  
Nanoactuators  
BT: Control equipment  
RT: Control systems  
Servomechanisms  
Servosystems  
Shape memory alloys  
Dielectric elastomer actuators  
Electrostatic actuators  
Hydraulic actuators  
Intelligent actuators  
Microactuators  
Piezoelectric actuators  
Pneumatic actuators

## Ad hoc networks

BT: Computer networks  
RT: Cross layer design  
Data communication  
Land mobile radio  
Mobile computing  
Multicast communication  
Protocols  
Wireless LAN  
Wireless sensor networks



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NT:	AODV	<b>Adaptive learning</b>	BT:	Education
	Mesh networks		RT:	Distance learning
	Mobile ad hoc networks			Human computer
	Vehicular ad hoc networks	interaction		User interfaces
<i>Ad hoc On Demand Distance Vector</i>				
USE:	AODV	<b>Adaptive mesh refinement</b>	BT:	Numerical analysis
<b>Adaptation models</b>		<b>Adaptive optics</b>	BT:	Optics
BT:	Adaptive algorithms	<b>Adaptive scheduling</b>	BT:	Scheduling
<b>Adaptive algorithms</b>		RT:	Adaptive systems	Production control
BT:	Algorithms			
NT:	Adaptation models	<b>Adaptive signal detection</b>	BT:	Adaptive signal processing
<i>Adaptive antenna arrays</i>			RT:	Adaptive arrays
USE:	Adaptive arrays			Blind source separation
				Source separation
<b>Adaptive arrays</b>		<b>Adaptive signal processing</b>	BT:	Signal processing
UF:	Adaptive antenna arrays		NT:	Adaptive filters
BT:	Antenna arrays			Adaptive signal detection
RT:	Adaptive signal detection			
	Array signal processing			
	Radar countermeasures			
	Radio communication			
countermeasures				
<i>Adaptive codes</i>				
USE:	Adaptive coding	<b>Adaptive systems</b>	BT:	Cybernetics
				Systems engineering and
<b>Adaptive coding</b>		theory	RT:	Adaptive scheduling
UF:	Adaptive codes			Learning systems
BT:	Data compression		NT:	Adaptive control
				Cognitive radar
<b>Adaptive control</b>				Line enhancers
UF:	Self-tuning regulators			Multi-agent systems
BT:	Adaptive systems			Variable structure systems
RT:	Cognitive systems			
	Control systems			
	Disturbance observers			
	Iterative learning control			
<i>Adaptive equalisers</i>		<i>ADAS</i>	USE:	Advanced driver assistance
USE:	Adaptive equalizers	systems		
<b>Adaptive equalizers</b>		<b>Add-drop multiplexers</b>	BT:	Multiplexing equipment
UF:	Adaptive equalisers		NT:	Optical add-drop
BT:	Equalizers	multiplexers		
<b>Adaptive estimation</b>		<b>Added delay</b>	BT:	Delay systems
BT:	Statistics			
<b>Adaptive filters</b>		<b>Adders</b>		
BT:	Adaptive signal processing			



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BT: Circuits  
RT: Digital integrated circuits  
Logic circuits

UF: Electric admittance  
BT: Electric variables  
RT: Admittance measurement  
Impedance

## *Additive manufacturing*

USE: Three-dimensional printing

## *Additive metric*

USE: Maximum likelihood  
detection

## **Additive noise**

BT: Noise  
NT: AWGN  
Additive white noise

## **Additive white noise**

BT: Additive noise  
RT: Gaussian noise

## **Additives**

UF: Fuel additives  
BT: Materials  
RT: Production materials

## *Adenoviridae*

USE: Adenoviruses

## **Adenoviruses**

UF: Adenoviridae  
BT: Microorganisms

## *Adhesive bonding*

USE: Adhesives

## **Adhesive strength**

BT: Materials testing

## **Adhesives**

UF: Adhesive bonding  
BT: Bonding  
NT: Conductive adhesives  
Nonconductive adhesives

## **Adiabatic**

BT: Power electronics

## *Adjacent channel interference*

USE: Interchannel interference

## **Admission control**

BT: Quality of service  
RT: Bandwidth

## **Admittance**

## **Admittance measurement**

BT: Electric variables  
measurement  
RT: Admittance  
Impedance measurement

## **Adsorption**

BT: Surface morphology  
RT: Interface phenomena  
Molecular sieves  
Surfactants

## **Advanced driver assistance systems**

UF: ADAS  
BT: Vehicle safety  
RT: Collision avoidance  
Intelligent vehicles

## *Advanced Research Projects Agency Network*

USE: ARPANET

## *Advanced TV*

USE: HDTV

## *Advanced video coding*

USE: Video coding

## **Advertising**

BT: Marketing management

## *Aerial robots*

USE: Unmanned aerial vehicles

## **Aerodynamics**

BT: Dynamics  
Mechanical factors  
RT: Aerospace control  
Shock waves  
Wind tunnels

## **Aerosols**

BT: Electrostatic processes  
RT: Liquids  
Particle production  
Spraying

## **Aerospace accidents**

BT: Accidents  
RT: Aerospace safety  
Space vehicles



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	NT:	Air accidents			Space vehicle
<b>Aerospace and electronic systems</b>			instrumentation		
	RT:	Auditory displays		BT:	Aerospace engineering
		Digital signal processing		RT:	Aircraft
		Programming			Space vehicles
		Systems engineering and			Total ionizing dose
theory			<b>Aerospace engineering</b>		
	NT:	Aerospace control		BT:	Aerospace and electronic
		Aerospace engineering	systems		
		Aerospace materials		RT:	Aerospace industry
		Aircraft manufacture			Aerospace materials
		Aircraft navigation			Lightweight structures
		Aircraft propulsion		NT:	Aerospace biophysics
		Command and control			Aerospace electronics
systems					Aerospace safety
		Electronic warfare			Aerospace simulation
		Military equipment			Aerospace testing
		Radar			Artificial satellites
		Sensor systems			Space technology
		Sonar			
		Telemetry	<i>Aerospace ground equipment</i>		
			USE:		Ground support
<b>Aerospace biophysics</b>			<i>Aerospace ground services</i>		
	BT:	Aerospace engineering	USE:		Ground support
		Biophysics			
	RT:	Human factors	<b>Aerospace industry</b>		
<b>Aerospace components</b>				BT:	Manufacturing industries
	BT:	Aerospace materials		RT:	Aerospace engineering
<b>Aerospace control</b>					Aerospace materials
	UF:	Aircraft control			Aerospace safety
		Flight control			Aircraft manufacture
	BT:	Aerospace and electronic			Lightweight structures
systems			<i>Aerospace instrumentation</i>		
	RT:	Aerodynamics	USE:		Aerospace electronics
		Aerospace simulation			
		Aircraft	<b>Aerospace materials</b>		
		Hardware-in-the loop		UF:	Aircraft materials
simulation					Spacecraft materials
		Missiles		BT:	Aerospace and electronic
		Motion control	systems		
		Space vehicles			Production materials
		Velocity control		RT:	Aerospace engineering
	NT:	Air traffic control			Aerospace industry
		Attitude control			Aircraft manufacture
		Ground support			Lightweight structures
					Space vehicles
<b>Aerospace electronics</b>				NT:	Aerospace components
	UF:	Aerospace instrumentation	<i>Aerospace navigation</i>		
		Aircraft electronics	USE:		Aircraft navigation
		Aircraft instrumentation			
		Avionics	<b>Aerospace propulsion</b>		
		Space vehicle electronics			



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BT:	Propulsion	RT:	Software agents
			Multi-agent systems
<b>Aerospace safety</b>		<b>Aggregates</b>	
BT:	Aerospace engineering	BT:	Materials
	Safety	RT:	Building materials
RT:	Aerospace accidents		
	Aerospace industry	<i>Agile computing</i>	
	Ion beam effects	USE:	Agile software development
	Space shuttles		
	Space vehicles	<b>Agile manufacturing</b>	
NT:	Air safety	BT:	Manufacturing systems
		RT:	Computer integrated
<b>Aerospace simulation</b>		manufacturing	Flexible manufacturing
UF:	Flight simulation	systems	
BT:	Aerospace engineering		
RT:	Aerospace control	<b>Agile software development</b>	
	Aerospace testing	UF:	Agile computing
	Wind tunnels	BT:	Software development
<b>Aerospace testing</b>		management	
BT:	Aerospace engineering	NT:	Scrum (Software
	Testing	development)	
RT:	Aerospace simulation		
NT:	Wind tunnels	<b>Aging</b>	
		UF:	Age factors
<b>Affective computing</b>			Aged
BT:	Artificial intelligence		Ageing
	Human computer	BT:	Materials science and
interaction		technology	
RT:	Behavioral sciences	RT:	Ambient assisted living
	Cognitive systems		Assisted living
	Emotion recognition		Cataracts
	Human factors		Electric breakdown
	Psychology		Energy storage
<b>Africa</b>			Gerontology
BT:	Continents		Insulation life
			Life estimation
<b>Afterburners</b>			Reliability
USE:	Incineration		Senior citizens
		NT:	Accelerated aging
<b>Ag</b>			
USE:	Silver	<b>Agricultural engineering</b>	
		BT:	Engineering - general
<b>Age factors</b>		RT:	Agricultural machinery
USE:	Aging		Agriculture
		<b>Agricultural machinery</b>	
<b>Aged</b>		UF:	Combine harvesters
USE:	Aging		Tractors
		BT:	Machinery
<b>Ageing</b>		RT:	Agricultural engineering
USE:	Aging		Agriculture
			Applicators
<b>Agent-based modeling</b>			Blades
BT:	Computational modeling		



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## Agricultural products

BT: Agriculture  
RT: Food products  
Irrigation  
NT: Cotton  
Crops  
Dairy products  
Sugar  
Wool

## Agriculture

UF: Livestock  
BT: Industries  
RT: Agricultural engineering  
Agricultural machinery  
Animals  
Dairy products  
Genetic engineering  
Pest control  
Soil pollution  
Vegetation mapping  
NT: Agricultural products  
Aquaculture  
Fertilizers  
Greenhouses  
Irrigation

## AI

USE: Artificial intelligence

## AIDS

USE: Acquired immune deficiency syndrome

## Aids for the handicapped

USE: Assistive technology

## AIEE Standards

BT: IEEE Standards

## Air accidents

BT: Aerospace accidents  
RT: Air safety  
Air traffic control

## Air bags

USE: Automotive components

## Air cleaners

UF: Air filters  
Air purifiers  
BT: Machine components  
RT: Air pollution  
Cleaning

## Purification

## Air conditioning

BT: Cooling  
RT: Building services  
Buildings  
Compressors  
Ducts  
Fans  
Ventilation  
Vents  
NT: Central air conditioning

## Air filters

USE: Air cleaners

## Air gaps

UF: Air-gap  
BT: Electromagnetic analysis  
RT: Electrodes  
Spark gaps

## Air interface

USE: Communication channels

## Air pollutants

USE: Air pollution

## Air pollution

UF: Air pollutants  
BT: Air quality  
Pollution  
RT: Air cleaners  
Ash  
Atmospheric

## measurements

Exhaust gases  
Flue gases  
Fossil fuels  
Global warming  
Incineration  
Industrial pollution  
Meteorology  
Thermal pollution

## Air purifiers

USE: Air cleaners

## Air quality

BT: Atmosphere  
RT: Atmospheric  
measurements  
NT: Environmental factors  
Air pollution



# 2018 IEEE Thesaurus

## Air safety

BT: Aerospace safety  
RT: Air accidents

## Air traffic control

BT: Aerospace control  
RT: Air accidents  
Air transportation  
Control systems  
Radio navigation

## Air transportation

BT: Transportation  
RT: Air traffic control  
Global Positioning System  
NT: Aircraft  
Airports

## Air-gap

USE: Air gaps

## Airborne radar

BT: Radar  
RT: Synthetic aperture radar

## Aircraft

BT: Air transportation  
RT: Aerospace control  
Aerospace electronics  
Aircraft manufacture  
Aircraft navigation  
Aircraft propulsion  
Ground support  
Military aircraft  
Propellers  
NT: Airplanes  
Helicopters

## Aircraft control

USE: Aerospace control

## Aircraft electronics

USE: Aerospace electronics

## Aircraft engines

USE: Aircraft propulsion

## Aircraft instrumentation

USE: Aerospace electronics

## Aircraft manufacture

BT: Aerospace and electronic  
systems  
RT: Aerospace industry  
Aerospace materials

## Aircraft

## Aircraft materials

USE: Aerospace materials

## Aircraft navigation

UF: Aerospace navigation  
Entry, descent and landing  
BT: Aerospace and electronic  
systems  
RT: Navigation  
Aircraft  
Course correction

## Aircraft propulsion

UF: Aircraft engines  
BT: Aerospace and electronic  
systems  
RT: Propulsion  
Aircraft  
Engines  
Jet engines  
Turbines  
NT: Propellers

## Airfoils

USE: Automotive components

## Airplanes

BT: Aircraft

## Airports

BT: Air transportation

## Al

USE: Aluminum

## Al<sub>2</sub>O<sub>3</sub>

USE: Aluminum oxide

## Alarm systems

UF: Warning systems  
BT: Security  
RT: Monitoring  
Safety  
Safety devices  
NT: Smoke detectors

## Alcoholic beverages

BT: Ethanol

## Alcoholism

BT: Diseases

## Algae



# 2018 IEEE Thesaurus

	BT:	Organisms		Dynamic programming
<b>Algebra</b>				Filtering algorithms
	BT:	Mathematics		Genetic algorithms
	RT:	Nonlinear equations		Heuristic algorithms
	NT:	Abstract algebra		Inference algorithms
		Boolean algebra		MLFMA
		Linear algebra	algorithms	Machine learning
		Set theory		Matching pursuit algorithms
<b>Algorithm design and analysis</b>			detection	Maximum likelihood
	BT:	Algorithms		Multicast algorithms
<b>Algorithm design and analysis</b>				Parallel algorithms
	BT:	Mathematics		Partitioning algorithms
	NT:	Algorithmic efficiency		Prediction algorithms
				Projection algorithms
<b>Algorithmic efficiency</b>				Pursuit algorithms
	BT:	Algorithm design and	algorithms	Signal processing
analysis				Software algorithms
	RT:	Computational complexity		Viterbi algorithm
		Software performance		
		Software quality	<i>All optical networks</i>	
			USE:	All-optical networks
<b>Algorithms</b>			<b>All-optical networks</b>	
	UF:	Subroutines	UF:	All optical networks
	BT:	Mathematics	BT:	Optical fiber networks
	RT:	Biometrics (access control)		
		Ciphers	<i>Allocation</i>	
		Cyclic redundancy check	USE:	Resource management
		Huffman coding		
		Linear programming	<b>Alloying</b>	
		Maximum likelihood	BT:	Metals
decoding			RT:	Aluminum alloys
		Model checking		Aluminum compounds
		Numerical stability		Barium compounds
		Random processes		Bismuth compounds
		Software		Calcium
		Software libraries		Cobalt
		Stability analysis		Cobalt alloys
	NT:	Adaptive algorithms		Copper alloys
analysis		Algorithm design and		Gallium alloys
				Gallium compounds
		Approximation algorithms		Germanium alloys
		Backpropagation algorithms		Gold alloys
		Basis algorithms		Hafnium compounds
		Change detection		Indium compounds
algorithms				Iron alloys
		Classification algorithms		Lithium
		Clustering algorithms		Lithium compounds
		Compression algorithms		Neodymium alloys
		Density estimation robust		Nickel alloys
algorithm				Niobium alloys
		Detection algorithms		Platinum alloys
		Distributed algorithms		





# 2018 IEEE Thesaurus

	Silicon alloys		Metals
	Strontium compounds	NT:	Aluminum alloys
	Tin alloys		Aluminum compounds
	Titanium alloys		
	Yttrium compounds		
NT:	Intermetallic	<b>Aluminum alloys</b>	
	Shape memory alloys	UF:	Aluminium alloys
		BT:	Aluminum
		RT:	Alloying
<i>Alloys</i>		<b>Aluminum compounds</b>	
USE:	Metals	UF:	Aluminium compounds
<b>Alpha particles</b>		BT:	Aluminum
BT:	Nuclear physics	RT:	Alloying
RT:	Ions	NT:	Aluminum gallium nitride
			Aluminum nitride
			Aluminum oxide
<i>Alphavoltaic power sources</i>		<b>Aluminum gallium nitride</b>	
USE:	Radioactive materials	BT:	Aluminum compounds
			Gallium compounds
<i>Alternating current generators</i>		RT:	III-V semiconductor
USE:	AC generators	materials	Transistors
<i>Alternating current machines</i>		<i>Aluminum industry</i>	
USE:	AC machines	USE:	Metals industry
<i>Alternating current motors</i>		<b>Aluminum nitride</b>	
USE:	AC motors	BT:	Aluminum compounds
<b>Alternators</b>		<b>Aluminum oxide</b>	
BT:	Electric machines	UF:	Al <sub>2</sub> O <sub>3</sub>
RT:	Synchronous generators		Aluminium oxide
		BT:	Aluminum compounds
		RT:	Ceramics
<b>Altimetry</b>		<b>Alzheimer's disease</b>	
BT:	Pressure measurement	BT:	Dementia
RT:	Atmospheric	RT:	Gerontology
measurements			Hippocampus
		<b>Ambient assisted living</b>	
<i>Aluminium</i>		UF:	AAL
USE:	Aluminum	BT:	Assisted living
			Information and
<i>Aluminium alloys</i>		communication technology	
USE:	Aluminum alloys	RT:	Aging
			Assistive devices
<i>Aluminium compounds</i>		<b>Ambient intelligence</b>	
USE:	Aluminum compounds	BT:	Consumer electronics
			Telecommunications
<i>Aluminium industry</i>		RT:	Intelligent systems
USE:	Metals industry		Internet of Things
			Ubiquitous computing
<i>Aluminium oxide</i>			
USE:	Aluminum oxide		
<b>Aluminum</b>			
UF:	Al		
	Aluminium		
BT:	Chemical elements		



# 2018 IEEE Thesaurus

User interfaces

## Ambient networks

UF: AN Project  
BT: Mobile communication  
RT: 3G mobile communication

## Amblyopia

USE: Vision defects

## Ambulatory surgery

BT: Surgery

## American Express

USE: Credit cards

## American National Institute of Standards

USE: ANSI

## American Standards Institute

USE: ASA

## Americium

BT: Chemical elements

## Amino acids

BT: Biochemistry

## AMLCDs

USE: Active matrix liquid crystal displays

## Ammeters

BT: Electric variables  
measurement  
RT: Current measurement

## Amniocentesis

BT: Medical tests  
RT: Genetics  
Ultrasonic imaging  
NT: Amniotic fluid  
Birth disorders

## Amniotic fluid

BT: Amniocentesis  
Fluids and secretions

## AMOLEDs

USE: Active matrix organic light emitting diodes

## Amorphous magnetic materials

BT: Magnetic materials

## Amorphous materials

BT: Materials  
NT: Diamond-like carbon  
Glass

## Amorphous semiconductors

BT: Semiconductor materials  
RT: Silicon  
Thin film devices

## Amorphous silicon

BT: Silicon

## Amperometric sensors

BT: Electrochemical devices  
Gas detectors

## Amplifiers

BT: Signal processing  
RT: Frequency response  
Klystrons  
Optical fiber amplifiers  
Rail to rail amplifiers  
Rail to rail operation  
NT: Broadband amplifiers  
Differential amplifiers  
Distributed amplifiers  
Low-noise amplifiers  
Operational amplifiers  
Power amplifiers  
Preamplifiers  
Pulse amplifiers  
Radiofrequency amplifiers  
Resonators

## Amplify-and-forward cooperative communication

USE: Cooperative communication

## Amplitude estimation

BT: Parameter estimation  
RT: Reflection coefficient

## Amplitude modulation

BT: Modulation  
RT: Demodulation  
Intensity modulation  
NT: Amplitude shift keying  
Quadrature amplitude

modulation

## Amplitude shift keying

UF: ASK  
BT: Amplitude modulation

AN Project



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# 2018 IEEE Thesaurus

USE:	Ambient networks	integrated circuits	Application specific
<i>Anaesthesia</i>		integrated circuits	Mixed analog digital
USE:	Anesthesia		Signal processing
<b>Analog circuits</b>		<i>Analog to digital conversion</i>	
BT:	Circuits	USE:	Analog-digital conversion
RT:	Microwave circuits	<i>Analog to digital converter</i>	
	Millimeter wave circuits	USE:	Analog-digital conversion
	Neuromorphics		
	Submillimeter wave circuits		
	Switched capacitor		
networks		<b>Analog TV</b>	
	UHF circuits	BT:	Digital TV
	VHF circuits	<i>Analog-digital</i>	
NT:	Analog integrated circuits	USE:	Analog-digital conversion
	Analog processing circuits		
<i>Analog CMOS integrated circuits</i>		<b>Analog-digital conversion</b>	
USE:	CMOS analog integrated	UF:	A/D
circuits			A/D conversion
			A/D converter
<b>Analog computers</b>			Analog to digital conversion
BT:	Computers		Analog to digital converter
RT:	Summing circuits		Analog-digital
			Analog-to-digital conversion
<b>Analog integrated circuits</b>			Analog-to-digital converter
UF:	Analogue integrated circuits		Analogue-digital conversion
	Linear integrated circuits		Analogue-digital converters
BT:	Analog circuits	BT:	Data conversion
	Integrated circuits	RT:	Data acquisition
RT:	Analog processing circuits		Quantization (signal)
	MMICs	NT:	Delta modulation
	Microwave integrated		
circuits		<b>Analog-digital integrated circuits</b>	
	Millimeter wave integrated	UF:	Minimum analog-digital
circuits		integrated circuits	
	Neural network hardware	BT:	Integrated circuits
	Submillimeter wave		
integrated circuits		<i>Analog-to-digital conversion</i>	
	UHF integrated circuits	USE:	Analog-digital conversion
NT:	CMOS analog integrated	<i>Analog-to-digital converter</i>	
circuits		USE:	AC-DC power converters
arrays	Field programmable analog	AND	Analog-digital conversion
<b>Analog memory</b>		<i>Analog-to-digital convertor</i>	
BT:	Memory	USE:	AC-DC power converters
RT:	Analog processing circuits		
		<i>Analogue CMOS integrated circuits</i>	
<b>Analog processing circuits</b>		USE:	CMOS analog integrated
BT:	Analog circuits	circuits	
RT:	Analog integrated circuits		
	Analog memory	<i>Analogue integrated circuits</i>	



# 2018 IEEE Thesaurus

USE: Analog integrated circuits	BT: Test facilities
<i>Analogue-digital conversion</i>	RT: Acoustic measurements
USE: Analog-digital conversion	Antenna measurements
<i>Analogue-digital converters</i>	Electromagnetic
USE: Analog-digital conversion	measurements
<b>Analysis of variance</b>	Immunity testing
UF: ANOVA	TEM cells
BT: Statistical analysis	
<b>Analytic hierarchy process</b>	<i>Anemometers</i>
BT: Decision making	USE: Fluid flow measurement
RT: Management	
Strategic planning	<b>Anesthesia</b>
	UF: Anaesthesia
	Anesthesiology
	BT: Medical treatment
	NT: Anesthetic drugs
<b>Analytical models</b>	<i>Anesthesiology</i>
BT: Modeling	USE: Anesthesia
RT: Neuroinformatics	
NT: Common Information Model	<b>Anesthetic drugs</b>
(computing)	BT: Anesthesia
<b>Anatomical structure</b>	<i>Aneurism</i>
BT: Medical diagnostic imaging	USE: Aneurysm
<b>Anatomy</b>	<b>Aneurysm</b>
BT: Biological systems	UF: Aneurism
NT: Auditory system	BT: Medical conditions
Biological tissues	
Body regions	<b>Angiocardiology</b>
Cardiovascular system	BT: Biomedical imaging
Circulatory system	RT: Biomedical applications of
Digestive system	radiation
Embryonic structures	<b>Angiography</b>
Endocrine system	UF: Arteriography
Fluids and secretions	BT: Biomedical imaging
Human anatomy	
Immune system	<b>Angioplasty</b>
Integumentary system	BT: Medical treatment
Lymphatic system	
Musculoskeletal system	<b>Angular velocity</b>
Nervous system	BT: Mechanical variables
Neuroanatomy	measurement
Respiratory system	RT: Velocity control
Sense organs	Velocity measurement
Stomatognathic system	
Urogenital system	<b>Angular velocity control</b>
	BT: Velocity control
<b>Androids</b>	<b>Animal behavior</b>
BT: Robots	BT: Behavioral sciences
RT: Human factors	
Man-machine systems	<b>Animal structures</b>
<b>Anechoic chambers</b>	



# 2018 IEEE Thesaurus

BT:	Animals		Anisotropic
NT:	Beak	magnetoresistance	sensors
	Feathers		Anisotropic material
	Tail		Anisotropic processing
<b>Animals</b>			Anisotropically
			Anisotropy
BT:	Organisms	BT:	Magnetoresistance
	Zoology		
RT:	Agriculture		<i>Anisotropic magnetoresistance sensors</i>
	Biological systems	USE:	Anisotropic
	Life sciences		magnetoresistance
NT:	Animal structures		
	Birds		<i>Anisotropic material</i>
	Bovine	USE:	Anisotropic
	Cats		magnetoresistance
	Dinosaurs		
	Dogs		<i>Anisotropic processing</i>
	Horses	USE:	Anisotropic
	Insects		magnetoresistance
	Marine animals		
	Mice		<i>Anisotropically</i>
	Rabbits	USE:	Anisotropic
	Rats		magnetoresistance
	Rodents		
	Wildlife		<i>Anisotropy</i>
		USE:	Anisotropic
			magnetoresistance
<b>Animation</b>		<b>Annealing</b>	
UF:	Computer animation	UF:	Annealing temperature
BT:	Graphics	BT:	Heat treatment
RT:	Computer graphics		Materials processing
	Image generation	RT:	Simulated annealing
	Visual effects		Softening
	Visualization		Thermal factors
NT:	Facial animation	NT:	Rapid thermal annealing
<b>Animatronics</b>			
BT:	Robotics and automation		<i>Annealing temperature</i>
<b>Anisotropic</b>		USE:	Annealing
BT:	Filters		
<b>Anisotropic conductive films</b>		<b>Announcements</b>	
BT:	Conductive films	USE:	IEEE news
<i>Anisotropic diffusion</i>		<b>Anodes</b>	
USE:	Anisotropic	BT:	Electrodes
magnetoresistance		RT:	Electron tubes
<i>Anisotropic effects</i>		<b>Anomaly detection</b>	
USE:	Anisotropic	UF:	Outlier detection
magnetoresistance		BT:	Data mining
<b>Anisotropic magnetoresistance</b>		<b>ANOVA</b>	
UF:	Anisotropic diffusion	USE:	Analysis of variance
	Anisotropic effects	<b>ANSI</b>	



# 2018 IEEE Thesaurus

UF: American National Institute  
of Standards  
BT: Standards organizations  
RT: ASA

## ANSI Standards

BT: Standards publications  
RT: ASA Standards  
IEEE Standards  
ISO Standards  
NT: National electric code

## Ant colony optimization

BT: Probability  
RT: Graph theory

## Antarctica

BT: Geoscience  
NT: South Pole

## Antenna accessories

UF: Antenna components  
BT: Antennas  
NT: Radomes

## Antenna arrays

UF: Distributed antennas  
BT: Antennas  
RT: Broadband antennas  
SIMO communication  
SISO communication  
NT: Adaptive arrays  
Butler matrices  
Linear antenna arrays  
Log periodic antennas  
Microstrip antenna arrays  
Microwave antenna arrays  
Phased arrays  
Planar arrays

## Antenna components

USE: Antenna accessories

## Antenna diversity

USE: Spatial diversity

## Antenna feeds

BT: Feeds  
RT: Antennas  
Aperture coupled antennas

## Antenna measurements

BT: Measurement  
RT: Anechoic chambers  
Antennas

Electromagnetic  
measurements

## Antenna phased arrays

USE: Phased arrays

## Antenna radiation patterns

UF: Radiation pattern  
BT: Antennas  
RT: Antenna theory  
NT: Near-field radiation pattern

## Antenna theory

BT: Antennas  
RT: Antenna radiation patterns  
Current distribution  
Mode matching methods  
Frequency selective

surfaces

## Antennas

BT: Antennas and propagation  
RT: Antenna feeds  
Antenna measurements  
Beam steering  
Butler matrices  
Fractals  
IEEE 802.11n Standard  
Microstrip antenna arrays  
Radio communication

equipment

Spatial diversity  
Waveguide theory  
NT: Antenna accessories  
Antenna arrays  
Antenna radiation patterns  
Antenna theory  
Apertures  
Broadband antennas  
Dielectric resonator

antennas

Dipole antennas  
Directional antennas  
Directive antennas  
Feeds  
Fractal antennas  
Helical antennas  
Horn antennas  
Leaky wave antennas  
Loaded antennas  
Log-periodic dipole

antennas

Microstrip antennas  
Microwave antennas  
Mobile antennas





# 2018 IEEE Thesaurus

	BT:	Ad hoc networks Wireless networks		NT:	System-on-chip
<i>APDs</i>			<b>Application specific processors</b>		
	USE:	Avalanche photodiodes		BT:	Program processors
<b>Aperture antennas</b>			<b>Application virtualization</b>		
	BT:	Apertures		UF:	Cross platform virtualization Cross-platform virtualization
	RT:	Aperture coupled antennas Reflector antennas		BT:	Computer applications
				RT:	Emulation Network function
<b>Aperture coupled antennas</b>			virtualization		
	BT:	Apertures			Simulation
	RT:	Antenna feeds Aperture antennas Microstrip antenna arrays Microstrip antennas		NT:	Edge computing
<b>Apertures</b>			<b>Applicators</b>		
	BT:	Antennas		BT:	Production equipment
	RT:	Couplers		RT:	Agricultural machinery Labeling
	NT:	Aperture antennas Aperture coupled antennas	<b>Appraisal</b>		
<i>Appearance matching</i>				BT:	Human resource
	USE:	Image matching	management		
<i>Appliances</i>				RT:	Incentive schemes Personnel
	USE:	Home appliances	<b>Appropriate technology</b>		
<b>Application programming interfaces</b>				BT:	Technology
	UF:	Mobile application		RT:	Microhydro power Picohydro power
development			<b>Approximate computing</b>		
	BT:	Computer interfaces		BT:	Computers and information
	RT:	Software defined	processing		
networking			<b>Approximation algorithms</b>		
	NT:	WebRTC		BT:	Algorithms
<b>Application security</b>			<b>Approximation error</b>		
	BT:	Computer security		BT:	Approximation methods
<b>Application software</b>			<b>Approximation methods</b>		
	BT:	Software		UF:	Approximation theory
<b>Application specific integrated circuits</b>				BT:	Numerical analysis
	UF:	ASIC Custom integrated circuits Semicustom integrated		RT:	Least squares
circuits			approximation		
	BT:	Circuits Integrated circuits			Minimization methods Signal representation
	RT:	Analog processing circuits CMOS logic circuits Field programmable analog		NT:	Approximation error Chebyshev approximation Curve fitting Extrapolation Function approximation Interpolation Linear approximation
arrays					





# 2018 IEEE Thesaurus

	Mean square error methods	<b>Architecture description languages</b>	UF: Architectural description languages
	Perturbation methods		BT: Computer languages
<i>Approximation theory</i>		<b>Arctic</b>	
USE: Approximation methods			BT: Geoscience
<b>Aquaculture</b>			NT: North Pole
UF: Fisheries		<b>Area measurement</b>	
BT: Agriculture			BT: Measurement
RT: Marine animals			RT: Size measurement
<b>Aquatic robots</b>		<b>Argon</b>	
UF: Swimming robots			UF: Ar
BT: Robots			BT: Gases
<i>Aquatic vehicles</i>		<b>Arithmetic</b>	
USE: Underwater vehicles			BT: Mathematics
<i>Ar</i>			NT: Digital arithmetic
USE: Argon			Fixed-point arithmetic
<b>Arc discharges</b>			Floating-point arithmetic
UF: Arc flash		<b>Armature</b>	
	Arc-flash		BT: Electromechanical devices
BT: Dielectric breakdown		<i>Armpit</i>	
RT: Electrostatic discharges			USE: Axilla
	High intensity discharge	<b>Arms</b>	
lamps			BT: Extremities
	Light sources		NT: Wrist
	Plasmas	<i>Arms (robotic)</i>	
<i>Arc flash</i>			USE: Manipulators
USE: Arc discharges		<b>ARPANET</b>	
<i>Arc lamps</i>			UF: Advanced Research Projects Agency Network
USE: Lighting			DARPA
<i>Arc-flash</i>			BT: Communication systems
USE: Arc discharges			RT: Internet
<b>Archaea</b>			Packet switching
BT: Organisms		<i>ARQ</i>	
<i>Architectural description languages</i>			USE: Automatic repeat request
USE: Architecture description languages		<i>Array</i>	
<b>Architecture</b>			USE: Arrays
BT: Industries		<i>Array processing</i>	
RT: Buildings			USE: Arrays AND Parallel processing
	Structural engineering	<b>Array signal processing</b>	
<i>Architecture (computer)</i>			
USE: Computer architecture			



# 2018 IEEE Thesaurus

UF:	Beamforming	USE:	Blood pressure
BT:	Signal processing		
RT:	Acoustic arrays		<i>Arterial wall structures</i>
	Acoustic transducers	USE:	Arteries
	Adaptive arrays		
	Blind source separation		<i>Arterial walls</i>
	Direction-of-arrival	USE:	Arteries
estimation			
	Signal resolution		
	Source separation		
	Time of arrival estimation		
<b>Arrayed waveguide gratings</b>		<b>Arteries</b>	
UF:	AWG device	UF:	Arterial wall structures
BT:	Optical waveguides		Arterial walls
RT:	Demultiplexing		Artery
	Integrated optics	BT:	Blood vessels
	Multiplexing	NT:	Arterial blood circulation
			Arterial blood pressure
			Arterial occlusion
			Carotid arteries
<b>Arrays</b>		<i>Arteriography</i>	
UF:	Array	USE:	Angiography
	Array processing		
BT:	Data structures	<b>Arteriosclerosis</b>	
NT:	Sensor arrays	BT:	Diseases
		NT:	Atherosclerosis
			Coronary arteriosclerosis
<b>Arresters</b>		<i>Artery</i>	
BT:	Surge protection	USE:	Arteries
RT:	Power system protection		
	Power system transients	<b>Arthritis</b>	
	Varistors	BT:	Diseases
<b>Arsenic</b>		<b>Artificial biological organs</b>	
BT:	Chemical elements	UF:	Artificial organs
NT:	Arsenic compounds	BT:	Prosthetics
		RT:	Biological systems
<b>Arsenic compounds</b>		NT:	Artificial heart
BT:	Arsenic		Artificial limbs
<b>Art</b>		<i>Artificial fibers</i>	
BT:	Graphics	USE:	Synthetic fibers
RT:	Computer graphics		
	Layout	<i>Artificial fibres</i>	
NT:	Digital art	USE:	Synthetic fibers
	Fractal art		
<b>Arterial blood circulation</b>		<b>Artificial heart</b>	
BT:	Arteries	BT:	Artificial biological organs
<b>Arterial blood pressure</b>		<b>Artificial immune systems</b>	
BT:	Arteries	BT:	Immune system
<b>Arterial occlusion</b>		<b>Artificial intelligence</b>	
BT:	Arteries	UF:	AI
		BT:	Computational and artificial intelligence
<i>Arterial pressure</i>			



# 2018 IEEE Thesaurus

	RT:	Autonomous automobiles Autonomous vehicles Computational intelligence Data mining Feedforward neural			
networks		Independent component		<b>Artificial satellites</b>	BT: Aerospace engineering RT: Satellite communication Satellites Space technology Space vehicles
analysis		Minimax techniques Natural languages Neural networks Neurocontrollers Pervasive computing Posthuman Prediction theory Radial basis function		NT:	Earth Observing System Low earth orbit satellites Military satellites Space stations
		Robot learning Semantic Web Software agents Support vector machines Synapses		<b>ASA</b>	
networks		NT: Affective computing Autonomous robots Cognitive systems Context awareness Cooperative systems Decision support systems Intelligent systems Knowledge based systems Knowledge engineering Learning (artificial		Institute	UF: American Standards BT: Standards organizations RT: ANSI
		Learning systems Machine learning Prediction methods Virtual artifact		<b>ASA Standards</b>	BT: Standards publications RT: ANSI Standards
intelligence)				<b>Ash</b>	BT: Industrial waste RT: Air pollution Exhaust gases Incineration Volcanic ash NT: Fly ash
				<b>Asia</b>	BT: Continents
<b>Artificial limbs</b>				<b>ASIC</b>	USE: Application specific integrated circuits
	BT:	Artificial biological organs Prosthetics		<b>ASK</b>	USE: Amplitude shift keying
<b>Artificial neural networks</b>				<b>Ask IEEE</b>	BT: Document delivery Information services
	BT:	Neural networks		<b>Asphalt</b>	UF: Bitumen BT: Building materials
	RT:	Mathematical model Neuromorphic engineering Synapses		<b>Asphyxia</b>	BT: Death
networks	NT:	Convolutional neural		<b>Aspirin</b>	BT: Drugs
		Hebbian theory Self-organizing feature		<b>ASR</b>	
maps					
<i>Artificial organs</i>	USE:	Artificial biological organs			



# 2018 IEEE Thesaurus

USE: Automatic speech  
recognition

## *Assemblers (program)*

USE: Program processors

## **Assembly**

BT: Manufacturing  
RT: Assembly systems  
Manipulators  
Manufacturing automation  
NT: Fitting  
Microassembly  
Preforms  
Soldering

## *Assembly robots*

USE: Robotic assembly

## **Assembly systems**

BT: Industrial electronics  
Manufacturing  
Production systems  
RT: Assembly  
Fitting  
Industrial control  
Manipulators  
Manufacturing automation  
Mobile robots  
Robots  
NT: Flexible electronics  
Robotic assembly

## **Asset management**

UF: Asset-management  
BT: Management  
NT: Public infrastructure

## *Asset-management*

USE: Asset management

## **Assisted living**

BT: Medical services  
RT: Aging  
Geriatrics  
Senior citizens  
NT: Ambient assisted living

## **Assistive devices**

BT: Assistive technology  
RT: Ambient assisted living

## *Assistive robotics*

USE: Rehabilitation robotics

## **Assistive technology**

UF: Aids for the handicapped  
Assistive devices  
Handicapped aids  
BT: Biomedical equipment  
RT: Communication aids  
Gaze tracking  
Gerontechnology  
Medical control systems  
Orthotics  
Prosthetics  
Sensory aids  
Sign language  
NT: Assistive devices  
Wheelchairs

## *Assistive devices*

USE: Assistive technology

## **Association rules**

BT: Data mining

## **Associative memory**

UF: Content addressable  
memory  
BT: Memory  
RT: Neural networks

## **Associative processing**

BT: Data processing  
RT: Computers and information  
processing

## **Astatine**

BT: Chemical elements

## *Asthma*

USE: Respiratory system

## **Astrochemistry**

UF: Planetary chemistry  
BT: Chemistry

## **Astronomy**

BT: Science - general  
RT: Extraterrestrial  
measurements  
Gamma-ray detectors  
Telescopes  
NT: Astrophysics  
Extrasolar planets  
Observatories  
Radio astronomy  
Solar system



# 2018 IEEE Thesaurus

## Astrophysics

BT: Astronomy  
Physics  
RT: Gravity measurement  
NT: Orbits  
Stellar dynamics

## Asymptotic stability

BT: System analysis and design  
RT: Discrete-time systems  
Stability

## Asynchronous circuits

BT: Circuits

## Asynchronous communication

BT: Data communication  
RT: Web services

## Asynchronous transfer mode

BT: Data communication  
Protocols  
RT: B-ISDN  
Broadband communication  
ISDN  
Multiprotocol label

switching

SONET

## Atherosclerosis

BT: Arteriosclerosis

## Atmosphere

BT: Geoscience  
RT: Atmospheric

measurements

NT: Meteorology  
Air quality  
Atmospheric modeling  
Atmospheric waves

## Atmospheric measurements

BT: Measurement  
RT: Air pollution  
Air quality  
Altimetry  
Atmosphere  
Geophysical measurements  
Global warming  
Meteorology  
Pressure gauges  
Remote sensing  
Terrestrial atmosphere

## Atmospheric modeling

BT: Atmosphere  
Modeling

## Atmospheric sintering

USE: Materials preparation

## Atmospheric waves

BT: Atmosphere  
Waves

## Atmospheric-pressure plasmas

BT: Plasmas

## Atom lasers

UF: Single atom lasers  
BT: Lasers  
RT: Atom optics  
Atomic beams  
Gas lasers

## Atom optics

UF: Atomic optics  
BT: Particle beam optics  
RT: Atom lasers  
Atomic beams

## Atomic batteries

UF: Nuclear batteries  
Tritium batteries  
BT: Energy conversion  
Nuclear power generation  
NT: Radioisotope thermoelectric  
generators

## Atomic beams

BT: Particle beams  
RT: Atom lasers  
Atom optics

## Atomic clocks

UF: Atomic frequency standards  
BT: Clocks  
RT: Frequency measurement  
International Atomic Time  
Masers

## Atomic force microscopy

BT: Microscopy  
RT: Casimir effect  
Magnetic force microscopy  
Nanotechnology  
Scanning microwave

microscopy

## Atomic frequency standards



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# 2018 IEEE Thesaurus

USE:	Atomic clocks		
<i>Atomic lasers</i>		<i>ATV</i>	
USE:	Gas lasers	USE:	HDTV
<b>Atomic layer deposition</b>		<i>Au</i>	
BT:	Chemical vapor deposition	USE:	Gold
<b>Atomic measurements</b>		<i>Audible noise</i>	
BT:	Measurement	USE:	Acoustic noise
RT:	Nuclear measurements	<b>Audio coding</b>	
	Radiation detectors	BT:	Encoding
	Spectroscopy		Information theory
<i>Atomic optics</i>		RT:	MPEG 7 Standard
USE:	Atom optics		Rate distortion theory
<i>ATPG</i>			Speech coding
USE:	Automatic test pattern	<b>Audio compression</b>	
generation		BT:	Data compression
<b>Atrial fibrillation</b>		<b>Audio databases</b>	
BT:	Fibrillation	BT:	Database systems
<b>Atrophy</b>		RT:	File systems
BT:	Medical conditions		Multimedia databases
<b>Attenuation</b>		<i>Audio enhancement</i>	
UF:	Acoustic wave attenuation	USE:	Acoustic signal processing
	Electromagnetic wave	AND	
attenuation			Noise reduction
	Light attenuation	<b>Audio recording</b>	
BT:	Propagation	BT:	Recording
RT:	Attenuation measurement	<i>Audio restoration</i>	
	Attenuators	USE:	Acoustic noise
	Diagnostic radiography	<b>Audio systems</b>	
	Insertion loss	UF:	Phonographs
<b>Attenuation measurement</b>			Sound systems
BT:	Electric variables		Stereophonic systems
measurement		BT:	Consumer electronics
RT:	Attenuation	RT:	Digital audio broadcasting
	Loss measurement		Music
<b>Attenuators</b>		NT:	Audio tapes
BT:	Signal processing		Audio-visual systems
RT:	Attenuation		Auditory displays
NT:	Optical attenuators		Headphones
<b>Attitude control</b>			Loudspeakers
BT:	Aerospace control		Microphones
RT:	Position control		Pitch control (audio)
<i>Attitude determination</i>			Portable media players
USE:	Position measurement	<b>Audio tapes</b>	
		BT:	Audio systems



# 2018 IEEE Thesaurus

## Audio user interfaces

UF: Auditory icons  
BT: User interfaces  
RT: Multimedia computing

## Audio visual systems

USE: Audio-visual systems

## Audio watermarking

USE: Watermarking

## Audio-visual instructional aids

USE: Educational technology

## Audio-visual systems

UF: Audio visual systems  
Audiovisual systems  
BT: Audio systems  
RT: Educational technology

## Audiovisual systems

USE: Audio-visual systems

## Auditory displays

BT: Audio systems  
Communication equipment  
RT: Aerospace and electronic  
systems  
Communication aids

## Auditory icons

USE: Audio user interfaces

## Auditory implants

UF: Auditory midbrain implants  
BT: Implants

## Auditory midbrain implants

USE: Auditory implants

## Auditory system

UF: Hearing  
BT: Anatomy  
RT: Biomedical acoustics  
Head  
Hearing aids  
Psychoacoustics  
NT: Psychoacoustic models

## Augmented reality

BT: Programming  
Virtual reality  
RT: Extended reality  
Network slicing

## Augmented virtuality

BT: Virtual reality

## Austenite

UF: Gamma phase iron  
BT: Iron alloys  
RT: Materials science and  
technology  
Smart materials

## Australia

BT: Continents

## Authentication

BT: Computer security  
RT: CAPTCHAs  
Image processing  
Interactive systems  
Multi-factor authentication  
Password  
Video signal processing

## Authoring systems

BT: Software tools  
RT: Computer aided instruction  
Courseware  
Multimedia systems  
Web design

## Authorisation

USE: Authorization

## Authorization

UF: Authorisation  
BT: Access control  
RT: Privacy

## Autism

BT: Medical conditions

## Autobiographies

UF: Memoirs  
BT: Biographies

## Autocorrelation

BT: Correlation  
RT: Signal analysis  
Time series analysis

## Automata

UF: Finite state machines  
BT: Robots  
RT: Cognitive systems  
Cybernetics



# 2018 IEEE Thesaurus

Intelligent systems  
NT: Turing machines

## *Automated guided vehicles*

USE: Autonomous vehicles

## **Automated highways**

BT: Automation  
Intelligent transportation

systems

RT: Road safety  
Smart transportation

## *Automated indexing*

USE: Machine assisted indexing

## *Automated storage and retrieval systems*

USE: Storage automation

## **Automatic control**

BT: Control systems  
NT: Power generation control

## **Automatic frequency control**

BT: Frequency control

## *Automatic gain control*

USE: Gain control

## **Automatic generation control**

BT: Automation  
Control systems  
Power generation

## *Automatic indexing*

USE: Machine assisted indexing

## **Automatic logic units**

BT: Microprocessors

## **Automatic meter reading**

BT: Meter reading  
RT: Flowmeters  
Smart meters

## **Automatic optical inspection**

BT: Inspection  
RT: Machine vision  
Manufacturing automation  
Pattern recognition

## **Automatic programming**

UF: Program generators  
BT: Programming

## *Automatic protection switching*

USE: Protection switching

## **Automatic repeat request**

UF: ARQ  
BT: Feedback communications

## **Automatic speech recognition**

UF: ASR  
BT: Speech recognition

## **Automatic test equipment**

BT: Test equipment  
RT: Automatic testing

## *Automatic Test Markup Language*

USE: XML

## **Automatic test pattern generation**

UF: ATPG  
BT: Automatic testing  
RT: Design automation  
NT: Test pattern generators

## **Automatic testing**

UF: Self testing  
BT: Automation  
Testing  
RT: Automatic test equipment  
Maintenance engineering  
NT: Automatic test pattern  
generation  
Ring generators

## **Automatic voltage control**

UF: AVC  
BT: Voltage control  
RT: Voltage  
Voltage measurement

## **Automation**

BT: Robotics and automation  
RT: Bagging  
Biometrics (access control)  
Flash memories  
Home automation  
Information technology  
Substation automation  
ZigBee  
NT: Automated highways  
Automatic generation

control

Automatic testing  
Building automation  
Manufacturing automation







# 2018 IEEE Thesaurus

## Autonomous agents

BT: Software agents

## Autonomous automobiles

UF: Autonomous cars  
Driver free automobiles  
Driver free cars  
Driver-free car  
Driverless automobiles  
Driverless cars  
Robot automobiles  
Robot cars  
Self-driving automobiles  
Self-driving car  
BT: Intelligent transportation systems

Mobile robots  
RT: Artificial intelligence

## Autonomous cars

USE: Autonomous automobiles  
AND Autonomous vehicles

## Autonomous driving

USE: Autonomous vehicles

## Autonomous mental development

BT: Computational and artificial intelligence

## Autonomous navigation

USE: Autonomous robots

## Autonomous robots

UF: Autonomous navigation  
BT: Artificial intelligence  
Autonomous systems  
Robots  
RT: Cognitive robotics  
Intelligent robots

## Autonomous systems

BT: Intelligent systems  
Robotics and automation  
NT: Autonomous robots  
Autonomous vehicles

## Autonomous trucks

USE: Autonomous vehicles

## Autonomous underwater vehicles

USE: Underwater autonomous vehicles

## Autonomous vehicles

UF: Automated guided vehicles  
Autonomous cars  
Autonomous driving  
Autonomous trucks  
Unmanned autonomous

## vehicle

BT: Autonomous systems  
Intelligent vehicles  
RT: Artificial intelligence  
Mechatronics  
Multi-agent systems  
Vehicular automation  
NT: Unmanned autonomous vehicles

## Autopsy

BT: Medical diagnosis  
RT: Pathology

## Autoregressive moving average models

USE: Autoregressive processes

## Autoregressive processes

UF: Autoregressive moving average models

Box Jenkins models  
BT: Statistics  
RT: Noise  
Time series analysis

## Auxetic materials

UF: Auxetics  
BT: Materials

## Auxetics

USE: Auxetic materials

## Auxiliary transmitters

BT: Transmitters

## Availability

UF: System availability  
BT: Reliability  
RT: Maintenance engineering

## Avalanche breakdown

BT: Electric breakdown

## Avalanche photodiodes

UF: APDs  
BT: Photodiodes  
RT: Optical fiber communication  
Photomultipliers



# 2018 IEEE Thesaurus

## Avatars

BT: Graphical user interfaces  
Virtual reality

## AVC

USE: Automatic voltage control

## Avionics

USE: Aerospace electronics

## Awards

BT: IEEE indexing

## AWG device

USE: Arrayed waveguide gratings

## AWGN

BT: Additive noise  
Gaussian noise  
White noise

## AWGN channels

BT: Gaussian channels  
RT: Intersymbol interference  
White noise

## Axilla

UF: Armpit  
Underarm  
BT: Shoulder

## Axles

BT: Mechanical products  
RT: Automotive components  
Wheels

## Axons

BT: Nerve fibers  
RT: Action potentials  
Myelin  
White matter

## Azimuth

BT: Mathematics  
NT: Azimuthal angle  
Azimuthal component  
Azimuthal current  
Azimuthal harmonics  
Azimuthal plane

## Azimuthal angle

BT: Azimuth

## Azimuthal component

BT: Azimuth

## Azimuthal current

BT: Azimuth

## Azimuthal harmonics

BT: Azimuth

## Azimuthal plane

BT: Azimuth

## Azobenzene

BT: Polymers  
RT: Smart materials

## B-ISDN

UF: Broadband ISDN  
BT: Broadband communication  
ISDN  
RT: Asynchronous transfer  
mode  
Data communication  
Frame relay  
Image communication  
Multimedia communication

## B-Spline

USE: Splines (mathematics)

## Ba

USE: Barium

## Babies

USE: Pediatrics

## Baby

USE: Pediatrics

## Back

BT: Body regions

## Background noise

BT: Acoustic noise

## Backplanes

BT: Data buses

## Backpropagation

UF: Backward propagation  
Backwards propagation of  
errors

BT: Learning systems  
RT: Backpropagation algorithms  
Neural networks

## Backpropagation algorithms



# 2018 IEEE Thesaurus

BT:	Algorithms		
RT:	Backpropagation		
<b>Backscatter</b>		<b>Ballistic transport</b>	
BT:	Reflection	BT:	Electron emission
RT:	Meteorological radar	NT:	Electronic ballasts
<i>Backscattering</i>		<b>Baluns</b>	
USE:	Scattering	BT:	Electromagnetic devices
<b>Backstepping</b>			Impedance matching
BT:	Control nonlinearities		Microwave technology
<i>Backward propagation</i>		RT:	Transmission lines
USE:	Backpropagation		
<i>Backwards propagation of errors</i>		<i>Band gap</i>	
USE:	Backpropagation	USE:	Photonic band gap
<i>Bacteria</i>		<i>Band pass filters</i>	
USE:	Microorganisms	USE:	Band-pass filters
<i>Bacterial content</i>		<i>Band-gap</i>	
USE:	Microorganisms	USE:	Photonic band gap
<b>Bacterial infections</b>		<b>Band-pass filters</b>	
BT:	Diseases	UF:	BPF
<b>Bagging</b>			Band pass filters
BT:	Packaging		Bandpass filters
RT:	Automation	BT:	Active filters
	Packaging machines	RT:	Frequency
	Plastic packaging		Signal processing
<b>Ball bearings</b>		NT:	Filter banks
BT:	Machinery	<i>Band-stop filters</i>	
RT:	Mechanical bearings	USE:	Notch filters
	Metal products	<i>Bandgap</i>	
	Rolling bearings	USE:	Photonic band gap
<i>Ball grid arrays</i>		<i>Bandpass filters</i>	
USE:	Electronics packaging	USE:	Band-pass filters
<b>Ball milling</b>		<b>Bandwidth</b>	
BT:	Production	BT:	Frequency
RT:	Milling machines	RT:	Admission control
<i>Ball screws</i>			Computer network
USE:	Mechanical products	management	Direct sequence spread
<i>Ballasts</i>		spectrum communication	Information theory
USE:	Electronic ballasts		Radio communication
			Signal processing
			Spectral efficiency
			Spectroscopy
		NT:	Narrowband
			Wideband
<b>Ballistic magnetoresistance</b>		<i>Bandwidth allocation</i>	
BT:	Magnetoresistance		



# 2018 IEEE Thesaurus

USE: Channel allocation

## *Bandwidth efficiency*

USE: Spectral efficiency

## *Bang bang control*

USE: Bang-bang control

## **Bang-bang control**

UF: Bang bang control

BT: Optimal control

RT: Time factors

## **Banking**

BT: Industries

RT: Finance

NT: Online banking

## **Bankruptcy**

BT: Finance

RT: Business

Commercial law

Economics

## **Bar codes**

UF: QR codes

BT: Optical detectors

Product codes

RT: Internet of Things

Inventory management

## *Barges*

USE: Boats

## **Barium**

UF: Ba

BT: Metals

NT: Barium compounds

## **Barium compounds**

BT: Barium

RT: Alloying

Yttrium barium copper

oxide

## *Baroreceptor reflex*

USE: Baroreflex

## **Baroreflex**

UF: Baroreceptor reflex

BT: Cardiovascular system

## **Bars**

BT: Structural shapes

NT: Billets

## **Basal ganglia**

BT: Brain

## **Base stations**

BT: Radio communication equipment

RT: Device-to-device communication

Femtocell networks

NT: Femtocells

## **Baseband**

BT: Digital communication

Radio communication

RT: Passband

## **Basis algorithms**

BT: Algorithms

## *Batch manufacturing*

USE: Batch production systems

## *Batch processing*

USE: Batch production systems

## **Batch production systems**

UF: Batch manufacturing

Batch processing

BT: Manufacturing systems

## **Batteries**

UF: Flow batteries

Secondary cells

Storage batteries

Storage battery

BT: Electrochemical devices

Energy conversion

Energy storage

RT: Battery charge

measurement

Battery chargers

Emergency power supplies

Lithium

Lithium compounds

Power generation

Uninterruptible power

systems

NT: Lead acid batteries

Lithium batteries

Lithium-ion batteries

Nickel cadmium batteries

Solid state batteries

## **Battery charge measurement**



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# 2018 IEEE Thesaurus

BT:	Charge measurement		
RT:	Batteries	<i>Bayesian methods</i>	
	Battery chargers	USE:	Bayes methods
	Battery powered vehicles		
<b>Battery chargers</b>		<i>Bayesian networks</i>	
UF:	Charging devices	USE:	Bayes methods
	Device chargers		
BT:	Power supplies	<b>Beak</b>	
RT:	Batteries	BT:	Animal structures
	Battery charge	RT:	Birds
measurement		<b>Beam steering</b>	
NT:	Charging stations	BT:	Microwave technology
	Electric vehicle charging	RT:	Antennas
	State of charge		
<b>Battery management systems</b>		<i>Beamforming</i>	
BT:	Electrochemical devices	USE:	Array signal processing
<b>Battery powered vehicles</b>		<b>Beams</b>	
BT:	Electric vehicles	UF:	Electromagnetic beams
RT:	Battery charge	BT:	Physics
measurement		NT:	Acoustic beams
	Energy storage		Laser beams
	Hybrid electric vehicles		Molecular beams
	Solar powered vehicles		Optical beams
	Traction motors		Particle beams
	Vehicle-to-grid	<b>Bean model</b>	
<b>Bayes methods</b>		UF:	Pry and Bean model
UF:	Bayesian approach	BT:	Superconductivity
	Bayesian belief networks	<i>Bearing estimation</i>	
	Bayesian estimation	USE:	Direction-of-arrival
	Bayesian inference	estimation	
	Bayesian learning	<b>Behavioral sciences</b>	
	Bayesian methods	BT:	Systems, man, and
	Bayesian networks	cybernetics	
BT:	Probability	RT:	Affective computing
RT:	Belief propagation		Cyberethics
NT:	Recursive estimation		Emotion recognition
<i>Bayesian approach</i>			Ergonomics
USE:	Bayes methods		Human factors
<i>Bayesian belief networks</i>			Medical services
USE:	Bayes methods		Persuasive systems
<i>Bayesian estimation</i>			Social computing
USE:	Bayes methods	NT:	System dynamics
<i>Bayesian inference</i>			Animal behavior
USE:	Bayes methods		Cognition
<i>Bayesian learning</i>			Consumer behavior
USE:	Bayes methods		Psychiatry
			Psychology
			Social intelligence
		<b>Belief propagation</b>	



# 2018 IEEE Thesaurus

	BT: Iterative algorithms		BT: Waves
	RT: Bayes methods		
<b>Bellows</b>		<i>BERT</i>	USE: Bit error rate
	BT: Mechanical products	<b>Beryllium</b>	BT: Chemical elements
	RT: Pistons		
	Pneumatic systems	<i>Bespoke production</i>	USE: Job production systems
	Pumps		
	Vacuum systems		
<b>Belts</b>		<b>Best practices</b>	BT: Management
	UF: Cambelts		Quality assurance
	Seat belts		RT: Business communication
	BT: Machine components		
	Machinery		
	RT: Automotive components	<b>Beta rays</b>	BT: Nuclear physics
	Camshafts		RT: Electrons
	Fasteners		
<i>Benchmark problems</i>		<i>Betavoltaic power sources</i>	USE: Radioactive materials
USE: Benchmark testing			
<i>Benchmark tasks</i>		<i>Bevel gears</i>	USE: Gears
USE: Benchmark testing			
<b>Benchmark testing</b>		<b>Beverage industry</b>	BT: Industries
	UF: Benchmark problems		RT: Bottling
	Benchmark tasks		Food industry
	Benchmarking		
	BT: Testing	<i>BI</i>	USE: Business intelligence
	RT: Performance evaluation		
<i>Benchmarking</i>		<i>Bi</i>	USE: Bismuth
USE: Benchmark testing			
<i>Benign masses</i>		<i>Bi-stable circuits</i>	USE: Bistable circuits
USE: Benign tumors			
<b>Benign tumors</b>		<b>Bibliographies</b>	BT: Writing
	UF: Benign masses		RT: Publishing
	BT: Tumors		
<i>BER</i>		<b>Bibliometrics</b>	BT: Publishing
USE: Bit error rate			NT: Citation analysis
<i>BER analysis</i>		<b>BiCMOS integrated circuits</b>	UF: BiMOS integrated circuits
USE: Bit error rate			BT: Bipolar transistor circuits
<i>BER performance</i>		<b>Bicycles</b>	BT: Land vehicles
USE: Bit error rate			RT: Sports equipment
<b>Berkelium</b>			
BT: Chemical elements			
<b>Berry phase</b>			



# 2018 IEEE Thesaurus

## *Bidirectional communication*

USE: Bidirectional control

## **Bidirectional control**

UF: Bidirectional communication

BT: Bidirectional reflectance  
Control systems

## **Bidirectional power flow**

BT: Power system control

## *Bidirectional reflectance*

USE: Bidirectional control

## **Bifurcation**

BT: Nonlinear equations  
RT: Chaos

## **Big Data**

BT: Data collection  
RT: Data handling  
Data mining  
Data storage systems  
Information management  
Information processing  
Information retrieval  
Linked data  
Neuroinformatics  
NoSQL databases  
NT: Big Data applications

## **Big Data applications**

BT: Big Data  
Computer applications  
RT: Cloud computing  
Data analysis  
Data systems  
Information analysis  
Information systems

## *Bilinear systems*

USE: Nonlinear systems

## **Billets**

BT: Bars

## **Bills of materials**

BT: Inventory management  
Materials requirements planning

## *BiMOS integrated circuits*

USE: BiCMOS integrated circuits

## **Binary codes**

BT: Codes  
NT: Reflective binary codes

## **Binary decision diagrams**

BT: Data structures

## **Binary phase shift keying**

UF: BPSK  
Binary phase-shift keying  
BT: Phase shift keying

## *Binary phase-shift keying*

USE: Binary phase shift keying

## **Binary search trees**

BT: Binary trees

## **Binary sequences**

BT: Sequences

## **Binary trees**

BT: Tree data structures  
NT: Binary search trees

## *Bio-MEMs*

USE: Biomedical microelectromechanical systems

## *Bio-nanotechnology*

USE: Bionanotechnology

## *Bioacoustics*

USE: Biomedical acoustics

## **Bioceramics**

BT: Biomedical materials  
RT: Ceramics industry  
Prosthetics

## **Biochemical analysis**

BT: Biochemistry

## **Biochemistry**

UF: Enzymes  
Hormones  
Metabolic networks  
Metabolism  
BT: Biology  
Chemistry  
RT: Biological cells  
Bioreactors  
Cell signaling  
Computational biochemistry





# 2018 IEEE Thesaurus

	Drugs	<b>Biogeography</b>	
	Molecular biophysics	BT:	Biodiversity
	Pharmaceutical technology		
	Pharmaceuticals	<b>Biographies</b>	
NT:	Amino acids	BT:	Writing
	Biochemical analysis	RT:	Engineering profession
	Peptides	NT:	Autobiographies
	Proteins		
	Receptor (biochemistry)	<b>Biohazards</b>	
<i>Biocomputing</i>		UF:	Germ warfare
USE:	Molecular computing	BT:	Hazards
		RT:	Chemical hazards
<i>Biocontrol</i>			Green products
USE:	Biological control systems		Medical treatment
			Terrorism
<i>Biocybernetics</i>		<b>Bioimpedance</b>	
USE:	Cybernetics	BT:	Biomedical engineering
			Current
<b>Biodegradable materials</b>		RT:	Blood flow
BT:	Biodegradation		
<b>Biodegradation</b>		<b>Bioinformatics</b>	
BT:	Environmental	BT:	Engineering in medicine
management		and biology	
RT:	Waste management	RT:	Biology
NT:	Biodegradable materials		Biomedical informatics
			Computational biochemistry
<b>Biodiversity</b>			Computational biology
BT:	Biology		Computational biophysics
NT:	Biogeography	NT:	Neuroinformatics
		<b>Biological cells</b>	
<b>Bioelectric phenomena</b>		UF:	Cell biology
UF:	Electrobiology		Chromosomes
BT:	Biology	BT:	Biology
RT:	Brain	RT:	Biochemistry
	Electrical accidents		Biological materials
	Electroencephalography		Biomembranes
	Electromyography		DNA
	Electrooculography		Microorganisms
	Nervous system		Self-assembly
NT:	Electric shock	NT:	Cell signaling
			Cells (biology)
<i>Bioelectric potentials</i>			Chromosome mapping
USE:	Action potentials		Fibroblasts
			RNA
<i>Bioengineering</i>			Stem cells
USE:	Biomedical engineering	<i>Biological clocks</i>	
		USE:	Chronobiology
<i>Biofeedback</i>		<b>Biological control systems</b>	
USE:	Biological control systems	UF:	Biocontrol
			Biofeedback
<b>Biofuels</b>			
BT:	Fuels		



# 2018 IEEE Thesaurus

BT: Systems, man, and  
cybernetics

RT: Immune system  
Legged locomotion  
Prosthetics  
NT: Biomarkers

## *Biological effects of protons*

USE: Proton effects

## **Biological effects of radiation**

UF: Biological radiation effects  
BT: Radiation effects  
RT: Biomedical applications of  
radiation

Neutron capture therapy  
Occupational health  
Proton therapy  
Radiation protection

## *Biological EPR*

USE: Electron paramagnetic  
resonance

## **Biological information theory**

BT: Biology  
Information theory  
RT: DNA  
Genetic communication

## **Biological interactions**

BT: Biological processes

## *Biological macromolecules*

USE: Molecular biophysics

## *Biological markers*

USE: Biomarkers

## **Biological materials**

BT: Materials  
RT: Biological cells  
Biomedical materials  
Fats  
Tissue engineering

## *Biological membranes*

USE: Biomembranes

## **Biological neural networks**

UF: Neuronal networks  
BT: Neural networks  
Neurophysiology

## *Biological organs*

USE: Biological systems

## **Biological processes**

BT: Biology  
NT: Biological interactions  
Chronobiology  
Circadian rhythm  
Coagulation  
Molecular biology  
Symbiosis

## *Biological radiation effects*

USE: Biological effects of  
radiation

## *Biological sensors*

USE: Biosensors

## **Biological system modeling**

BT: Biology  
RT: Synthetic biology

## *Biological systematics*

USE: Systematics

## **Biological systems**

UF: Biological organs  
Organs (biological)  
BT: Biology  
RT: Animals  
Artificial biological organs  
Biomedical engineering  
NT: Anatomy  
Molecular communication  
Organisms

## **Biological techniques**

BT: Biomedical engineering  
RT: Biomedical equipment

## *Biological tissue*

USE: Biological tissues

## **Biological tissues**

UF: Biological tissue  
Tissues  
BT: Anatomy  
NT: Bone tissue  
Breast tissue  
Cardiac tissue  
Connective tissue  
Glands  
Neoplasms

## **Biology**



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# 2018 IEEE Thesaurus

BT: Engineering in medicine  
and biology

RT: Science - general  
Bioinformatics  
Computational biology  
Immune system  
Life sciences

NT: Biochemistry  
Biodiversity  
Bioelectric phenomena  
Biological cells  
Biological information

theory

Biological processes  
Biological system modeling  
Biological systems  
Biology computing  
Biophotonics  
Biophysics  
Cryobiology  
Evolution (biology)  
Genetics  
Homeostasis  
Microinjection  
Nanobioscience  
Physiology  
Predator prey systems  
Synthetic biology  
Systematics  
Systems biology  
Vegetation  
Zoology

## Biology computing

BT: Biology  
RT: Biomedical computing  
Computers and information

processing

## Bioluminescence

BT: Luminescence

## Biomagnetics

UF: Biomagnetism  
BT: Biophysics  
Magnetism

RT: Biomedical engineering  
Magnetic fields  
Magnetic materials  
Magnetic particles

NT: Magnetoencephalography

## Biomagnetism

USE: Biomagnetics

## Biomarkers

UF: Biological markers  
Human disease markers

BT: Biological control systems  
Biomedical measurement

NT: Molecular biomarkers

## Biomass

BT: Renewable energy sources

## Biomechanics

BT: Mechanical factors

RT: Anthropometry  
Cell signaling

## Biomechatronics

BT: Mechatronics

## Biomedical acoustics

UF: Bioacoustics  
Biomedical ultrasonics

BT: Acoustics

RT: Acoustic applications  
Acoustic measurements  
Auditory system

## Biomedical applications of electromagnetic radiation

USE: Biomedical applications of radiation

## Biomedical applications of radiation

UF: Biomedical applications of electromagnetic radiation

BT: Radiation therapy  
Biomedical engineering  
Nuclear and plasma

sciences

RT: Angiocardiology  
Biological effects of

radiation

Biomedical imaging  
Cancer  
Collimators  
Computed tomography  
Gamma-ray detectors  
Medical treatment  
Positron emission

tomography

Radiation effects  
Radiography  
Synchrotron radiation

## Biomedical communication

BT: Communication systems



# 2018 IEEE Thesaurus

and biology	Engineering in medicine	processing	Biomedical signal
communication systems	RT: Picture archiving and NT: Biomedical telemetry Telemedicine		Biotechnology Cloning Drug delivery Neural engineering Protein engineering Tissue engineering
<b>Biomedical computing</b>		<b>Biomedical engineering education</b>	
UF: Medical computing		BT: Engineering education	
BT: Engineering in medicine		RT: Biomedical engineering	
and biology		<b>Biomedical equipment</b>	
RT: Biology computing Biomedical signal		UF: Clinical equipment Medical equipment	
processing	Computer applications Picture archiving and	BT: Engineering in medicine	
communication systems	Signal processing	and biology	
NT: Biomedical informatics Medical expert systems Medical information		RT: Biological techniques Biomedical electronics Biomedical measurement Biomedical microelectromechanical systems	
systems		Collimators Electrocardiography Electroencephalography Insulin pumps Medical control systems Medical robotics Molecular biophysics Nanosensors Needles Orthotics Prosthetics Sensory aids Speech synthesis Surgery ZigBee	
<b>Biomedical electrodes</b>		NT: Assistive technology Biomedical electrodes Biomedical telemetry Biomedical transducers Catheters Cybercare Endoscopes Gerontechnology Hypodermic needles Implants Intracranial pressure	
BT: Biomedical equipment			
RT: Biomedical engineering Biomedical measurement Electrophysiology			
<b>Biomedical electronics</b>			
BT: Biomedical engineering			
RT: Biomedical equipment			
<b>Biomedical engineering</b>			
UF: Bioengineering			
BT: Engineering in medicine			
and biology			
RT: Biological systems Biomagnetics Biomedical electrodes Biomedical engineering			
education	Biomedical monitoring Biomedical optical imaging Colloidal lithography Genetic communication Genetic engineering Hospitals Microfluidics Orthotics		
	NT: Bioimpedance Biological techniques Biomedical applications of	sensors	Lithotriptors Medical instruments Pacemakers Stethoscope Surgical instruments
radiation	Biomedical electronics		



# 2018 IEEE Thesaurus

## Biomedical image processing

UF: Medical image processing  
 BT: Biomedical signal  
 processing  
 RT: Biomedical imaging  
 Biomedical optical imaging  
 Functional magnetic  
 resonance imaging  
 Magnetoencephalography  
 Subtraction techniques  
 NT: Imaging phantoms  
 Motion artifacts  
 Neuroimaging  
 Radiographic image  
 enhancement  
 Radiology  
 Ultrasonography  
 Whole body imaging

## Biomedical imaging

UF: Biomedical X-ray imaging  
 Medical imaging  
 Tomosynthesis  
 BT: Engineering in medicine  
 and biology  
 Imaging  
 RT: Biomedical applications of  
 radiation  
 Biomedical image  
 processing  
 Data visualization  
 Isosurfaces  
 Medical diagnosis  
 Molecular biophysics  
 Picture archiving and  
 communication systems  
 Radiation imaging  
 Tomography  
 Ultrasonic imaging  
 NT: Angiocardiology  
 Angiography  
 Biomedical optical imaging  
 Cardiology  
 DICOM  
 Elastography  
 Encephalography  
 Mammography  
 Medical diagnostic imaging  
 Molecular imaging  
 Phantoms  
 Photoacoustic imaging

## Biomedical informatics

BT: Biomedical computing

Informatics

RT: Bioinformatics

## Biomedical infrared imaging

USE: Biomedical optical imaging

## Biomedical instruments

USE: Biomedical measurement

## Biomedical materials

BT: Materials  
 RT: Biological materials  
 Diamond-like carbon  
 Molecular biophysics  
 NT: Bioceramics  
 Biomembranes

## Biomedical measurement

UF: Biomedical instruments  
 Biomedical measurements  
 BT: Measurement  
 RT: Anthropometry  
 Biomedical electrodes  
 Biomedical equipment  
 Biosensors  
 NT: Biomarkers  
 Biomedical monitoring  
 Electroencephalography  
 Electromyography  
 Electrooculography  
 Electrophysiology  
 Photoplethysmography  
 Reproducibility of results  
 Sensitivity and specificity

## Biomedical measurements

USE: Biomedical measurement

## Biomedical microelectromechanical systems

UF: Bio-MEMs  
 BT: Micromechanical devices  
 RT: Biomedical equipment

## Biomedical monitoring

BT: Biomedical measurement  
 RT: Biomedical engineering  
 Phonocardiography  
 NT: Nanomedicine

## Biomedical MRI

USE: Magnetic resonance  
 imaging

## Biomedical optical imaging

UF: Biomedical infrared imaging



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# 2018 IEEE Thesaurus

<b>Biorthogonal modulation</b>	BT: Wavelet transforms	BT: Animals	RT: Beak
<b>Biosensors</b>	UF: Biological sensors	<b>Birefringence</b>	BT: Optics
sensors	BT: Chemical and biological	RT: Photorefractive effect	Photorefractive materials
	RT: Biomedical measurement		Refractive index
			Thermooptic effects
<b>Biosphere</b>	BT: Environmental factors	<b>Birth disorders</b>	BT: Amniocentesis
	Geoscience		
<b>Biotechnology</b>	BT: Biomedical engineering	<b>Bismuth</b>	UF: Bi
	RT: Genetic engineering	BT: Metals	RT: Bismuth compounds
<i>Biotelemetry</i>	USE: Biomedical telemetry	<b>Bismuth compounds</b>	UF: BSCCO
		BT: Compounds	RT: Alloying
<b>Bioterrorism</b>	BT: Engineering in medicine		Bismuth
and biology	Terrorism	<i>BIST</i>	USE: Built-in self-test
<b>Bipartite graph</b>	BT: Graph theory	<i>Bistability (optical)</i>	USE: Optical bistability
<i>Biped locomotion</i>	USE: Legged locomotion	<b>Bistable circuits</b>	UF: Bi-stable circuits
		BT: Circuits	NT: Latches
<b>Bipolar integrated circuits</b>	BT: Bipolar transistor circuits	<i>Bistable multivibrator</i>	USE: Pulse circuits
	RT: Bipolar transistors	<b>Bistatic radar</b>	BT: Radar
<b>Bipolar transistor circuits</b>	BT: Circuits	<i>Bit allocation</i>	USE: Bit rate
	RT: Parameter extraction	<b>Bit error rate</b>	UF: BER
	NT: BiCMOS integrated circuits		BER analysis
	Bipolar integrated circuits		BER performance
<b>Bipolar transistors</b>	BT: Power semiconductor		BERT
switches	RT: Bipolar integrated circuits		Bit error rate test
	Proton radiation effects	BT: Error analysis	
layers	Semiconductor epitaxial	<i>Bit error rate test</i>	USE: Bit error rate
	Transistors		
	NT: Insulated gate bipolar		
transistors	Kirk field collapse effect		
<b>Birds</b>			



# 2018 IEEE Thesaurus

## *Bit interleaved coded*

USE: Interleaved codes

## **Bit rate**

UF: Bit allocation  
Bitrate  
BT: Timing  
RT: Communication system

## signaling

Computer networks  
Signal processing

## *Bit-interleaved coded*

USE: Interleaved codes

## **Bitcoin**

BT: Cryptocurrency  
RT: Cryptography  
Finance  
Online banking

## *Bitrate*

USE: Bit rate

## *Bitumen*

USE: Asphalt

## *Black lead*

USE: Graphite

## *BlackBerry*

USE: Handheld computers

## *Blacklist*

USE: Blacklisting

## **Blacklisting**

UF: Blacklist  
BT: Access control  
RT: Computer security  
Countermeasures

(computer)

## **Bladder**

BT: Urogenital system

## **Blades**

UF: Vanes  
BT: Mechanical products  
RT: Agricultural machinery  
Cutting tools  
Fans  
Impellers  
Propellers  
Turbomachinery

## **Blanking**

BT: Manufacturing systems  
RT: Metal products  
Metals  
Sheet metal processing

## **Blast furnaces**

BT: Furnaces  
RT: Smelting

## **Bleaching**

BT: Materials processing  
RT: Manufacturing systems  
Paper making  
Process control  
Textile technology

## *Bleeding*

USE: Hemorrhaging

## *Blind channel estimation*

USE: Blind equalizers

## *Blind equalisers*

USE: Blind equalizers

## **Blind equalizers**

UF: Blind channel estimation  
Blind equalisers  
BT: Equalizers

## *Blind signal separation*

USE: Blind source separation

## **Blind source separation**

UF: Blind signal separation  
BT: Source separation  
RT: Adaptive signal detection  
Array signal processing  
Independent component

## analysis

Signal analysis  
Signal detection

## **Blindness**

BT: Medical conditions  
RT: Visual prosthesis

## **Blob detection**

BT: Computer vision  
Image processing  
RT: Feature extraction

## **Block codes**





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UF:	Block coding	RT:	Radio communication
BT:	Channel coding	RT:	Communication equipment
RT:	Mobile communication		Digital communication
NT:	Linear codes		IEEE 802.11 Standard
			IEEE 802.11g Standard
			IEEE 802.11n Standard
			IEEE 802.15 Standard
			Land mobile radio
			Land mobile radio cellular
<i>Block coding</i>			
USE:	Block codes		
<i>Blogging</i>			
USE:	Blogs	systems	
			Protocols
			Spread spectrum
<b>Blogs</b>			
UF:	Blogging	communication	
BT:	Information retrieval		Wireless LAN
RT:	Electronic mail		Wireless communication
	Internet		ZigBee
	Social network services		
		<i>BNCT</i>	
<b>Blood</b>		USE:	Neutron capture therapy
BT:	Blood vessels		
NT:	Blood platelets	<b>BNSC</b>	
	Coagulation	UF:	British National Space
	Red blood cells	Centre	
	White blood cells	BT:	Organizations
<i>Blood clots</i>		<i>Boat building industry</i>	
USE:	Coagulation	USE:	Shipbuilding industry
<b>Blood flow</b>		<b>Boats</b>	
BT:	Blood pressure	UF:	Barges
RT:	Bioimpedance		Yachts
NT:	Hemodynamics	BT:	Marine vehicles
<b>Blood platelets</b>		<i>Body area networking</i>	
BT:	Blood	USE:	Body area networks
RT:	Coagulation		
		<b>Body area networks</b>	
<b>Blood pressure</b>		UF:	Body area networking
UF:	Arterial pressure	BT:	Personal area networks
BT:	Blood vessels		
NT:	Blood flow	<b>Body regions</b>	
	Blood pressure variability	BT:	Anatomy
		NT:	Abdomen
<b>Blood pressure variability</b>			Back
BT:	Blood pressure		Breast
			Extremities
<b>Blood vessels</b>			Head
BT:	Cardiovascular system		Neck
NT:	Arteries		Pelvis
	Blood		Perineum
	Blood pressure		Thorax
	Veins		Torso
			Viscera
<b>Bluetooth</b>			
BT:	Personal area networks	<b>Body sensor networks</b>	



# 2018 IEEE Thesaurus

	BT:	Personal area networks Wireless sensor networks		<b>Bone diseases</b>	BT:	Diseases
					NT:	Osteoarthritis Osteoporosis
<b>Boilers</b>	BT:	Heating systems		<b>Bone tissue</b>	BT:	Biological tissues
	RT:	Heat recovery Steam engines Turbines Waste heat			RT:	Bones
					NT:	Cancellous bone Cortical bone
<b>Bolometers</b>	BT:	Radiation detectors		<b>Bones</b>	BT:	Skeleton
	RT:	Infrared detectors Temperature measurement			RT:	Bone tissue Skull
<i>Bolts</i>					NT:	Bone density Pelvic bones
	USE:	Fasteners		<i>Bonuses</i>	USE:	Incentive schemes
<b>Boltzmann distribution</b>	BT:	Statistics		<b>Book reviews</b>	BT:	IEEE indexing
	NT:	Lattice Boltzmann methods		<b>Boolean algebra</b>	BT:	Algebra
<b>Boltzmann equation</b>	UF:	Boltzmann transport equation			RT:	Logic Logic gates Set theory
	BT:	Equations			NT:	Boolean functions
<i>Boltzmann transport equation</i>	USE:	Boltzmann equation		<b>Boolean functions</b>	BT:	Boolean algebra
<i>Bomb</i>	USE:	Weapons			RT:	Fault trees
<b>Bonding</b>	BT:	Bonding processes			NT:	Logic functions
	RT:	Manufacturing Materials processing		<b>Boosting</b>	BT:	Machine learning Supervised learning
	NT:	Adhesives		<b>Bootling</b>	BT:	Operating systems
<b>Bonding forces</b>	BT:	Materials testing		<b>Boring</b>	BT:	Machining
<b>Bonding processes</b>	BT:	Fabrication Joining processes			RT:	Drilling Milling Turning
	RT:	Soldering Welding		<b>Boron</b>	BT:	Chemical elements Metals
	NT:	Bonding Diffusion bonding Wafer bonding			RT:	Fertilizers
<b>Bone density</b>					NT:	Boron alloys
	BT:	Bones				
	RT:	Density measurement				



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## Boron alloys

BT: Boron  
RT: Magnetic materials

## Boron neutron capture therapy

USE: Neutron capture therapy

## Bot (Internet)

UF: WWW robot  
Web robot  
BT: Computer applications  
Internet  
World Wide Web  
RT: Crawlers

## Botnet

BT: Interconnected systems  
Internet  
Software agents  
RT: Computer crime  
Distributed denial-of-service  
attack  
Robots

## Bottling

BT: Packaging  
RT: Beverage industry  
Glass products  
Packaging machines  
Plastic products

## Boundary conditions

BT: Boundary value problems  
NT: Upper bound

## Boundary element methods

BT: Partial differential equations  
RT: Integral equations  
Method of moments

## Boundary value problems

BT: Mathematics  
RT: Partial differential equations  
NT: Boundary conditions

## Bovine

BT: Animals  
NT: Cows

## Box Jenkins models

USE: Autoregressive processes

## BPF

USE: Band-pass filters

## BPR

USE: Business process re-engineering

## BPSK

USE: Binary phase shift keying

## Brachial

USE: Brachytherapy

## Brachytherapy

UF: Brachial  
BT: Medical treatment  
RT: Radiation effects

## Bragg gratings

UF: Fiber Bragg gratings  
Fiber-Bragg gratings  
BT: Filters  
Optical devices  
RT: Diffraction  
Diffraction gratings  
Laser beams  
Light deflectors  
Optical beams  
Optical transmitters  
Temperature sensors  
Wavelength division

## multiplexing

NT: Fiber gratings

## Brain

BT: Nervous system  
RT: Bioelectric phenomena  
Cerebrospinal fluid  
Cognition  
Cognitive informatics  
Cognitive science  
Diffusion tensor imaging  
Electroencephalography  
Encephalography  
Head  
Intracranial pressure

## sensors

Magnetoencephalography  
Synapses  
White matter  
NT: Basal ganglia  
Brain cells  
Brain injuries  
Brain modeling  
Brain ventricles  
Brainstem  
Cerebellum  
Cerebral cortex



# 2018 IEEE Thesaurus

Cerebrum  
Corpus callosum  
Forebrain  
Frontal lobe  
Hindbrain  
Hypothalamus  
Limbic system  
Midbrain  
Neural activity  
Neural implants  
Neurodynamics  
Neurophysiology  
Neuropsychology  
Neurotechnology  
Occipital Lobe  
Parietal lobe  
Primary motor cortex  
Sleep  
Temporal lobe  
Thalamus  
Ventricle system  
Virtual artifact

## Brain cells

BT: Brain

## Brain computer interfaces

USE: Brain-computer interfaces

## Brain implants

USE: Neural implants

## Brain injuries

BT: Brain  
Injuries

## Brain interfaces

USE: Brain-computer interfaces

## Brain machine interfaces

USE: Brain-computer interfaces

## Brain mapping

BT: Nervous system  
NT: Neuroimaging

## Brain modeling

UF: Brain modelling  
BT: Brain  
Modeling

## Brain modelling

USE: Brain modeling

## Brain plasticity

USE: Neuroplasticity

## Brain stem

USE: Brainstem

## Brain stem implants

USE: Brainstem implants

## Brain stimulation

BT: Medical treatment

## Brain ventricles

BT: Brain

## Brain-computer interaction

USE: Brain-computer interfaces

## Brain-computer interfaces

UF: Brain computer interfaces  
Brain interfaces  
Brain machine interfaces  
Brain-computer interaction  
Brain-computer-interfaces  
Brain-machine interfaces  
Mind-machine interfaces  
BT: User interfaces  
RT: Neural engineering

## Brain-computer-interfaces

USE: Brain-computer interfaces

## Brain-machine interfaces

USE: Brain-computer interfaces

## BrainLobe

USE: Frontal lobe

## Brainstem

UF: Brain stem  
BT: Brain

## Brainstem implants

UF: Brain stem implants  
BT: Implants

## Brakes

BT: Control systems  
Mechanical products  
RT: Automotive components

## Brand management

BT: Marketing management  
RT: Market research  
Product development



# 2018 IEEE Thesaurus

## Brazing

BT: Soldering  
RT: Welding

## Breadboard circuit

UF: Plugboard  
Solderless breadboard  
BT: Electronic circuits

## Breakdown

USE: Electric breakdown

## Breakdown voltage

BT: Voltage  
RT: Current  
Diodes  
Insulators

## Breast

BT: Body regions  
NT: Breast biopsy  
Breast cancer  
Breast tissue  
Breast tumors

## Breast biopsy

BT: Breast

## Breast cancer

UF: Breast-cancer  
BT: Breast  
Cancer

## Breast neoplasms

UF: Mammary neoplasms  
BT: Neoplasms

## Breast tissue

UF: Breast tissues  
BT: Biological tissues  
Breast

## Breast tissues

USE: Breast tissue

## Breast tumor

USE: Breast tumors

## Breast tumors

UF: Breast tumor  
Breast tumour  
Breast tumours  
BT: Breast  
Tumors

## Breast tumour

USE: Breast tumors

## Breast tumours

USE: Breast tumors

## Breast-cancer

USE: Breast cancer

## Bremsstrahlung

BT: Electromagnetic radiation

## Bridge circuits

BT: Circuits  
RT: Rectifiers

## Bridges

BT: Structural shapes  
RT: Civil engineering  
Structural engineering  
Transportation

## Brightness

BT: Optics  
NT: Brightness temperature

## Brightness temperature

BT: Brightness

## Brillouin scattering

BT: Scattering

## Bring your own device

UF: BYOD  
BT: Information technology  
RT: Mobile computing  
Office automation  
Personnel  
Security  
Smart phones

## British National Space Centre

USE: BNSC

## Broadband amplifiers

UF: Wideband amplifiers  
BT: Amplifiers  
Broadband communication

## Broadband antennas

UF: Wideband antennas  
BT: Antennas  
RT: Antenna arrays  
Microstrip  
Microwave propagation



# 2018 IEEE Thesaurus

NT:	UHF propagation Ultra wideband antennas Vivaldi antennas	RT:	Flame retardants
<b>Broadband communication</b>		<i>Bronchi</i>	USE: Respiratory system
UF:	Broadband networks	<b>Bronchoscopy</b>	BT: Medical diagnosis
BT:	Communication systems	<b>Brownian motion</b>	UF: Fractional brownian motion
RT:	Asynchronous transfer	BT:	Random processes
mode	Cable TV Frequency division	RT:	Diffusion processes
multiaccess	IEEE 802.16 Standard IPTV Multimedia communication Optical fiber communication Ultra wideband	<b>Browsers</b>	UF: Google Chrome Web browsers
communication	Video on demand	BT:	Computer interfaces
NT:	B-ISDN Broadband amplifiers	RT:	User interfaces
<i>Broadband ISDN</i>		<b>Brushes</b>	BT: Contacts RT: Rotating machines
USE:	B-ISDN	<b>Brushless DC motors</b>	UF: Brushless direct current
<i>Broadband networks</i>		motors	BT: Brushless motors DC motors
USE:	Broadband communication	<i>Brushless direct current motors</i>	USE: Brushless DC motors
<b>Broadcast technology</b>		<b>Brushless machines</b>	BT: Electric machines
NT:	Broadcasting	<b>Brushless motors</b>	BT: Motors NT: Brushless DC motors
<b>Broadcasting</b>		<i>BSCCO</i>	USE: Bismuth compounds
UF:	Broadcasts	<b>Buck converters</b>	BT: DC-DC power converters
BT:	Broadcast technology	<i>Buckeyballs</i>	USE: Fullerenes
RT:	Entertainment industry	<i>Buckminsterfullerene</i>	USE: Fullerenes
NT:	Digital audio broadcasting Digital multimedia	<i>Buckyballs</i>	USE: Fullerenes
broadcasting	Digital video broadcasting Motion pictures Radio broadcasting Satellite broadcasting Web TV	<i>Buckytubes</i>	
<i>Broadcasts</i>			
USE:	Broadcasting		
<b>Bromine</b>			
BT:	Chemical elements		
NT:	Bromine compounds		
<b>Bromine compounds</b>			
UF:	Organobromine compounds		
BT:	Bromine Chemical compounds		



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USE:	Fullerenes	photovoltaics	Building integrated
<b>Buffer layers</b>			Furnaces
BT:	Thin films		Lighting
RT:	Diffusion processes		Space heating
	Semiconductor films		Wiring
	Semiconductor growth	NT:	Building automation
			Elevators
<b>Buffer overflows</b>			Facilities management
BT:	Computer crashes		
<b>Buffer storage</b>		<i>Building-integrated photovoltaics</i>	
BT:	Memory	USE:	Building integrated
RT:	Data handling	photovoltaics	
	Telecommunication buffers		
NT:	Computer buffers	<b>Buildings</b>	
<b>Bugs</b>		UF:	Space habitats
USE:	Computer bugs	BT:	Construction
		RT:	Air conditioning
			Architecture
			Civil engineering
<b>Building automation</b>			Construction industry
BT:	Automation		Elevators
	Building services		Industrial power systems
RT:	Construction industry		Lighting
			Modular construction
<b>Building integrated photovoltaics</b>			Prefabricated construction
UF:	Building-integrated		Smart cities
photovoltaics			Space cooling
	Roof mounted photovoltaics		Vents
	Roof mounted solar cell	NT:	Building materials
arrays			Building services
BT:	Photovoltaic systems		Flexible structures
RT:	Building services		Intelligent structures
	Solar power generation		Smart buildings
			Smart homes
<b>Building materials</b>			
BT:	Buildings	<b>Built-in self-test</b>	
	Materials	UF:	BIST
RT:	Aggregates		Self-testing
	Construction	BT:	Testing
	Construction industry	RT:	Circuit testing
	Prefabricated construction		Design for testability
	Structural beams		
NT:	Asphalt	<b>Bulk acoustic wave devices</b>	
	Concrete	BT:	Acoustic devices
	Floors	RT:	Film bulk acoustic
	Mortar	resonators	
	Tiles		
	Windows	<b>Bulk storage</b>	
<b>Building services</b>		BT:	Material storage
BT:	Buildings	RT:	Containers
RT:	Access control		
	Air conditioning	<b>Bundle adjustment</b>	
		BT:	Three-dimensional displays



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## Buoyancy

BT: Fluid dynamics  
RT: Fluids  
Physics

Management  
Operations research  
Organizations

## Buried object detection

UF: Buried objects  
Underground object

detection

BT: Underground objects  
Object detection  
RT: Geophysical measurements  
Ground penetrating radar  
NT: Landmine detection

## Buried objects

USE: Buried object detection

## Burnishing

BT: Surface finishing  
RT: Machining

## Burst switching

BT: Packet switching  
NT: Optical burst switching

## Bushings

USE: Insulators

## Business

UF: Commerce  
Trade  
BT: Engineering management  
RT: Bankruptcy  
Business process

integration

management

Business process

Commercial law  
Consortia  
Contracts  
Employment  
Enterprise resource

planning

Finance  
Industrial communication  
Industries  
International trade  
Manufacturing  
Productivity  
Service computing  
NT: Business data processing  
Business intelligence  
Entrepreneurship  
Industrial relations

## Business communication

BT: Organizational aspects  
RT: Best practices

## Business continuity

BT: Management  
RT: Security  
System recovery  
Venture capital

## Business data processing

BT: Business  
Data processing  
RT: Information processing

## Business intelligence

UF: BI  
BT: Business  
Data analysis  
RT: Competitive intelligence  
Data mining  
Strategic planning

## Business organisation

USE: Organizational aspects

## Business organization

USE: Organizational aspects

## Business process integration

BT: Enterprise resource  
planning  
RT: Process planning  
Business  
Resource management  
Supply chain management  
Systems engineering and

theory

## Business process management

BT: Management  
Process planning  
RT: Business  
Resource management  
Supply chain management  
Systems engineering and  
theory  
NT: Task analysis

## Business process re-engineering

UF: BPR





# 2018 IEEE Thesaurus

BT: Management  
RT: Corporate acquisitions  
Organizational aspects  
Total quality management  
WS-BPEL

## *Business writing*

USE: Writing

## **Butler matrices**

UF: Butler matrix  
BT: Antenna arrays  
RT: Antennas  
IEEE 802.11 Standard  
Phase shifters  
Wireless LAN

## *Butler matrix*

USE: Butler matrices

## *Butter*

USE: Dairy products

## **Buttocks**

BT: Extremities

## *BYOD*

USE: Bring your own device

## **C languages**

BT: Computer languages  
RT: Object oriented  
programming  
NT: C# languages  
C++ languages

## *C sharp languages*

USE: C# languages

## **C# languages**

UF: C sharp languages  
BT: C languages  
RT: Object oriented  
programming

## **C++ languages**

BT: C languages

## **C-band**

BT: Microwave bands

## *Ca*

USE: Calcium

## **Cable insulation**

BT: Insulation  
RT: Cables  
Oil filled cables  
NT: Power cable insulation

## **Cable shielding**

BT: Electromagnetic shielding  
RT: Cables

## *Cable splicing*

USE: Splicing

## **Cable TV**

BT: TV  
RT: Broadband communication  
Image communication

## **Cables**

BT: Transmission lines  
RT: Cable insulation  
Cable shielding  
Conductors  
Fault location  
Winches  
Wiring  
NT: Coaxial cables  
Communication cables  
Mechanical cables  
Optical fiber cables  
Power cables  
Underwater cables

## *Cables (mechanical)*

USE: Mechanical cables

## **Cache memory**

BT: Memory  
NT: Cache storage

## **Cache storage**

BT: Cache memory  
RT: Computer buffers

## *CAD*

USE: Design automation

## **Cadaver**

UF: Corpse  
BT: Pathological processes

## **CADCAM**

BT: Computer aided  
manufacturing  
Design automation



# 2018 IEEE Thesaurus

RT: Computer integrated  
manufacturing  
Integrated manufacturing  
systems

Rapid prototyping  
Virtual manufacturing

## Cadmium

BT: Metals  
NT: Cadmium compounds

## Cadmium compounds

BT: Cadmium

## CAE

USE: Computer aided  
engineering

## Caesium

USE: Cesium

## CAI

USE: Computer aided instruction

## Calcination

BT: Heat treatment  
RT: Kilns

## Calcium

UF: Ca  
BT: Metals  
RT: Alloying  
NT: Calcium compounds

## Calcium compounds

BT: Calcium

## Calculators

BT: Computers  
RT: Digital arithmetic  
NT: Difference engines

## Calculus

BT: Mathematics  
NT: Differential equations  
Integral equations  
Level set

## Calibration

UF: Intercalibration  
BT: Measurement techniques

## Californium

BT: Chemical elements

## Call admission control

BT: Telecommunication  
congestion control

## Call conference

BT: Collaborative tools

## Callosal commissure

USE: Corpus callosum

## Calorimetry

BT: Measurement  
RT: Energy measurement  
Thermal variables

measurement

## CAM

USE: Computer aided  
manufacturing

## CAMAC

UF: Computer automated  
measurement and control  
BT: Control systems  
RT: Data buses  
Data communication  
Data processing  
Nuclear measurements

## Cambelts

USE: Belts

## Camcorders

USE: Video equipment

## Cameras

BT: Imaging  
RT: Digital photography  
Image capture  
Image sensors  
Motion pictures  
Photography  
NT: Digital cameras  
Smart cameras  
Webcams

## Cams

BT: Machine components  
RT: Engines  
Mechanical power

transmission

NT: Camshafts

## Camshafts

BT: Cams



# 2018 IEEE Thesaurus

	RT:	Shafts Automotive components Belts Engines		RT:	Access control
<b>Cancellous bone</b>			<b>Capacitance</b>		
	BT:	Bone tissue		BT:	Electric variables
	RT:	Osteoporosis		RT:	Capacitance measurement Capacitance-voltage
<b>Cancer</b>			characteristics		
	UF:	Malignancy Malignant			Capacitive transducers Capacitors Supercapacitors Transmission line theory
	BT:	Diseases		NT:	Parasitic capacitance Quantum capacitance
	RT:	Biomedical applications of radiation	<b>Capacitance measurement</b>		
		Chemotherapy Medical diagnostic imaging Oncological surgery Oncology Single photon emission		BT:	Electric variables
		computed tomography	measurement	RT:	Capacitance Capacitors Dielectric measurement Supercapacitors
		Tumors			
	NT:	Breast cancer Cervical cancer Metastasis Prostate cancer Skin cancer	<b>Capacitance-voltage characteristics</b>		
<b>Cancer detection</b>				BT:	Electric variables
	BT:	Medical tests		RT:	Capacitance Voltage
<b>Cancer drugs</b>			<b>Capacitive sensors</b>		
	BT:	Drugs		UF:	Strain based sensors Strain sensors
<b>Canning</b>				BT:	Mechanical sensors
	BT:	Packaging	<b>Capacitive transducers</b>		
	RT:	Containers Material storage Materials handling Materials processing		BT:	Transducers
<b>Cantilever beams</b>				RT:	Capacitance Position control Sensors
	USE:	Structural beams	<b>Capacitor testing</b>		
<b>Capability engineering</b>				USE:	Capacitors
	BT:	Systems engineering and theory	<b>Capacitors</b>		
<b>Capability maturity model</b>				UF:	Capacitor testing Electric condensers
	BT:	Software engineering		BT:	Dielectric devices Electronic components Voltage multipliers
	RT:	Software performance Software reusability		RT:	Capacitance Capacitance measurement Dielectric constant Electrets MOS capacitors Q-factor Switched capacitor
<b>Capability-based security</b>			networks		
	BT:	Security			



# 2018 IEEE Thesaurus

NT:	Power capacitors Varactors	<i>Carbon nanotube</i> USE: Carbon nanotubes
<b>Capacity planning</b>		<i>Carbon nanotube FETs</i> USE: CNTFETs
BT:	Production planning	<i>Carbon nanotube field effect transistors</i> USE: CNTFETs
RT:	Supply chain management	<i>Carbon nanotube field-effect transistors</i> USE: CNTFETs
NT:	Storage management	<b>Carbon nanotubes</b> UF: Carbon nanotube Carbon-nanotube Single-wall carbon nanotubes BT: Nanotubes RT: CNTFETs
<i>Capital cost reduction</i> USE: Costing		<b>Carbon tax</b> BT: Environmental economics RT: Carbon dioxide
<b>CAPTCHAs</b>		<i>Carbon-nanotube</i> USE: Carbon nanotubes
BT:	Symbols	<i>Carbon-nanotube FETs</i> USE: CNTFETs
RT:	Access protocols Authentication	<i>Carbon-nanotube field effect transistors</i> USE: CNTFETs
<i>Carbinol</i> USE: Methanol		<b>Cardiac arrest</b> UF: Cardiopulmonary arrest Heart arrest Heart attack BT: Cardiovascular diseases
<i>CarboFullerene</i> USE: Fullerenes		<b>Cardiac disease</b> BT: Cardiovascular diseases
<b>Carbon</b>		<b>Cardiac tissue</b> BT: Biological tissues Cardiology
BT:	Chemical elements	<b>Cardiography</b> BT: Biomedical imaging RT: Cardiology Sputter etching NT: Echocardiography
RT:	Carbon compounds Graphite Organic compounds	
NT:	Fullerenes	
<b>Carbon capture and storage</b> BT: Carbon dioxide		
<b>Carbon compounds</b>		
BT:	Organic compounds	
RT:	Carbon	
NT:	Carbon dioxide Carbon emissions Carbon monoxide	
<b>Carbon dioxide</b>		
BT:	Carbon compounds	
RT:	Carbon tax	
NT:	Carbon capture and storage	
<b>Carbon emissions</b>		
BT:	Carbon compounds Gases	
RT:	Global warming Greenhouse effect Methane Pollution control	
<b>Carbon monoxide</b> BT: Carbon compounds		



# 2018 IEEE Thesaurus

	Electrocardiography Phonocardiography	USE:	Charge carrier processes
<b>Cardiology</b>			<i>Carrier sense multiaccess</i>
BT:	Medical specialties	USE:	Multiaccess communication
RT:	Cardiography		<i>Cars</i>
	Defibrillation	USE:	Automobiles
	Heart		<b>Cartilage</b>
	Pacemakers	BT:	Musculoskeletal system
	Phonocardiography		<i>Cascade lasers</i>
NT:	Cardiac tissue	USE:	Quantum cascade lasers
<i>Cardiopulmonary arrest</i>			<b>Cascading style sheets</b>
USE:	Cardiac arrest	BT:	Style sheet languages
		RT:	Markup languages
<b>Cardiovascular diseases</b>			<b>Casimir effect</b>
BT:	Diseases	UF:	Casimir energy
NT:	Cardiac arrest		Casimir force
	Cardiac disease	BT:	Electric fields
			Nanotechnology
<b>Cardiovascular system</b>		RT:	Atomic force microscopy
BT:	Anatomy		Elementary particle vacuum
NT:	Baroreflex		Vacuum systems
	Blood vessels		
	Heart		
<b>Career development</b>			<i>Casimir energy</i>
BT:	Education	USE:	Casimir effect
NT:	Continuing education		<i>Casimir force</i>
	Jobs listings	USE:	Casimir effect
	Mentoring		<b>Cast iron</b>
<i>Careers</i>		BT:	Iron
USE:	Engineering profession	RT:	Casting
			Production materials
<i>Cargo handling</i>			<i>Castellations</i>
USE:	Freight handling	USE:	Flip chip solder joints
			<b>Casting</b>
<b>Carotid arteries</b>		BT:	Materials processing
UF:	Carotoid arteries	RT:	Cast iron
BT:	Arteries		Foundries
<i>Carotoid arteries</i>		NT:	Die casting
USE:	Carotid arteries		Tape casting
<b>Carrier confinement</b>			<i>Catalytic converters</i>
BT:	Charge carrier processes	USE:	Exhaust systems
<i>Carrier density</i>			<i>Catalytic convertors</i>
USE:	Charge carrier density	USE:	Exhaust systems
<i>Carrier lifetime</i>			
USE:	Charge carrier lifetime		
<i>Carrier processes</i>			<b>Cataracts</b>



# 2018 IEEE Thesaurus

BT:	Eyes	NT:	Laser cavity resonators
RT:	Medical conditions		
	Aging	<i>CCD</i>	
		USE:	Charge coupled devices
<b>Catheterization</b>			
BT:	Medical services	<b>CCD image sensors</b>	
RT:	Catheters	BT:	Image sensors
		RT:	Digital photography
<b>Catheters</b>			
BT:	Biomedical equipment	<b>CD recording</b>	
RT:	Catheterization	UF:	Compact disk
	Surgery	BT:	Optical recording
		RT:	Laser applications
		NT:	CD-ROMs
<b>Cathode ray tubes</b>			
UF:	CRT	<i>CD-ROM</i>	
BT:	Displays	USE:	CD-ROMs
	Electron devices		
RT:	Flyback transformers	<b>CD-ROM reviews</b>	
		BT:	IEEE indexing
<i>Cathode-ray oscilloscopes</i>			
USE:	Oscilloscopes	<b>CD-ROMs</b>	
		UF:	CD-ROM
<b>Cathodes</b>		BT:	CD recording
UF:	Photocathodes	RT:	Electronic publishing
BT:	Electrodes		Information systems
RT:	Electron emission		
	Electron tubes	<i>CDMA</i>	
		USE:	Multiaccess communication
<b>Cats</b>			
BT:	Animals	<i>Cell biology</i>	
		USE:	Biological cells
<i>Cattle</i>			
USE:	Cows	<i>Cell clones</i>	
		USE:	Cloning
<b>Cause effect analysis</b>		<i>Cell phones</i>	
UF:	Fishbone diagrams	USE:	Cellular phones
	Ishikawa diagrams		
BT:	Process planning	<b>Cell signaling</b>	
RT:	Expert systems	UF:	Cell signaling
	Failure analysis	BT:	Biological cells
	Fault diagnosis	RT:	Biochemistry
	Pareto analysis		Biomechanics
	Testing		
<b>Cavity perturbation methods</b>		<b>Cells (biology)</b>	
BT:	Perturbation methods	BT:	Biological cells
RT:	Cavity resonators	NT:	Extracellular
			Ganglia
<b>Cavity resonators</b>			Glial cells
BT:	Resonators		Progenitor cells
RT:	Cavity perturbation		
methods		<b>Cellular biophysics</b>	
	Klystrons	BT:	Biophysics
	Microcavities	RT:	Molecular biophysics
	Resonance		



# 2018 IEEE Thesaurus

Nanomedicine

## *Cellular land mobile radio*

USE: Land mobile radio cellular systems

## **Cellular manufacturing**

BT: Manufacturing systems  
RT: Flexible manufacturing systems

Production control

## **Cellular networks**

BT: Land mobile radio cellular systems  
RT: Device-to-device communication  
NT: Handover  
Femtocell networks  
Macrocell networks  
Microcell networks

## **Cellular neural networks**

BT: Neural networks

## **Cellular phones**

UF: Cell phones  
BT: Telephone equipment

## *Cellular radio*

USE: Land mobile radio cellular systems

## **Cement industry**

BT: Manufacturing industries

## **Censorship**

BT: Law  
RT: Consumer protection  
Government policies  
Law enforcement  
Legal factors

## **Central air conditioning**

UF: Central air-conditioning  
BT: Air conditioning

## *Central air-conditioning*

USE: Central air conditioning

## **Central nervous system**

BT: Nervous system  
RT: Hypothalamus  
NT: Grey matter  
Midbrain

White matter

## **Central office**

BT: Communication networks

## **Central Processing Unit**

UF: CPU  
BT: Electronic circuits  
NT: VLIW

## **Centralized control**

UF: Integrated control  
BT: Control systems

## **Cepstral analysis**

BT: Acoustics  
RT: Music information retrieval  
Speech analysis  
Speech recognition  
NT: Cepstrum  
Mel frequency cepstral

coefficient

## **Cepstrum**

BT: Cepstral analysis  
RT: Fourier transforms

## **Ceramic glazes**

BT: Glazes

## **Ceramic products**

BT: Manufactured products  
RT: Ceramics  
Glass products  
Insulators  
Porcelain  
Tiles

## **Ceramics**

UF: Glass ceramics  
BT: Insulation  
Materials  
RT: Aluminum oxide  
Ceramic products  
Ceramics industry  
Cermets  
Dielectric materials  
Diffusion bonding  
Electrets  
Firing  
Glass  
Glass products  
Glazes  
High-temperature

superconductors



# 2018 IEEE Thesaurus

	NT:	Magnesium oxide Powders Tape casting Tiles Porcelain
<b>Ceramics industry</b>		
	BT:	Manufacturing industries
	RT:	Bioceramics Ceramics Porcelain
<b>Cerebellum</b>		
	BT:	Brain
<b>Cerebral cortex</b>		
	BT:	Brain
<b>Cerebrospinal fluid</b>		
	BT:	Fluids and secretions Spinal cord
	RT:	Brain
<b>Cerebrum</b>		
	BT:	Brain
<b>Cerenkov lasers</b>		
	USE:	Free electron lasers
<b>Cerium</b>		
	BT:	Chemical elements
<b>Cermet</b>		
	BT:	Composite materials
	RT:	Ceramics Metallic materials
<b>Certification</b>		
	BT:	Training
<b>Cervical cancer</b>		
	BT:	Cancer
<b>Cesium</b>		
	UF:	Caesium
	BT:	Chemical elements
<b>CFD</b>		
	USE:	Computational fluid dynamics
<b>CGM</b>		
	USE:	Computer generated music

	BT:	Chemical compounds
<b>Change detection algorithms</b>		
	BT:	Algorithms
<b>Channel allocation</b>		
	UF:	Bandwidth allocation
	BT:	Communication channels
	NT:	Spectral efficiency
<b>Channel bank filters</b>		
	BT:	Filters
<b>Channel capacity</b>		
	BT:	Communication channels
<b>Channel coding</b>		
	BT:	Encoding
		Information theory
	RT:	Communication channels
		Convolutional codes
		Rate distortion theory
		Space-time codes
	NT:	Block codes
		Combined source-channel
coding		Turbo codes
<b>Channel estimation</b>		
	UF:	Channel state estimation
		Channel-state estimation
	BT:	Communication channels
	RT:	Equalizers
		Land mobile radio
		Land mobile radio cellular
systems		Multipath channels
		Signal detection
		Spread spectrum
communication		
<b>Channel hot electron injection</b>		
	UF:	Channel hot-electron
injection		
	BT:	Hot carrier injection
<i>Channel hot-electron injection</i>		
	USE:	Channel hot electron
injection		
<b>Channel models</b>		
	BT:	Communication channels
<b>Channel rate control</b>		
	BT:	Rate distortion theory





# 2018 IEEE Thesaurus

## Channel spacing

BT: Communication channels  
RT: Optical fiber applications  
Rate distortion theory

## Channel state estimation

USE: Channel estimation

## Channel state information

BT: Communication channels

## Channel-state estimation

USE: Channel estimation

## Chaos

BT: Nonlinear systems  
RT: Bifurcation  
Econophysics  
Fractals  
Nonlinear circuits  
Nonlinear dynamical

## systems

Pattern formation  
Predator prey systems  
Random media  
NT: Chaotic communication  
Complexity theory  
Spatiotemporal phenomena

## Chaotic communication

BT: Chaos  
RT: Cryptography  
Synchronization  
Time series analysis

## Character generation

BT: Graphics  
RT: Computer graphics  
Displays  
Printing

## Character recognition

UF: Print readers  
BT: Pattern recognition  
RT: Text recognition

## Characteristic mode analysis

BT: Electromagnetic analysis

## Charge carrier density

UF: Carrier density  
BT: Charge carriers

## Charge carrier lifetime

UF: Carrier lifetime  
BT: Charge carriers

## Charge carrier mobility

BT: Charge carriers

## Charge carrier processes

UF: Carrier processes  
Charge carrier trapping  
Electron carriers  
Hole carriers  
Semiconductor charge

## carriers

BT: Charge carriers  
RT: Diffusion processes  
Semiconductor impurities  
NT: Carrier confinement  
Charge transfer  
Electron mobility  
Electron traps  
Excitons  
Space charge

## Charge carrier trapping

USE: Charge carrier processes

## Charge carriers

BT: Elementary particles  
RT: Conductivity  
Impact ionization  
Semiconductivity  
Semiconductor materials  
NT: Charge carrier density  
Charge carrier lifetime  
Charge carrier mobility  
Charge carrier processes  
Hot carriers

## Charge coupled devices

UF: CCD  
Charge injection devices  
Charge transfer devices  
Charge-injection devices  
Charge-transfer devices  
BT: MIS devices

## Charge injection devices

USE: Charge coupled devices

## Charge measurement

BT: Electrostatic measurements  
RT: Pulsed electroacoustic  
methods  
NT: Battery charge  
measurement



# 2018 IEEE Thesaurus

## Charge pumps

UF: Charge-pumping  
BT: Circuits  
RT: Voltage multipliers

## Charge transfer

BT: Charge carrier processes

## Charge transfer devices

USE: Charge coupled devices

## Charge-coupled image sensors

BT: Image sensors  
Optoelectronic devices

## Charge-injection devices

USE: Charge coupled devices

## Charge-pumping

USE: Charge pumps

## Charge-transfer devices

USE: Charge coupled devices

## Charged device model

USE: Electrostatic discharges

## Charging devices

USE: Battery chargers

## Charging stations

BT: Power supplies  
RT: Battery chargers  
Electric vehicles  
Hybrid electric vehicles  
Plug-in hybrid electric

vehicles

## CHCP

USE: Trigenation

## Chebyshev approximation

BT: Approximation methods  
RT: Discrete cosine transforms

## Checkpointing

BT: System recovery

## Cheese

USE: Dairy products

## Chemical analysis

BT: Chemistry

technology

RT: Chemical technology  
Drugs  
Fractionation  
NT: Activation analysis  
Chemical processes  
Chemicals  
Electronic noses  
pH measurement

## Chemical and biological sensors

BT: Sensors  
NT: Biosensors  
Gas detectors

## Chemical compounds

BT: Chemistry  
NT: Anti-freeze  
Bromine compounds  
Chalcogenides  
Ethanol  
Methanol

## Chemical elements

BT: Chemicals  
Materials, elements, and  
compounds

NT: Actinium  
Aluminum  
Americium  
Antimony  
Arsenic  
Astatine  
Berkelium  
Beryllium  
Boron  
Bromine  
Californium  
Carbon  
Cerium  
Cesium  
Chlorine  
Curium  
Darmstadtium  
Dysprosium  
Europium  
Fluorine  
Francium  
Gadolinium  
Hafnium  
Helium  
Holmium  
Hydrogen  
Iodine



# 2018 IEEE Thesaurus

Iridium  
Isotopes  
Krypton  
Lutetium  
Mercury (metals)  
Molybdenum  
Neon  
Neptunium  
Nitrogen  
Osmium  
Oxygen  
Phosphorus  
Plutonium  
Polonium  
Potassium  
Praseodymium  
Promethium  
Protactinium  
Radium  
Radon  
Rhenium  
Rhodium  
Roentgenium  
Rubidium  
Ruthenium  
Scandium  
Selenium  
Sodium  
Sulfur  
Tantalum  
Technetium  
Tellurium  
Terbium  
Thallium  
Thorium  
Thulium  
Titanium  
Uranium  
Vanadium  
Ytterbium  
Yttrium  
Zirconium

## Chemical engineering

BT: Engineering - general  
RT: Chemical industry  
Chemical products  
Chemical technology  
Process design

## Chemical hazards

BT: Hazards  
RT: Biohazards  
Contamination  
Explosions

Hazardous materials  
Toxicology  
NT: Toxic chemicals

## Chemical industry

BT: Industries  
RT: Chemical engineering  
Chemical reactors  
Chemical technology  
Electrochemical processes  
Petrochemicals  
Petroleum industry  
Pipelines  
Plastic products  
Plastics industry  
Rubber industry

## Chemical lasers

BT: Lasers  
RT: Gas lasers  
NT: Chemical oxygen iodine

lasers

## Chemical mechanical planarisation

USE: Planarization

## Chemical mechanical planarization

USE: Planarization

## Chemical oxygen iodine lasers

BT: Chemical lasers

## Chemical processes

BT: Chemical analysis  
NT: Leaching  
Molecular sieves  
Osmosis  
Oxidation  
Reverse osmosis  
Solvents  
Thermolysis

## Chemical products

BT: Manufactured products  
RT: Chemical engineering  
Chemistry  
Glass products  
Plastic products  
Production materials  
NT: Fats  
Inhibitors  
Lacquers  
Mortar  
Paints  
Petrochemicals



# 2018 IEEE Thesaurus

	Petroleum		
	Pharmaceuticals	<b>Chemistry</b>	
	Plastics	BT:	Science - general
	Propellants	RT:	Chemical products
			Chemical technology
<b>Chemical reactors</b>			Drugs
UF:	CSTR		Petrochemicals
BT:	Chemical technology		Pharmaceutical technology
RT:	Chemical industry		Pharmaceuticals
	Crystallizers		Pickling
	Process control		Plastic products
NT:	Bioreactors	NT:	Astrochemistry
	Continuous-stirred tank		Biochemistry
reactor			Chemical analysis
	Ignition		Chemical compounds
			Geochemistry
<b>Chemical sensors</b>			Inorganic chemicals
BT:	Chemical technology		Interstellar chemistry
RT:	Detectors		Organic chemicals
			Photochemistry
<b>Chemical technology</b>		<b>Chemotherapy</b>	
BT:	Industry applications	BT:	Medical treatment
RT:	Chemical analysis	RT:	Cancer
	Chemical engineering		Drugs
	Chemical industry		Medical services
	Chemistry		Oncology
	Decontamination		Patient monitoring
	Refining		
NT:	Chemical reactors	<i>Child</i>	USE: Pediatrics
	Chemical sensors	<i>Children</i>	USE: Pediatrics
	Crystallizers		
	Distillation equipment	<i>Chip design</i>	USE: Chip scale packaging
	Fluidization		
	Pharmaceutical technology	<i>Chip development</i>	USE: Chip scale packaging
	Vitrification		
<b>Chemical transducers</b>		<i>Chip fabrication</i>	USE: Chip scale packaging
BT:	Transducers		
RT:	Gas detectors	<b>Chip scale packaging</b>	
<b>Chemical vapor deposition</b>		UF:	CSP
UF:	CVD		Chip design
	Vapour deposition		Chip development
BT:	Plasma materials		Chip fabrication
processing			Chip-making process
RT:	Coatings	BT:	Electronics packaging
	Epitaxial layers	RT:	Integrated circuit packaging
	Films		
NT:	Atomic layer deposition	<i>Chip-making process</i>	USE: Chip scale packaging
	MOCVD		
	Pulsed laser deposition		
<b>Chemicals</b>			
BT:	Chemical analysis		
NT:	Chemical elements		



# 2018 IEEE Thesaurus

## Chirp

BT: Signal processing

## Chirp modulation

UF: Linear frequency modulation

BT: Modulation

RT: Sonar

Spread spectrum

communication

Spread spectrum radar

## Chlorine

BT: Chemical elements

NT: Chlorine compounds

## Chlorine compounds

BT: Chlorine

## Chokes

USE: Inductors

## Choppers (circuits)

BT: Switching circuits

RT: Power conversion

## CHP

USE: Cogeneration

## Chromatic dispersion

BT: Dispersion

## Chrome plating

BT: Plating

RT: Coatings

## Chromium

UF: Cr

BT: Metals

NT: Chromium alloys

## Chromium alloys

BT: Chromium

## Chromosome mapping

BT: Biological cells

## Chromosomes

USE: Biological cells

## Chronobiology

UF: Biological clocks

BT: Biological processes

## CIM

USE: Common Information Model (computing) AND

(electricity) AND

Computer integrated manufacturing

## Cinema

USE: Motion pictures

## Cinematography

BT: Photography

RT: Motion pictures

Object tracking

## Ciphers

UF: Cyphers

BT: Cryptography

RT: Algorithms

Codes

Encryption

## Circadian rhythm

UF: Circadian rhythms

BT: Biological processes

## Circadian rhythms

USE: Circadian rhythm

## Circuit analysis

BT: Circuits

RT: Frequency-domain analysis

SPICE

Sensitivity

Tolerance analysis

Yield estimation

NT: Circuit analysis computing

Coupled mode analysis

Nonlinear network analysis

## Circuit analysis computing

BT: Circuit analysis

## Circuit boards

USE: Printed circuits

## Circuit breakers

BT: Switchgear

RT: Interrupters

Power system protection

Protection

Switching circuits

## Circuit CAD



# 2018 IEEE Thesaurus

USE:	Design automation	RT:	Circuits and systems
<i>Circuit complexity</i>		<b>Circuit synthesis</b>	
USE:	Complexity theory	UF:	Circuit design
<i>Circuit design</i>		BT:	Circuits
USE:	Circuit synthesis	RT:	Control system synthesis
<i>Circuit design (CAD)</i>			Logic design
USE:	Design automation		Solid state circuit design
<i>Circuit design (logic)</i>		NT:	High level synthesis
USE:	Logic design		Integrated circuit synthesis
<b>Circuit faults</b>		<b>Circuit testing</b>	
BT:	Circuits	BT:	Testing
NT:	Electrical fault detection	RT:	Built-in self-test
<i>Circuit feedback</i>		NT:	Integrated circuit
USE:	Feedback circuits		measurements
<i>Circuit layout CAD</i>		<b>Circuit theory</b>	
USE:	Design automation	BT:	Solid state circuits
<b>Circuit noise</b>		<i>Circuit tolerance analysis</i>	
BT:	Circuits	USE:	Tolerance analysis
RT:	Transmission lines	<b>Circuit topology</b>	
NT:	Thermal noise	BT:	Digital circuits
<i>Circuit optimisation</i>		RT:	Graph theory
USE:	Circuit optimization		Tree graphs
<b>Circuit optimization</b>		<i>Circuit tuning</i>	
UF:	Circuit optimisation	USE:	Circuit optimization
	Circuit performance	<b>Circuits</b>	
	Circuit tuning	BT:	Circuits and systems
BT:	Optimization methods	RT:	Flow graphs
RT:	Tolerance analysis		Impedance matching
<i>Circuit performance</i>			Oscillators
USE:	Circuit optimization		Phase transformers
<b>Circuit simulation</b>			Poles and zeros
BT:	Circuits		Scattering parameters
RT:	Design automation	NT:	Active circuits
	Semiconductor process		Adders
modeling			Analog circuits
<b>Circuit stability</b>			Application specific
BT:	Stability		Asynchronous circuits
RT:	Grounding		Bipolar transistor circuits
	Jitter		Bistable circuits
<b>Circuit subsystems</b>			Bridge circuits
BT:	Solid state circuits		Charge pumps
			Circuit analysis
			Circuit faults
			Circuit noise
			Circuit simulation
			Circuit synthesis
			Coprocessors
			integrated circuits



# 2018 IEEE Thesaurus

circuits	Counting circuits	UHF integrated circuits
	Coupling circuits	Ultra large scale integration
	Digital circuits	VHF circuits
	Digital signal processors	Very large scale integration
	Distributed parameter	Voltage multipliers
		Wafer scale integration
	Driver circuits	
	Electronic circuits	<b>Circuits and systems</b>
	Equivalent circuits	RT: Circuit subsystems
	Feedback	Formal verification
	Hybrid integrated circuits	Solid state circuits
	Integrated circuits	NT: Circuits
	Isolators	Contacts
	Large scale integration	Filtering
	Linear circuits	Integrated circuit
	Logic arrays	
	Logic circuits	technology
	MOSFET circuits	Logic devices
	Magnetic circuits	Oscillators
	Microprocessors	Single electron devices
	Microwave circuits	Tunable circuits and
	Millimeter wave circuits	
	Millimeter wave integrated	<i>Circular polarisation</i>
		USE: Polarization
circuits	Monolithic integrated	<i>Circular polarization</i>
		USE: Polarization
circuits	Multiplying circuits	
	Nonlinear circuits	<b>Circulators</b>
	Passive circuits	BT: Ferrite devices
	Phase shifters	Microwave technology
	Power dissipation	RT: Electromagnetic coupling
	Power integrated circuits	Waveguide components
	Printed circuits	
	Programmable circuits	<b>Circulatory system</b>
	Programmable logic arrays	UF: Vascular system
	Programmable logic	BT: Anatomy
devices	Pulse circuits	
	RLC circuits	<b>Citation analysis</b>
	Radiation detector circuits	UF: Citation studies
	Rail to rail operation	BT: Bibliometrics
	Rectifiers	<i>Citation studies</i>
	Sampled data circuits	USE: Citation analysis
	Sequential circuits	
	Silicon-on-insulator	<i>Cities and towns</i>
	Submillimeter wave circuits	USE: Urban areas
	Summing circuits	
	Switched circuits	<i>City</i>
	Switching circuits	USE: Urban areas
	Thick film circuits	
	Thin film circuits	<i>City planning</i>
	Thyristor circuits	USE: Urban planning
	Time varying circuits	
	Trigger circuits	<b>Civil engineering</b>
	UHF circuits	



# 2018 IEEE Thesaurus

UF:	Geotechnical structures		Software architecture
BT:	Engineering - general	RT:	Unified modeling language
RT:	Bridges	NT:	Middleware
	Buildings		Servers
	Construction		
	Energy resources	<i>Clientserver systems</i>	
	Environmental factors	USE:	Client-server systems
	Power systems		
	Road transportation	<i>Climate</i>	
	Roads	USE:	Meteorology
	Transmission lines		
NT:	Railway engineering	<b>Climbing robots</b>	
	Structural engineering	BT:	Mobile robots
<i>Cladistics</i>		<i>Clinical analysis</i>	
USE:	Phylogeny	USE:	Clinical diagnosis
<i>Clamping</i>		<b>Clinical diagnosis</b>	
USE:	Clamps	UF:	Clinical analysis
<b>Clamps</b>			Clinical engineering
UF:	Clamping		Clinical information
BT:	Production equipment	BT:	Medical services
RT:	Machine tools	NT:	Clinical neuroscience
	Machining		
<b>Classification algorithms</b>		<i>Clinical engineering</i>	
BT:	Algorithms	USE:	Clinical diagnosis
<b>Classification tree analysis</b>		<i>Clinical equipment</i>	
BT:	Decision trees	USE:	Biomedical equipment
RT:	Formal concept analysis		
<b>Cleaning</b>		<i>Clinical information</i>	
BT:	Materials handling	USE:	Clinical diagnosis
RT:	Air cleaners		
	Refining	<b>Clinical neuroscience</b>	
NT:	Purification	UF:	Cloud security
	Surface cleaning	BT:	Clinical diagnosis
			Neuroscience
<i>Client server model</i>		<b>Clinical trials</b>	
USE:	Client-server systems	BT:	Medical treatment
<i>Client server systems</i>		<i>Clock synchronization</i>	
USE:	Client-server systems	USE:	Synchronization
<i>Client-server model</i>		<b>Clocks</b>	
USE:	Client-server systems	BT:	Time measurement
		RT:	Timing
		NT:	Atomic clocks
			Watches
<b>Client-server systems</b>		<i>Clone</i>	
UF:	Client server model	USE:	Cloning
	Client server systems		
	Client-server model	<i>Clones</i>	
	Clientserver systems	USE:	Cloning
BT:	Distributed computing		





# 2018 IEEE Thesaurus

## Cloning

UF: Cell clones  
Clone  
Clones  
Human cloning  
Molecular clones  
Reproductive cloning  
BT: Biomedical engineering  
RT: DNA

## Closed form solution

USE: Closed-form solutions

## Closed loop systems

UF: Closed-loop systems  
BT: Control systems  
RT: H infinity control

## Closed-form expression

USE: Closed-form solutions

## Closed-form solutions

UF: Closed form solution  
Closed-form expression  
BT: Mathematics

## Closed-loop systems

USE: Closed loop systems

## Clothing

UF: Garments  
BT: Consumer products  
RT: Clothing industry  
Fabrics  
Wool  
NT: Footwear  
Protective clothing

## Clothing industry

UF: Garment industry  
BT: Manufacturing industries  
RT: Clothing  
Footwear  
Footwear industry  
Protective clothing  
Textile industry

## Clotting

USE: Coagulation

## Cloud computing

BT: Web services  
RT: Big Data applications  
Edge computing

virtualization

networking

NT: Cloud computing security  
Cloud gaming  
Elastic computing  
Platform as a service

## Cloud computing security

UF: Cloud security  
BT: Cloud computing  
Computer security

## Cloud gaming

UF: Gaming on demand  
BT: Cloud computing  
Games  
RT: Online services

## Cloud security

USE: Clinical neuroscience AND  
Cloud computing security

## Clouds

BT: Terrestrial atmosphere

## Clustering algorithms

BT: Algorithms

## Clustering methods

BT: Pattern recognition  
NT: Pattern clustering

## Clutter

BT: Interference  
RT: Echo interference

## CMM

USE: Coordinate measuring  
machines

## CMOS analog integrated circuits

UF: Analog CMOS integrated  
circuits  
Analogue CMOS integrated  
circuits  
CMOS analogue integrated  
circuits  
BT: Analog integrated circuits  
CMOS integrated circuits



# 2018 IEEE Thesaurus

## *CMOS analogue integrated circuits*

USE: CMOS analog integrated circuits

## **CMOS digital integrated circuits**

BT: CMOS integrated circuits  
NT: CMOS logic circuits

## **CMOS image sensors**

BT: Image sensors

## **CMOS integrated circuits**

BT: Integrated circuits  
RT: CMOSFETs  
NT: CMOS analog integrated

circuits

circuits CMOS digital integrated

CMOS logic circuits  
CMOS memory circuits  
Transconductors

## **CMOS logic circuits**

BT: CMOS digital integrated circuits

RT: CMOS integrated circuits  
Application specific  
Power dissipation

## **CMOS memory circuits**

UF: CMOS memory integrated circuits  
BT: CMOS integrated circuits  
RT: Memory  
SRAM chips

## *CMOS memory integrated circuits*

USE: CMOS memory circuits

## **CMOS process**

BT: CMOS technology

## **CMOS technology**

BT: Integrated circuit  
technology  
RT: MOSFET  
Microcontrollers  
Microprocessors  
Transistors  
NT: CMOS process  
Silicon on sapphire

## **CMOSFET circuits**

BT: MOSFET circuits

RT: Rail to rail operation

## **CMOSFET logic devices**

BT: CMOSFETs  
RT: MISFETs  
MOSFET  
P-i-n diodes

## **CMOSFETs**

BT: MOSFET  
RT: CMOS integrated circuits  
Semiconductor-insulator

interfaces

NT: CMOSFET logic devices

## *CNC*

USE: Computer numerical control

## *CNFETs*

USE: CNTFETs

## **CNTFETs**

UF: CNFETs  
Carbon nanotube FETs  
Carbon nanotube field

effect transistors

Carbon nanotube field-

effect transistors

Carbon-nanotube FETs  
Carbon-nanotube field

effect transistors

Carbon-nanotube field-

effect transistors

BT: Field effect transistors  
RT: Carbon nanotubes  
Quantum capacitance

## *Co-channel interference*

USE: Interchannel interference

## *Coagulate*

USE: Coagulation

## **Coagulation**

UF: Blood clots  
Clotting  
Coagulate  
BT: Biological processes  
Blood  
RT: Blood platelets

## **Coal**

BT: Fuels  
RT: Coal gas  
Coal mining





# 2018 IEEE Thesaurus

RT:	Decoding	<i>Cogging</i>	
	Encoding	USE:	Forging
NT:	Speech codecs		
	Video codecs		
<i>Coder-decoders</i>		<b>Cognition</b>	
USE:	Codecs	UF:	Cognitive processes
			Reasoning
<b>Codes</b>		BT:	Behavioral sciences
UF:	Parity check	RT:	Brain
BT:	Information theory		Cognitive systems
RT:	Ciphers		Psychology
	Code division multiplexing	NT:	Activity recognition
	Cryptography		Cognitive neuroscience
	Decoding		
	Encoding	<i>Cognitive computing</i>	
	Error correction	USE:	Cognitive systems
	Redundancy		
	Sequences	<b>Cognitive informatics</b>	
	Vector quantization	BT:	Cybernetics
NT:	Binary codes		Informatics
	Convolutional codes	RT:	Brain
	Cyclic redundancy check		
codes		<b>Cognitive neuroscience</b>	
	Error correction codes	BT:	Cognition
	Parity check codes		Neuroscience
	Product codes		
	Space-time codes	<i>Cognitive processes</i>	
<i>Coding</i>		USE:	Cognition
USE:	Encoding		
<i>Coding theory</i>		<b>Cognitive radar</b>	
USE:	Information theory	BT:	Adaptive systems
			Radar
<b>Coercive force</b>		<b>Cognitive radio</b>	
UF:	Coercivity	UF:	Cognitive radio network
BT:	Magnetic forces	BT:	Wireless communication
<i>Coercivity</i>		<i>Cognitive radio network</i>	
USE:	Coercive force	USE:	Cognitive radio
<i>Cogen</i>		<b>Cognitive robotics</b>	
USE:	Cogeneration	BT:	Robots
		RT:	Autonomous robots
<b>Cogeneration</b>		<b>Cognitive science</b>	
UF:	CHP	UF:	Mental models
	Cogen	BT:	Cybernetics
	Combined heat and power	RT:	Brain
BT:	Heating systems		Computational and artificial
	Power generation	intelligence	
RT:	Industrial power systems		Human factors
	Trigeneration		Inference mechanisms
	Waste heat		Logic
			Psychology
			Uncertainty
		NT:	Problem-solving



# 2018 IEEE Thesaurus

## Cognitive systems

UF: Cognitive computing  
Reasoning  
BT: Artificial intelligence  
Learning systems  
RT: Adaptive control  
Affective computing  
Automata  
Cognition  
Cybernetics  
Machine learning

BT: Collaborative work  
Multi-agent systems  
RT: Distributed management  
Intelligent systems

## Collaborative learning

USE: Collaborative work

## Collaborative networking

USE: Collaborative work

## Collaborative problem solving

USE: Collaborative work

## Coherence

UF: Coherent detection  
BT: Electromagnetic scattering  
RT: Interference

## Collaborative software

BT: Collaborative tools  
RT: Communication system  
software

## Coherent detection

USE: Coherence

## Collaborative tools

BT: Collaboration  
NT: Call conference  
Collaborative software  
Videoconferences

## Coilguns

BT: Electromagnetic launching

## Coils

UF: Electric coils  
BT: Electronic components  
RT: Electromagnets  
Generators  
Inductance  
Inductors  
Magnetic circuits  
Motors  
Rotating machines  
Transformers  
Windings  
NT: Superconducting coils

## Collaborative work

UF: Collaborative learning  
Collaborative networking  
Collaborative problem  
solving  
Cooperative work  
Groupware  
BT: Distributed computing  
RT: Communication  
effectiveness  
Multimedia computing  
Professional  
communication  
Software  
NT: Collaborative intelligence  
Cooperative communication  
Crowdsourcing  
Social computing

## Cold plates

BT: Cooling

## Collaboration

BT: Professional  
communication  
RT: Collective intelligence  
Cyber-physical systems  
Information sharing  
Interoperability  
Wikipedia  
NT: Collaborative tools  
Discussion forums  
Teamwork  
Virtual groups

## Collective bargaining

USE: Industrial relations

## Collective intelligence

BT: Decision making  
Intelligent systems  
RT: Collaboration  
Crowdsourcing  
Sociology

## Collaborative intelligence

## Colleges



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# 2018 IEEE Thesaurus

USE:	Educational institutions	Nanobioscience
		Nanotopography
		Polymers
		Surface treatment
		Tissue engineering
<b>Colliding beam accelerators</b>		
BT:	Colliding beam devices	
	Particle accelerators	
RT:	Klystrons	
	Particle beams	
	Synchrotrons	
<b>Colliding beam devices</b>		
BT:	Nuclear and plasma	
sciences		
RT:	Particle accelerators	
NT:	Colliding beam accelerators	
	Muon colliders	
<b>Collimators</b>		
UF:	Multileaf collimators	
BT:	Optical devices	
RT:	Biomedical applications of	
radiation		
	Biomedical equipment	
	Dosimetry	
	Gamma-rays	
	Linear accelerators	
	Single photon emission	
computed tomography		
	X-ray applications	
	X-rays	
<b>Collision avoidance</b>		
UF:	Collision detection	
	Obstacle avoidance	
	Sense and avoid	
BT:	Motion control	
RT:	Advanced driver assistance	
systems		
<i>Collision detection</i>		
USE:	Collision avoidance	
<b>Collision mitigation</b>		
BT:	Motion control	
<i>Collision theory</i>		
USE:	Kinetic theory	
<b>Colloidal crystals</b>		
BT:	Crystals	
RT:	Crystallizers	
<b>Colloidal lithography</b>		
BT:	Lithography	
	Nanopatterning	
RT:	Biomedical engineering	
<b>Colon</b>		
BT:	Digestive system	
NT:	Colonic polyps	
<b>Colonic polyps</b>		
BT:	Colon	
	Tumors	
<b>Colonography</b>		
BT:	Medical diagnosis	
<b>Colonoscopy</b>		
BT:	Medical tests	
NT:	Virtual colonoscopy	
<b>Color</b>		
BT:	Optics	
RT:	Electrochromism	
	Imaging	
	Photochromism	
	Pigmentation	
NT:		
<i>Color blindness</i>		
USE:	Vision defects	
<i>Color center lasers</i>		
USE:	Solid lasers	
<b>Colored noise</b>		
UF:	Coloured noise	
BT:	Noise	
<b>Colossal magnetoresistance</b>		
BT:	Magnetoresistance	
<i>Coloured noise</i>		
USE:	Colored noise	
<b>Combinational circuits</b>		
UF:	Combinational logic circuits	
BT:	Logic circuits	
<i>Combinational logic circuits</i>		
USE:	Combinational circuits	
<b>Combinatorial mathematics</b>		
BT:	Mathematics	
NT:	Graph theory	
	Steiner trees	



# 2018 IEEE Thesaurus

## *Combine harvesters*

USE: Agricultural machinery

## *Combined heat and power*

USE: Cogeneration

## *Combined heat, cooling and power*

USE: Trigeneneration

## *Combined heat, cooling, and power*

USE: Trigeneneration

## *Combined source channel coding*

USE: Combined source-channel coding

## **Combined source-channel coding**

UF: Combined source channel coding

BT: Channel coding

## **Combustion**

BT: Oxidation

RT: Exhaust gases

NT: Plasma-assisted

combustion

## **Command and control systems**

UF: Military command and control

BT: Aerospace and electronic

systems

RT: Military communication

## **Command languages**

BT: Computer languages

## *Commerce*

USE: Business

## **Commercial law**

BT: Law

RT: Bankruptcy

Business

Consumer products

Consumer protection

Economics

## *Commercial power systems*

USE: Industrial power systems

## **Commercialization**

BT: Engineering management

## **Common Information Model (computing)**

UF: CIM

BT: Analytical models  
Information management

RT: DMTF Standards  
Information exchange

## **Common Information Model (electricity)**

UF: CIM

BT: Information management  
Power transmission

RT: IEC Standards  
Information exchange  
Interoperability  
Open systems  
Unified modeling language

## *Communicable disease*

USE: Infectious diseases

## **Communication aids**

BT: Professional communication

RT: Assistive technology  
Auditory displays

## **Communication cables**

UF: Underground communication cables

BT: Cables

RT: Fault location  
Wire

## *Communication cables (optical)*

USE: Optical fiber cables

## **Communication channels**

UF: Air interface  
Telecom channels  
Telecommunication

channels

BT: Information theory

RT: Channel coding  
Communication systems  
IEEE 802.11e Standard  
IEEE 802.11n Standard  
Multicarrier code division

multiple access

OFDM

Synapses

NT: Channel allocation

Channel capacity

Channel estimation

Channel models

Channel spacing



# 2018 IEEE Thesaurus

Channel state information  
Gaussian channels  
Multipath channels  
Multiuser channels  
Partial response channels  
Throughput  
Time-varying channels

BT: Communication systems  
RT: Network security  
NT: Central office  
Cyberspace  
Industrial communication  
Relay networks

(telecommunications)

## *Communication complexity*

USE: Complexity theory

## *Communication protocols*

USE: Protocols

## **Communication effectiveness**

BT: Professional  
communication  
RT: Collaborative work  
Cooperative communication

## *Communication satellites*

USE: Satellite communication

## **Communication engineering education**

BT: Engineering education

## **Communication standards**

UF: Telecommunication  
standards  
BT: Standards categories  
RT: Communication systems  
FDDI  
IEC  
ISO  
ISO Standards  
Radio spectrum

## **Communication equipment**

BT: Communications  
technology  
RT: Bluetooth  
Communication systems  
Multiplexing equipment  
Satellite ground stations  
NT: Auditory displays  
Codecs  
Modems  
Optical communication

management

NT: Long Term Evolution  
Near field communication  
SONET  
Synchronous digital

hierarchy

Universal Serial Bus

equipment

equipment

Radio communication

Receivers  
Repeaters  
Speech codecs  
TV equipment  
Telephone equipment  
Transceivers  
Transmitters  
Transponders  
Video codecs  
Video equipment  
Vocoders

## **Communication switching**

BT: Communications  
technology  
RT: IEEE 802.3 Standard  
Switching systems  
NT: Code division multiplexing  
Electronic switching

systems

Frame relay  
Handover  
Multiprotocol label

switching

Packet switching

## **Communication industry**

BT: Industries  
RT: Communication systems

## **Communication symbols**

BT: Professional  
communication  
RT: Pragmatics  
Semiotics  
Syntactics  
NT: Semiotics

## *Communication network reliability*

USE: Telecommunication  
network reliability

## **Communication networks**

## **Communication system control**



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# 2018 IEEE Thesaurus

BT:	Communication systems	BT:	Communication systems
RT:	Control systems		
NT:	Telecommunication control		
<b>Communication system operations and management</b>		<b>Communication systems</b>	
BT:	Management	UF:	Quantum communication
RT:	Communication system	BT:	Communications
signaling		technology	
	Communication systems	RT:	Antennas and propagation
			Communication channels
			Communication equipment
			Communication industry
			Communication standards
			Communication system
<i>Communication system privacy</i>		operations and management	
USE:	Communication system		Digital systems
security			Huffman coding
			Information theory
<b>Communication system security</b>			Office automation
UF:	Communication system		Telecontrol equipment
privacy			Traffic control
	Telecommunication security		
	Wireless security	NT:	ARPANET
BT:	Communication systems		Biomedical communication
RT:	Access control		Broadband communication
	Cryptography		Communication networks
	Data security		Communication system
	Electronic warfare	control	
	Privacy		Communication system
NT:	Denial-of-service attack	security	
	Radio communication		Communication system
countermeasures		signaling	
			Communication system
<b>Communication system signaling</b>		software	
UF:	Signaling systems		Communication system
	Telecom signaling	traffic	
	Telecom system signaling		Communication system
	Telecommunication	traffic control	
signalling			Computer networks
BT:	Communication systems		Cross layer design
RT:	Bit rate		Data buses
	Communication system		Data communication
operations and management			Device-to-device
	Handover	communication	
NT:	Received signal strength		Digital communication
indicator			FDDI
			Facsimile
<b>Communication system software</b>			IP networks
BT:	Communication systems		ISDN
RT:	Collaborative software		Indoor communication
NT:	Streaming media		Internet
			Local area networks
<b>Communication system traffic</b>			MIMO communication
UF:	Mice flows		MISO communication
BT:	Communication systems		Machine-to-machine
RT:	Telecommunication traffic	communications	
			Metropolitan area networks
<b>Communication system traffic control</b>			Microwave communication



# 2018 IEEE Thesaurus

networks		Military communication			Couplers
		Mobile communication			High-speed electronics
		Molecular communication			Image communication
		Multiaccess communication			Information and
		Multicast communication	communication technology		
		Multimedia communication			Message systems
		NOMA			Modulation
		Narrowband			Multiplexing
		Optical fiber communication			Network topology
		Personal communication			Presence network agents
communication		Protocols			TV
		Quality of experience			UHF technology
		Quality of service			Ultra wideband technology
		Radio communication			VHF devices
		Regional area networks			
		Routing	<b>Commutation</b>		
		SIMO communication	BT:		Motors
		SISO communication	<b>Commutators</b>		
		Satellite communication	BT:		DC motors
		Satellite ground stations			
hierarchy		Spatial diversity	<i>Compact disk</i>		
		Submillimeter wave	USE:		CD recording
		Subscriber loops	<b>Compaction</b>		
		Switching systems	BT:		Waste reduction
		Synchronous digital	RT:		Materials handling
		Telecommunications	<b>Companies</b>		
		Teleconferencing	BT:		Organizations
		Telegraphy			
		Telephony	<b>Company reports</b>		
		Teleprinting	BT:		Publishing
Computing		Teletext	RT:		Competitive intelligence
		Token networks			Management
		UHF communication			Management accounting
		Underwater communication			
		Videophone systems	<b>Compass</b>		
		Videotex	UF:		Compasses
		Visual communication	BT:		Instruments
		Wide area networks	RT:		Magnetic fields
		Wideband			Navigation
		Wireless communication			
Communications computing		Wireless mesh networks	<i>Compasses</i>		
		Wireless sensor networks	USE:		Compass
			<b>Competitive intelligence</b>		
	USE:	Telecommunication	BT:		Information management
			RT:		Business intelligence
					Company reports
					Decision support systems
					Knowledge management
					Market research
			<i>Compilers (program)</i>		
Communications technology					
	RT:	Antennas and propagation			
	NT:	Communication equipment			
		Communication switching			
		Communication systems			



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# 2018 IEEE Thesaurus

USE:	Program processors		Semiconductor device
<b>Complex networks</b>		packaging	
BT:	Network topology		Thermal management of
RT:	System dynamics	electronics	
	System of systems		
<b>Complex systems</b>		<b>Composite materials</b>	
BT:	Systems engineering and	BT:	Materials
theory		NT:	Cermet
RT:	Configuration management	<i>Composite media</i>	
	Large-scale systems	USE:	Nonhomogeneous media
<i>Complexity</i>		<i>Composite systems</i>	
USE:	Complexity theory	USE:	Interconnected systems
<i>Complexity constrained detection</i>		<b>Compounds</b>	
USE:	Maximum likelihood	BT:	Materials, elements, and
detection		compounds	
		NT:	Bismuth compounds
<b>Complexity theory</b>			Gallium compounds
UF:	Circuit complexity		Indium compounds
	Communication complexity		Inorganic compounds
	Complexity		Lead compounds
BT:	Chaos		Organic compounds
RT:	Computation theory		Silicon compounds
	Econophysics		
NT:	Computational complexity	<b>Compressed sensing</b>	
	NP-complete problem	UF:	Compressive sensing
	NP-hard problem	BT:	Sampling methods
<i>Compliant mechanisms</i>		<b>Compression algorithms</b>	
USE:	Manufacturing processes	BT:	Algorithms
<b>Component architectures</b>		<b>Compression molding</b>	
UF:	Component-based systems	UF:	Compression moulding
BT:	Components, packaging,	BT:	Production
and manufacturing technology		RT:	Injection molding
<i>Component-based systems</i>		<i>Compression moulding</i>	
USE:	Component architectures	USE:	Compression molding
<b>Components, packaging, and manufacturing technology</b>		<i>Compressive sensing</i>	
NT:	Component architectures	USE:	Compressed sensing
	Electronic components	<b>Compressive stress</b>	
	Electronic equipment	BT:	Stress
manufacture		<b>Compressors</b>	
	Electronics packaging	BT:	Electric machines
	Environmentally friendly	RT:	Air conditioning
manufacturing techniques			Pumps
	Integrated circuit		Turbines
manufacture			Turbomachinery
	Integrated circuit packaging		

*Computation complexity*



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# 2018 IEEE Thesaurus

USE: Computational complexity

## Computation theory

BT: Computational intelligence  
RT: Complexity theory  
NT: Computational complexity  
Concurrent computing  
Greedy algorithms  
Support vector machines

## Computational and artificial intelligence

RT: Cognitive science  
Digital systems  
NT: Artificial intelligence  
Autonomous mental

development

Computational intelligence  
Logic  
Machine intelligence  
Neural networks

## Computational biochemistry

BT: Computational biology  
RT: Biochemistry  
Bioinformatics

## Computational biology

BT: Engineering in medicine  
and biology

RT: Bioinformatics  
Biology  
Computational

neuroscience

Synthetic biology  
NT: Computational biochemistry  
Computational biophysics  
Computational systems

biology

## Computational biophysics

BT: Computational biology  
RT: Bioinformatics  
Biophysics

## Computational complexity

UF: Computation complexity  
BT: Complexity theory  
Computation theory  
RT: Algorithmic efficiency  
NT: Time complexity

## Computational cultural dynamics

USE: Computational cultural  
modeling

## Computational cultural modeling

UF: Computational cultural  
dynamics  
Computational social and  
behavioral modeling  
BT: Computational modeling

## Computational efficiency

BT: Mathematics

## Computational electrodynamics

USE: Computational  
electromagnetics

## Computational electromagnetics

UF: Computational  
electrodynamics  
BT: Electromagnetic analysis  
RT: Computer applications  
Electromagnetic field theory  
Electromagnetic fields  
Finite difference methods  
Monte Carlo methods  
Stochastic processes

## Computational fluid dynamics

UF: CFD  
BT: Fluid dynamics  
RT: Isosurfaces

## Computational geometry

BT: Geometry  
RT: Computer graphics  
Layered manufacturing  
Surface fitting  
NT: Fractals

## Computational intelligence

BT: Computational and artificial  
intelligence  
RT: Artificial intelligence  
Synapses  
NT: Computation theory  
Evolutionary computation  
Fuzzy systems  
Genetic algorithms

## Computational life sciences

USE: Computational modeling  
AND  
Life sciences

## Computational linguistics

BT: Systems, man, and  
cybernetics



# 2018 IEEE Thesaurus

RT: Context modeling  
 NT: Sentiment analysis analysis  
 Independent component  
 Simulation

## Computational modeling

UF: Computational life sciences  
 Life sciences computing  
 ZINDO  
 BT: Modeling  
 RT: Neuroinformatics  
 Time complexity  
 NT: Agent-based modeling  
 Computational cultural

modeling

## Computational neuroscience

UF: Theoretical neuroscience  
 BT: Computer science  
 Neuroscience  
 RT: Computational biology  
 Nervous system

*Computational science*

USE: Scientific computing

*Computational social and behavioral modeling*

USE: Computational cultural

modeling

## Computational systems biology

BT: Computational biology

*Computed microtomography*

USE: Computed tomography

## Computed tomography

UF: CT scan  
 Computed

microtomography

tomography

Computerised axial

Computerised tomography  
 Computerized axial

tomography

Computerized tomography  
 Tomography

BT: Tomography  
 RT: Biomedical applications of

radiation

NT: Single photon emission

computed tomography

## Computer aided analysis

BT: Computer applications  
 RT: Digital simulation  
 Geophysics computing

*Computer aided design*

USE: Design automation

## Computer aided diagnosis

UF: Computer assisted

diagnosis

Computer-aided diagnosis

Computer-assisted

diagnosis

BT: Medical diagnosis

## Computer aided engineering

UF: CAE

BT: Computer applications

## Computer aided instruction

UF: CAI

Computer aided learning  
 Computer-aided instruction  
 Computer-aided learning  
 Teaching machines

BT: Computer applications  
 Educational technology

RT: Authoring systems  
 Continuing education  
 Courseware  
 Electronic learning  
 Matlab

NT: Learning management

systems

*Computer aided learning*

USE: Computer aided instruction

## Computer aided manufacturing

UF: CAM

BT: Industrial electronics  
 Manufacturing automation  
 Computer integrated

manufacturing

Integrated manufacturing

systems

NT: CAD/CAM  
 Silicon compiler

## Computer aided software engineering

BT: Software engineering

RT: Programming environments  
 Software tools

*Computer animation*



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# 2018 IEEE Thesaurus

USE: Animation

World Wide Web

## Computer applications

UF: Volunteer computing  
 BT: Computers and information processing  
 RT: Biomedical computing  
 Computational electromagnetics  
 Computerized monitoring  
 Edge computing  
 Electrical engineering computing  
 Flexible manufacturing systems  
 Information technology  
 Learning management systems  
 Middleware  
 Mobile agents  
 Software agents  
 Software packages  
 NT: Application virtualization  
 Big Data applications  
 Bot (Internet)  
 Computer aided analysis  
 Computer aided engineering  
 Computer aided instruction  
 Computer generated music  
 Computer integrated manufacturing  
 Control engineering computing  
 Green computing  
 High energy physics instrumentation computing  
 Knowledge management  
 Mathematics computing  
 Medical information systems  
 Military computing  
 Mobile applications  
 Physics computing  
 Power engineering computing  
 Power system analysis computing  
 Publishing  
 Scientific computing  
 Telecommunication computing  
 Virtual enterprises  
 Virtual manufacturing  
 Web sites

## Computer architecture

UF: Architecture (computer)  
 BT: Computers and information processing  
 RT: Microprogramming  
 NT: Accelerator architectures  
 Data structures  
 Dynamic voltage scaling  
 Memory architecture  
 Memory management  
 Multiprocessor interconnection  
 Parallel architectures  
 Reconfigurable architectures

## Computer arithmetic

USE: Digital arithmetic

## Computer assisted diagnosis

USE: Computer aided diagnosis

## Computer automated measurement and control

USE: CAMAC

## Computer buffers

BT: Buffer storage  
 RT: Cache storage

## Computer bugs

UF: Bugs  
 BT: Computer crashes

## Computer buses

USE: Data buses

## Computer control

USE: Digital control

## Computer crashes

BT: Computer errors  
 NT: Buffer overflows  
 Computer bugs

## Computer crime

UF: Cyber crime  
 Cyber-crime  
 Cybercrime  
 DDoS attack  
 DoS attack  
 Hacking  
 Piracy (software)  
 Software piracy



# 2018 IEEE Thesaurus

attack	BT:	Computer security			Ray tracing
	RT:	Botnet			Simulation
		Computer viruses			Surface fitting
		Computer worms			Visual effects
		Data security			Workstations
		Digital rights management	NT:		Data visualization
		Distributed denial-of-service			Rendering (computer
			graphics)		
		Invasive software			Shadow mapping
		Unsolicited electronic mail			Sprites (computer)
NT:		Counterfeiting			Video sequences
		Cyber terrorism			Virtual reality
		Cyberattack			Visualization
		SQL injection			
<b>Computer displays</b>					
	BT:	Displays			
	RT:	Computer graphics			
		Computer peripherals			
		Workstations			
	NT:	Mesh generation			
		Touch sensitive screens			
<i>Computer documentation</i>					
	USE:	Documentation			
<i>Computer engineering education</i>					
	USE:	Computer science			
education					
<b>Computer errors</b>					
	BT:	Computer performance			
	NT:	Computer crashes			
<b>Computer generated music</b>					
	UF:	CGM			
		Computer music			
	BT:	Computer applications			
		Music			
<b>Computer graphics</b>					
	BT:	Graphics			
	RT:	Animation			
		Art			
		Character generation			
		Computational geometry			
		Computer displays			
		Computer peripherals			
		Curve fitting			
		Fractals			
		Graphics processing units			
		Image generation			
		Mesh generation			
		Modeling			
		Multimedia computing			
<b>Computer hacking</b>					
	UF:	Hacker			
		Hacks			
	BT:	Computer security			
<i>Computer hardware</i>					
	USE:	Hardware			
<b>Computer industry</b>					
	UF:	DP industry			
	BT:	Industries			
	RT:	Computers and information			
processing					
<b>Computer integrated manufacturing</b>					
	UF:	CIM			
	BT:	Computer applications			
		Manufacturing automation			
	RT:	Agile manufacturing			
		CADCAM			
		Computer aided			
manufacturing					
		Virtual manufacturing			
<b>Computer interfaces</b>					
	UF:	Docking stations			
	BT:	Computers and information			
processing					
	RT:	Computer peripherals			
		Data buses			
		Interface management			
		User interfaces			
	NT:	Application programming			
interfaces					
		Browsers			
		Field buses			
		Firewire			
		Haptic interfaces			
		Hypertext systems			
		Input devices			
		Interface phenomena			





# 2018 IEEE Thesaurus

interfaces	Interface states	<b>Computer network reliability</b> BT: Computer network management Network topology
	Musical instrument digital	
	Ports (Computers) System buses	
<b>Computer languages</b>	UF: Programming languages	<b>Computer networks</b> UF: Mice flows BT: Communication systems Computers and information processing RT: Bit rate Cyber terrorism Cyber warfare Data communication Delay estimation Distributed computing File servers Firewalls (computing) Frame relay Hypercubes IEEE 802.11 Standard IEEE 802.11g Standard IEEE 802.11n Standard IEEE 802.16 Standard IEEE 802.3 Standard IPTV Internetworking LAN interconnection Middleware Multiprocessing systems Multiprocessor Open systems Personal area networks Ports (Computers) Radial basis function TCPIP Web sites Ad hoc networks Computer network Content distribution Cyberspace Diffserv networks Domain Name System Ethernet Google Heterogeneous networks IP networks Internet Intserv networks Metropolitan area networks
	BT: Formal languages	
	RT: Data structures Natural languages Software	
languages	NT: Architecture description	
	C languages Command languages Database languages Hardware design	
	High level languages Markup languages Specification languages Style sheet languages Systems Modeling	
Language	Visual BASIC WS-BPEL	
	<b>Computer mediated communication</b> UF: Computer-mediated communication BT: Social network services	interconnection networks management networks
	<i>Computer music</i> USE: Computer generated music	
AND	Music	
<b>Computer network management</b>	BT: Computer networks	NT: Ad hoc networks Computer network Content distribution Cyberspace Diffserv networks Domain Name System Ethernet Google Heterogeneous networks IP networks Internet Intserv networks Metropolitan area networks
	RT: Bandwidth Computer security Data security Software defined	
	Traffic control	
networking	NT: Computer network reliability Disruption tolerant	
	Management information	
	Middleboxes Network address translation Network synthesis	
base		





# 2018 IEEE Thesaurus

interconnection networks	Multiprocessor	USE:	Programming profession
virtualization	Network function	<b>Computer science</b>	
	Network security	BT:	Computers and information
	Network servers	processing	
	Next generation networking	RT:	Function approximation
	Overlay networks		Logic
	Peer-to-peer computing		Software
	Software defined	NT:	Computational
networking		neuroscience	
	Storage area networks		Formal languages
	Token networks		Network theory (graphs)
	Unicast		Programming
	Virtual private networks	<b>Computer science education</b>	
	Wide area networks	UF:	Computer engineering
	Wireless access points	education	
		BT:	Engineering education
<b>Computer numerical control</b>		<b>Computer security</b>	
UF:	CNC	UF:	Cyber security
	NC machines		Cyber-security
BT:	Manufacturing automation		Cybersecurity
RT:	Digital control	BT:	Computers and information
	Industrial control	processing	
<i>Computer operating systems</i>			Security
USE:	Operating systems	RT:	Access control
<b>Computer performance</b>			Blacklisting
BT:	Computers and information		Computer network
processing		management	
NT:	Computer errors		Cryptography
	Performance loss		Data protection
			Data security
<b>Computer peripherals</b>			Eavesdropping
UF:	Computer terminals		Invasive software
	Peripheral equipment		Operating systems
BT:	Computers and information	NT:	Privacy
processing			Application security
RT:	Computer displays		Authentication
	Computer graphics		Cloud computing security
	Computer interfaces		Computer crime
	Device drivers		Computer hacking
	Firewire	(computer)	Countermeasures
	Flash memories		
	User interfaces		Cross-site scripting
NT:	Disk drives		Cyber espionage
	Keyboards		Cyber warfare
	Modems		Cyberattack
	Printers		Data integrity
<i>Computer pipeline processing</i>			Denial-of-service attack
USE:	Pipeline processing		Firewalls (computing)
		systems	Honey pot (computing)
<i>Computer programming profession</i>			Identity management
			Internet security



# 2018 IEEE Thesaurus

Mobile security  
Password  
Penetration testing  
Permission  
Phishing

## Computer simulation

BT: Simulation  
RT: EMTF

## Computer software

USE: Software

## Computer terminals

USE: Computer peripherals

## Computer viruses

UF: Viruses (computer)  
BT: Invasive software  
RT: Anti-virus software  
Computer crime  
Computer worms  
NT: Malware

## Computer vision

BT: Robots  
RT: Activity recognition  
Distributed vision networks  
Gaze tracking  
Image capture  
Indoor navigation  
Pattern recognition  
Pose estimation  
NT: Active appearance model  
Blob detection  
Corner detection  
Face detection  
Interest point detection  
Smart cameras  
Visual odometry

## Computer worms

UF: Worms (computer)  
BT: Invasive software  
RT: Computer crime  
Computer viruses

## Computer-aided design

USE: Design automation

## Computer-aided diagnosis

USE: Computer aided diagnosis

## Computer-aided instruction

USE: Computer aided instruction

## Computer-aided learning

USE: Computer aided instruction

## Computer-assisted diagnosis

USE: Computer aided diagnosis

## Computer-mediated communication

USE: Computer mediated communication

## Computerised axial tomography

USE: Computed tomography

## Computerised instrumentation

USE: Computerized instrumentation

## Computerised monitoring

USE: Computerized monitoring

## Computerised tomography

USE: Computed tomography

## Computerized axial tomography

USE: Computed tomography

## Computerized instrumentation

UF: Computerised instrumentation  
BT: Instrumentation and measurement

## Computerized monitoring

UF: Computerised monitoring  
BT: Monitoring  
RT: Computer applications

## Computerized tomography

USE: Computed tomography

## Computers

UF: Computing technology  
BT: Computers and information processing  
RT: Cyberspace  
NT: Analog computers  
Calculators  
Microcomputers  
Parallel machines  
Supercomputers  
Tablet computers  
Wearable Computers  
Wearable computers



# 2018 IEEE Thesaurus

## Computers and information processing

RT: Associative processing  
 Biology computing  
 Computer industry  
 Data processing  
 Electronic learning  
 Home computing  
 Information systems  
 Logic circuits  
 Multimedia computing  
 Multiprocessing systems  
 NT: Approximate computing  
 Computer applications  
 Computer architecture  
 Computer interfaces  
 Computer networks  
 Computer performance  
 Computer peripherals  
 Computer science  
 Computer security  
 Computers  
 Concurrency control  
 DNA computing  
 Data systems  
 Database machines  
 Digital systems  
 Distributed computing  
 File servers  
 Hardware  
 High performance  
 computing  
 Image processing  
 Memory  
 Mobile computing  
 Molecular computing  
 Multitasking  
 Open systems  
 Optical computing  
 Parallel processing  
 Pattern recognition  
 Pervasive computing  
 Petascale computing  
 Platform virtualization  
 Probabilistic computing  
 Probability computing  
 Quantum computing  
 Real-time systems  
 Software  
 Software engineering  
 System recovery  
 Time sharing computer  
 systems  
 Virtual machine monitors

USE: Computers

## Concatenated codes

BT: Programming

## Concrete

BT: Building materials  
 RT: Pressure vessels

## Concurrency

USE: Concurrent computing

## Concurrency control

BT: Computers and information processing  
 RT: Distributed computing  
 Distributed databases  
 Multiprocessing systems  
 Parallel processing  
 Protocols  
 Synchronization  
 NT: Processor scheduling

## Concurrent computing

UF: Concurrency  
 BT: Computation theory  
 RT: Granular computing  
 Model checking

## Concurrent engineering

BT: Engineering - general  
 RT: Product design  
 Project management  
 Quality function deployment  
 Research and development  
 management  
 Time to market  
 Virtual manufacturing

## Condition monitoring

BT: Preventive maintenance

## Conditions of employment

USE: Employee welfare

## Conducting bodies

USE: Conductors

## Conducting materials

BT: Materials  
 RT: Conductivity  
 Conductors  
 Semiconductor materials  
 NT: Electrolytes

## Computing technology



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# 2018 IEEE Thesaurus

## Conductive adhesives

BT: Adhesives

## Conductive films

BT: Films

NT: Anisotropic conductive films

## Conductivity

UF: Electric conductivity  
Electrical conductivity  
Resistivity

BT: Electric variables

RT: Charge carriers  
Conducting materials  
Conductivity measurement  
Grain boundaries  
Impact ionization  
Transmission line theory

NT: Photoconductivity  
Semiconductivity  
Transconductance

## Conductivity measurement

UF: Resistivity measurement

BT: Electric variables

measurement

RT: Conductivity

## Conductors

UF: Conducting bodies

BT: Electric machines

RT: Cables  
Conducting materials  
Core loss  
Power cables  
Power distribution lines  
Power transmission lines  
Proximity effects  
Skin effect  
Thermal noise  
Three-phase electric power  
Wire  
Wireless power

transmission

Wiring

## Conference management

BT: Management

## Conferences

UF: Meetings (technical)  
Symposia  
Workshops

BT: Meetings

## Configuration management

BT: Systems engineering and theory

RT: Complex systems  
Maintenance engineering  
System analysis and design

## Conformal mapping

BT: Mathematics

RT: Coplanar waveguides  
Wave functions  
Waveguide components  
Waveguide theory

## Connecting

USE: Joining processes

## Connective tissue

BT: Biological tissues

## Connectors

BT: Electronic components

NT: Plugs  
Sockets

## Consortia

BT: Engineering management

RT: Business

## Constellation diagram

UF: Signal constellation

BT: Digital modulation

## Constraint optimization

BT: Design optimization

RT: Electronics packaging

## Constraint theory

BT: Integer linear programming

## Construction

UF: Erection

BT: Industries  
Building materials  
Civil engineering  
Construction industry  
Structural engineering

NT: Buildings  
Green buildings  
Modular construction  
Prefabricated construction

## Construction industry

BT: Industries

RT: Building automation



# 2018 IEEE Thesaurus

	Building materials		Microwave ovens
	Buildings		
	Construction	<b>Consumer protection</b>	
	Floors	BT:	Law
	Mortar		Product safety engineering
	Shipbuilding industry	RT:	Censorship
	Smart cities		Commercial law
NT:	Prefabricated construction		Customer relationship
<b>Consumer behavior</b>		management	Quality assurance
UF:	Consumer behaviour		
BT:	Behavioral sciences	<i>Consumer-generated media</i>	
RT:	Consumer products	USE:	User-generated content
	Customer profiles		
	Customer relationship	<b>Contact resistance</b>	
management		BT:	Contacts
	Market opportunities		
<i>Consumer behaviour</i>		<b>Contactors</b>	
USE:	Consumer behavior	BT:	Switches
<b>Consumer electronics</b>		<b>Contacts</b>	
UF:	Kindle	BT:	Circuits and systems
RT:	Consumer products	RT:	Semiconductor devices
	Digital systems	NT:	Brushes
	Firewire		Contact resistance
	Microcomputers		Ohmic contacts
	Video equipment	<b>Containers</b>	
NT:	Ambient intelligence	BT:	Material storage
	Audio systems		Materials handling
	Home automation	equipment	
	Home computing	RT:	Bulk storage
	Low-power electronics		Canning
	Microwave ovens		Filling
	Multimedia systems		Fuel storage
<b>Consumer products</b>			Loading
BT:	Manufactured products		Measurement
RT:	Commercial law		Pallets
	Consumer behavior		Production
	Consumer electronics		Stacking
	Domestic safety	NT:	Freight containers
	Electrical products	<b>Contamination</b>	
	Food industry	BT:	Materials science and
	Food manufacturing	technology	
	Food products	RT:	Chemical hazards
	Footwear industry		Decontamination
	Market research		Hazards
	Plastic products		Impurities
	Product liability		Microfiltration
	Product safety		Pollution
	Watches		Quality control
NT:	Clothing		Radiation protection
	Games	NT:	Surface contamination
	Home appliances		



# 2018 IEEE Thesaurus

## *Content addressable memory*

USE: Associative memory

## **Content addressable storage**

BT: Memory

RT: Content-based retrieval

## *Content based retrieval*

USE: Content-based retrieval

## *Content delivery networks*

USE: Content distribution  
networks

## **Content distribution networks**

UF: Content delivery networks

BT: Computer networks

## **Content management**

BT: Electronic publishing  
Management

RT: Document handling  
MPEG 7 Standard  
Multimedia computing  
Publish subscribe systems  
Semantic Web  
Web design  
Web sites

## **Content-based retrieval**

UF: Content based retrieval

BT: Information retrieval

RT: Content addressable

storage

## **Context**

BT: Professional  
communication

RT: Pragmatics

## *Context aware\**

USE: Context-aware services

## **Context awareness**

BT: Artificial intelligence

RT: Intelligent control  
Intelligent systems  
Knowledge acquisition  
Learning systems  
Pervasive computing  
Semantic search

## **Context modeling**

BT: Modeling

RT: Computational linguistics

## *Context-aware applications*

USE: Context-aware services

## *Context-aware computing*

USE: Context-aware services

## **Context-aware services**

UF: Context aware\*  
Context-aware applications  
Context-aware computing  
BT: Ubiquitous computing

## **Continents**

BT: Geoscience

NT: Africa

Asia

Australia

Europe

North America

South America

## **Contingency management**

BT: Management

NT: Crisis management  
Disaster management  
Mission critical systems

## **Continuing education**

UF: Further education

BT: Career development

Educational programs

RT: Computer aided instruction

Engineering education

Management training

Training

## **Continuing professional development**

UF: Life long learning

BT: Human resource

management

RT: Qualifications

Training

## **Continuous improvement**

UF: Kaizen

BT: Total quality management

RT: Production management

Quality awards

## **Continuous phase modulation**

BT: Phase modulation

## **Continuous production**

BT: Flow production systems



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# 2018 IEEE Thesaurus

RT: Production control  
Process control  
Production management

## *Continuous systems*

USE: Continuous time systems

## *Continuous time models*

USE: Continuous time systems

## **Continuous time systems**

UF: Continuous systems  
Continuous time models  
BT: Time factors

## **Continuous wavelet transforms**

BT: Wavelet transforms

## **Continuous-stirred tank reactor**

BT: Chemical reactors

## *Continuously variable transmission*

USE: Mechanical power transmission

## **Contract law**

BT: Law  
RT: Contracts  
Employment law

## **Contract management**

BT: Contracts  
Management  
RT: Risk management

## **Contracts**

BT: Management  
RT: Business  
Contract law  
Procurement  
Proposals  
NT: Contract management  
Forward contracts  
Licenses  
Subcontracting

## **Control charts**

UF: Cusum charts  
Shewhart charts  
BT: Production management  
RT: Control systems  
Quality management

## **Control design**

BT: Control systems

RT: Feedback  
Lyapunov methods

## **Control engineering**

BT: Control systems  
RT: Control engineering  
education  
Predictive control

## **Control engineering computing**

BT: Computer applications  
RT: Control engineering  
education  
simulation  
Hardware-in-the loop

## **Control engineering education**

BT: Engineering education  
RT: Control engineering  
Control engineering  
computing

## **Control equipment**

BT: Control systems  
RT: Manipulators  
Mechatronics  
Robots  
NT: Actuators  
Fasteners  
Microcontrollers  
Regulators  
Servosystems  
Switches  
Switchgear  
Telecontrol equipment  
Thermostats

## **Control nonlinearities**

BT: Control theory  
RT: Nonlinear control systems  
NT: Backstepping  
Feedback linearization

## **Control system analysis**

BT: System analysis and design  
RT: Piecewise linear techniques  
NT: State-space methods

## **Control system synthesis**

UF: Control systems synthesis  
BT: Control systems  
RT: Circuit synthesis  
Hardware-in-the loop  
simulation  
Linearization techniques





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	Piecewise linear techniques		Controllability
			Cruise control
<b>Control systems</b>			Decentralized control
RT:	Actuators		Delay systems
	Adaptive control		Digital control
	Air traffic control		Fault tolerant control
	Communication system		Feedback
control			Feedback linearization
	Control charts		Fluid flow control
	Cybernetics		Fluidics
	Discrete-event systems		Gaze tracking
	Discrete-time systems		Homeostasis
	Estimation		Linear feedback control
	Flexible structures	systems	
	Force control		Magnetic variables control
	Game theory	control	Mechanical variables
	H infinity control		
	Interconnected systems		Medical control systems
	Inventory control		Moisture control
	Legged locomotion		Motion compensation
	Linear systems		Networked control systems
	Linearization techniques		Nonlinear control systems
	MIMO communication		Open loop systems
	Manipulators		Optical control
	Microcontrollers		Optimal control
	Microsensors		PD control
	Mobile robots		PI control
	Neuromodulation		Pneumatic systems
	Nonlinear systems		Positive train control
	Parameter estimation		Pressure control
	Poles and zeros		Proportional control
	Real-time systems		Radio control
	Robots		Robot control
	Robustness		SCADA systems
	Sensitivity		Sensorless control
	Stability		Sliding mode control
	State estimation		Supervisory control
	Stochastic systems		Thermal variables control
	Switched systems		Traffic control
	Target tracking		
	Time-varying systems	<i>Control systems synthesis</i>	
	Transfer functions	USE:	Control system synthesis
	Uncertain systems		
NT:	Automatic control	<b>Control theory</b>	
	Automatic generation	BT:	Cybernetics
control		RT:	Dynamics
	Bidirectional control		Feedback circuits
	Brakes	NT:	Control nonlinearities
	CAMAC		Iterative learning control
	Centralized control		Observability
	Closed loop systems		
	Control design	<b>Controllability</b>	
	Control engineering	BT:	Control systems
	Control equipment		
	Control system synthesis	<b>Convection</b>	





# 2018 IEEE Thesaurus

UF:	Mixed convection	RT:	Channel coding
convection	Rayleigh-Benard	broadcasting	Digital multimedia
BT:	Heat transfer		Error correction
<b>Convergence</b>			Error correction codes
BT:	Mathematics		Radio communication
			Satellite communication
			Telecommunications
<b>Convergence of numerical methods</b>		<b>Convolutional neural networks</b>	
BT:	Numerical analysis	BT:	Artificial neural networks
<b>Converters</b>		RT:	Machine learning
UF:	Convertors		
	Switching convertors	<b>Convolvers</b>	
BT:	Power electronics	BT:	Convolution
RT:	Data conversion		
	Pulse width modulation	<b>Coolants</b>	
	Pulse width modulation	UF:	Antifreeze materials
inverters		BT:	Cooling
	Space vector pulse width	RT:	Space cooling
modulation		NT:	Refrigerants
NT:	AC-AC converters		
	DC-AC power converters	<b>Cooling</b>	
	Digital-to-frequency	BT:	Temperature control
converters		RT:	Electronics cooling
	Frequency conversion		Electronics packaging
	Modular multilevel		Heat pipes
converters			Thermal engineering
	Power conversion	NT:	Air conditioning
	Pulse width modulation		Cold plates
converters			Coolants
	Resonant converters		Heat sinks
	Static power converters		Immersion cooling
	Voltage-source converters		Liquid cooling
	Wavelength converters		Refrigeration
<i>Convertors</i>			Solar cooling
USE:	Converters		Space cooling
			Thermal quenching
<b>Convex functions</b>			Trigeneration
UF:	Convex optimization		Ventilation
BT:	Mathematics	<i>Cooperative cache</i>	
<i>Convex optimization</i>		USE:	System performance
USE:	Convex functions	<b>Cooperative caching</b>	
<b>Convolution</b>		BT:	System performance
BT:	Signal processing	<b>Cooperative communication</b>	
RT:	Deconvolution	UF:	Amplify-and-forward
	Numerical analysis	cooperative communication	
NT:	Convolvers	BT:	Collaborative work
			Wireless communication
<b>Convolutional codes</b>		RT:	Communication
UF:	Trellis codes	effectiveness	
BT:	Codes		



# 2018 IEEE Thesaurus

communication	Professional	NT:	Trademarks Intellectual property Software protection
<i>Cooperative networks</i>			
USE:	Cooperative systems	<b>Core dumps</b>	
		BT:	System recovery
<b>Cooperative systems</b>		<b>Core loss</b>	
UF:	Cooperative networks	UF:	Core losses
BT:	Artificial intelligence	BT:	Energy loss
		RT:	Conductors Transformers
<i>Cooperative work</i>			
USE:	Collaborative work		
<b>Coordinate measuring machines</b>		<i>Core losses</i>	
UF:	CMM	USE:	Core loss
BT:	Measurement		
RT:	Inspection Machine tools Quality control	<i>Core-shelf nanostructures</i>	
		USE:	Nanostructured materials
<b>Coplanar transmission lines</b>		<b>Cornea</b>	
BT:	Planar transmission lines	BT:	Eyes
NT:	Coplanar waveguides	<b>Corner detection</b>	
		BT:	Computer vision Image processing
<b>Coplanar waveguides</b>		RT:	Image edge detection Motion detection
UF:	CPW		
BT:	Coplanar transmission lines	<b>Corona</b>	
RT:	Conformal mapping Electromagnetic	BT:	Electric breakdown
waveguides		RT:	Partial discharges
<b>Copper</b>		<b>Coronary arteriosclerosis</b>	
UF:	Cu	BT:	Arteriosclerosis
BT:	Metals		
NT:	Copper alloys Copper compounds	<b>Corporate acquisitions</b>	
		UF:	Mergers
<b>Copper alloys</b>		BT:	Organizational aspects
BT:	Copper	RT:	Business process re- engineering
RT:	Alloying		
<b>Copper compounds</b>		<i>Corpse</i>	
BT:	Copper	USE:	Cadaver
<b>Coprocessors</b>		<b>Corpus callosum</b>	
BT:	Circuits Integrated circuits Microprocessors	UF:	Callosal commissure
RT:	Digital arithmetic	BT:	Brain
<b>Copyright protection</b>		<b>Correlation</b>	
BT:	Legal factors	BT:	Statistics
RT:	Plagiarism Public domain software Publishing	RT:	Correlation coefficient
		NT:	Autocorrelation
		<b>Correlation coefficient</b>	
		BT:	Statistics



# 2018 IEEE Thesaurus

	RT: Correlation Regression analysis		USE: Cost benefit analysis
<b>Correlators</b>		<b>Cost benefit analysis</b>	
BT: Electromagnetic radiation		UF: Cost analysis	
RT: Signal detection		Cost-benefit analysis	
Signal processing		BT: Costs	
		RT: Functional point analysis	
<b>Corrosion</b>		<b>Cost function</b>	
BT: Surfaces		BT: Optimization	
RT: Coatings			
Corrosion inhibitors		<i>Cost of living index</i>	
Galvanizing		USE: Economic indicators	
Grain boundaries			
Magnetic flux leakage		<i>Cost-benefit analysis</i>	
Passivation		USE: Cost benefit analysis	
<b>Corrosion inhibitors</b>		<i>Cost-of-living index</i>	
BT: Inhibitors		USE: Economic indicators	
Materials			
RT: Corrosion		<b>Costing</b>	
Galvanizing		UF: Capital cost reduction	
Materials preparation		Operating cost reduction	
Materials processing		BT: Financial management	
		NT: Cost accounting	
<b>Corrugated surfaces</b>		<b>Costs</b>	
BT: Rough surfaces		BT: Economics	
Surfaces		RT: Cost accounting	
<b>Cortical bone</b>		Econometrics	
BT: Bone tissue		Exchange rates	
		NT: Cost benefit analysis	
<i>Cortical plasticity</i>		<b>Cotton</b>	
USE: Neuroplasticity		BT: Agricultural products	
<i>Cosmic gamma ray bursts</i>		Textiles	
USE: Gamma-ray bursts		RT: Natural fibers	
<b>Cosmic rays</b>		Textile fibers	
BT: Extraterrestrial phenomena		Textile industry	
RT: Electrons		Weaving	
Elementary particles			
Mesons		<i>Counseling</i>	
Neutrons		USE: Employee welfare	
Protons		<i>Counselling</i>	
<b>Cost accounting</b>		USE: Employee welfare	
UF: Valuation		<i>Counterfeit goods</i>	
BT: Costing		USE: Counterfeiting AND	
Management accounting		Manufactured products	
RT: Costs		<b>Counterfeiting</b>	
Economics		UF: Counterfeit goods	
Profitability		BT: Computer crime	

*Cost analysis*



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# 2018 IEEE Thesaurus

## Countermeasures (computer)

BT: Computer security  
Data protection  
RT: Access control  
Anti-virus software  
Blacklisting  
Firewalls (computing)

USE: Course correction

## Courseware

BT: Educational technology  
RT: Authoring systems  
Computer aided instruction  
Software

## Counters

USE: Radiation detectors

## Counting circuits

BT: Circuits  
RT: Logic circuits  
Radiation detector circuits

## Covariance matrices

UF: Covariance matrix  
BT: Statistics

## Covariance matrix

USE: Covariance matrices

## Coupled circuits

USE: Coupling circuits

## Cows

UF: Cattle  
BT: Bovine

## Coupled mode analysis

BT: Circuit analysis  
RT: Multiconductor transmission

## CPU

USE: Central Processing Unit

lines

## CPW

USE: Coplanar waveguides

## Couplers

BT: Communications  
technology  
RT: Apertures  
Coupling circuits  
Electromagnetic coupling  
NT: Directional couplers

## Cr

USE: Chromium

## Cramer Rao bound

USE: Cramer-Rao bounds

## Coupling (process)

USE: Joining processes

## Cramer Rao bounds

USE: Cramer-Rao bounds

## Coupling circuits

UF: Coupled circuits  
BT: Circuits  
RT: Couplers

## Cramer-Rao bounds

UF: Cramer Rao bound  
Cramer Rao bounds  
Cramer-Rao inequality  
Information inequality  
BT: Estimation theory

## Couplings

UF: Linkages  
BT: Mechanical products  
RT: Fasteners  
Joining processes  
Machine components  
Shafts

## Cramer-Rao inequality

USE: Cramer-Rao bounds

## Course correction

UF: Course-correction  
BT: Navigation  
RT: Aircraft navigation  
Path planning

## Cranes

BT: Lifting equipment

## Cranial

BT: Nervous system  
NT: Cranial pressure

## Cranial pressure

BT: Cranial  
NT: Intracranial system

## Course-correction



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# 2018 IEEE Thesaurus

## Cranium

BT: Head

## Crawlers

BT: Web search  
RT: Bot (Internet)

## CRC codes

USE: Cyclic redundancy check codes

## Creativity

BT: Innovation management

## Credit cards

UF: American Express  
Mastercard  
Visa gold  
BT: Financial management

## Creep

BT: Material properties

## Criminal law

BT: Law

## Crimping

BT: Joining processes

## Crisis management

BT: Contingency management

## Critical current density

BT: Critical current density (superconductivity)  
RT: Silicon compounds  
Superconducting materials  
Thermal factors

## Critical current density (superconductivity)

BT: Superconductivity  
RT: Magnetic fields  
NT: Critical current density

## Critical infrastructure

UF: Critical national infrastructure  
BT: Public infrastructure

## Critical national infrastructure

USE: Critical infrastructure

## Crops

BT: Agricultural products  
Vegetation

RT: Fertilizers  
Greenhouses  
Irrigation  
Water storage  
Yield estimation

## Cross cultural communication

USE: Cross-cultural communication

## Cross layer design

BT: Communication systems  
RT: Ad hoc networks  
IEEE 802.16 Standard  
Land mobile radio cellular systems  
Military communication  
Radio communication

## Cross platform virtualization

USE: Application virtualization

## Cross-cultural communication

UF: Cross cultural communication  
BT: Global communication  
RT: Cultural differences

## Cross-platform virtualization

USE: Application virtualization

## Cross-site scripting

UF: XSS  
BT: Computer security

## Crosstalk

UF: Crosstalk noise  
BT: Interference  
RT: Electromagnetic interference  
Interchannel interference  
Transmission line theory

## Crosstalk noise

USE: Crosstalk

## Crowdsourcing

BT: Collaborative work  
Internet  
RT: Collective intelligence  
Distributed processing  
Mobile computing  
Outsourcing  
Social computing  
Social network services



# 2018 IEEE Thesaurus

	NT:	Product development		RT:	Bitcoin
<i>CRT</i>					Chaotic communication
	USE:	Cathode ray tubes			Codes
					Communication system
<b>Cruise control</b>			security		
	BT:	Control systems			Computer security
		Electromechanical systems			Data handling
	RT:	Velocity control			Encoding
					Message authentication
<b>Cryobiology</b>					Privacy
	BT:	Biology			Random sequences
		Temperature measurement		NT:	Steganography
					Ciphers
<b>Cryogenic electronics</b>					Cryptocurrency
	BT:	Industrial electronics			Encryption
	RT:	Cryogenics			Public key
		Superconducting devices			Quantum cryptography
		Superconducting materials	generation		Random number
					Side-channel attacks
<b>Cryogenics</b>					
	UF:	Cryonics	<b>Crystal growth</b>		
	BT:	Industry applications		BT:	Crystallization
		Temperature measurement		RT:	Epitaxial growth
	RT:	Cryogenic electronics			Semiconductor growth
<i>Cryonics</i>			<b>Crystal microstructure</b>		
	USE:	Cryogenics		BT:	Crystals
				RT:	Microstructure
<b>Cryotherapy</b>			<b>Crystalline materials</b>		
	BT:	Medical treatment		BT:	Materials
		Temperature measurement		NT:	Martensite
<i>Crypto currency</i>					Nanocrystals
	USE:	Cryptocurrency			Superlattices
<b>Cryptocurrency</b>			<i>Crystallisation</i>		
	UF:	Crypto currency		USE:	Crystallization
	BT:	Cryptography			
		Currencies	<i>Crystallisers</i>		
	RT:	Digital systems		USE:	Crystallizers
		Finance			
		Online banking	<b>Crystallization</b>		
	NT:	Bitcoin		UF:	Crystallisation
<i>Cryptographic</i>				BT:	Crystallography
	USE:	Cryptography		NT:	Crystal growth
<b>Cryptographic protocols</b>			<b>Crystallizers</b>		
	BT:	Protocols		UF:	Crystallisers
				BT:	Chemical technology
<b>Cryptography</b>				RT:	Chemical reactors
	UF:	Cryptographic			Colloidal crystals
	BT:	Data security			Crystallography
		Security			Crystals



# 2018 IEEE Thesaurus

## Crystallography

BT: Crystals  
RT: Crystallizers  
Diffraction  
X-ray detectors  
NT: Crystallization

## Crystals

BT: Materials  
RT: Crystallizers  
Epitaxial growth  
Materials science and  
technology  
growth  
Molecular beam epitaxial  
Phonons  
Piezoelectric materials  
Semiconductor materials  
Solids  
NT: Colloidal crystals  
Crystal microstructure  
Crystallography  
Grain boundaries  
Grain size  
Liquid crystals

## CSMA

USE: Multiaccess communication

## CSP

USE: Chip scale packaging

## CSTR

USE: Chemical reactors

## CT scan

USE: Computed tomography

## Cu

USE: Copper

## Cultural differences

BT: Social implications of  
technology  
RT: Cross-cultural  
communication  
Digital divide  
Memetics  
Social intelligence

## Curing

BT: Materials processing  
RT: Heat treatment  
Kilns

## Curium

BT: Chemical elements

## Currencies

BT: Finance  
NT: Cryptocurrency

## Current

UF: Electric current  
BT: Electric variables  
RT: Breakdown voltage  
Current control  
Current limiters  
Current measurement  
Current supplies  
Current transformers  
NT: Bioimpedance  
Current slump  
Dark current  
Fault currents  
Leakage currents  
Persistent currents  
Short-circuit currents  
Threshold current

## Current control

UF: Current regulation  
BT: Electric variables control  
RT: Current  
Current measurement  
Regulators  
Switches  
Switchgear  
NT: Electric current control  
Electrical ballasts

## Current crowding

USE: Proximity effects

## Current density

BT: Current measurement  
RT: Density measurement  
Particle measurements  
NT: Skin effect

## Current distribution

BT: Current measurement  
RT: Antenna theory

## Current limiters

BT: Power electronics  
RT: Current  
Current measurement  
NT: Fault current limiters



# 2018 IEEE Thesaurus

## Current measurement

UF: Electric current  
measurement  
BT: Electric variables  
measurement  
RT: Ammeters  
Current  
Current control  
Current limiters  
NT: Current density  
Current distribution

## Current measurement (water)

USE: Sea measurements

## Current mode circuits

USE: Current-mode circuits

## Current regulation

USE: Current control

## Current slump

BT: Current

## Current supplies

BT: Power supplies  
RT: Current

## Current transformers

BT: Transformers  
RT: Current

## Current voltage characteristics

USE: Current-voltage  
characteristics AND  
Electric variables

## Current-mode circuits

UF: Current mode circuits  
BT: Integrated circuits

## Current-voltage characteristics

UF: Current voltage  
characteristics  
BT: Electric variables

## Curriculum development

BT: Education courses  
RT: Educational programs  
STEM

## Curve fitting

BT: Approximation methods  
Visualization  
RT: Computer graphics

Interpolation  
Least squares

approximation

Splines (mathematics)  
Surface fitting

## Custom integrated circuits

USE: Application specific  
integrated circuits

## Customer profiles

BT: Customer relationship  
management  
RT: Consumer behavior  
Market opportunities

## Customer relationship management

BT: Management  
RT: Consumer behavior  
Consumer protection  
Management information

systems

Public relations  
Quality management  
Supply chain management  
NT: Customer profiles  
Customer satisfaction  
Customer services  
Market research  
Stakeholders

## Customer satisfaction

BT: Customer relationship  
management  
RT: Customer services  
Market research  
Product customization  
Quality management  
Quality of experience  
Quality of service  
NT:

## Customer services

BT: Customer relationship  
management  
RT: Customer satisfaction

## Cusum charts

USE: Control charts

## Cutoff frequency

BT: Integrated circuit modeling

## Cutting fluids

USE: Lubricants





# 2018 IEEE Thesaurus

## Cutting tools

BT: Production equipment  
RT: Blades  
Dies  
Machine tools  
Metalworking machines  
Milling machines  
NT: Water jet cutting

## CVD

USE: Chemical vapor deposition

## Cyber attack

USE: Cyberattack

## Cyber crime

USE: Computer crime

## Cyber eavesdropping

USE: Eavesdropping

## Cyber espionage

UF: Cyber spying  
Cyberespionage  
Cyberspying  
BT: Computer security  
Information security  
RT: Malware  
Trojan horses

## Cyber ethics

USE: Cyberethics

## Cyber security

USE: Computer security

## Cyber spying

USE: Cyber espionage

## Cyber terrorism

UF: Cyberterrorism  
BT: Computer crime  
Terrorism  
RT: Computer networks

## Cyber warfare

UF: Cyberwarfare  
BT: Computer security  
RT: Computer networks  
Cyberattack  
National security

## Cyber-crime

USE: Computer crime

## Cyber-physical systems

UF: Cyberphysical systems  
BT: System of systems  
RT: Collaboration  
Embedded systems  
Human computer

## interaction

Internet of Things  
Operating systems  
Smart cities  
Smart grids  
Wireless sensor networks

## Cyber-security

USE: Computer security

## Cyber-space

USE: Cyberspace

## Cyberattack

UF: Cyber attack  
BT: Computer crime  
Computer security  
RT: Cyber warfare  
Cyberethics

## Cybercare

BT: Biomedical equipment  
Medical services

## Cybercrime

USE: Computer crime

## Cybereavesdropping

USE: Eavesdropping

## Cyberespionage

USE: Cyber espionage

## Cyberethics

UF: Cyber ethics  
BT: Ethics  
RT: Behavioral sciences  
Cyberattack  
Intellectual property  
Privacy  
Social implications of

## technology

## Cybernetics

UF: Biocybernetics  
BT: Systems, man, and

## cybernetics

RT: Automata  
Cognitive systems



# 2018 IEEE Thesaurus

	Control systems		Data communication
	Cyberspace		Error analysis
	Econometrics		Error correction
	Ergonomics		Information theory
	Information theory		Noise
	Learning systems	NT:	Cyclic redundancy check
	Man-machine systems	codes	
	Neural networks		
	Radial basis function		
networks		<b>Cyclic redundancy check codes</b>	
	Robots	UF:	CRC codes
NT:	Adaptive systems	BT:	Codes
	Cognitive informatics		Cyclic redundancy check
	Cognitive science	RT:	Decoding
	Control theory		Error analysis
	Decision theory		Error correction
	Econophysics		
	Emergent phenomena	<b>Cyclones</b>	
	Intelligent control	UF:	Polar cyclones
	Linear feedback control	BT:	Geoscience
systems		NT:	Hurricanes
			Tropical cyclones
<i>Cyberphysical systems</i>		<i>Cyclonic storms</i>	
USE:	Cyber-physical systems	USE:	Tropical cyclones
<i>Cybersecurity</i>		<b>Cyclotrons</b>	
USE:	Computer security	BT:	Particle accelerators
<b>Cyberspace</b>		<i>Cyphers</i>	
UF:	Cyber-space	USE:	Ciphers
BT:	Communication networks		
	Computer networks		
RT:	Computers	<b>D-HEMTs</b>	
	Cybernetics	UF:	Depletion mode HEMTs
	Electromagnetics		Depletion-mode HEMTs
	Internet	BT:	HEMTs
	Telematics		
	Virtual reality	<i>D/A</i>	
	World Wide Web	USE:	Digital-analog conversion
<i>Cyberspying</i>		<i>D/A conversion</i>	
USE:	Cyber espionage	USE:	Digital-analog conversion
<i>Cyberterrorism</i>		<i>D/A converters</i>	
USE:	Cyber terrorism	USE:	Digital-analog conversion
<i>Cyberwarfare</i>		<i>D2D</i>	
USE:	Cyber warfare	USE:	Device-to-device
		communication	
<i>Cyborgs</i>		<b>Dairy products</b>	
USE:	Man-machine systems	UF:	Butter
			Cheese
			Milk
		BT:	Agricultural products
			Food products
<b>Cyclic redundancy check</b>			
BT:	Mathematics		
RT:	Algorithms		



# 2018 IEEE Thesaurus

RT: Agriculture	RT: Data assimilation
<b>Damascene integration</b>	Data handling
BT: Electronic equipment	Data integration
manufacture	Database systems
RT: Very large scale integration	Information management
<i>Dampers</i>	<b>Data analysis</b>
USE: Shock absorbers	UF: Data analytics
<b>Damping</b>	BT: Data processing
BT: Mechanical factors	RT: Big Data applications
RT: Hysteresis	Data collection
Impedance	Data mining
Oscillators	Formal concept analysis
Propagation	Text categorization
Shock absorbers	NT: Business intelligence
Stability	Data science
Transfer functions	Itemsets
Transient response	Training data
Vibration control	
Vibrations	<i>Data analytics</i>
<i>DAQ</i>	USE: Data analysis
USE: Data acquisition	<b>Data assimilation</b>
<b>Dark current</b>	BT: Data handling
BT: Current	RT: Data aggregation
<b>Dark energy</b>	Meteorology
BT: Physics	<b>Data buses</b>
<b>Dark states</b>	UF: Computer buses
BT: Laser applications	BT: Communication systems
<b>Darmstadtium</b>	RT: Data communication
BT: Chemical elements	RT: CAMAC
<i>DARPANET</i>	Computer interfaces
USE: ARPANET	Fastbus
<b>Data acquisition</b>	IEEE 1394 Standard
UF: DAQ	NT: Backplanes
BT: Data systems	<b>Data centers</b>
RT: Analog-digital conversion	UF: Data centres
Data handling	BT: Data systems
Data processing	<i>Data centres</i>
High energy physics	USE: Data centers
instrumentation computing	<b>Data collection</b>
NT: Measurement	BT: Data processing
Fastbus	RT: Data analysis
User-generated content	Information processing
<b>Data aggregation</b>	NT: Big Data
BT: Data collection	Data aggregation
	<b>Data communication</b>
	UF: Data transmission
	BT: Communication systems
	RT: Ad hoc networks



# 2018 IEEE Thesaurus

interconnection		B-ISDN	<b>Data conversion</b>	BT:	Data systems	
		CAMAC		RT:	Converters	
		Computer networks		NT:	Analog-digital conversion	
		Cyclic redundancy check			Digital-analog conversion	
		Data dissemination		<b>Data dissemination</b>		
		Data security			BT:	Data handling
		Digital communication				Information sharing
		Distributed computing			RT:	Data communication
		Extranets				Data integration
		Fastbus				Mobile computing
communication mode		File servers	<b>Data encapsulation</b>	BT:	Data handling	
		Firewire				
		IEEE 1394 Standard				
		ISDN	<b>Data engineering</b>			
		Modems		BT:	Data systems	
		Multiprocessor				
		Office automation	<b>Data envelopment analysis</b>	BT:	Linear programming	
		Packet loss				
		Personal area networks				
		TCPIP	<b>Data flow computing</b>	BT:	Multiprocessing systems	
	Telecontrol equipment					
	Teletext					
	Videotex	<i>Data flow graphs</i>	USE:	Flow graphs		
	Asynchronous	<i>Data fusion</i>	USE:	Data integration		
	Asynchronous transfer	<b>Data gloves</b>	BT:	Haptic interfaces		
	Data buses					
	Data transfer					
<b>Data compression</b>		Telecommunication buffers	<b>Data handling</b>	UF:	Electronic data interchange	
		Telemetry		BT:	Data systems	
		Teleprinting		RT:	Big Data	
		Visible light communication			Buffer storage	
					Cryptography	
					Data acquisition	
					Data aggregation	
					Data processing	
					Data security	
					Encoding	
			Enterprise resource			
			planning	NT:	Data assimilation	
				Data dissemination		
				Data encapsulation		
				Data integrity		
				Document handling		
				Merging		
				Sorting		
<i>Data confidentiality</i>						
	USE:	Data privacy				



# 2018 IEEE Thesaurus

## Data integration

UF: Data fusion  
BT: Data processing  
RT: Data aggregation  
Data dissemination

planning

Database systems  
Enterprise resource

Fastbus  
Signal processing  
Smart cards  
Technology management  
Associative processing  
Business data processing  
Data analysis  
Data collection  
Data integration  
Data preprocessing  
Data transfer  
Information exchange  
Spreadsheet programs  
Text processing  
Virtual enterprises

## Data integrity

UF: Data quality  
BT: Computer security  
Data handling  
RT: Digital preservation  
Quality assurance  
Quality control

NT:

## Data mining

BT: Pattern recognition  
RT: Artificial intelligence  
Big Data  
Business intelligence  
Data analysis  
Data visualization  
Knowledge discovery  
Nearest neighbor methods  
NT: Anomaly detection  
Association rules  
Data privacy  
Text analysis  
Text mining  
Web mining

## Data protection

BT: Data privacy  
RT: Computer security  
Data security  
Information security  
Privacy  
NT: Countermeasures

(computer)

## Data quality

USE: Data integrity

## Data models

BT: Modeling  
RT: Database systems  
Semantic Web  
Semantic technology  
NT: Metadata

## Data science

BT: Data analysis  
RT: Knowledge discovery  
Neuroinformatics

## Data preprocessing

BT: Data processing

## Data security

UF: Security of data  
System privacy

## Data privacy

UF: Data confidentiality  
Privacy preserving data

management

BT: Security  
RT: Communication system

mining

BT: Data mining  
RT: Privacy  
NT: Data protection

security

Computer crime  
Computer network

management

Computer security  
Data communication  
Data handling  
Data protection  
Privacy  
Virtual private networks  
Cryptography  
Message authentication

## Data processing

BT: Data systems  
RT: CAMAC  
Computers and information

processing

NT:

Data acquisition  
Data handling



# 2018 IEEE Thesaurus

## *Data storage*

USE: Memory

## Data mining

Modeling

NT: Isosurfaces

## Data storage systems

BT: Data systems  
RT: Big Data  
Storage area networks  
NT: Triples (Data structure)

## Data warehouses

BT: Data systems  
RT: NoSQL databases

## Data structures

BT: Computer architecture  
RT: Computer languages  
Database systems  
File systems  
NoSQL databases  
NT: Arrays  
Binary decision diagrams  
Null value  
Octrees  
Persistent identifiers  
Table lookup  
Tree data structures

## Database languages

UF: Query languages  
BT: Computer languages  
RT: Database systems  
NT: Structured Query Language

## Database machines

BT: Computers and information processing  
RT: Database systems  
Information systems

## Database management systems

USE: Database systems

## Data systems

BT: Computers and information processing  
Information systems  
RT: Big Data applications  
NT: Data acquisition  
Data centers  
Data compression  
Data conversion  
Data engineering  
Data handling  
Data processing  
Data storage systems  
Data warehouses

## Database systems

UF: Database management systems  
Technical data  
management  
BT: Databases  
Information systems  
RT: Data aggregation  
Data models  
Data processing  
Data structures  
Database languages  
Database machines  
File systems  
Hypertext systems  
Information architecture  
Linked data  
NT: Triples (Data structure)  
Audio databases  
Deductive databases  
Image databases  
Indexes  
Multimedia databases  
NoSQL databases  
Object oriented databases  
Query processing

## Data transfer

BT: Data communication  
Data processing  
RT: Packet switching  
NT: Handover

## Data transmission

USE: Data communication

## Data visualisation

USE: Data visualization

## Data visualization

UF: Data visualisation  
BT: Computer graphics  
User interfaces  
RT: Biomedical imaging

## Databases

BT: Professional communication  
NT: Database systems  
Deductive databases





# 2018 IEEE Thesaurus

BT:	System recovery	TOPSIS	
<b>Deburring</b>		<b>Decision trees</b>	
BT:	Surface finishing	UF:	Tree searching
RT:	Drilling	BT:	Decision theory
	Machining	NT:	Classification tree analysis
	Polishing machines		Regression tree analysis
<i>Decentralised control</i>		<i>Decoder</i>	
USE:	Decentralized control	USE:	Decoding
<b>Decentralized control</b>		<b>Decoding</b>	
UF:	Decentralised control	UF:	Decoder
	Distrbuted control	BT:	Information theory
	Distributed generation	RT:	Codecs
	Distributed modeling		Codes
BT:	Control systems		Cyclic redundancy check
RT:	Flexible structures	codes	
NT:	Distributed parameter		Demodulation
systems			Parity check codes
			Product codes
<b>Decision analysis</b>			Signal processing
BT:	Decision making		Space-time codes
	Information analysis		Speech codecs
			Video codecs
<b>Decision feedback equalizers</b>		NT:	Maximum likelihood
BT:	Equalizers	decoding	
<b>Decision making</b>		<b>Decontamination</b>	
BT:	Management	BT:	Materials handling
RT:	Decision support systems	RT:	Chemical technology
	Expert systems		Contamination
	Planning		Environmental monitoring
	Risk analysis		Pollution control
	Signal detection		Purification
	Stakeholders		
	Strategic planning	<b>Deconvolution</b>	
	TOPSIS	BT:	Inverse problems
NT:	Analytic hierarchy process	RT:	Convolution
	Collective intelligence		Integral equations
	Decision analysis		Numerical analysis
	Distributed decision making		Signal processing
	Game theory		Signal restoration
	Pattern classification		
	Persuasive systems	<b>Decorrelation</b>	
		BT:	Signal processing
<b>Decision support systems</b>		<b>Deductive databases</b>	
BT:	Artificial intelligence	UF:	Intelligent databases
RT:	Competitive intelligence	BT:	Database systems
	Decision making		Databases
	Knowledge based systems	RT:	Knowledge based systems
<b>Decision theory</b>		<i>Deep etching</i>	
BT:	Cybernetics	USE:	Etching
NT:	Decision trees		





# 2018 IEEE Thesaurus

<i>Deep learning</i>	RT: Computer networks
USE: Machine learning	Multiaccess communication
	Speech processing
<i>Deep reinforcement learning</i>	
USE: Machine learning	<b>Delay lines</b>
	BT: Delay systems
	RT: Delay effects
<b>Deep-space communications</b>	
BT: Space communications	<i>Delay lock loops</i>
RT: Telemetry	USE: Tracking loops
<i>Defence industry</i>	
USE: Defense industry	<b>Delay systems</b>
	BT: Control systems
<b>Defense industry</b>	RT: Delay effects
UF: Defence industry	Telerobotics
BT: Industries	NT: Added delay
RT: Military equipment	Delay lines
Weapons	
<b>Defibrillation</b>	
BT: Medical treatment	<b>Delays</b>
RT: Cardiology	BT: Timing
Fibrillation	NT: Delay estimation
<i>Definitions</i>	
USE: Terminology	<b>Delta modulation</b>
	BT: Analog-digital conversion
	Digital signal processing
	NT: Delta-sigma modulation
	Sigma-delta modulation
<b>Deformable models</b>	
BT: Modeling	<i>Delta sigma</i>
	USE: Sigma-delta modulation
<i>Deformation</i>	
USE: Strain	<i>Delta sigma modulators</i>
	USE: Delta-sigma modulation
<b>Degenerative diseases</b>	
BT: Diseases	<b>Delta-sigma modulation</b>
	UF: DDSM
<b>Degradation</b>	Delta sigma modulators
BT: Materials science and	BT: Delta modulation
technology	
<b>Delamination</b>	<i>Demagnetisation</i>
BT: Materials testing	USE: Demagnetization
<b>Delay effects</b>	
UF: Time delay	<b>Demagnetization</b>
BT: Electromagnetic analysis	UF: Demagnetisation
RT: Delay lines	BT: Magnetics
Delay systems	
Distortion	<b>Demand forecasting</b>
Phase distortion	BT: Forecasting
NT: Propagation delay	RT: Production planning
<b>Delay estimation</b>	
BT: Delays	<b>Demand response</b>
	BT: Power demand
	<b>Demand-side management</b>
	BT: Energy management



# 2018 IEEE Thesaurus

RT:	Power system planning Vehicle-to-grid	<i>Density function theory</i> USE: Density functional theory
<b>Dementia</b>		<b>Density functional theory</b> UF: Density function Density function theory Density-function BT: Quantum mechanics
BT: Diseases NT: Alzheimer's disease		
<b>Demodulation</b>		<b>Density measurement</b> BT: Measurement RT: Bone density Current density Pressure gauges NT: Hydrometers
UF: Demodulators BT: Modulation RT: Amplitude modulation Decoding Detectors Frequency modulation Mixers Modems Phase modulation Pulse modulation Receivers Signal detection		<i>Density-function</i> USE: Density functional theory
<i>Demodulators</i> USE: Demodulation		<i>Dental</i> USE: Dentistry
<b>Demography</b> BT: Social factors		<b>Dentistry</b> UF: Dental BT: Medical treatment
<b>Demultiplexing</b> BT: Multiplexing RT: Arrayed waveguide gratings		<b>Dependability management</b> BT: Management RT: Reliability Safety management
<b>Dendrites (neurons)</b> UF: Dendrons BT: Neurons		<i>Depletion mode HEMTs</i> USE: D-HEMTs
<i>Dendrons</i> USE: Dendrites (neurons)		<i>Depletion-mode HEMTs</i> USE: D-HEMTs
<b>Denial-of-service attack</b> UF: DoS attack BT: Communication system security NT: Computer security Distributed denial-of-service attack		<i>Deployable structures</i> USE: Flexible structures
<i>Denoising</i> USE: Noise reduction		<i>DER</i> USE: Density estimation robust algorithm
<b>Density estimation robust algorithm</b> UF: DER BT: Algorithms		<i>Derailments</i> USE: Railway accidents
<i>Density function</i> USE: Density functional theory		<b>Dermatology</b> BT: Medical specialties
		<b>Dermis</b> BT: Skin
		<b>Desalination</b>



# 2018 IEEE Thesaurus

BT:	Water conservation	<b>Design for quality</b>	BT:	Design methodology
	Water resources		RT:	Process design
RT:	Reverse osmosis			Product design
<b>Description logic</b>				Quality assurance
BT:	Knowledge representation			Quality control
	Ontologies			Quality management
				Total quality management
<i>Design</i>		<b>Design for testability</b>		
USE:	Design methodology	UF:	Design-for-test	
			Design-for-testing	
<b>Design automation</b>		BT:	Design methodology	
UF:	CAD	RT:	Built-in self-test	
	Circuit CAD		Logic design	
	Circuit design (CAD)		Logic testing	
	Circuit layout CAD			
	Computer aided design	<b>Design methodology</b>		
	Computer-aided design	UF:	Design	
BT:	Electronic design	BT:	Electronic design	
automation and methodology			automation and methodology	
RT:	Automatic test pattern	RT:	Ergonomics	
generation			Industrial engineering	
	Circuit simulation		Logic design	
	Design tools		Optical design techniques	
	Hardware design		Rapid prototyping	
languages			System analysis and design	
	Laser sintering	NT:	Design for disassembly	
	SPICE		Design for experiments	
NT:	CADCAM		Design for manufacture	
	Logic design		Design for quality	
	PSCAD		Design for testability	
			Design standards	
<b>Design engineering</b>			Design tools	
BT:	Engineering - general		Graphics	
RT:	Design optimization		Green design	
NT:	Design tools		Integrated design	
			Process design	
<b>Design for disassembly</b>			Product design	
BT:	Design methodology		Prototypes	
RT:	Pollution		Technical drawing	
	Process design		Time to market	
	Product design		User centered design	
	Waste reduction		Virtual prototyping	
		<b>Design optimization</b>		
<b>Design for experiments</b>		BT:	Optimization methods	
BT:	Design methodology	RT:	Design engineering	
		NT:	Constraint optimization	
<i>Design for manufacturability</i>				
USE:	Design for manufacture	<b>Design standards</b>		
		BT:	Design methodology	
<b>Design for manufacture</b>				
UF:	Design for manufacturability	<b>Design tools</b>		
BT:	Design methodology	BT:	Design engineering	
RT:	Design tools			



# 2018 IEEE Thesaurus

RT:	Design methodology Design automation Design for manufacture Instruments Media Product design Visualization	USE:	Doped fiber amplifiers
<i>Design-for-test</i>		<i>DFIG</i>	USE: Doubly fed induction generators
USE:	Design for testability	<i>DFT</i>	USE: Discrete Fourier transforms
<i>Design-for-testing</i>		<i>DGPS</i>	USE: Global Positioning System
USE:	Design for testability	<b>DH-HEMTs</b>	
<b>Desktop publishing</b>		HEMTs	UF: Double heterojunction
BT:	Electronic publishing Publishing	BT:	HEMTs
RT:	Document handling Office automation Page description languages Text processing	<i>DHBTs</i>	USE: Double heterojunction bipolar transistors
<i>Detection (signal)</i>		<b>Diabetes</b>	
USE:	Signal detection	UF:	Diabetic
<b>Detection algorithms</b>		BT:	Medical conditions
BT:	Algorithms	<i>Diabetic</i>	USE: Diabetes
<b>Detectors</b>		<i>Diacs</i>	USE: Thyristors
BT:	Sensor systems and applications	<i>Diagnosis (medical)</i>	USE: Medical diagnosis
RT:	Chemical sensors Demodulation Nonlinear filters Readout electronics	<b>Diagnostic expert systems</b>	
NT:	Envelope detectors Semiconductor detectors	BT:	Expert systems
<b>Deuterium</b>		RT:	Failure analysis Fault diagnosis
BT:	Hydrogen	<b>Diagnostic radiography</b>	
<i>Device chargers</i>		BT:	Radiography
USE:	Battery chargers	RT:	Attenuation Magnetic resonance imaging
<b>Device drivers</b>			Medical diagnosis X-ray detection
BT:	Input-output programs	<b>Diakoptics</b>	
RT:	Computer peripherals	BT:	System analysis and design
<b>Device-to-device communication</b>		<b>Diamagnetic materials</b>	
UF:	D2D	BT:	Magnetic materials
BT:	Communication systems	<b>Diamond</b>	
RT:	Base stations Cellular networks	UF:	Diamonds
<i>DFA</i>			



# 2018 IEEE Thesaurus

BT: Minerals	RT: Dielectric measurement
<i>Diamond carbon</i>	Insulation
USE: Diamond-like carbon	Lightning
<i>Diamond like carbon</i>	NT: Arc discharges
USE: Diamond-like carbon	Discharges (electric)
<b>Diamond-like carbon</b>	Electrostatic discharges
UF: Diamond carbon	Flashover
Diamond like carbon	Glow discharges
Hard amorphous carbon	Partial discharges
BT: Amorphous materials	Surface discharges
RT: Biomedical materials	Vacuum breakdown
Thin films	
Tissue engineering	
<i>Diamonds</i>	<b>Dielectric constant</b>
USE: Diamond	BT: Dielectrics
<b>DICOM</b>	RT: Capacitors
UF: Digital Imaging and	Permittivity
Communications in Medicine	NT: High-k gate dielectrics
BT: Biomedical imaging	
Digital communication	<b>Dielectric devices</b>
<b>Dictionaries</b>	BT: Dielectrics
BT: Information services	RT: Dielectric materials
Terminology	Dielectric resonator
Writing	antennas
<i>Dictionary learning</i>	NT: Electrets
USE: Machine learning	Capacitors
<i>Die attach</i>	Ferroelectric devices
USE: Microassembly	Piezoelectric devices
<i>Die bonding</i>	Pyroelectric devices
USE: Microassembly	<b>Dielectric elastomer actuators</b>
<b>Die casting</b>	BT: Actuators
BT: Casting	NT: Dielectric elastomers
RT: Automobile manufacture	<b>Dielectric elastomers</b>
Dies	UF: Smart elastomers
Materials handling	BT: Dielectric elastomer
Melt processing	actuators
Metals	RT: Smart materials
<i>Dielectric barrier discharges</i>	<i>Dielectric electroactive polymer actuators</i>
USE: Discharges (electric)	USE: Actuators
<b>Dielectric breakdown</b>	<b>Dielectric films</b>
UF: Dielectric strength	BT: Dielectric materials
Voltage breakdown	Films
BT: Electric breakdown	RT: Planarization
	Thick films
	Thin films
	NT: Dielectric thin films
	Piezoelectric films
	<b>Dielectric liquids</b>
	UF: Liquid insulation
	BT: Dielectric materials



# 2018 IEEE Thesaurus

## Dielectric loss measurement

BT: Dielectric measurement  
RT: Dielectric losses

## Dielectric losses

UF: Dielectric loss  
BT: Dielectrics  
RT: Dielectric loss measurement

Insulation

## Dielectric materials

UF: Antiferroelectric materials  
Dielectric material  
Paraelectric materials  
BT: Materials  
RT: Ceramics  
Dielectric devices  
Dielectric thin films  
Electrohydrodynamics  
Electrokinetics  
Ferroelectric materials  
Glass  
Insulation  
Loaded waveguides  
Permittivity  
Plastic insulation  
NT: Dielectric films  
Dielectric liquids  
Electrets  
Epoxy resins  
High-k dielectric materials  
Piezoelectric materials

## Dielectric measurement

UF: Dielectric measurements  
BT: Electric variables  
measurement  
RT: Capacitance measurement  
Dielectric breakdown  
Electromagnetic  
measurements  
NT: Dielectric loss  
measurement  
Permittivity measurement

## Dielectric measurements

USE: Dielectric measurement

## Dielectric properties

USE: Dielectrics

## Dielectric resonator antennas

BT: Antennas  
RT: Dielectric devices

Resonance

## Dielectric strength

USE: Dielectric breakdown

## Dielectric substrate

USE: Dielectric substrates

## Dielectric substrates

UF: Dielectric substrate  
BT: Dielectrics

## Dielectric thin films

BT: Dielectric films  
RT: Dielectric materials  
Polymer films  
Semiconductor films

## Dielectrics

UF: Dielectric properties  
Electrical insulation  
BT: Dielectrics and electrical insulation  
NT: Dielectric constant  
Dielectric devices  
Dielectric losses  
Dielectric substrates  
Dielectrophoresis  
Electrohydrodynamics  
Electrokinetics  
Electrostriction

## Dielectrics and electrical insulation

NT: Dielectrics  
Electric breakdown  
Insulation

## Dielectrophoresis

BT: Dielectrics

## Dielectric loss

USE: Dielectric losses

## Dielectric material

USE: Dielectric materials

## Dies

UF: Dies (machine tools)  
BT: Machine tools  
RT: Cutting tools  
Die casting  
Presses

## Dies (machine tools)

USE: Dies



# 2018 IEEE Thesaurus

## Diesel engines

BT: Internal combustion engines  
RT: Automotive engineering

## Difference engines

BT: Calculators

## Difference equations

BT: Equations  
RT: Discrete-time systems  
Numerical analysis  
Piecewise linear techniques

## Differential algebraic equations

BT: Differential equations

## Differential amplifiers

BT: Amplifiers

## Differential equations

BT: Calculus  
RT: Higher order statistics  
Integrodifferential equations  
Numerical analysis  
Predator prey systems  
Stability analysis  
Time invariant systems  
NT: Differential algebraic equations  
Navier-Stokes equations  
Partial differential equations  
Transfer functions

## Differential gears

USE: Gears

## Differential GPS

USE: Global Positioning System

## Differential phase shift keying

UF: DPKS  
Differential phase-shift  
keying  
BT: Phase modulation

## Differential phase-shift keying

USE: Differential phase shift  
keying

## Differential quadrature phase shift keying

BT: Quadrature phase shift  
keying

## Differentiated services networks

USE: Diffserv networks

## Diffraction

UF: Wave diffraction  
BT: Interference  
RT: Bragg gratings  
Crystallography  
Fourier transforms  
X-ray detection

## Diffraction gratings

BT: Optical diffraction  
RT: Bragg gratings

## DiffServ

USE: Diffserv networks

## Diffserv networks

UF: DiffServ  
Differentiated services  
networks  
BT: Computer networks  
Distributed computing  
RT: Internet  
Multimedia communication

## Diffusion bonding

BT: Bonding processes  
RT: Ceramics

## Diffusion processes

BT: Semiconductor device  
manufacture  
RT: Brownian motion  
Buffer layers  
Charge carrier processes  
Image denoising  
Image processing  
Stochastic processes  
NT: Electromigration

## Diffusion tensor imaging

UF: DT-MRI  
DTI  
Diffusion tensor magnetic  
resonance imaging  
BT: Magnetic resonance  
imaging  
RT: Brain

## Diffusion tensor magnetic resonance imaging

USE: Diffusion tensor imaging

## Digestive system



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# 2018 IEEE Thesaurus

BT: Anatomy  
 NT: Colon  
 Esophagus  
 Gallbladder  
 Gastrointestinal tract  
 Intestines  
 Liver  
 Mouth  
 Pancreas  
 Pharynx  
 Stomach  
 Tongue

## Digital alloys

BT: Metals

## Digital arithmetic

UF: Computer arithmetic  
 BT: Arithmetic  
 RT: Calculators  
 Coprocessors

## Digital art

BT: Art

## Digital audio broadcasting

UF: Digital audio broadcasts  
 Podcast  
 BT: Broadcasting  
 Digital communication  
 RT: Audio systems  
 Portable media players  
 NT: Digital Radio Mondiale  
 Digital audio players

## Digital audio broadcasts

USE: Digital audio broadcasting

## Digital audio players

UF: MP3  
 BT: Digital audio broadcasting

## Digital camera

USE: Digital cameras

## Digital cameras

UF: Digital camera  
 BT: Cameras  
 RT: Digital photography

## Digital circuits

BT: Circuits  
 RT: Logic circuits  
 Pulse circuits  
 Switching circuits

NT: Circuit topology  
 Digital integrated circuits

## Digital communication

UF: Digital radio  
 BT: Communication systems  
 RT: Bluetooth  
 Data communication  
 Digital recording  
 Musical instrument digital

interfaces

hierarchy

Synchronous digital

TCPIP  
 Teleprinting  
 Baseband  
 DICOM  
 DSL  
 Digital audio broadcasting  
 Digital images  
 Digital multimedia

NT:

broadcasting

communication

## Digital control

UF: Computer control  
 BT: Control systems  
 RT: Computer numerical control  
 NT: Programmable control

## Digital divide

BT: Sociology  
 RT: Cultural differences  
 Economics  
 Ethical aspects  
 Gender issues  
 Social factors  
 Social implications of

technology

## Digital elevation modeling

USE: Digital elevation models

## Digital elevation models

UF: Digital elevation modeling  
 Digital terrain model  
 Digital terrain modeling  
 Digital terrain models  
 BT: Modeling





# 2018 IEEE Thesaurus

	Terrain mapping	BT:	Broadcasting
<i>Digital factories</i>		RT:	Digital communication
USE:	Virtual manufacturing		Convolutional codes
			Digital TV
<b>Digital filters</b>			Land mobile radio cellular
BT:	Filters	systems	
RT:	Frequency response		MPEG 4 Standard
	Line enhancers		MPEG 7 Standard
	Optical resonators		MPEG standards
	Transversal filters		Multimedia communication
NT:	Finite impulse response		Radio broadcasting
filters			Video on demand
<b>Digital forensics</b>		<i>Digital multimedia broadcasts</i>	
BT:	Forensics	USE:	Digital multimedia
		broadcasting	
<i>Digital image</i>		<b>Digital photography</b>	
USE:	Digital images	BT:	Photography
		RT:	CCD image sensors
<b>Digital images</b>			Cameras
UF:	Digital image		Digital cameras
	Digital imaging		Transform coding
BT:	Digital communication		
NT:	Pixel	<b>Digital preservation</b>	
<i>Digital imaging</i>		BT:	Digital systems
USE:	Digital images		Information management
		RT:	Data integrity
<i>Digital Imaging and Communications in Medicine</i>		<b>Digital printing</b>	
USE:	DICOM	BT:	Printing
		RT:	Publishing
<b>Digital integrated circuits</b>		<i>Digital publishing</i>	
BT:	Digital circuits	USE:	Electronic publishing
	Integrated circuits		
RT:	Adders	<i>Digital radio</i>	
	Logic circuits	USE:	Digital communication
	Multiplying circuits		
<b>Digital magnetic recording</b>		<b>Digital Radio Mondiale</b>	
BT:	Magnetic recording	BT:	Digital audio broadcasting
<i>Digital micromirror devices</i>		<b>Digital recording</b>	
USE:	Micromirrors	BT:	Recording
		RT:	Digital communication
<b>Digital modulation</b>			Digital systems
BT:	Modulation	<b>Digital relays</b>	
NT:	Constellation diagram	BT:	Relays
	Partial response signaling		
<b>Digital multimedia broadcasting</b>		<b>Digital rights management</b>	
UF:	DMB	BT:	Intellectual property
	Digital multimedia	RT:	Computer crime
broadcasts			Software protection



# 2018 IEEE Thesaurus

## *Digital sequences*

USE: Sequences

## **Digital signal processing**

UF: DSP  
BT: Signal processing  
RT: Aerospace and electronic

systems

Digital TV  
Fast Fourier transforms  
OFDM  
NT: Delta modulation  
Digital signal processing

chips

## **Digital signal processing chips**

BT: Digital signal processing

## **Digital signal processors**

BT: Circuits  
RT: Signal processing

## **Digital signatures**

BT: Security  
RT: Message authentication  
Message systems

## **Digital simulation**

BT: Simulation  
RT: Computer aided analysis  
Modeling  
Power system analysis

computing

NT: Discrete event simulation

## *Digital subscriber lines*

USE: DSL

## *Digital subscriber loops*

USE: DSL

## **Digital systems**

BT: Computers and information  
processing  
RT: Communication systems  
Computational and artificial

intelligence

Consumer electronics  
Cryptocurrency  
Digital recording  
Persistent identifiers  
Personal communication

networks

NT: Digital preservation  
ISDN

Internet

Local area networks  
Metropolitan area networks  
Token networks  
Virtual artifact

## *Digital terrain model*

USE: Digital elevation models

## *Digital terrain modeling*

USE: Digital elevation models

## *Digital terrain models*

USE: Digital elevation models

## *Digital to analog conversion*

USE: Digital-analog conversion

## *Digital to analog converters*

USE: Digital-analog conversion

## **Digital TV**

BT: TV  
RT: Digital multimedia  
broadcasting  
Digital signal processing  
HbbTV Standards  
NT: Analog TV  
HDTV  
IPTV

## *Digital versatile discs*

USE: DVD

## **Digital video broadcasting**

UF: Digital video broadcasts  
BT: Broadcasting  
Digital communication

## *Digital video broadcasts*

USE: Digital video broadcasting

## *Digital video discs*

USE: DVD

## *Digital watermarking*

USE: Watermarking

## *Digital-analog*

USE: Digital-analog conversion

## **Digital-analog conversion**

UF: D/A  
D/A conversion  
D/A converters



# 2018 IEEE Thesaurus

	Digital to analog conversion		
	Digital to analog converters		
	Digital-analog		
	Digital-analog converters		
	Digital-analogue conversion		
	Digital-analogue converters		
	Digital-to-analog conversion		
	Digital-to-analog converters		
BT:	Data conversion		
RT:	Interpolation		
<i>Digital-analog converters</i>			
USE:	Digital-analog conversion		
<i>Digital-analogue conversion</i>			
USE:	Digital-analog conversion		
<i>Digital-analogue converters</i>			
USE:	Digital-analog conversion		
<b>Digital-controlled oscillators</b>			
BT:	Oscillators		
<i>Digital-to-analog conversion</i>			
USE:	Digital-analog conversion		
<i>Digital-to-analog converters</i>			
USE:	Digital-analog conversion		
<b>Digital-to-frequency converters</b>			
BT:	Converters		
<i>Dike</i>			
USE:	Levee		
<i>DIL</i>			
USE:	Electronics packaging		
<i>Dimension reduction</i>			
USE:	Dimensionality reduction		
<b>Dimensionality reduction</b>			
UF:	Dimension reduction		
BT:	Information retrieval		
	Machine learning		
	Statistics		
<b>Dinosaurs</b>			
BT:	Animals		
<b>Diode lasers</b>			
UF:	Laser diodes		
BT:	Diodes		
	Lasers		
<b>Diodes</b>			
BT:	Electronic components		
	Voltage multipliers		
RT:	Breakdown voltage		
	Optical transmitters		
	Semiconductor diodes		
NT:	Diode lasers		
<i>DIP</i>			
USE:	Electronics packaging		
<b>Dip coating</b>			
BT:	Coatings		
<b>Dipole antennas</b>			
BT:	Antennas		
<i>Direct broadcast satellites</i>			
USE:	Satellite broadcasting		
<i>Direct current generators</i>			
USE:	DC generators		
<i>Direct current machines</i>			
USE:	DC machines		
<i>Direct current motors</i>			
USE:	DC motors		
<i>Direct sequence CDMA</i>			
USE:	Direct-sequence code-division multiple access		
<i>Direct sequence code division multiple access</i>			
USE:	Direct-sequence code-division multiple access		
<b>Direct sequence spread spectrum communication</b>			
BT:	Radio spectrum management		
RT:	Bandwidth Modulation		
<i>Direct-sequence CDMA</i>			
USE:	Direct-sequence code-division multiple access		
<b>Direct-sequence code-division multiple access</b>			
UF:	Direct sequence CDMA		
	Direct sequence code division multiple access		
	Direct-sequence CDMA		
BT:	Multiaccess communication		



# 2018 IEEE Thesaurus

## *Direction of arrival*

USE: Direction-of-arrival  
estimation

## *Direction of arrival estimation*

USE: Direction-of-arrival  
estimation

## *Direction-finding*

USE: Navigation

## **Direction-of-arrival estimation**

UF: Bearing estimation  
DOA estimation  
Direction of arrival  
Direction of arrival  
estimation  
of arrival  
Estimation of the direction  
BT: Parameter estimation  
RT: Array signal processing  
Position measurement  
Spectral analysis  
Time of arrival estimation

## **Directional antennas**

BT: Antennas

## **Directional couplers**

BT: Couplers  
RT: Hybrid junctions

## **Directive antennas**

BT: Antennas

## *Disaster and recovery*

USE: Disaster management

## **Disaster management**

UF: Disaster and recovery  
Disaster planning  
BT: Contingency management

## *Disaster planning*

USE: Disaster management

## **Discharge lamps**

BT: Lamps  
NT: High intensity discharge  
lamps

## **Discharges (electric)**

UF: Dielectric barrier discharges  
Gas discharges

Ozone generators

Ozonizers

BT: Dielectric breakdown

RT: Electrostatic processes

Gas discharge devices

Gases

Ionization

Plasmas

## **Discrete cosine transforms**

UF: DCT

BT: Discrete transforms

RT: Chebyshev approximation

## *Discrete element method*

USE: Finite element analysis

## **Discrete event simulation**

BT: Digital simulation

NT: Time warp simulation

## *Discrete event systems*

USE: Discrete-event systems

## **Discrete Fourier transforms**

UF: DFT

BT: Fourier transforms

RT: Signal processing

## *Discrete Fournier transforms*

USE: Discrete transforms

## *Discrete time systems*

USE: Discrete-time systems

## **Discrete transforms**

UF: Discrete Fournier  
transforms

BT: Transforms

NT: Discrete cosine transforms

## **Discrete wavelet transforms**

BT: Wavelet transforms

RT: Finite impulse response

filters

## **Discrete-event systems**

UF: Discrete event systems

BT: Signal analysis

RT: Control systems

Manufacturing

Petri nets

Production systems

## **Discrete-time systems**



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# 2018 IEEE Thesaurus

UF: Discrete time systems  
 BT: Time factors  
 RT: Asymptotic stability  
 Control systems  
 Difference equations  
 NT: Sampled data systems

## Discussion forums

BT: Collaboration

## Diseases

BT: Medical conditions  
 RT: Medical diagnosis  
 Metastasis  
 NT: Acquired immune

deficiency syndrome

Alcoholism  
 Arteriosclerosis  
 Arthritis  
 Bacterial infections  
 Bone diseases  
 Cancer  
 Cardiovascular diseases  
 Degenerative diseases  
 Dementia  
 Epilepsy  
 Human immunodeficiency

virus

Infectious diseases  
 Influenza  
 Multiple sclerosis  
 Neurological diseases  
 Parasitic diseases  
 Parkinson's disease  
 Pathogens  
 Retinopathy

## Disk drives

BT: Computer peripherals  
 RT: Disk recording  
 Perpendicular magnetic

recording

## Disk recording

BT: Recording  
 RT: Disk drives

*Disks (structures)*

USE: Structural discs

*Dismissal (employment)*

USE: Termination of employment

## Dispatching

BT: Object oriented  
 programming  
 RT: Materials handling

*Dispersed power generation*

USE: Distributed power  
 generation

## Dispersion

UF: Dispersion effect  
 Dispersion measurement  
 Dispersion relations  
 Dispersive  
 BT: Signal processing  
 RT: Refractive index  
 NT: Chromatic dispersion  
 Optical fiber dispersion

*Dispersion effect*

USE: Dispersion

*Dispersion measurement*

USE: Dispersion

*Dispersion relations*

USE: Dispersion

*Dispersive*

USE: Dispersion

## Displacement control

BT: Mechanical variables  
 control

## Displacement measurement

BT: Mechanical variables  
 measurement

## Displays

BT: Optical devices  
 RT: Character generation  
 Graphics  
 Thin film transistors  
 User interfaces  
 NT: Active matrix technology  
 Cathode ray tubes  
 Computer displays  
 Flat panel displays  
 Head-mounted displays  
 Head-up displays  
 Liquid crystal devices  
 Microdisplays  
 Readout electronics  
 Three-dimensional displays  
 Two dimensional displays



# 2018 IEEE Thesaurus

## Disruption tolerant networking

BT: Computer network management

## Dissolved air flotation

USE: Wastewater treatment

## Dissolved gas analysis

BT: Fault diagnosis

## Distance

USE: Distance measurement

## Distance learning

BT: Learning (artificial intelligence)

RT: Adaptive learning  
Mobile learning

## Distance measurement

UF: Distance  
Ranging  
BT: Measurement  
RT: Micrometers  
Position measurement  
NT: Euclidean distance

## Distance relays

USE: Protective relaying

## Distillation columns

USE: Distillation equipment

## Distillation equipment

UF: Distillation columns  
BT: Chemical technology

## Distortion

UF: Distortion information  
BT: Signal processing  
RT: Delay effects  
Distortion measurement  
Image restoration  
Interference  
Noise  
Rate distortion theory  
Signal restoration  
NT: Acoustic distortion  
Four-wave mixing  
Jitter  
Nonlinear distortion  
Phase distortion

## Distortion information

USE: Distortion

## Distortion measurement

UF: Acoustic distortion measurement

Electric distortion measurement

Optical distortion measurement

BT: Measurement

RT: Distortion

Noise measurement

NT: Total harmonic distortion

## Distributed control

USE: Decentralized control

## Distributed algorithms

BT: Algorithms

## Distributed amplifiers

BT: Amplifiers

## Distributed antennas

USE: Antenna arrays

## Distributed Bragg reflectors

UF: DBR

BT: Mirrors

RT: Integrated optics

Vertical cavity surface emitting lasers

## Distributed computing

BT: Computers and information processing

RT: Computer networks  
Concurrency control  
Data communication  
Local area networks  
Metropolitan area networks  
Mobile agents  
Multiprocessing systems  
Semantic Web  
Software agents  
Software architecture  
NT: Client-server systems  
Collaborative work  
Diffserv networks  
Distributed databases  
Distributed information

systems

Internet

Metacomputing

Peer-to-peer computing



# 2018 IEEE Thesaurus

## Distributed databases

BT: Databases  
Distributed computing  
RT: Concurrency control  
NoSQL databases

## Distributed decision making

BT: Decision making

## Distributed denial-of-service attack

UF: DDoS  
BT: Denial-of-service attack  
RT: Botnet  
Computer crime

## Distributed feedback devices

UF: Distributed feedback lasers  
BT: Laser applications  
RT: Feedback circuits  
Optical feedback

## Distributed feedback lasers

USE: Distributed feedback  
devices

## Distributed generation

USE: Decentralized control AND  
Distributed power  
generation

## Distributed information systems

BT: Distributed computing  
Information systems  
NT: Distributed management  
Publish-subscribe

## Distributed management

BT: Distributed information  
systems  
Management  
RT: Collaborative intelligence

## Distributed management task force

USE: DMTF

## Distributed modeling

USE: Decentralized control

## Distributed parameter circuits

UF: Nonuniform transmission  
lines  
Transmission line circuits  
BT: Circuits  
RT: Microwave circuits

Millimeter wave circuits  
Transmission lines

## Distributed parameter systems

BT: Decentralized control

## Distributed power generation

UF: Dispersed power  
generation  
Distributed generation  
Embedded power  
generation  
BT: Power generation  
RT: Hybrid power systems  
Microgrids  
Vehicle-to-grid

## Distributed processing

UF: Volunteer computing  
BT: System analysis and design  
RT: Crowdsourcing  
Software defined  
networking  
NT: Edge computing  
Message passing

## Distributed vision networks

UF: Distributed vision  
processing  
BT: System analysis and design  
RT: Computer vision  
Embedded computing  
Smart cameras  
Wireless sensor networks

## Distributed vision processing

USE: Distributed vision networks

## Distribution functions

BT: Statistical distributions  
RT: Probability  
Probability density function

## Distribution of electric power

USE: Power distribution

## Distribution strategy

BT: Marketing management

## Disturbance observers

BT: Observers  
RT: Adaptive control  
Robust control

## Diversity gain



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# 2018 IEEE Thesaurus

USE: Diversity methods

## Diversity methods

UF: Diversity gain  
BT: Transmitters  
RT: Fading channels  
Multipath channels  
Radio communication

## Diversity reception

BT: Signal resolution  
RT: SIMO communication  
SISO communication  
Telecommunications

## Diversity schemes

BT: Telecommunication  
network reliability  
RT: Fading channels  
Interference

## Diving equipment

USE: Underwater equipment

## DMB

USE: Digital multimedia  
broadcasting

## DMTF

UF: Distributed management  
task force  
BT: Standards organizations

## DMTF Standards

BT: Standards publications  
RT: Common Information Model  
(computing)

## DNA

BT: Genetics  
RT: Biological cells  
Biological information  
theory  
Cloning  
DNA computing  
Genetic communication  
Molecular biophysics  
NT: Genetic mutations

## DNA computing

BT: Computers and information  
processing  
Nanobioscience  
RT: DNA  
Molecular computing

## DOA estimation

USE: Direction-of-arrival  
estimation

## Docking stations

USE: Computer interfaces

## Doctor

USE: Medical services

## Document delivery

BT: Information services  
NT: Ask IEEE

## Document handling

BT: Data handling  
Information management  
RT: Content management  
Desktop publishing  
Information retrieval  
Office automation  
Publishing  
Semantic Web  
Text processing  
NT: Document image  
processing  
Portable document format

## Document image processing

BT: Document handling  
RT: Portable document format

## Documentation

UF: Computer documentation  
Software documentation  
BT: Writing  
RT: Engineering drawings  
Manuals  
Software

## DoD

USE: US Department of Defense

## DoE

USE: US Department of Energy

## Dogs

BT: Animals

## Dolphins

BT: Marine animals

## Domain Name System

BT: Computer networks





# 2018 IEEE Thesaurus

## Domain specific languages

UF: Domain-specific languages  
BT: Specification languages

## Domain-specific languages

USE: Domain specific languages

## Domestic appliances

USE: Home appliances

## Domestic induction appliances

USE: Home appliances

## Domestic safety

UF: Safety in the home  
BT: Safety  
RT: Accidents  
Consumer products  
Electrical safety  
Occupational health  
Occupational safety  
Smoke detectors

## Doped fiber amplifiers

UF: DFA  
BT: Optical amplifiers

## Doping

BT: Materials preparation  
RT: Semiconductor device

## doping

NT: Silicon devices  
Doping profiles

## Doping profiles

BT: Doping  
RT: Optimization  
Thin film devices

## Doppler

USE: Doppler effect

## Doppler effect

UF: Doppler  
BT: Waves  
RT: Doppler measurement  
Doppler radar  
NT: Doppler shift

## Doppler measurement

BT: Measurement  
RT: Doppler effect  
Doppler radar  
Frequency measurement

Motion measurement  
Velocity measurement

## Doppler radar

BT: Radar  
RT: Doppler effect  
Doppler measurement

## Doppler shift

BT: Doppler effect

## DoS attack

USE: Computer crime AND  
Denial-of-service attack

## Dosimetry

UF: Radiation dosimetry  
BT: Measurement  
RT: Collimators  
Neutron capture therapy  
Phantoms  
Radiation detectors  
Radiation monitoring  
Radiation protection

## DOT

USE: US Department of  
Transportation

## Double gate FETs

USE: Double-gate FETs

## Double heterojunction bipolar transistors

UF: DHBTs  
BT: Heterojunction bipolar  
transistors

## Double heterojunction HEMTs

USE: DH-HEMTs

## Double-gate FETs

UF: Double gate FETs  
BT: Field effect transistors  
RT: Silicon-on-insulator

## Doubly fed induction generators

UF: DFIG  
BT: Induction generators  
RT: Wind turbines

## Downlink

BT: Satellite communication  
RT: Land mobile radio cellular  
systems



# 2018 IEEE Thesaurus

## *DP industry*

USE: Computer industry

## *DPKS*

USE: Differential phase shift

## keying

## Drag

BT: Fluid dynamics

RT: Friction

## Drain avalanche hot carrier injection

UF: Drain avalanche hot-carrier

## injection

BT: Hot carrier injection

## *Drain avalanche hot-carrier injection*

USE: Drain avalanche hot carrier

## injection

## DRAM

USE: DRAM chips

## DRAM chips

UF: DRAM

BT: Random access memory

## *Drift velocity*

USE: Electron mobility

## Drilling

UF: Drilling (machining)

BT: Machining

RT: Boring

Deburring

Drilling machines

Geoengineering

Oil drilling

## *Drilling (machining)*

USE: Drilling

## Drilling machines

BT: Machine tools

RT: Drilling

## *Drilling oil*

USE: Oil drilling

## Driver circuits

BT: Circuits

RT: Power transistors

## *Driver free automobiles*

USE: Autonomous automobiles

## *Driver free cars*

USE: Autonomous automobiles

## *Driver-free car*

USE: Autonomous automobiles

## *Driverless automobiles*

USE: Autonomous automobiles

## *Driverless cars*

USE: Autonomous automobiles

## Drives

BT: Machinery

RT: Mechanical power

## transmission

Sensorless control

Torque converters

NT: Hydraulic drives

Motor drives

Variable speed drives

## Drones

BT: Unmanned aerial vehicles

## Drug delivery

UF: Drug delivery systems

BT: Biomedical engineering

NT: Targeted drug delivery

## *Drug delivery systems*

USE: Drug delivery

## Drugs

BT: Pharmaceuticals

RT: Biochemistry

Chemical analysis

Chemistry

Chemotherapy

Molecular biomarkers

NT: Antibiotics

Antidepressants

Aspirin

Cancer drugs

Insulin

## Dry etching

BT: Etching

## DSL

UF: Digital subscriber lines

Digital subscriber loops

BT: Digital communication



# 2018 IEEE Thesaurus

DSP			BT:	Measurement techniques
	USE:	Digital signal processing	NT:	Steady-state
DT-MRI				Dynamic program analysis
	USE:	Diffusion tensor imaging	USE:	Performance analysis
DTI				Dynamic programming
	USE:	Diffusion tensor imaging	BT:	Algorithms
			RT:	Markov processes
				Neural networks
				Viterbi algorithm
Dual band				Dynamic range
	UF:	Dual-band	BT:	Measurement
		Dualband		
	BT:	Mobile communication		
	RT:	GSM		
		Mobile handsets		
		Roaming		
Dual inline packaging				Dynamic scheduling
	USE:	Electronics packaging	BT:	Scheduling
Dual-band				Dynamic service delivery
	USE:	Dual band	USE:	Network resource management
Dualband				Dynamic spectrum access
	USE:	Dual band	BT:	Radio transceivers
			RT:	Telecommunication
				network topology
				Wireless communication
Ducts				Dynamic voltage scaling
	BT:	Structural shapes	UF:	Self-dynamic voltage scaling
	RT:	Air conditioning	BT:	Computer architecture
		Vents		Voltage
Dusty plasma				Dynamics
	USE:	Dusty plasmas	BT:	Mechanical factors
			RT:	Control theory
Dusty plasmas				Force
	UF:	Dusty plasma		Friction
	BT:	Plasma properties		Vibrations
			NT:	Aerodynamics
DVD				Elastodynamics
	UF:	DVD-ROM		Electrodynamics
		Digital versatile discs		Hydrodynamics
		Digital video discs		Magnetohydrodynamics
	BT:	Video coding		
	RT:	Video recording		
DVD-ROM				Dynamo
	USE:	DVD	USE:	Generators
Dynamic algorithms				Dynamometers
	USE:	Heuristic algorithms	UF:	Dyno
Dynamic compiler			BT:	Force measurement
	BT:	Runtime		Meters
				Power measurement
				Torque measurement
Dynamic equilibrium				



# 2018 IEEE Thesaurus

<i>Dyno</i>	USE: Dynamometers	RT: Cochlear implants	
<b>Dysprosium</b>	BT: Chemical elements	<i>EAROM</i>	USE: EPROM
<b>Dysprosium compounds</b>	BT: Europium	<i>Earphones</i>	USE: Headphones
<i>E health</i>	USE: Electronic healthcare	<b>Earth</b>	BT: Geoscience Planets RT: Geophysics Remote sensing Soil Terrain factors Terrain mapping
<i>E learning</i>	USE: Electronic learning	<i>Earth atmosphere</i>	USE: Terrestrial atmosphere
<i>E-banking</i>	USE: Online banking	<i>Earth observation system</i>	USE: Earth Observing System
<i>E-books</i>	USE: Electronic publishing	<b>Earth Observing System</b>	UF: EOS Earth observation system BT: Artificial satellites Observers NT: Global Earth Observation System of Systems
<i>E-commerce</i>	USE: Electronic commerce	<i>Earth science</i>	USE: Geoscience
<i>E-currency</i>	USE: Online banking	<i>earthing</i>	USE: Grounding
<i>E-government</i>	USE: Electronic government	<b>Earthquake engineering</b>	UF: Seismic retrofitting BT: Earthquakes RT: Seismology
<i>E-health records</i>	USE: Electronic medical records	<b>Earthquakes</b>	BT: Geoscience RT: Seismic waves Seismology NT: Earthquake engineering
<i>E-learning</i>	USE: Electronic learning	<b>Eavesdropping</b>	UF: Cyber eavesdropping Cybereavesdropping BT: Privacy RT: Computer security
<i>E-mail</i>	USE: Electronic mail	<i>ECC</i>	
<i>E-publishing</i>	USE: Electronic publishing		
<i>E-reader</i>	USE: Electronic publishing		
<i>E-voting</i>	USE: Electronic voting		
<i>E-waste</i>	USE: Electronic waste		
<b>Ear</b>	BT: Head Sense organs		



# 2018 IEEE Thesaurus

AND	USE:	Elliptic curve cryptography	Mathematics
		Error correction codes	Profitability
			Regression analysis
			Statistics
<i>ECCM</i>			NT: Economic forecasting
	USE:	Electronic countermeasures	
<i>ECG</i>			<b>Economic forecasting</b>
	USE:	Electrocardiography	BT: Econometrics
			Forecasting
			RT: Economic indicators
<i>Echo cancellation</i>			
	USE:	Echo cancellers	<b>Economic indicators</b>
<b>Echo cancellers</b>			UF: Cost of living index
	UF:	Echo cancellation	Cost-of-living index
	BT:	Active noise reduction	GDP
			GNP
			Gross domestic product
			Gross national product
			Harmonised index of
<b>Echo interference</b>			consumer prices
	BT:	Interference	
	RT:	Clutter	Harmonized index of
		TV interference	
			consumer prices
<b>Echocardiography</b>			Index of production
	UF:	ECHOEG	Interest rates
	BT:	Cardiography	RPI
			Retail price index
<i>ECHOEG</i>			BT: Economics
	USE:	Echocardiography	RT: Economic forecasting
			Exchange rates
<i>ECM</i>			NT: Share prices
	USE:	Electronic countermeasures	
			<b>Economics</b>
<i>Eco design</i>			BT: Engineering management
	USE:	Ecodesign	RT: Bankruptcy
			Commercial law
			Cost accounting
<i>Eco-design</i>			Digital divide
	USE:	Ecodesign	Econophysics
			Finance
<b>Ecodesign</b>			Planning
	UF:	Eco design	NT: Costs
		Eco-design	Econometrics
	BT:	Green design	Economic indicators
	RT:	Energy conservation	Electronic commerce
		Environmental factors	Environmental economics
			Exchange rates
<b>Ecology</b>			Fuel economy
	BT:	Environmental factors	International trade
			Macroeconomics
<i>Ecommerce</i>			Microeconomics
	USE:	Electronic commerce	Monopoly
			Oligopoly
<b>Econometrics</b>			Power generation
	BT:	Economics	
	RT:	Costs	economics
		Cybernetics	Profitability



# 2018 IEEE Thesaurus

	Stock markets		Mobile computing
	Supply and demand		Wireless sensor networks
	Trade agreements		
	Venture capital	<i>Edge detection</i>	
	Virtual enterprises	USE:	Image edge detection
<b>Economies of scale</b>		<b>Editorials</b>	
BT:	Microeconomics	BT:	IEEE indexing
RT:	Industrial economics		
<b>Econophysics</b>		<i>EDTV</i>	
BT:	Cybernetics	USE:	HDTV
RT:	Chaos		
	Complexity theory	<b>Education</b>	
	Economics	UF:	Inverted classroom
	Fractals		Reverse teaching
	Information theory		Teaching
	Knowledge acquisition	RT:	Personnel
	Nonlinear dynamical	NT:	Adaptive learning
systems			Career development
	Philosophical		Education courses
considerations			Educational institutions
	Science - general		Educational programs
			Educational technology
			Engineering education
			Training
<b>Ecosystems</b>		<b>Education courses</b>	
BT:	Environmental factors	BT:	Education
NT:	Wetlands	RT:	Educational programs
<i>EDA</i>			STEM
USE:	Electronic design	NT:	Curriculum development
automation and methodology			Open Educational
<i>Eddy current losses</i>		Resources	
USE:	Eddy currents		
<b>Eddy current testing</b>		<b>Educational institutions</b>	
BT:	Eddy currents	UF:	Colleges
RT:	Finite element analysis		Schools
			Universities
<b>Eddy currents</b>		BT:	Education
UF:	Eddy current losses		
BT:	Electromagnetic induction	<b>Educational programs</b>	
RT:	Magnetic losses	BT:	Education
NT:	Eddy current testing	RT:	Curriculum development
			Education courses
<i>EDFA</i>		NT:	Accreditation
USE:	Erbium-doped fiber		Continuing education
amplifiers			Pre-college programs
			STEM
			Scholarships
			Self-study courses
			Seminars
			Tutorials
<b>Edge computing</b>		<b>Educational robots</b>	
UF:	Fog computing	BT:	Robots
BT:	Application virtualization		
	Distributed processing		
RT:	Cloud computing		
	Computer applications		



# 2018 IEEE Thesaurus

	RT:	Engineering education			Eigenfunctions and
			eigenvalues		
<b>Educational technology</b>					Eigenplaces
	UF:	Audio-visual instructional			Eigenvalues
aids		Instructional aids		BT:	Mathematics
		Programmed instruction		RT:	Functional analysis
	BT:	Education			Linear algebra
	RT:	Audio-visual systems			Vectors
		Visualization	<i>EKG</i>		
	NT:	Computer aided instruction		USE:	Electrocardiography
		Courseware			
		Electronic learning	<b>Elastic computing</b>		
<i>EEG</i>			BT:		Cloud computing
	USE:	Electroencephalography			Resource management
<i>EEPROM</i>			<i>Elastic optical networks</i>		
	USE:	EPROM		USE:	Optical fiber networks
<b>Effective mass</b>			<b>Elastic recovery</b>		
	BT:	Energy states	BT:		Materials testing
<i>EFFF</i>			<b>Elasticity</b>		
	USE:	Field-flow fractionation	BT:		Material properties
			RT:		Strain
<b>Effluents</b>			<b>Elastodynamics</b>		
	BT:	Waste materials	BT:		Dynamics
	RT:	Flue gases	RT:		Seismic waves
		Industrial waste			Vibrations
		Waste disposal	<b>Elastography</b>		
		Waste management	BT:		Biomedical imaging
		Water pollution	<b>Elbow</b>		
<i>Ehealth</i>			BT:		Extremities
	USE:	Electronic healthcare	<i>Elderly</i>		
<i>Eigenfunctions</i>				USE:	Senior citizens
	USE:	Eigenvalues and	<i>Elearning</i>		
eigenfunctions				USE:	Electronic learning
<i>Eigenfunctions and eigenvalues</i>			<b>Electrets</b>		
	USE:	Eigenvalues and	BT:		Dielectric materials
eigenfunctions			RT:		Capacitors
<i>Eigenplaces</i>					Ceramics
	USE:	Eigenvalues and			Dielectric devices
eigenfunctions			<i>Electric admittance</i>		
<i>Eigenvalues</i>				USE:	Admittance
	USE:	Eigenvalues and	<i>Electric ballast</i>		
eigenfunctions				USE:	Electronic ballasts
<b>Eigenvalues and eigenfunctions</b>					
	UF:	Eigenfunctions			



# 2018 IEEE Thesaurus

## Electric breakdown

UF: Breakdown  
BT: Dielectrics and electrical

### insulation

RT: Aging  
Fault currents  
NT: Avalanche breakdown  
Corona  
Dielectric breakdown  
Sparks

## Electric characteristics

USE: Electric variables

## Electric coils

USE: Coils

## Electric condensers

USE: Capacitors

## Electric conductivity

USE: Conductivity

## Electric current

USE: Current

## Electric current control

BT: Current control  
RT: Power control  
Power transmission  
Voltage control  
NT: Power factor correction  
Shunts (electrical)

## Electric current measurement

USE: Current measurement

## Electric distortion measurement

USE: Distortion measurement

## Electric fences

BT: Electric machines

## Electric field

USE: Electric fields

## Electric fields

UF: Electric field  
BT: Electromagnetic fields  
RT: Electrohydrodynamics  
Electrokinetics  
Electrostatic analysis  
Electrostatic processes  
Maxwell equations  
Synchrotrons

NT: Acoustoelectric effects  
Casimir effect  
Nonuniform electric fields

## Electric generators

BT: Generators  
RT: Nanogenerators

## Electric heating

USE: Resistance heating

## Electric impedance

USE: Impedance

## Electric machines

BT: Machinery  
RT: Windings  
NT: AC machines  
Alternators  
Brushless machines  
Compressors  
Conductors  
DC machines  
Electric fences  
Generators  
Permanent magnet

### machines

Rotating machines  
Rotors  
Stators  
Washing machines

## Electric motors

BT: Motors  
NT: Planar motors

## Electric potential

BT: Electric variables

## Electric power

USE: Power electronics AND  
Power systems

## Electric resistance

UF: Electrical resistivity  
BT: Resistance

## Electric sensing devices

BT: Sensor systems and  
applications

## Electric shock

UF: Shock  
BT: Bioelectric phenomena  
RT: Accidents





# 2018 IEEE Thesaurus

	Electrical accidents		Power system control
	Grounding		Reactive power control
	Occupational health		Voltage control
	Occupational safety		
	Safety		
<i>Electric stimulation therapy</i>		<b>Electric variables measurement</b>	
USE:	Electrical stimulation	BT:	Measurement
		RT:	Electric variables
<i>Electric utilities</i>			Electromagnetic
USE:	Electricity supply industry	measurements	
AND			Frequency measurement
	Power industry	measurements	Gain measurement
			Integrated circuit
<b>Electric variables</b>			Noise measurement
UF:	Current voltage		Oscilloscopes
characteristics			Phase measurement
	Electric characteristics		Pulse measurements
	Electrical characteristics	NT:	Transducers
BT:	Instrumentation and		Admittance measurement
measurement			Ammeters
RT:	Electric variables control		Attenuation measurement
	Electric variables		Capacitance measurement
measurement			Conductivity measurement
	Frequency		Current measurement
NT:	Admittance		Dielectric measurement
	Capacitance	measurement	Electrical resistance
	Capacitance-voltage		Electrostatic measurements
characteristics			Energy measurement
	Conductivity		Impedance measurement
	Current		Inductance measurement
	Current-voltage	measurement	Partial discharge
characteristics			Phasor measurement units
	Electric potential		Power measurement
	Gain		Q measurement
	Impedance		Transmission line
	Impedance matching	measurements	
	Inductance		Voltage measurement
	Permittivity		
	Piezoresistance		
	Q-factor		
	Resistance		
	Voltage		
	Wiring		
<b>Electric variables control</b>		<b>Electric vehicle charging</b>	
BT:	Power engineering and	UF:	EV charging
energy		BT:	Battery chargers
RT:	Electric variables		Electric vehicles
	Frequency control		
	Phase control		
	Regulators		
NT:	Current control		
	Gain control		
	Power control		
		<b>Electric vehicles</b>	
		BT:	Land vehicles
		RT:	Charging stations
		NT:	Battery powered vehicles
			Electric vehicle charging
			Fuel cell vehicles
			Hybrid electric vehicles
			Solar powered vehicles
			Vehicle-to-grid



# 2018 IEEE Thesaurus

## Electrical accidents

BT: Accidents  
RT: Bioelectric phenomena  
Electric shock  
Electrical safety

## Electrical appliances

USE: Electrical products

## Electrical ballast

USE: Electronic ballasts

## Electrical ballasts

BT: Current control  
Lighting  
RT: High intensity discharge

lamps

Inductors  
Resistors

## Electrical brain stimulation

USE: Electrical stimulation

## Electrical capacitance tomography

BT: Tomography

## Electrical characteristics

USE: Electric variables

## Electrical conductivity

USE: Conductivity

## Electrical double layer capacitors

USE: Supercapacitors

## Electrical engineering

BT: Engineering - general  
RT: Engineering profession  
Research and development  
NT: Electrical engineering

computing

## Electrical engineering computing

BT: Electrical engineering  
RT: Computer applications

## Electrical engineering education

BT: Engineering education  
NT: Electronics engineering

education

## Electrical engineering industry

BT: Industries

## Electrical equipment industry

BT: Power industry  
RT: Electrical products industry  
Electricity supply industry  
Electronics industry

## Electrical fault detection

BT: Circuit faults

## Electrical insulation

USE: Dielectrics

## Electrical products

UF: Electrical appliances  
BT: Electrical products industry  
Manufactured products  
RT: Consumer products  
NT: Washing machines

## Electrical products industry

BT: Manufacturing industries  
RT: Electrical equipment

industry

Electronics industry  
NT: Electrical products

## Electrical resistance measurement

UF: Ohmmeters  
BT: Electric variables  
measurement  
RT: Resistance

## Electrical resistivity

USE: Electric resistance

## Electrical safety

BT: Power system protection  
RT: Domestic safety  
Electrical accidents  
Islanding  
Partial discharge

measurement

NT: Fault protection  
Grounding

## Electrical stimulation

UF: Electric stimulation therapy  
Electrical brain stimulation  
Microelectronic stimulation  
Spinal cord stimulation  
BT: Medical treatment

## Electrically alterable read only memory

USE: EPROM



# 2018 IEEE Thesaurus

*Electrically erasable programmable read only memory*

USE: EPROM

## Electricity

BT: Science - general  
NT: Photoelectricity  
Piezoelectricity  
Pyroelectricity  
Thermoelectricity  
Triboelectricity

*Electricity grids*

USE: Power grids

*Electricity market*

USE: Electricity supply industry

*Electricity markets*

USE: Power markets

## Electricity supply industry

UF: Electric utilities  
Electricity market  
Power supply industry  
BT: Power industry  
RT: Electrical equipment  
Power demand  
Power distribution  
Power quality  
Power system faults  
Power system planning  
Power system restoration  
Public infrastructure  
NT: Electricity supply industry

deregulation

## Electricity supply industry deregulation

UF: Electricity supply industry  
liberalisation  
Electricity supply industry  
liberalization  
Electricity supply industry  
privatisation  
Electricity supply industry  
privatization  
BT: Electricity supply industry  
Power generation  
economics  
RT: Power system economics  
NT: Power markets

*Electricity supply industry liberalisation*

USE: Electricity supply industry  
deregulation

*Electricity supply industry liberalization*

USE: Electricity supply industry  
deregulation

*Electricity supply industry privatisation*

USE: Electricity supply industry  
deregulation

*Electricity supply industry privatization*

USE: Electricity supply industry  
deregulation

*Electricity trading*

USE: Power markets

*Electro hydraulics*

USE: Electrohydraulics

*Electro oculography*

USE: Electrooculography

*Electro-chromic devices*

USE: Electrochromic devices

*Electro-fluid dynamics*

USE: Electrohydrodynamics

*Electro-oculography*

USE: Electrooculography

*Electro-optic deflectors*

USE: Electrooptic deflectors

*Electro-optic devices*

USE: Electrooptic devices

*Electro-optic effects*

USE: Electrooptic effects

*Electro-optic modulators*

USE: Electrooptic modulators

## Electro-osmosis

BT: Osmosis

*Electroacoustic devices*

USE: Acoustoelectric devices

*Electroacoustic effects*

USE: Acoustoelectric effects

*Electroactive polymer actuators*



# 2018 IEEE Thesaurus

USE: Actuators	<b>Electrodeless lamps</b>
<i>Electroactive polymers</i>	BT: Lamps
USE: Polymers	<b>Electrodes</b>
<i>Electrobiological</i>	BT: Electronic components
USE: Bioelectric phenomena	RT: Air gaps
<b>Electrocardiography</b>	Electron emission
UF: ECG	Electron tubes
EKG	Metal-insulator structures
BT: Cardiology	Spark gaps
RT: Biomedical equipment	NT: Anodes
	Cathodes
	Microelectrodes
<b>Electrochemical devices</b>	<b>Electrodynamics</b>
BT: Industry applications	BT: Dynamics
RT: Electrochemical processes	Waves
Power engineering and	RT: Electromagnetic fields
energy	Electron beams
	Electron optics
	Electron tubes
	Ion beams
	Particle beam optics
	NT: Electromagnetic wave
	polarization
NT: Synapses	<b>Electroencephalography</b>
Amperometric sensors	UF: EEG
Batteries	BT: Biomedical measurement
Battery management	RT: Bioelectric phenomena
	Biomedical equipment
	Brain
	Electrooculography
	Medical diagnosis
systems	
Fuel cells	<i>Electrofluid dynamics</i>
Supercapacitors	USE: Electrohydrodynamics
<b>Electrochemical impedance spectroscopy</b>	<b>Electrohydraulics</b>
BT: Spectroscopy	UF: Electro hydraulics
RT: Electrochemical processes	BT: Hydraulic systems
	RT: Fluid flow
<b>Electrochemical machining</b>	Liquids
UF: Electrolytic machining	Magnetohydrodynamics
BT: Machining	
RT: Micromachining	
<b>Electrochemical processes</b>	<b>Electrohydrodynamics</b>
UF: Electrolysis	UF: Electro-fluid dynamics
BT: Industry applications	Electrofluid dynamics
RT: Chemical industry	Electrostrictive
Electrochemical devices	
Electrochemical impedance	hydrodynamics
spectroscopy	BT: Dielectrics
Electrolytes	Hydrodynamics
<b>Electrochromic devices</b>	RT: Dielectric materials
UF: Electro-chromic devices	Electric fields
BT: Electrooptic devices	Electrokinetics
RT: Electrochromism	
<b>Electrochromism</b>	
BT: Electrooptic effects	
RT: Color	
Electrochromic devices	



# 2018 IEEE Thesaurus

## Electrokinetics

BT: Dielectrics  
RT: Dielectric materials  
Electric fields  
Electrohydrodynamics

## Electroluminescence

BT: Luminescence  
RT: Electrooptic effects  
Organic light emitting

diodes

NT: Electroluminescent devices

## Electroluminescent devices

BT: Electroluminescence  
Light sources  
Luminescent devices  
RT: Electrooptic devices

## Electrolysis

USE: Electrochemical processes

## Electrolytes

BT: Conducting materials  
RT: Electrochemical processes  
Supercapacitors

## Electrolytic machining

USE: Electrochemical machining

## Electromagnetic analysis

BT: Electromagnetics  
RT: Electrostatic analysis  
Magnetic analysis  
Mie scattering  
NT: Air gaps  
Characteristic mode

analysis

electromagnetics

Computational  
Delay effects  
Electromagnetic fields  
Electromagnetic forces  
Electromagnetic refraction  
Permeability  
Spark gaps  
Time-domain analysis

## Electromagnetic beams

USE: Beams

## Electromagnetic compatibility

UF: EMC

BT: Electromagnetic  
compatibility and interference  
NT: Immunity testing  
Reverberation chambers

## Electromagnetic compatibility and interference

RT: Electromagnetic  
interference  
Open area test sites  
TEM cells

NT: Electromagnetic  
compatibility

Electromagnetics  
Interference

## Electromagnetic coupling

BT: Electromagnetics  
RT: Circulators  
Couplers  
Electromagnetic induction  
Electromagnetic shielding  
NT: Mutual coupling  
Optical coupling

## Electromagnetic devices

BT: Electromagnetics  
RT: Magnetic gears  
NT: Baluns

## Electromagnetic diffraction

BT: Electromagnetic  
propagation  
RT: Electromagnetic fields  
NT: Optical diffraction  
Physical theory of  
diffraction  
X-ray diffraction

## Electromagnetic field theory

BT: Electromagnetic fields  
RT: Computational  
electromagnetics  
Optical fiber theory

## Electromagnetic fields

BT: Electromagnetic analysis  
RT: Computational  
electromagnetics  
Electrodynamics  
Electromagnetic diffraction  
Electromagnetic  
propagation  
Electromagnetic radiation  
Electromagnetic reflection



# 2018 IEEE Thesaurus

	Electromagnetic refraction		Launching
	Electromagnetic scattering	(electromagnetic)	
	Magnetic fields	BT:	Propulsion
	Mie scattering	RT:	Electromagnetic forces
NT:	Electric fields		Electrothermal launching
	Electromagnetic field theory	NT:	Coilguns
	Electromagnetic spectrum		Railguns
	Windings		
<b>Electromagnetic forces</b>		<b>Electromagnetic measurements</b>	
BT:	Electromagnetic analysis	BT:	Measurement
RT:	Electromagnetic launching	RT:	Anechoic chambers
	Magnetic forces		Antenna measurements
	Mie scattering		Dielectric measurement
			Electric variables
<i>Electromagnetic guns</i>		measurement	
USE:	Electromagnetic launching		Frequency measurement
			Mie scattering
<b>Electromagnetic heating</b>			Reflectometry
UF:	Microwave heating		Wavelength measurement
BT:	Heating systems	NT:	Electromagnetic modeling
RT:	Hyperthermia		Linearity
	Induction heating		Microwave measurement
			Millimeter wave
<b>Electromagnetic induction</b>		measurements	
UF:	Induction (electromagnetic)		Parameter extraction
BT:	Electromagnetics		Polarimetry
RT:	Electromagnetic coupling		Radiometry
	Geomagnetism		Submillimeter wave
NT:	Eddy currents	measurements	
	Inductive power		
transmission		<b>Electromagnetic metamaterials</b>	
		BT:	Electromagnetics
<b>Electromagnetic interference</b>			Metamaterials
UF:	EMI	RT:	Optical metamaterials
	Electromagnetic noise		Photonics
	RF interference	NT:	Terahertz metamaterials
	Radio interference		
BT:	Interference	<i>Electromagnetic model</i>	
RT:	Crosstalk	USE:	Electromagnetic modeling
	Electromagnetic		
compatibility and interference		<b>Electromagnetic modeling</b>	
	Environmental factors	UF:	Electromagnetic model
	Immunity testing		Electromagnetic modelling
	Noise	BT:	Electromagnetic
	Open area test sites	measurements	
	TEM cells		
NT:	Radiofrequency	<i>Electromagnetic modelling</i>	
interference		USE:	Electromagnetic modeling
	Specific absorption rate		
<b>Electromagnetic launching</b>		<i>Electromagnetic noise</i>	
UF:	Electromagnetic guns	USE:	Electromagnetic
	Electromagnetic propulsion		interference
		<b>Electromagnetic propagation</b>	



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	UF:	Electromagnetic wave			Correlators
propagation	BT:	Antennas and propagation Propagation	absorption		Electromagnetic wave
	RT:	Electromagnetic fields Electromagnetic transients Electromagnetic			Frequency Gamma-rays Line-of-sight propagation
waveguides		Magnetostatic waves Mie scattering Waves		<b>Electromagnetic radiative interference</b>	
	NT:	Electromagnetic diffraction Electromagnetic		BT:	Interference
propagation in absorbing media		Electromagnetic reflection Microwave propagation Millimeter wave		<b>Electromagnetic reflection</b>	
propagation		Optical propagation Propagation constant Propagation losses Radio propagation Radiowave propagation Submillimeter wave	reflection	UF:	Electromagnetic wave
			propagation	BT:	Electromagnetic
				RT:	Reflection Electromagnetic fields Electromagnetic scattering Reflectometry
				NT:	Optical reflection
propagation				<b>Electromagnetic refraction</b>	
				BT:	Electromagnetic analysis
				RT:	Electromagnetic fields
				<b>Electromagnetic scattering</b>	
<b>Electromagnetic propagation in absorbing media</b>			scattering	UF:	Electromagnetic wave
	BT:	Electromagnetic		BT:	Electromagnetic waves Scattering
propagation				RT:	Electromagnetic fields Electromagnetic reflection Electromagnetic transients Waves
<i>Electromagnetic propulsion</i>				NT:	Coherence Mie scattering Optical scattering Polarization Radar scattering Raman scattering Rayleigh scattering
	USE:	Electromagnetic launching			
<i>Electromagnetic pulse</i>					
	USE:	EMP radiation effects			
<i>Electromagnetic pulse propagation</i>					
	USE:	Electromagnetic transients			
<i>Electromagnetic pulse scattering</i>					
	USE:	Electromagnetic transients		<b>Electromagnetic shielding</b>	
<b>Electromagnetic radiation</b>				BT:	Electromagnetics
	BT:	Electromagnetics		RT:	EMP radiation effects Electromagnetic coupling
	RT:	Electromagnetic fields Electromagnetic wave		NT:	Cable shielding Magnetic shielding
polarization				<b>Electromagnetic spectrum</b>	
		Terahertz radiation Waves X-ray detection X-ray detectors X-rays		BT:	Electromagnetic fields
	NT:	Bremsstrahlung		<i>Electromagnetic transient program</i>	
				USE:	EMTP





# 2018 IEEE Thesaurus

## Electromagnetic transients

UF: Electromagnetic pulse  
propagation  
Electromagnetic pulse  
scattering  
BT: Electromagnetics  
RT: Electromagnetic  
propagation  
Electromagnetic scattering  
Transient analysis  
NT: EMP radiation effects  
EMTDC  
EMTP  
Power system transients  
Surges

### *Electromagnetic transients DC*

USE: EMTDC

### *Electromagnetic transients including DC*

USE: EMTDC

## Electromagnetic wave absorption

BT: Electromagnetic radiation

### *Electromagnetic wave attenuation*

USE: Attenuation

### *Electromagnetic wave polarisation*

USE: Electromagnetic wave  
polarization

## Electromagnetic wave polarization

UF: Electromagnetic wave  
polarisation  
BT: Electrodynamics  
RT: Electromagnetic radiation  
Photonic band gap

### *Electromagnetic wave propagation*

USE: Electromagnetic  
propagation

### *Electromagnetic wave reflection*

USE: Electromagnetic reflection

### *Electromagnetic wave scattering*

USE: Electromagnetic scattering

## Electromagnetic waveguides

BT: Transmission lines  
RT: Coaxial cables  
Coplanar waveguides  
Electromagnetic

propagation

Helical antennas  
Microwave devices  
Microwave propagation  
Optical fibers  
Propagation  
Waveguide discontinuities  
NT: Hollow waveguides  
Loaded waveguides  
Planar waveguides  
Rectangular waveguides  
Waveguide components  
Waveguide lasers  
Waveguide theory

### *Electromagnetic waves*

USE: Electromagnetic scattering

## Electromagnetics

BT: Electromagnetic  
compatibility and interference  
RT: Cyberspace  
Neuroradiology  
NT: Electromagnetic analysis  
Electromagnetic coupling  
Electromagnetic devices  
Electromagnetic induction  
Electromagnetic

metamaterials

Electromagnetic radiation  
Electromagnetic shielding  
Electromagnetic transients  
Proximity effects

## Electromagnets

BT: Magnets  
RT: Coils  
Magnetic confinement  
Magnetic levitation  
NT: Superconducting magnets

## Electromechanical devices

BT: Electromechanical systems  
NT: Armature  
SAW filters

## Electromechanical sensors

BT: Sensors  
NT: Microsensors

## Electromechanical systems

BT: Industry applications  
NT: Cruise control  
Electromechanical devices

## Electromigration



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BT: Diffusion processes

## Electromyography

UF: EMG  
BT: Biomedical measurement  
RT: Bioelectric phenomena

## Electron accelerators

BT: Particle accelerators  
RT: Electron beams  
Electron sources  
Electrons

## Electron beam applications

BT: Electron beams  
RT: Flyback transformers  
Scanning electron

microscopy

## Electron beam pumping

USE: Laser excitation

## Electron beams

BT: Particle beams  
RT: Electrodynamics  
Electron accelerators  
Electron emission  
Electron sources  
Electrons  
Flyback transformers  
Free electron lasers  
Gyrotrons  
Relativistic effects  
Transmission electron

microscopy

NT: Electron beam applications

## Electron carriers

USE: Charge carrier processes

## Electron devices

RT: Threshold current  
NT: Cathode ray tubes  
Electron guns  
Electron multipliers  
Electron tubes  
Mechatronics  
Microelectromechanical

systems

Microfluidics  
Micromechanical devices  
Photoelectricity  
Photovoltaic cells  
Quantum computing  
Quantum well devices

Semiconductivity  
Semiconductor devices  
Single electron devices  
Thick film devices  
Thin film devices  
Tunneling  
Vacuum technology

## Electron emission

UF: Field electron emission  
Secondary electron

emission

BT: Nuclear and plasma  
sciences

RT: Cathodes  
Electrodes  
Electron beams  
Electron guns  
Electron multipliers  
Electron sources  
Electron tubes  
Electrons  
Photoelectricity  
Thermionic emission  
Vacuum arcs  
Vacuum breakdown  
NT: Ballistic transport

## Electron guns

BT: Electron devices  
RT: Electron emission

## Electron microscopy

BT: Microscopy  
NT: Photoelectron microscopy  
Scanning electron

microscopy

microscopy Transmission electron

## Electron mobility

UF: Drift velocity  
BT: Charge carrier processes  
RT: Plasma properties

## Electron multipliers

BT: Electron devices  
RT: Electron emission  
Electron tubes  
Photomultipliers

## Electron optics

BT: Optics  
Particle beam optics  
RT: Electrodynamics



# 2018 IEEE Thesaurus

Stripboard circuit

## Electron paramagnetic resonance

UF: Biological EPR  
Electron spin resonance  
BT: Spectroscopy

## Electron sources

BT: Electrons  
RT: Electron accelerators  
Electron beams  
Electron emission

## Electron spin resonance

USE: Electron paramagnetic resonance

## Electron traps

BT: Charge carrier processes  
RT: Leakage currents  
Reliability

## Electron tubes

UF: Thermionic valves  
Tubes  
Vacuum tubes  
BT: Electron devices  
RT: Anodes  
Cathodes  
Electrodes  
Electrodynamics  
Electron emission  
Electron multipliers  
Gettering  
NT: Field emitter arrays  
Klystrons  
Magnetrons  
Thyratrons

## Electronic ballasts

UF: Ballasts  
Electric ballast  
Electrical ballast  
BT: Ballistic transport

## Electronic banking

USE: Online banking

## Electronic books

USE: Electronic publishing

## Electronic circuits

BT: Circuits  
NT: Breadboard circuit  
Central Processing Unit  
Multivibrators

## Electronic commerce

UF: E-commerce  
Ecommerce  
BT: Economics  
RT: Financial management  
Internet  
Marketing management  
Online banking  
Supply chain management  
Virtual enterprises

## Electronic components

BT: Components, packaging, and manufacturing technology  
NT: Capacitors  
Coils  
Connectors  
Diodes  
Electrodes  
Fuses  
Inductors  
Resistors  
Structural plates  
Switches  
Transducers

## Electronic counter-countermeasures

USE: Electronic countermeasures

## Electronic countermeasures

UF: ECCM  
ECM  
Electronic counter-countermeasures  
BT: Electronic warfare  
RT: Jamming  
Military communication  
Radar countermeasures  
Radio communication  
countermeasures  
Spread spectrum  
communication  
Spread spectrum radar  
Weapons

## Electronic currency

USE: Online banking

## Electronic data interchange

USE: Data handling

## Electronic design automation and methodology



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# 2018 IEEE Thesaurus

UF:	EDA				Learning (artificial
NT:	Design automation		intelligence)		
	Design methodology		RT:	Computer aided instruction	
				Computers and information	
<b>Electronic equipment</b>			processing		
BT:	Electronics industry			Electronic mail	
RT:	Electronic equipment			Internet	
manufacture				Learning management	
	Electronic equipment		systems		
testing				TV	
	Low-power electronics			Training	
NT:	Electronic voting systems			Wide area networks	
	Microelectronics		NT:	Mobile learning	
	Organic electronics				
	Smart devices				
	Soft electronics				
<b>Electronic equipment manufacture</b>			<b>Electronic mail</b>		
BT:	Components, packaging,		UF:	E-mail	
and manufacturing technology				Email	
RT:	Electronic equipment			Mail (electronic)	
	Electronics industry		BT:	Message systems	
	Optical device fabrication		RT:	Blogs	
NT:	Damascene integration			Electronic learning	
	Micromachining			Office automation	
	Radiation hardening			Postal services	
(electronics)			NT:	Social network services	
	Semiconductor device			Voice mail	
manufacture				Unified messaging	
				Unsolicited electronic mail	
<b>Electronic equipment testing</b>			<b>Electronic medical prescriptions</b>		
BT:	Testing		BT:	Medical treatment	
RT:	Electronic equipment		RT:	Electronic medical records	
	TEM cells				
NT:	Immunity testing		<b>Electronic medical records</b>		
			UF:	E-health records	
<b>Electronic government</b>				Electronic health records	
UF:	E-government		BT:	Medical information	
BT:	Government				
<i>Electronic health records</i>			systems		
USE:	Electronic medical records		RT:	Electronic medical	
			prescriptions	Patient monitoring	
<b>Electronic healthcare</b>			<b>Electronic messaging</b>		
UF:	E health		UF:	Text messaging	
	Ehealth		BT:	Message systems	
BT:	Information processing		NT:	Instant messaging	
	Medical services			Unified messaging	
<b>Electronic learning</b>			<b>Electronic music</b>		
UF:	E learning		BT:	Music	
	E-learning		NT:	Synthesizers	
	Elearning		<b>Electronic noses</b>		
BT:	Educational technology		BT:	Chemical analysis	
			RT:	Intelligent sensors	



# 2018 IEEE Thesaurus

## Electronic packaging thermal management

BT: Thermal management of electronics

## Electronic portfolios

USE: Portfolios

## Electronic publications

USE: IEEE online publications

## Electronic publishing

UF: Digital publishing  
E-books  
E-publishing  
E-reader  
Electronic books  
Epublishing  
Kindle  
BT: Publishing  
RT: CD-ROMs  
Multimedia systems  
NT: Content management  
Desktop publishing

## Electronic switching systems

BT: Communication switching  
Switching systems

## Electronic visual prosthesis

USE: Visual prosthesis

## Electronic voting

UF: E-voting  
Online voting  
BT: Voting

## Electronic voting systems

BT: Electronic equipment  
NT: Optical scan voting systems

## Electronic warfare

BT: Aerospace and electronic systems  
RT: Communication system  
security  
Radio communication  
countermeasures  
Spread spectrum  
communication  
Spread spectrum radar  
NT: Electronic countermeasures  
Jamming  
Radar countermeasures

## Electronic waste

UF: E-waste  
WEEE  
Waste electrical and electronic equipment  
BT: Waste materials

## Electronics cooling

BT: Thermal management of electronics  
RT: Cooling

## Electronics engineering education

BT: Electrical engineering education

## Electronics industry

UF: Integrated circuits industry  
Semiconductor electronics  
industry  
Semiconductor industry  
BT: Manufacturing industries  
RT: Electrical equipment  
industry  
Electrical products industry  
Electronic equipment  
manufacture  
Toy manufacturing industry  
NT: Electronic equipment

## Electronics packaging

UF: Ball grid arrays  
DIL  
DIP  
Dual inline packaging  
PGA  
Pin grid arrays  
QFP  
Quad flat packs  
BT: Components, packaging, and manufacturing technology  
RT: Constraint optimization  
Cooling  
Plastic packaging  
Printed circuits  
NT: Chip scale packaging

## Electrons

BT: Elementary particles  
RT: Beta rays  
Cosmic rays  
Electron accelerators  
Electron beams  
Electron emission  
Elementary particle  
exchange interactions



# 2018 IEEE Thesaurus

NT: Impact ionization  
Phonons  
Schrodinger equation  
Electron sources  
Quantum wells  
Trions

Laser beams  
Microwave photonics  
Optical waveguides  
P-i-n diodes  
Phase modulation  
Quantum well devices

## Electrooculography

UF: EOG  
Electro oculography  
Electro-oculography  
BT: Biomedical measurement  
Gaze tracking  
RT: Bioelectric phenomena  
Electroencephalography  
Eyes

## Electrooptic (EO) waveguides

USE: Electrooptical waveguides

## Electrooptic deflectors

UF: Electro-optic deflectors  
BT: Electrooptic devices

## Electrooptic devices

UF: Electro-optic devices  
BT: Lasers and electrooptics  
RT: Electroluminescent devices  
Electrooptic effects  
Liquid crystal devices  
Optical bistability  
Optoelectronic devices  
NT: Electrochromic devices  
Electrooptic deflectors  
Electrooptic modulators

## Electrooptic effects

UF: Electro-optic effects  
BT: Lasers and electrooptics  
RT: Electroluminescence  
Electrooptic devices  
Nonlinear optics  
NT: Electrochromism  
Kerr effect  
Optical bistability  
Stark effect

## Electrooptic modulators

UF: Electro-optic modulators  
Pockels readout optical  
modulator  
BT: Electrooptic devices  
Optical modulation  
RT: Integrated optics  
Intensity modulation

## Electrooptic waveguides

USE: Electrooptical waveguides

## Electrooptical waveguides

UF: EO waveguides  
Electrooptic (EO)  
waveguides  
BT: Electrooptic waveguides  
Optical waveguides

## Electrophotography

UF: Xerography  
BT: Electrostatic processes  
Photoconducting devices  
RT: Gas discharge devices  
Photography

## Electrophotoluminescence

USE: Photoluminescence

## Electrophysiology

BT: Biomedical measurement  
RT: Biomedical electrodes

## Electrostatic actuation

USE: Electrostatic actuators

## Electrostatic actuators

UF: Electrostatic actuation  
BT: Actuators  
RT: Electrostatic devices

## Electrostatic analysis

BT: Electrostatic processes  
RT: Electric fields  
Electromagnetic analysis  
Electrostatic measurements

## Electrostatic charges

USE: Electrostatic discharges

## AND

Electrostatics

## Electrostatic devices

BT: Industry applications  
RT: Electrostatic actuators  
Electrostatic processes



# 2018 IEEE Thesaurus

## Electrostatic discharges

UF: Charged device model  
ESD  
Electrostatic charges  
BT: Dielectric breakdown  
RT: Arc discharges  
Electrostatic interference

## Electrostatic induction

UF: Induction (electrostatic)  
BT: Electrostatic processes

## Electrostatic interference

BT: Interference  
RT: Electrostatic discharges  
NT: Immunity testing

## Electrostatic levitation

BT: Electrostatics  
Levitation

## Electrostatic measurements

BT: Electric variables  
measurement  
RT: Electrostatic analysis  
NT: Charge measurement

## Electrostatic precipitators

BT: Industry applications  
RT: Pollution control

## Electrostatic processes

BT: Industry applications  
RT: Discharges (electric)  
Electric fields  
Electrostatic devices  
Lightning  
NT: Aerosols  
Electrophotography  
Electrostatic analysis  
Electrostatic induction  
Electrostatics  
Particle charging  
Particle production  
Space charge  
Surface charging  
Triboelectricity

## *Electrostatic self assembly*

USE: Electrostatic self-assembly

## Electrostatic self-assembly

UF: Electrostatic self assembly  
BT: Self-assembly

## Electrostatics

UF: Electrostatic charges  
BT: Electrostatic processes  
RT: Poisson equations  
NT: Electrostatic levitation

## Electrostriction

BT: Dielectrics  
RT: Mechanical factors  
Piezoelectricity

## *Electrostrictive hydrodynamics*

USE: Electrohydrodynamics

## *Electrostrictive polymer actuators*

USE: Actuators

## Electrothermal effects

BT: Thermoelectricity  
RT: Electrothermal launching  
NT: Proton effects

## Electrothermal launching

UF: Launching (electrothermal)  
BT: Propulsion  
RT: Electromagnetic launching  
Electrothermal effects

## Elemental semiconductors

BT: Semiconductor materials  
RT: Silicon

## Elementary particle exchange interactions

BT: Elementary particles  
RT: Electrons  
Ions  
Proton effects  
Wave functions

## Elementary particle vacuum

UF: Instanton vacuum  
QCD vacuum  
Quantum vacuum  
String vacuum  
Superstring vacuum  
Vacuum energy  
BT: Elementary particles  
RT: Casimir effect

## Elementary particles

UF: Particles (elementary)  
BT: Nuclear and plasma  
sciences  
RT: Cosmic rays



# 2018 IEEE Thesaurus

High energy physics  
instrumentation computing  
Microwave photonics  
Nuclear thermodynamics  
Proton effects  
NT: Charge carriers  
Electrons  
Elementary particle  
exchange interactions  
Elementary particle vacuum  
Ions  
Mesons  
Neutrino sources  
Neutrons  
Particle beams  
Particle collisions  
Phonons  
Positrons  
Protons

## Elevators

BT: Building services  
RT: Buildings

## Ellipsoids

BT: Elliptic design

## Ellipsometry

BT: Optical variables  
measurement  
RT: Polarimetry

## Elliptic curve cryptography

UF: ECC  
Elliptic curve cryptosystems  
BT: Public key cryptography

## *Elliptic curve cryptosystems*

USE: Elliptic curve cryptography

## Elliptic curves

BT: Geometry

## Elliptic design

UF: Elliptical design  
BT: Geometry  
NT: Ellipsoids

## *Elliptical design*

USE: Elliptic design

## *Email*

USE: Electronic mail

## Embedded computing

BT: Embedded systems  
RT: Distributed vision networks

## Embedded multicore processing

BT: Multicore processing

## *Embedded power generation*

USE: Distributed power  
generation

## Embedded software

BT: Software

## *Embedded system*

USE: Embedded systems

## Embedded systems

UF: Embedded system  
BT: Operating systems  
RT: Cyber-physical systems  
Hardware-in-the loop

## simulation

NT: Microprocessors  
Embedded computing

## Embolization

BT: Medical treatment  
Noninvasive treatment

## Embossing

BT: Manufacturing  
Production  
RT: Injection molding  
Micromachining  
Sheet metal processing  
Watermarking

## Embryo

BT: Embryonic structures

## Embryonic structures

BT: Anatomy  
NT: Embryo  
Fetus

## *EMC*

USE: Electromagnetic  
compatibility

## Emergency lighting

BT: Lighting  
RT: High intensity discharge

## lamps

## *Emergency management*



# 2018 IEEE Thesaurus

USE: Emergency services

*Emergency medical services*

USE: Medical services

*Emergency power generators*

USE: Standby generators

## Emergency power supplies

UF: Standby power supplies

BT: Power supplies

RT: Batteries

Standby generators

Uninterruptible power

systems

*Emergency response*

USE: Emergency services

## Emergency services

UF: Emergency management

Emergency response

BT: Safety

RT: Accidents

Fires

Medical services

Rescue robots

## Emergent phenomena

BT: Cybernetics

*EMG*

USE: Electromyography

*EMI*

USE: Electromagnetic  
interference

## Emotion recognition

BT: User interfaces

RT: Affective computing

Behavioral sciences

Image recognition

Psychology

Sentiment analysis

Speech recognition

*Emotional responses*

USE: Psychology

## EMP radiation effects

UF: Electromagnetic pulse

BT: Electromagnetic transients

RT: Electromagnetic shielding

## Empirical mode decomposition

UF: Hilbert?Huang transforms

BT: Transforms

RT: Signal processing

## Employee rights

BT: Employment

## Employee welfare

UF: Conditions of employment

Counseling

Counselling

Maternity benefits

Sick pay

Working conditions

BT: Human resource

management

RT: Incentive schemes

Industrial psychology

Occupational health

Occupational safety

Occupational stress

Pensions

Psychology

Remuneration

## Employment

UF: Workplace

BT: Human resource

management

RT: Business

Employment law

Engineering profession

Jobs listings

Personnel

Programming profession

NT: Employee rights

Termination of employment

## Employment law

BT: Law

RT: Contract law

Employment

## EMTDC

UF: Electromagnetic transients

DC

Electromagnetic transients

including DC

BT: Electromagnetic transients

Geophysics

Software packages

## EMTP





# 2018 IEEE Thesaurus

program  
 UF: Electromagnetic transient  
 BT: Electromagnetic transients  
 RT: Computer simulation

## Emulation

BT: Modeling  
 RT: Application virtualization  
 Simulation

## Encapsulation

BT: Packaging  
 RT: Integrated circuit packaging  
 Plastic packaging

## Encephalography

BT: Biomedical imaging  
 RT: Brain

## Encoding

UF: Coding  
 BT: Information theory  
 RT: Codecs  
 Codes  
 Cryptography  
 Data compression  
 Data handling  
 Modulation  
 Modulation coding  
 Quantization (signal)  
 Semantic technology  
 Signal processing  
 Vector quantization  
 NT: Audio coding  
 Channel coding  
 Code refractoring  
 Entropy coding  
 Precoding  
 Source coding  
 Speech coding  
 Transcoding

## Encryption

BT: Cryptography  
 RT: Ciphers

## Encyclopedias

BT: Information services  
 RT: Wikipedia

## End effectors

BT: Manipulators  
 RT: Grippers

## Endocrine glands

USE: Glands

## Endocrine system

BT: Anatomy

## Endoscopes

UF: Endoscopy  
 BT: Biomedical equipment  
 RT: Biomedical optical imaging  
 Image sensors  
 Laser applications  
 Surgery

## Endoscopy

USE: Endoscopes

## Energy

energy  
 BT: Power engineering and

RT: Thermal energy  
 NT: Energy barrier  
 Energy capture  
 Energy consumption  
 Energy conversion  
 Energy dissipation  
 Energy exchange  
 Energy harvesting  
 Energy management  
 Energy resources  
 Energy states  
 Energy storage

## Energy barrier

BT: Energy

## Energy capture

BT: Energy

## Energy conservation

BT: Energy management  
 RT: Ecodesign  
 Energy resources  
 Power demand  
 Waste heat  
 NT: Green computing  
 Potential energy  
 Renewable energy sources

## Energy consumption

BT: Energy

## Energy conversion

BT: Energy  
 NT: Atomic batteries  
 Batteries



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	Fuel cells		Watt-hour meters
	Motors	NT:	Energy loss
	Photovoltaic cells		
	Potential well	<b>Energy resolution</b>	
	Solar heating	BT:	Nuclear imaging
	Thermoelectricity	RT:	Nuclear medicine
	Waste heat		Solid scintillation detectors
<b>Energy dissipation</b>		<b>Energy resources</b>	
BT:	Energy	BT:	Energy
<b>Energy efficiency</b>		RT:	Civil engineering
UF:	Energy efficient		Energy conservation
BT:	Energy management		Environmental economics
NT:	Energy efficient ethernet		Natural gas
			Power demand
<i>Energy efficient</i>		NT:	Fuels
USE:	Energy efficiency		Geothermal energy
			Nuclear fuels
<b>Energy efficient ethernet</b>			Solar energy
UF:	EtherEEE		Wave power
BT:	Energy efficiency		Wind energy
	Ethernet		Wind farms
		<i>Energy scavenging</i>	
<b>Energy exchange</b>		USE:	Energy harvesting
UF:	Energy transfer		
BT:	Energy	<b>Energy states</b>	
NT:	Inductive charging	UF:	Energy levels
			Levels, energy
<b>Energy harvesting</b>		BT:	Energy
UF:	Energy scavenging	NT:	Effective mass
	Power harvesting		Orbital calculations
BT:	Energy		Surface states
NT:	Nanogenerators		
<i>Energy levels</i>		<b>Energy storage</b>	
USE:	Energy states	UF:	Energy storage systems
			Stored energy
<b>Energy loss</b>		BT:	Energy
BT:	Energy measurement	RT:	Aging
NT:	Core loss		Battery powered vehicles
			Fuel cell vehicles
<b>Energy management</b>			Fuel storage
BT:	Energy		Hybrid electric vehicles
NT:	Demand-side management		Load management
	Energy conservation		Material storage
	Energy efficiency		Pulse power systems
	Load management		Solar powered vehicles
	Transactive energy	NT:	Batteries
			Flywheels
<b>Energy measurement</b>			Fuel cells
BT:	Electric variables		Hydrogen storage
measurement			Supercapacitors
RT:	Calorimetry		Superconducting magnetic
	Enthalpy	energy storage	



# 2018 IEEE Thesaurus

## *Energy storage systems*

USE: Energy storage

## *Energy transfer*

USE: Energy exchange

## **Engine cylinders**

BT: Machine components

RT: Engines

Gaskets

Pistons

Structural rings

## **Engineering - general**

RT: STEM

Technology

NT: Acoustical engineering

Agricultural engineering

Chemical engineering

Civil engineering

Concurrent engineering

Design engineering

Electrical engineering

Engineering profession

Environmental engineering

Maintenance engineering

Mechanical engineering

Optical engineering

Precision engineering

Production engineering

Research and development

Reverse engineering

Sanitary engineering

Standardization

Thermal engineering

## **Engineering drawings**

BT: Graphics

RT: Documentation

Technical drawing

NT: Flowcharts

## **Engineering education**

BT: Education

RT: Continuing education

Educational robots

Laboratories

Logic design

NT: Biomedical engineering

education

Communication

engineering education

Computer science

education

education

education

education

education

## *Engineering geology*

USE: Geoengineering

## **Engineering in medicine and biology**

NT: Bioinformatics

Biology

Biomedical communication

Biomedical computing

Biomedical engineering

Biomedical equipment

Biomedical imaging

Bionanotechnology

Bioterrorism

Computational biology

Genetic engineering

Medical services

Medical specialties

Nuclear medicine

Synthetic biology

## **Engineering management**

NT: Business

Commercialization

Consortia

Economics

Innovation management

Legal factors

Market research

Planning

Product development

Project engineering

Research and development

management

Research initiatives

Software development

management

## **Engineering profession**

UF: Careers

BT: Engineering - general

RT: Biographies

Electrical engineering

Employment



# 2018 IEEE Thesaurus

Ethics  
Programming profession  
Research and development  
Research and development

management  
NT: Professional aspects

## Engineering students

UF: Student engineers  
BT: Engineering education

## Engineering writing

USE: Writing

## Engines

BT:	Industry applications
RT:	Aircraft propulsion
	Automobile manufacture
	Cams
	Camshafts
	Engine cylinders
	Exhaust systems
	Fuel pumps
	Gaskets
	Machine components
	Manifolds
	Mechanical power

transmission

- Oils
- Pistons
- Propellers
- Propulsion
- Rockets
- Torque converters
- Turbomachinery
- Heat engines
- Internal combustion

NT: Heat engines  
Internal combustion

engines

## Jet engines

## Enhanced magnetoresistance

BT: Magnetoresistance  
RT: Nanocontacts

### Entangled states

USE: Quantum entanglement

## Enterprise resource planning

BT:	Management
RT:	Business
	Data handling
	Data processing
	Software
	System integration
	Venture capital

NT: Business process integration

## Entertainment industry

BT: Industries  
RT: Broadcasting  
Films  
Games  
Motion pictures  
TV

## Enthalpy

BT:	Thermodynamics
RT:	Energy measurement
	Thermal management

*Entrepreneurial*

USE: Entrepreneurship

## Entrepreneurship

UF: Entrepreneurial  
BT: Business  
RT: Innovation management

## Entropy

BT: Physics  
RT: Heating systems  
Nuclear thermodynamics

## Entropy coding

BT:	Encoding
RT:	Data compression
NT:	Huffman coding

*Entry, descent and landing*

USE: Aircraft navigation

## Envelope detectors

BT: Detectors

### Environmental design

USE: Green design

## Environmental economics

BT:	Economics
	Environmental factors
RT:	Energy resources
	Environmental

management

NT: Pollution  
Carbon tax

## Environmental engineering

BT: Engineering - general  
RT: Environmental factors



# 2018 IEEE Thesaurus

management	Environmental	BT:	Environmental factors
	Resource management	RT:	Monitoring
			Decontamination
			Pollution control
			Pollution measurement
<b>Environmental factors</b>			
	UF:	Environmental problems	
	BT:	Geoscience and remote	
sensing			<i>Environmental noise</i>
		USE:	Working environment noise
technology	Social implications of		<i>Environmental problems</i>
	RT:	Acoustic noise	USE:
		Air quality	Environmental factors
		Civil engineering	
		Ecodesign	
		Electromagnetic	
interference			<b>Environmentally friendly manufacturing techniques</b>
	Environmental engineering	BT:	Components, packaging, and manufacturing technology
	Green buildings		
	Green computing		<i>Enzymatic fuel cells</i>
	Greenhouse effect	USE:	Fuel cells
	Health and safety		
	International collaboration		<i>Enzymes</i>
	Meteorology	USE:	Biochemistry
	Occupational health		
	Ozonation		<i>EO waveguides</i>
	Safety	USE:	Electrooptical waveguides
	NT:		
	Biosphere		<i>EOG</i>
	Ecology	USE:	Electrooculography
	Ecosystems		
	Environmental economics		<i>EOS</i>
	Environmental monitoring	USE:	Earth Observing System
	Global warming		
	Green products		<i>Epidermal</i>
	Pollution	USE:	Epidermis
<b>Environmental management</b>			
	BT:	Industry applications	<b>Epidermis</b>
	RT:	Environmental economics	UF:
		Environmental engineering	BT:
		Global warming	Skin
		International collaboration	
		Public infrastructure	<b>Epilepsy</b>
		Sanitary engineering	BT:
	NT:	Biodegradation	Diseases
		Land use planning	
		Pest control	<b>Epitaxial growth</b>
		Pollution control	UF:
		Recycling	Epitaxy
		Renewable energy sources	BT:
		Sustainable development	Thin films
		Waste management	RT:
		Water conservation	Crystal growth
		Water resources	Crystals
			Gallium
			Germanium
			Molecular beams
			Nanotechnology
			Photonics
			Semiconductor devices
			Semiconductor thin films
			Silicon
<b>Environmental monitoring</b>			



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growth	NT:	Substrates	BT:	Filters
		Molecular beam epitaxial	RT:	Channel estimation
<b>Epitaxial layers</b>	BT:	Coatings	NT:	Impedance matching
		Films		Intersymbol interference
	RT:	Chemical vapor deposition	equalizers	Adaptive equalizers
		Semiconductor growth		Blind equalizers
layers	NT:	Thin films	<b>Equations</b>	Decision feedback
		Superconducting epitaxial		Mathematics
<i>Epitaxy</i>	USE:	Epitaxial growth	BT:	Boltzmann equation
				Difference equations
<b>EPON</b>	UF:	Ethernet passive optical	NT:	Integrodifferential equations
				Maxwell equations
networks	BT:	Ethernet		Nonlinear equations
				Polynomials
<b>Epoxy resins</b>	BT:	Dielectric materials	<b>Equipment failure</b>	Riccati equations
				Failure analysis
	BT:	Plastics	<b>Equivalent circuits</b>	Circuits
		Resins		
<b>EPROM</b>	UF:	EAROM	<i>Er</i>	USE: Erbium
		EEPROM		
only memory		Electrically alterable read	<i>Er-doped fiber amplifier</i>	USE: Erbium-doped fiber
		Electrically erasable		
programmable read only memory		Erased programmable	<i>Er-doped fiber lasers</i>	USE: Erbium-doped fiber lasers
		Erased programmable		
read only memory	BT:	PROM	<i>Erasable programmable read only memory</i>	USE: EPROM
<i>Epublishing</i>	USE:	Electronic publishing	<b>Erbium</b>	UF: Er
<b>Equal opportunities</b>	BT:	Human resource	BT:	Metals
				Erbium-doped fiber
management	RT:	Industrial relations	amplifiers	Lasers and electrooptics
		Labor resources		Optical amplifiers
	NT:	Personnel		Optics
		Recruitment		
<i>Equalisers</i>	USE:	Gender equity	<b>Erbium-doped fiber amplifiers</b>	UF: EDFA
		Gender issues		
		Equalizers	BT:	Er-doped fiber amplifier
				Optical amplifiers
<b>Equalizers</b>	UF:	Equalisers	RT:	Erbium
			<i>Erbium-doped fiber laser</i>	USE: Erbium-doped fiber lasers



# 2018 IEEE Thesaurus

## Erbium-doped fiber lasers

UF: Er-doped fiber lasers  
Erbium-doped fiber laser  
Erbiumdoped fiber laser  
BT: Fiber lasers

BT: Signal processing  
RT: Codes  
Convolutional codes  
Cyclic redundancy check  
Cyclic redundancy check

codes

## Erbiumdoped fiber laser

USE: Erbium-doped fiber lasers

## Erection

USE: Construction

## Ergonomics

UF: Human engineering  
Human factors engineering  
BT: Systems, man, and

cybernetics

RT: Anthropometry  
Behavioral sciences  
Cybernetics  
Design methodology  
Human factors  
Keyboards  
Man-machine systems  
Occupational health  
Working environment noise  
NT: Job design

NT: Forward error correction

## Error correction codes

UF: ECC  
Error correcting codes  
Error-correcting codes  
Error-correction codes  
Errorcorrection codes  
BT: Codes  
RT: Convolutional codes  
Error correction  
NT: Reed-Solomon codes

## Error analysis

UF: Error estimation  
Error rate  
Error rates  
Error statistics  
BT: Testing  
RT: Cyclic redundancy check  
Cyclic redundancy check

codes

Error correction  
Estimation  
Mean square error methods  
Measurement errors  
Numerical analysis  
Roundoff errors  
NT: Bit error rate  
Finite wordlength effects

## Error estimation

USE: Error analysis

## Error free operation

USE: Error-free operations

## Error probability

BT: Probability

## Error rate

USE: Error analysis

## Error rates

USE: Error analysis

## Error recovery (computers)

USE: System recovery

## Error statistics

USE: Error analysis

## Error compensation

BT: Information theory  
RT: Error correction

## Error correcting codes

USE: Error correction codes

## Error-correcting codes

USE: Error correction codes

## Error-correction codes

USE: Error correction codes

## Error correction

## Error-free operations

UF: Error free operation



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BT:	Testing	BT:	Materials processing
<i>Error correction codes</i>			Surface treatment
USE:	Error correction codes	RT:	Fabrication
			Micromachining
<i>ESD</i>		NT:	Dry etching
			Wet etching
USE:	Electrostatic discharges		
<b>Esophagus</b>		<b>Ethanol</b>	
BT:	Digestive system	UF:	Ethyl alcohol
			Grain alcohol
<b>Estimation</b>		BT:	Chemical compounds
UF:	Signal estimation	NT:	Alcoholic beverages
BT:	Mathematics		
RT:	Control systems	<i>EtherEEE</i>	
	Error analysis	USE:	Energy efficient ethernet
	Filtering theory		
	Kalman filters	<b>Ethernet</b>	
	Measurement uncertainty	BT:	Computer networks
	Prediction methods	RT:	IEEE 802.3 Standard
	Prediction theory		Local area networks
	Reduced order systems	NT:	EPON
	Signal processing		Energy efficient ethernet
	Spectral analysis		
NT:	Estimation error	<i>Ethernet passive optical networks</i>	
	Estimation theory	USE:	EPON
	Functional point analysis		
	Life estimation	<b>Ethical aspects</b>	
	Maximum likelihood	BT:	Social implications of
estimation		technology	
	Pose estimation	RT:	Digital divide
	State estimation		Ethics
	Yield estimation		Genetic engineering
			Legal factors
<b>Estimation error</b>			Management
BT:	Estimation		Philosophical
		considerations	
<i>Estimation of the direction of arrival</i>		<b>Ethics</b>	
USE:	Direction-of-arrival	UF:	Morals
estimation		BT:	Social implications of
		technology	
<b>Estimation theory</b>		RT:	Engineering profession
BT:	Estimation		Ethical aspects
RT:	Mean square error methods	NT:	Cyberethics
	Signal processing		
	Statistics	<i>Ethyl alcohol</i>	
NT:	Cramer-Rao bounds	USE:	Ethanol
	Maximum a posteriori		
estimation		<b>ETSI</b>	
		UF:	European
<i>Etalons</i>		Telecommunications	Standards Institute
USE:	Interferometers	BT:	Standards organizations
<b>Etching</b>		<b>ETSI Standards</b>	
UF:	Deep etching	BT:	Standards publications





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NT:	HbbTV Standards SONET Synchronous digital	UF:	Evolutionary algorithm
hierarchy		BT:	Computational intelligence
		NT:	Evolutionary robotics Particle swarm optimization
<b>Euclidean distance</b>		<b>Evolutionary robotics</b>	
UF:	Euclidean measurement Euclidean metric	BT:	Evolutionary computation Robots
BT:	Distance measurement Mathematics	<b>Exchange rates</b>	
NT:	Hilbert space	BT:	Economics
<i>Euclidean measurement</i>		RT:	Costs Economic indicators International trade
USE:	Euclidean distance	<i>Excitation of lasers</i>	
<i>Euclidean metric</i>		USE:	Laser excitation
USE:	Euclidean distance	<b>Excitons</b>	
<b>Europe</b>		BT:	Charge carrier processes
BT:	Continents	RT:	Semiconductor materials
<i>European Telecommunications Standards Institute</i>		<i>Executive programs</i>	
USE:	ETSI	USE:	Operating systems
<b>Europium</b>		<b>Exhaust gases</b>	
BT:	Chemical elements	BT:	Gases
NT:	Dysprosium compounds	RT:	Air pollution Ash Combustion Exhaust systems Flue gases Internal combustion
<i>EUV Lithography</i>		engines	
USE:	Extreme ultraviolet		Jet engines
lithography		<i>Exhaust manifolds</i>	
<i>EV charging</i>		USE:	Manifolds
USE:	Electric vehicle charging	<b>Exhaust systems</b>	
<b>Event detection</b>		UF:	Catalytic converters Catalytic convertors Mufflers
BT:	Wireless sensor networks	BT:	Machine components Production systems
<i>Everyware</i>		RT:	Engines Exhaust gases Manifolds
USE:	Pervasive computing	<i>Exo planets</i>	
<i>Evolution</i>		USE:	Extrasolar planets
USE:	Evolution (biology)	<i>Exo-planets</i>	
<b>Evolution (biology)</b>		USE:	Extrasolar planets
UF:	Evolution		
BT:	Biology		
NT:	Memetics Phylogeny		
<i>Evolutionary algorithm</i>			
USE:	Evolutionary computation		
<b>Evolutionary computation</b>			



# 2018 IEEE Thesaurus

## *Exocrine glands*

USE: Glands

## *Exoplanets*

USE: Extrasolar planets

## **Exoskeletons**

BT: User interfaces

## *Expectation-maximisation algorithms*

USE: Expectation-maximization algorithms

## **Expectation-maximization algorithms**

UF: Expectation-maximisation algorithms

BT: Iterative methods

## **Expert systems**

BT: Knowledge based systems  
Cause effect analysis  
Decision making  
Intelligent systems  
Knowledge acquisition  
Knowledge representation  
NT: Diagnostic expert systems  
Medical expert systems

## **Explosion protection**

BT: Protection  
Safety  
RT: Accident prevention  
Flammability  
Hazards  
Military equipment

## **Explosions**

BT: Hazards  
RT: Accidents  
Chemical hazards  
Flammability  
Hazardous areas  
Safety  
Seismic waves  
NT: Explosives

## **Explosives**

BT: Explosions

## **Exponential distribution**

BT: Probability distribution

## *Extended definition TV*

USE: HDTV

## **Extended reality**

UF: HumanXR  
BT: Human computer interaction  
Man-machine systems  
Virtual reality  
RT: Augmented reality

## *Extensible Markup Language*

USE: XML

## **External stimuli**

UF: PhysiStimuli  
BT: Interactive systems  
Physiology

## **Extinction coefficients**

BT: Optics  
NT: Extinction ratio

## **Extinction ratio**

BT: Extinction coefficients

## *Extra solar planets*

USE: Extrasolar planets

## *Extra-solar planets*

USE: Extrasolar planets

## **Extracellular**

BT: Cells (biology)

## **Extranets**

BT: Virtual private networks  
RT: Data communication  
Information systems  
Internet  
Web sites

## **Extraordinary magnetoresistance**

BT: Magnetoresistance

## **Extrapolation**

BT: Approximation methods  
RT: Statistics

## **Extrasolar planetary atmospheres**

BT: Extrasolar planets

## **Extrasolar planetary mass**

BT: Extrasolar planets

## **Extrasolar planets**

UF: Exo planets  
Exo-planets



# 2018 IEEE Thesaurus

Exoplanets  
Extra solar planets  
Extra-solar planets  
Super earths  
BT: Astronomy  
RT: Extraterrestrial  
measurements  
Extraterrestrial phenomena  
NT: Extrasolar planetary  
atmospheres  
Extrasolar planetary mass

## Extraterrestrial measurements

UF: Planetary composition  
Space measurements  
BT: Measurement  
RT: Astronomy  
Extrasolar planets  
Extraterrestrial phenomena  
Interstellar chemistry

## Extraterrestrial phenomena

UF: Space phenomena  
BT: Geophysics  
RT: Extrasolar planets  
Extraterrestrial

measurements

Planets  
Space technology  
NT: Cosmic rays  
Solar radiation

## Extreme ultraviolet lithography

UF: EUV Lithography  
BT: Lithography

## Extremities

BT: Body regions  
NT: Arms  
Buttocks  
Elbow  
Fingers  
Foot  
Hip  
Knee  
Leg  
Shoulder  
Thigh

## Eye protection

UF: Goggles  
BT: Safety devices  
RT: Occupational health  
Occupational safety  
Protective clothing

Safety

## Eyebrows

BT: Hair

## Eyelashes

BT: Eyes  
Hair

## Eyelids

BT: Eyes

## Eyes

BT: Sense organs  
RT: Electrooculography  
Gaze tracking  
Optical coherence

tomography

NT: Cataracts  
Cornea  
Eyelashes  
Eyelids  
Iris  
Retina

## FAA

UF: Federal Aviation  
Administration  
BT: US Government agencies

## Fabrication

UF: Fabrication process  
BT: Manufacturing  
RT: Etching  
Materials processing  
NT: Bonding processes  
Microfabrication  
Optical device fabrication  
Soldering  
Welding

## Fabrication process

USE: Fabrication

## Fabrics

UF: Knitted fabric composites  
Woven fabric composites  
BT: Textiles  
RT: Clothing  
Weaving  
Wool

## Fabry-Perot

BT: Interferometry  
NT: Fabry-Perot interferometers



# 2018 IEEE Thesaurus

## Fabry-Perot interferometers

BT: Fabry-Perot

## Face

BT: Head  
RT: Stomatognathic system  
NT: Facial muscles

## Face detection

BT: Computer vision  
RT: Facial animation  
NT: Facial features

## Face recognition

UF: Facial recognition  
BT: Biometrics (access control)  
Identification of persons  
Pattern recognition  
RT: Gaze tracking  
Image recognition

## Facebook

BT: Social network services  
Video sharing  
Web sites

## Facial animation

BT: Animation  
RT: Face detection

## Facial features

BT: Face detection

## Facial muscles

BT: Face

## Facial recognition

USE: Face recognition

## Facilities management

BT: Building services  
Management  
Organizational aspects

## Facsimile

BT: Communication systems  
Image communication

## Factories

USE: Production facilities

## Factory automation

USE: Manufacturing automation

## FACTS

USE: Flexible AC transmission systems

## Fading channels

BT: Signal processing  
RT: Diversity methods  
Diversity schemes  
Meteorological factors  
Multipath channels  
Radio propagation  
NT: Frequency-selective fading  
channels  
Rayleigh channels  
Weibull fading channels

## Failure analysis

UF: Failure mechanisms  
BT: Testing  
RT: Cause effect analysis  
Diagnostic expert systems  
Fatigue  
Fault diagnosis  
Fault trees  
Green's function methods  
Life estimation  
Quality control  
Reliability  
Remaining life assessment  
Weibull distribution  
NT: Equipment failure  
Semiconductor device  
breakdown

## Failure mechanisms

USE: Failure analysis

## Fans

BT: Machinery  
Ventilation  
RT: Air conditioning  
Blades  
Jet engines

## Faraday effect

UF: Faraday rotation  
BT: Magneto optic effects  
RT: Gyromagnetism  
Gyrotropism

## Faraday rotation

USE: Faraday effect

## Fascia

BT: Musculoskeletal system



# 2018 IEEE Thesaurus

## Fast Fourier transforms

BT: Fourier transforms  
RT: Digital signal processing  
Harmonic analysis

## Fast light

BT: Light sources

## Fastbus

BT: Data acquisition  
RT: Data buses  
Data communication  
Data processing  
Nuclear measurements

## Fasteners

UF: Bolts  
Hinges  
Nuts (fasteners)  
Screws  
Zip fasteners  
BT: Control equipment  
Mechanical products  
RT: Belts  
Couplings  
Joining processes  
Welding

## Fastening

USE: Joining processes

## Fatigue

BT: Mechanical factors  
RT: Failure analysis  
Life estimation

## Fats

BT: Chemical products  
Food products  
RT: Biological materials  
Lipidomics  
Oils

## Fault current limiters

BT: Current limiters

## Fault currents

BT: Current  
RT: Electric breakdown  
Grounding  
Leakage currents  
NT: Fault protection

## Fault detection

BT: System analysis and design

## Fault diagnosis

BT: Reliability  
RT: Cause effect analysis  
Diagnostic expert systems  
Failure analysis  
Maintenance engineering  
Testing  
NT: Dissolved gas analysis  
Fault location

## Fault location

BT: Fault diagnosis  
RT: Cables  
Communication cables  
Fault trees  
Insulation testing

## Fault protection

BT: Electrical safety  
Fault currents

## Fault tolerance

UF: System resilience  
BT: Reliability  
NT: Fault tolerant control  
Redundancy

## Fault tolerant control

BT: Control systems  
Fault tolerance

## Fault tolerant systems

BT: System analysis and design

## Fault trees

BT: Risk analysis  
RT: Boolean functions  
Failure analysis  
Fault location

## FBAR

USE: Film bulk acoustic resonators

## FBARs

USE: Film bulk acoustic resonators

## FBT

USE: Flyback transformers

## FCC



# 2018 IEEE Thesaurus

UF: Federal Communications Commission  
BT: US Government agencies

## FDDI

UF: Fiber distributed data interface  
BT: Communication systems  
Optical fiber communication  
RT: Communication standards  
Local area networks

## FDM

USE: Frequency division multiplexing

## FDMA

USE: Frequency division multiaccess

## FDTD

USE: Finite difference methods  
AND Time-domain analysis

## Fe

USE: Iron

## Feathers

BT: Animal structures

## Feature extraction

BT: Image processing  
RT: Blob detection  
Image annotation  
Image edge detection  
Image recognition  
Independent component analysis

analysis

Mixture models  
Pattern classification  
Pattern recognition  
Principal component

analysis

Saliency detection  
Signal processing  
Speech recognition

## Federal Aviation Administration

USE: FAA

## Federal Communications Commission

USE: FCC

## Federated search

USE: Metasearch

## Federated searching

USE: Metasearch

## Feedback

UF: Saturation detection  
BT: Circuits  
Control systems  
RT: Control design  
Positive train control  
SIMO communication  
Scrum (Software

development)

NT: System dynamics  
Feedback circuits  
Negative feedback  
Neurofeedback

## Feedback amplifiers

UF: NFB  
BT: Negative feedback amplifier  
Operational amplifiers

## Feedback circuits

UF: Circuit feedback  
BT: Feedback  
RT: Control theory  
Distributed feedback

devices

NT: Feedback communications  
Output feedback

## Feedback communications

BT: Telecommunications  
RT: Feedback circuits  
NT: Automatic repeat request  
Feedback control  
Feedback loop

## Feedback control

BT: Feedback communications  
NT: Windup

## Feedback linearization

BT: Control nonlinearities  
Control systems

## Feedback loop

BT: Feedback communications  
NT: Negative feedback loops

## Feedforward neural nets

USE: Feedforward neural networks



# 2018 IEEE Thesaurus

## Feedforward neural networks

UF: Feedforward neural nets  
BT: Neural networks  
RT: Artificial intelligence  
Pattern recognition  
Self-organizing feature

maps

Support vector machines  
NT: Multilayer perceptrons

## Feedforward systems

BT: Intelligent control  
RT: Forward error correction  
Open loop systems

## Feeds

BT: Antennas  
NT: Antenna feeds

*FEM*

USE: Finite element analysis

## Femtocell networks

UF: Access point base station  
BT: Cellular networks  
RT: Base stations

## Femtocells

BT: Base stations

## Ferrimagnetic films

BT: Ferrimagnetic materials  
Films  
Magnetic films  
Magnetic materials  
NT: Ferrite films  
Garnet films

## Ferrimagnetic materials

BT: Magnetic materials  
NT: Ferrimagnetic films  
Ferrite films  
Ferrites  
Garnet films  
Garnets

## Ferrite devices

BT: Magnetic devices  
RT: Ferrites  
Flyback transformers  
Gyrators  
NT: Circulators

## Ferrite films

BT: Ferrimagnetic films  
Ferrimagnetic materials  
Ferrites  
Films  
Magnetic films  
Magnetic materials

## Ferrites

BT: Ferrimagnetic materials  
Magnetic materials  
RT: Ferrite devices  
Gyromagnetism  
NT: Ferrite films

## Ferroelectric devices

BT: Dielectric devices  
RT: Ferroelectric materials

## Ferroelectric films

BT: Ferroelectric materials  
RT: Magnetic field induced

strain

## Ferroelectric materials

BT: Ultrasonics, ferroelectrics,  
and frequency control  
RT: Dielectric materials  
Ferroelectric devices  
Magnetic field induced

strain

NT: Pyroelectricity  
Ferroelectric films  
Relaxor ferroelectrics

## Ferrofluid

UF: LiquiFerrofluid  
BT: Fluids  
Magnetic materials

## Ferromagnetic materials

USE: Magnetic materials

## Ferromagnetic resonance

USE: Magnetic resonance

## Ferroresonance

BT: Power engineering  
Resonance  
RT: Magnetic resonance  
Nonlinear magnetics

## Fertilisers

USE: Fertilizers

## Fertilizers



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# 2018 IEEE Thesaurus

UF: Fertilisers  
BT: Agriculture  
RT: Boron  
Crops

Nonlinear optics

*Fiber optic sensors*

USE: Optical fiber sensors

## FET circuits

BT: Solid state circuits  
RT: Nuclear electronics  
Operational amplifiers  
NT: FET integrated circuits  
JFET circuits  
MESFET circuits  
MODFET circuits  
MOSFET circuits

## Fiber optics

UF: Fibre optics  
BT: Optics  
NT: Fiber nonlinear optics  
Optical fibers

## Fiber reinforced plastics

UF: Fibre reinforced plastics  
BT: Plastics  
RT: Plastic insulators

## FET integrated circuits

BT: FET circuits  
Integrated circuits  
RT: Field effect transistors  
NT: Field effect MMIC  
MESFET integrated circuits

*Fiber-Bragg gratings*

USE: Bragg gratings

*Fiber-in-the-loop*

USE: Optical fiber subscriber loops

## Fetal heart

BT: Heart

*Fibers*

USE: Textile fibers

## Fetal heart rate

BT: Heart rate

*Fibre gratings*

USE: Fiber gratings

*FETs*

USE: Field effect transistors

*Fibre lasers*

USE: Fiber lasers

## Fetus

BT: Embryonic structures

*Fibre optic sensors*

USE: Optical fiber sensors

*FFF*

USE: Field-flow fractionation

*Fibre optics*

USE: Fiber optics

*Fiber Bragg gratings*

USE: Bragg gratings

*Fibre reinforced plastics*

USE: Fiber reinforced plastics

*Fiber distributed data interface*

USE: FDDI

## Fibrillation

BT: Medical treatment  
RT: Defibrillation  
NT: Atrial fibrillation

## Fiber gratings

UF: Fibre gratings  
BT: Bragg gratings

## Fibroblasts

BT: Biological cells

## Fiber lasers

UF: Fibre lasers  
BT: Ring lasers  
NT: Erbium-doped fiber lasers  
High power fiber lasers

## Fiducial markers

UF: Imagemarkers  
BT: Image processing  
RT: Microfabrication  
Semiconductor device

## Fiber nonlinear optics

BT: Fiber optics

manufacture





# 2018 IEEE Thesaurus

## Field buses

UF: Instrumentation buses  
BT: Computer interfaces  
RT: Industrial control  
Local area networks

## Field effect MMIC

BT: FET integrated circuits

## Field effect transistors

UF: FETs  
BT: Transistors  
RT: FET integrated circuits  
Graphene devices  
Semiconductor devices  
NT: CNTFETs  
Double-gate FETs  
HEMTs  
JFETs  
MESFETs  
MISFETs  
MODFETs  
MOSFET  
MOSHFETs  
OFETs  
Schottky gate field effect

transistors

TFETs  
Thin film transistors

## Field electron emission

USE: Electron emission

## Field emitter arrays

BT: Electron tubes  
RT: Vacuum technology

## Field flow fractionation

USE: Field-flow fractionation

## Field ion emission

USE: Ion emission

## Field multiplication

USE: Galois fields

## Field programmable analog arrays

UF: FPAA  
Field programmable

analogue arrays

BT: Analog integrated circuits  
Programmable circuits  
RT: Application specific

integrated circuits

arrays

Field programmable gate

Space technology

## Field programmable analogue arrays

USE: Field programmable analog  
arrays

## Field programmable gate arrays

UF: FPGA  
Field-programmable gate

arrays

BT: Integrated circuits  
RT: Field programmable analog

arrays

Reconfigurable devices

## Field-flow fractionation

UF: EFFF  
FFF  
Field flow fractionation  
BT: Fractionation

## Field-programmable gate arrays

USE: Field programmable gate  
arrays

## Filament lamps

BT: Lamps  
RT: Lighting

## File servers

BT: Computers and information  
processing  
RT: Computer networks  
Data communication  
Local area networks

## File sharing

USE: Peer-to-peer computing

## File system permissions

USE: Permission

## File systems

BT: System software  
RT: Audio databases  
Data structures  
Database systems  
Information systems

## Fill factor (solar cell)

BT: Photovoltaic systems

## Filler metals



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# 2018 IEEE Thesaurus

<b>Filling</b>	BT:	Joining materials	<b>Filtering</b>	BT:	Circuits and systems
	RT:	Metals		RT:	Noise cancellation
	BT:	Freight handling		NT:	Filters
	RT:	Containers			Information filtering
		Loading	<b>Filtering algorithms</b>	UF:	Loop-filtering algorithm
		Packaging		BT:	Post-filtering algorithm
<b>Film bulk acoustic resonators</b>	UF:	FBAR	<b>Filtering theory</b>	BT:	Algorithms
		FBARs		UF:	Filter-theory
	BT:	Acoustic devices		BT:	Filters
		Thin film devices		RT:	Estimation
	RT:	Bulk acoustic wave devices			Line enhancers
		Land mobile radio cellular			Matched filters
systems		Mobile communication	detection		Maximum likelihood
		Radio communication		NT:	Transversal filters
		Resonance			Image filtering
		Telecommunications			
<b>Films</b>	BT:	Materials	<b>Filters</b>	BT:	Filtering
	RT:	Chemical vapor deposition			Signal processing
		Coatings		RT:	Passive filters
		Entertainment industry		NT:	Signal to noise ratio
		Sputtering			Active filters
	NT:	Conductive films			Anisotropic
		Dielectric films			Bragg gratings
		Epitaxial layers			Channel bank filters
		Ferrimagnetic films			Digital filters
		Ferrite films			Equalizers
		Garnet films			Filtering theory
		Magnetic films			Gabor filters
		Optical films			Harmonic filters
		Piezoelectric films			IIR filters
		Plastic films			Kalman filters
		Polymer films			Low pass filters
		Semiconductor films			Matched filters
		Thick films			Microstrip filters
		Thin films			Nonlinear filters
					Notch filters
<i>Films (Motion pictures)</i>					Particle filters
	USE:	Motion pictures			Power filters
<b>Filter banks</b>	UF:	Filterbank			Resonator filters
	BT:	Band-pass filters			Spatial filters
<i>Filter-theory</i>					Superconducting filters
	USE:	Filtering theory			Transversal filters
<i>Filterbank</i>			<b>Filtration</b>	UF:	Nanofiltration
	USE:	Filter banks		BT:	Materials science and
					technology



# 2018 IEEE Thesaurus

	NT:	Microfiltration		Fingerprint matching
<b>Finance</b>				Fingerprint modality
	UF:	Taxes		Fingerprint sensing
	BT:	Financial management		Fingerprint sensors
	RT:	Banking		Fingerprint verification
		Bitcoin	BT:	Fingerprinting
		Business		Biometrics (access control)
		Cryptocurrency		Identification of persons
		Economics	RT:	Pattern recognition
	NT:	Bankruptcy		Image matching
		Currencies		
			<i>Fingerprint sensing</i>	
			USE:	Fingerprint recognition
<b>Financial management</b>				
	UF:	Financial planning	<i>Fingerprint sensors</i>	
		Money management	USE:	Fingerprint recognition
	BT:	Management		
	RT:	Electronic commerce	<i>Fingerprint verification</i>	
		Profitability	USE:	Fingerprint recognition
		Public finance		
	NT:	Costing	<i>Fingerprinting</i>	
		Credit cards	USE:	Fingerprint recognition
		Finance		
		Insurance	<b>Fingers</b>	
		Investment	BT:	Extremities
		Loans and mortgages	NT:	Thumb
		Management accounting		
		Mutual funds	<b>Finishing</b>	
		Pricing	BT:	Surface treatment
		Venture capital	RT:	Machining
				Materials processing
<i>Financial planning</i>				Planing
USE:		Financial management	NT:	Surface finishing
<b>FinFETs</b>			<b>Finite difference methods</b>	
	BT:	MOSFET	UF:	FDTD
				Finite difference time
<i>Fingerprint identification</i>			domain analysis	
USE:		Fingerprint recognition		Finite difference time
			domain methods	
<i>Fingerprint images</i>				Finite-difference methods
USE:		Image matching		Finite-difference time-
			domain methods	
<i>Fingerprint indexing</i>			BT:	Mathematics
USE:		Fingerprint recognition		Numerical analysis
			RT:	Computational
<i>Fingerprint matching</i>			electromagnetics	
USE:		Fingerprint recognition		Perfectly matched layers
<i>Fingerprint modality</i>			<i>Finite difference time domain analysis</i>	
USE:		Fingerprint recognition	USE:	Finite difference methods
<b>Fingerprint recognition</b>			<i>Finite difference time domain methods</i>	
	UF:	Fingerprint identification	USE:	Finite difference methods
		Fingerprint indexing		



# 2018 IEEE Thesaurus

## Finite element analysis

UF: Discrete element method  
FEM  
Finite element methods  
Finite element modeling  
Finite element modelling  
Finite-element analysis  
Finite-element methods  
Finite-element modeling  
Finite-element modelling  
BT: Mathematics  
Numerical analysis  
RT: Eddy current testing  
Perfectly matched layers

## Finite element methods

USE: Finite element analysis

## Finite element modeling

USE: Finite element analysis

## Finite element modelling

USE: Finite element analysis

## Finite fields

USE: Galois fields

## Finite impulse response filters

UF: FIR  
FIR filters  
BT: Digital filters  
RT: Discrete wavelet transforms  
Frequency response

## Finite state machines

USE: Automata

## Finite volume methods

UF: Finite-volume method  
BT: Numerical analysis  
RT: Navier-Stokes equations

## Finite wordlength effects

UF: Overflow oscillations  
Truncation errors  
BT: Error analysis  
RT: Quantization (signal)  
NT: Roundoff errors

## Finite-difference methods

USE: Finite difference methods

## Finite-difference time-domain methods

USE: Finite difference methods

## Finite-element analysis

USE: Finite element analysis

## Finite-element methods

USE: Finite element analysis

## Finite-element modeling

USE: Finite element analysis

## Finite-element modelling

USE: Finite element analysis

## Finite-volume method

USE: Finite volume methods

## Finline

BT: Planar transmission lines

## FIR

USE: Finite impulse response filters

## FIR filters

USE: Finite impulse response filters

## Fire retardants

USE: Flame retardants

## Fireproofing

USE: Flame retardants

## Fires

UF: Flames  
Wild fires  
Wildfires  
BT: Hazards  
RT: Accidents  
Emergency services  
Flammability  
Hazardous areas  
Safety  
Smoke detectors

## Firewalls (computing)

BT: Computer security  
RT: Computer networks  
Countermeasures

(computer)

Hardware  
Software

## FireWire

USE: Firewire



# 2018 IEEE Thesaurus

## Firewire

UF: FireWire  
BT: Computer interfaces  
RT: Computer peripherals  
Consumer electronics  
Data communication  
Home computing  
IEEE 1394 Standard  
Video signal processing

## Fireworks algorithm

BT: Optimization methods  
RT: Particle swarm optimization

## Firing

BT: Materials preparation  
RT: Ceramics  
Heat treatment  
Kilns

## Firmware

USE: Microprogramming

## Fish

BT: Organisms

## Fishbone diagrams

USE: Cause effect analysis

## Fisheries

USE: Aquaculture

## Fission reactors

UF: Nuclear fission  
Nuclear reactors (fission)  
BT: Nuclear power generation  
RT: Pressure vessels  
Radiation protection

## Fitting

BT: Assembly  
RT: Assembly systems

## Fixed point arithmetic

USE: Fixed-point arithmetic

## Fixed-point arithmetic

UF: Fixed point arithmetic  
BT: Arithmetic

## Fixtures

UF: Fixturing  
Jigs  
BT: Production equipment  
RT: Machine tools

## Fixturing

USE: Fixtures

## Flame retardants

UF: Fire retardants  
Fireproofing  
BT: Retardants  
RT: Bromine compounds  
Flammability  
Materials preparation

## Flames

USE: Fires

## Flammability

UF: Inflammability  
BT: Hazards  
RT: Explosion protection  
Explosions  
Fires  
Flame retardants  
Hazardous materials

## Flanges

BT: Mechanical products  
RT: Rails  
Structural plates  
Wheels

## Flash memories

UF: NAND flash  
BT: Memory  
RT: Automation  
Computer peripherals  
NT: Flash memory cells

## Flash memory cells

BT: Flash memories  
NT: Split gate flash memory

cells

## Flashover

BT: Dielectric breakdown

## Flat panel displays

BT: Displays

## Flex

USE: Flexible printed circuits

## Flexible ac transmission systems

USE: Flexible AC transmission systems



# 2018 IEEE Thesaurus

## Flexible AC transmission systems

UF: FACTS  
Flexible ac transmission  
systems  
BT: Power transmission

## Flexible electronics

BT: Assembly systems  
RT: Graphene devices  
Soft electronics

## Flexible fuel vehicles

USE: Land vehicles

## Flexible manufacturing systems

BT: Manufacturing automation  
RT: Agile manufacturing  
Cellular manufacturing  
Computer applications

## Flexible printed circuits

UF: Flex  
BT: Printed circuits

## Flexible structures

UF: Deployable structures  
BT: Buildings  
Structural shapes  
RT: Control systems  
Decentralized control  
Mechanical variables  
control  
Structural engineering

## Flickr

BT: Social network services

## Flight control

USE: Aerospace control

## Flight simulation

USE: Aerospace simulation

## Flip chip

USE: Flip-chip devices

## Flip chip solder joints

UF: Castellations  
BT: Soldering  
RT: Flip-chip devices

## Flip-chip

USE: Flip-chip devices

## Flip-chip devices

UF: Flip chip  
Flip-chip  
BT: Semiconductor device  
manufacture  
Semiconductor devices  
RT: Flip chip solder joints  
Microassembly  
Microprocessor chips  
Microprocessors

## Flip-flops

BT: Pulse circuits  
RT: Logic circuits

## FLL

USE: Frequency locked loops

## Floating point arithmetic

USE: Floating-point arithmetic

## Floating-point arithmetic

UF: Floating point arithmetic  
BT: Arithmetic

## Floods

BT: Hazards  
Hydrology  
RT: Land use planning  
Rain  
Rivers  
Structural engineering

## Floors

BT: Building materials  
RT: Construction industry  
Tiles

## Floppy disks

BT: Magnetic memory

## Flotation devices

USE: Underwater equipment

## Flow

USE: Fluid flow

## Flow batteries

USE: Batteries

## Flow graphs

UF: Data flow graphs  
Signal flow graphs  
BT: Programmable control  
RT: Circuits



# 2018 IEEE Thesaurus

## *Flow meters*

USE: Flowmeters

NT: Magnetohydrodynamics  
Fluid dynamics  
Hydraulic diameter  
Hydrology  
Pipelines  
Valves

## **Flow production systems**

UF: Sequential production  
BT: Manufacturing systems  
RT: System dynamics  
NT: Continuous production

## **Fluid flow control**

BT: Control systems  
RT: Valves

## **Flowcharts**

BT: Engineering drawings  
RT: Programming  
System analysis and design

## **Fluid flow measurement**

UF: Anemometers  
BT: Measurement  
RT: Fluid flow  
Hydrologic measurements  
Pressure gauges

## **Flowmeters**

UF: Flow meters  
BT: Meters  
RT: Automatic meter reading  
Fluid flow  
Velocity measurement

## **Fluidic microsystems**

BT: Micromechanical devices  
RT: Microfluidics

## **Fluctuations**

BT: Reliability

## **Fluidics**

BT: Control systems  
RT: Fluid flow  
Nanotechnology  
Pneumatic systems  
NT: Microfluidics  
Nanofluidics

## **Flue gases**

BT: Gases  
RT: Air pollution  
Effluents  
Exhaust gases

## **Fluid dynamics**

BT: Fluid flow  
Fluids  
RT: Hydrodynamics  
Lattice Boltzmann methods  
NT: Buoyancy  
Computational fluid

## *Fluidisation*

USE: Fluidization

## **Fluidization**

UF: Fluidisation  
BT: Chemical technology  
RT: Fluids

## *dynamics*

Drag  
Navier-Stokes equations  
Rheology

## **Fluids**

BT: Materials  
RT: Buoyancy  
Fluidization  
Oils  
NT: Ferrofluid  
Fluid dynamics  
Gases  
Hydraulic fluids  
Liquids  
Viscosity

## **Fluid flow**

UF: Flow  
Gas flow  
Liquid flow  
Smoothed particle

## *hydrodynamics*

BT: Physics  
RT: Electrohydraulics  
Flowmeters  
Fluid flow measurement  
Fluidics  
Hydraulic systems  
Hydrodynamics

## **Fluids and secretions**

BT: Anatomy  
NT: Amniotic fluid  
Cerebrospinal fluid



# 2018 IEEE Thesaurus

## Fluorescence

BT: Luminescence  
Optics  
RT: Fluorescent lamps  
Judd-Ofelt theory

BT: Imaging  
RT: Lenses

## *Fog computing*

USE: Edge computing

## Fluorescent lamps

BT: Lamps  
RT: Fluorescence  
Lighting

## Food industry

BT: Manufacturing industries  
RT: Beverage industry  
Consumer products  
Food preservation  
Food products  
Food technology  
Sugar industry  
Sugar refining  
NT: Food manufacturing

## Fluorine

BT: Chemical elements  
NT: Fluorine compounds

## Fluorine compounds

BT: Fluorine  
NT: Hydrogen fluoride

## Food manufacturing

BT: Food industry  
Manufacturing systems  
RT: Consumer products  
Food preservation  
Food products  
Food technology  
NT: Food packaging

## Flux pinning

BT: Magnetic flux  
Superconductivity  
RT: Type II superconductors

## *Fluxtronics*

USE: Spintronics

## Food packaging

BT: Food manufacturing  
Packaging  
RT: Food products  
Food technology

## Fly ash

BT: Ash  
RT: Slag

## Flyback transformers

UF: FBT  
LOPT  
Line output transformer  
BT: Transformers  
RT: Cathode ray tubes  
Electron beam applications  
Electron beams  
Ferrite devices

## Food preservation

UF: Food preservatives  
BT: Food technology  
RT: Food industry  
Food manufacturing  
Food products

## *Food preservatives*

USE: Food preservation

## Flywheels

BT: Energy storage

## Food products

BT: Manufactured products  
Production  
RT: Agricultural products  
Consumer products  
Food industry  
Food manufacturing  
Food packaging  
Food preservation  
Sugar industry  
Sugar refining  
Vegetable oils  
NT: Dairy products

## *FM*

USE: Frequency modulation

## *FMR*

USE: Magnetic resonance

## *fMRI*

USE: Functional magnetic  
resonance imaging

## Focusing



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# 2018 IEEE Thesaurus

	Fats		<b>Forebrain</b>	
	Sugar		UF:	Prosencephalon
			BT:	Brain
			RT:	Hindbrain
				Midbrain
			NT:	Olfactory bulb
<b>Food technology</b>			<b>Forecast uncertainty</b>	
BT:	Industry applications		BT:	Forecasting
RT:	Food industry			Uncertainty
	Food manufacturing			
	Food packaging			
	Sugar refining			
NT:	Food preservation			
<b>Foot</b>			<b>Forecasting</b>	
BT:	Extremities		BT:	Probability
			RT:	Prediction methods
<b>Footwear</b>			NT:	Demand forecasting
UF:	Shoes			Economic forecasting
BT:	Clothing			Forecast uncertainty
RT:	Clothing industry			Technology forecasting
	Footwear industry			
<b>Footwear industry</b>			<b>Forehead</b>	
UF:	Shoe manufacture		BT:	Head
BT:	Manufacturing industries			
RT:	Clothing industry		<i>Forensic photography</i>	
	Consumer products		USE:	Image forensics
	Footwear			
<b>Force</b>			<b>Forensics</b>	
BT:	Mechanical factors		BT:	Law
RT:	Dynamics		NT:	Digital forensics
	Force control			Image forensics
	Magnetic forces			
NT:	Gravity		<b>Forestry</b>	
			BT:	Geoscience
<b>Force control</b>			RT:	Pulp and paper industry
BT:	Mechanical variables			Resource management
control				Vegetation
				Vegetation mapping
RT:	Control systems			Wood industry
	Force			
	Robot control		<b>Forgery</b>	
<b>Force feedback</b>			UF:	Imposter signature
BT:	Haptic interfaces		generation	
			BT:	Handwriting recognition
<b>Force measurement</b>			<b>Forging</b>	
BT:	Mechanical variables		UF:	Cogging
measurement			BT:	Manufacturing systems
RT:	Gravity			
	Pressure gauges		<b>Formal concept analysis</b>	
NT:	Dynamometers		BT:	Mathematical analysis
	Gravity measurement		RT:	Classification tree analysis
				Data analysis
<b>Force sensors</b>				Knowledge representation
BT:	Sensors			Unsupervised learning
			<b>Formal languages</b>	



# 2018 IEEE Thesaurus

BT: Computer science  
NT: Computer languages  
Runtime library

## *Formal logic*

USE: Logic

## **Formal specifications**

BT: Standardization  
RT: Service-oriented systems

engineering

## **Formal verification**

BT: Software engineering  
RT: Circuits and systems  
Model checking

## **Forward contracts**

BT: Contracts

## **Forward error correction**

BT: Error correction  
RT: Feedforward systems

## **Fossil fuels**

BT: Fuels  
RT: Air pollution  
NT: Natural gas

## **Foundries**

BT: Production facilities  
RT: Casting  
Furnaces  
Heat treatment  
Materials processing

## *Four wave mixing*

USE: Four-wave mixing

## **Four-wave mixing**

UF: Four wave mixing  
BT: Distortion  
Optics

## **Fourier series**

BT: Mathematics  
RT: Data compression  
Signal processing  
Spectroscopy

## *Fourier transform infrared spectra*

USE: Fourier transform infrared  
spectroscopy

## **Fourier transform infrared spectroscopy**

UF: Fourier transform infrared  
spectra

BT: Fourier transforms  
Spectroscopy

## **Fourier transforms**

BT: Transforms  
RT: Acoustics  
Cepstrum  
Diffraction  
Harmonic analysis  
Optics  
Partial differential equations  
Probability  
Statistics  
Time-frequency analysis  
NT: Discrete Fourier transforms  
Fast Fourier transforms  
Fourier transform infrared

spectroscopy

## *FPAA*

USE: Field programmable analog  
arrays

## *FPGA*

USE: Field programmable gate  
arrays

## *Fracking*

USE: Fracking

## **Fracking**

UF: Fracking  
Hydraulic fracking  
BT: Hydrological techniques  
RT: Mining industry  
Natural gas

## **Fractal antennas**

BT: Antennas

## **Fractal art**

BT: Art

## **Fractals**

BT: Computational geometry  
RT: Antennas  
Chaos  
Computer graphics  
Econophysics

## *Fractional brownian motion*

USE: Brownian motion



# 2018 IEEE Thesaurus

## Fractional calculus

BT: Mathematical analysis

NT: Transmission line theory

Bandwidth

Frequency dependence

Frequency diversity

Frequency synchronization

Resonant frequency

## Fractionation

BT: Separation processes

RT: Chemical analysis

Oils

Petroleum industry

NT: Field-flow fractionation

## Frequency allocation

USE: Radio spectrum management

## Frame relay

BT: Communication switching

Packet switching

RT: B-ISDN

Computer networks

ISDN

Protocols

Wide area networks

## Frequency control

UF: Frequency regulation

BT: Ultrasonics, ferroelectrics, and frequency control

RT: Electric variables control

Frequency locked loops

Mechanical variables control

control

Optical variables control

Tuners

NT: Automatic frequency control

Tunable circuits and

devices

Tuning

## Francium

BT: Chemical elements

## Free electron lasers

UF: Cerenkov lasers

BT: Lasers

RT: Electron beams

Relativistic effects

Undulators

## Frequency conversion

UF: Frequency division

Frequency multiplication

Harmonic generation

BT: Converters

RT: Image converters

Image intensifiers

NT: Mixers

Optical frequency

conversion

## Free trade

USE: Trade agreements

## Free-space optical communication

BT: Optical fiber communication

NT:

## Freight containers

BT: Containers

RT: Freight handling

Transportation

## Frequency dependence

UF: Frequency dependent

BT: Frequency

## Freight handling

UF: Cargo handling

BT: Materials handling

RT: Freight containers

Lifting equipment

Pulleys

Transmission line

## Frequency dependent

USE: Frequency dependence

## Frequency diversity

BT: Frequency

## discontinuities

NT: Filling

Loading

## Frequency division

USE: Frequency conversion

## Frequency

BT: Electromagnetic radiation

RT: Band-pass filters

Electric variables

## Frequency division multiaccess

UF: FDMA

BT: Multiaccess communication

RT: Broadband communication



# 2018 IEEE Thesaurus

## Frequency division multiplexing

UF: FDM  
Frequency multiplexing  
BT: Multiplexing

## Frequency domain

USE: Frequency-domain analysis

## Frequency domain analysis

USE: Frequency-domain analysis

## Frequency estimation

BT: Frequency measurement  
Parameter estimation  
RT: Spectral analysis  
Speech analysis

## Frequency hop communication

USE: Spread spectrum communication

## Frequency hop radar

USE: Spread spectrum radar

## Frequency locked loops

UF: FLL  
BT: Linear feedback control systems  
Signal processing  
RT: Frequency control  
Frequency synthesizers  
Phase locked loops  
Synchronization

## Frequency measurement

BT: Measurement  
RT: Acoustic measurements  
Atomic clocks  
Doppler measurement  
Electric variables  
measurement  
Electromagnetic  
measurements  
Frequency response  
Mechanical variables  
measurement  
Optical variables  
measurement  
Phase frequency detector  
Time-frequency analysis  
Wavelength measurement  
NT: Frequency estimation  
Frequency-domain analysis

## Frequency modulation

UF: FM  
BT: Modulation  
Radio broadcasting  
RT: Demodulation  
NT: Frequency shift keying

## Frequency multiplexing

USE: Frequency division multiplexing

## Frequency multiplication

USE: Frequency conversion

## Frequency regulation

USE: Frequency control

## Frequency response

BT: Testing  
RT: Amplifiers  
Digital filters  
Finite impulse response  
filters  
Frequency measurement  
Impulse testing

## Frequency selective surfaces

UF: FSS  
BT: Antenna theory

## Frequency shift keying

UF: FSK  
Frequency-shift modulation  
Frequency-shift signaling  
BT: Frequency modulation

## Frequency synchronization

BT: Frequency  
NT: Frequency synthesizers

## Frequency synthesizers

BT: Frequency synchronization  
RT: Frequency locked loops  
Tuners

## Frequency-domain analysis

UF: Frequency domain  
Frequency domain analysis  
BT: Frequency measurement  
RT: Circuit analysis  
Functional analysis  
Signal analysis  
NT: Time-frequency analysis

## Frequency-hop communication



# 2018 IEEE Thesaurus

USE: Spread spectrum  
communication

## Frequency-selective fading channels

BT: Fading channels

## Frequency-shift modulation

USE: Frequency shift keying

## Frequency-shift signaling

USE: Frequency shift keying

## Fresnel integral

USE: Fresnel reflection

## Fresnel lenses

USE: Fresnel reflection

## Fresnel reflection

UF: Fresnel integral  
Fresnel lenses  
Fresnel zones  
BT: Reflection

## Fresnel zones

USE: Fresnel reflection

## Friction

BT: Mechanical factors  
RT: Drag  
Dynamics  
Lubrication  
NT: Mechanical bearings

## Friction stir processing

USE: Strain control

## Frontal lobe

UF: BrainLobe  
BT: Brain

## Froth flotation

USE: Manufacturing processes

## FSK

USE: Frequency shift keying

## FSS

USE: Frequency selective  
surfaces

## FTTH

USE: Optical fiber subscriber  
loops

## Fuel additives

USE: Additives

## Fuel cell vehicles

BT: Electric vehicles  
RT: Energy storage  
Fuel cells  
Traction motors  
Vehicle-to-grid

## Fuel cells

UF: Enzymatic fuel cells  
Microbial eletrolysis cells  
Microbial fuel cells  
Solid oxide electrolyzer  
cells  
BT: Electrochemical devices  
Energy conversion  
Energy storage  
RT: Fuel cell vehicles  
Fuel storage  
Power generation

## Fuel economy

BT: Economics  
Fuels

## Fuel processing industries

UF: Coal tar  
BT: Manufacturing industries  
RT: Fuel storage  
Fuels  
Mining industry  
Oil drilling  
Oils  
Petroleum  
Petroleum industry

## Fuel pumps

BT: Pumps  
RT: Engines  
Fuels

## Fuel storage

UF: Fuel tanks  
Oil tanks  
BT: Material storage  
RT: Containers  
Energy storage  
Fuel cells  
Fuel processing industries  
Fuels

## Fuel tanks

USE: Fuel storage



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# 2018 IEEE Thesaurus

## Fuels

BT: Energy resources  
Manufactured products  
RT: Coal gas  
Fuel processing industries  
Fuel pumps  
Fuel storage  
Methanol  
Petrochemicals  
Waste materials  
NT: Biofuels  
Coal  
Fossil fuels  
Fuel economy  
Nuclear fuels  
Petroleum

## Fullerenes

UF: Buckeyballs  
Buckminsterfullerene  
Buckyballs  
Buckytubes  
CarboFullerene  
Fullerites  
BT: Carbon

## Fullerites

USE: Fullerenes

## Function approximation

BT: Approximation methods  
RT: Computer science

## Function generators

USE: Signal generators

## Functional analysis

BT: Mathematics  
RT: Eigenvalues and  
eigenfunctions  
Frequency-domain analysis  
Inverse problems  
Lyapunov methods  
Wave functions

## Functional electrical stimulation

USE: Neuromuscular stimulation

## Functional magnetic resonance imaging

UF: fMRI  
BT: Magnetic resonance  
imaging  
RT: Biomedical image  
processing

## Functional neuroimaging

BT: Neuroimaging

## Functional point analysis

BT: Estimation  
Size measurement  
RT: Cost benefit analysis  
Software engineering

## Functional programming

BT: Programming

## Fungi

BT: Organisms

## Furnaces

BT: Machinery  
RT: Building services  
Foundries  
Gas appliances  
Heating systems  
NT: Blast furnaces  
Kilns

## Further education

USE: Continuing education

## Fuses

BT: Electronic components  
RT: Interrupters  
Power system protection  
Protection  
Switchgear

## Fusion power generation

BT: Nuclear and plasma  
sciences  
RT: Nuclear power generation  
Fusion reactors  
Magnetic confinement

## Fusion reactor design

BT: Fusion reactors

## Fusion reactors

UF: Nuclear reactors (fusion)  
Thermonuclear fusion  
BT: Nuclear and plasma  
sciences  
RT: Fusion power generation  
NT: Fusion reactor design  
Tokamaks

## Fusion splicing



# 2018 IEEE Thesaurus

USE:	Splicing	<b>Fuzzy sets</b>	BT:	Set theory
<i>Futurism</i>			RT:	Fuzzy control
USE:	Technology forecasting			Fuzzy logic
<i>Fuzz testing</i>				Fuzzy set theory
USE:	Fuzzing			Fuzzy systems
<b>Fuzzing</b>		systems		Nonlinear dynamical
UF:	Fuzz testing			Uncertainty
BT:	Software testing	<b>Fuzzy systems</b>	BT:	Computational intelligence
<b>Fuzzy cognitive maps</b>			RT:	Fuzzy logic
BT:	Fuzzy logic			Fuzzy set theory
<b>Fuzzy control</b>				Fuzzy sets
BT:	Fuzzy systems			Large-scale systems
RT:	Fuzzy logic		NT:	Takagi-Sugeno model
	Fuzzy sets			Fuzzy control
	Takagi-Sugeno model			Fuzzy neural networks
				Hybrid intelligent systems
<i>Fuzzy inference</i>		<i>Ga</i>	USE:	Gallium
USE:	Fuzzy logic			
<b>Fuzzy logic</b>		<i>GaAs</i>	USE:	Gallium arsenide
UF:	Fuzzy inference			
BT:	Logic	<b>Gabor filters</b>	BT:	Filters
RT:	Fuzzy control		RT:	Image processing
	Fuzzy reasoning	<b>Gadolinium</b>	BT:	Chemical elements
	Fuzzy sets		NT:	Gadolinium oxide
	Fuzzy systems	<b>Gadolinium oxide</b>	BT:	Gadolinium
	Possibility theory			
NT:	Fuzzy cognitive maps	<b>Gain</b>	BT:	Electric variables
	Takagi-Sugeno model			
<i>Fuzzy neural nets</i>		<b>Gain control</b>	UF:	Automatic gain control
USE:	Fuzzy neural networks		BT:	Electric variables control
<b>Fuzzy neural networks</b>		<b>Gain measurement</b>	BT:	Measurement
UF:	Fuzzy neural nets		RT:	Electric variables
	Neuro fuzzy networks	measurement		
	Neuro-fuzzy networks			Refractive index
BT:	Fuzzy systems	<i>Gait assessment</i>	USE:	Legged locomotion
<b>Fuzzy reasoning</b>				
BT:	Inference mechanisms	<i>Gait control</i>		
RT:	Fuzzy logic			
<b>Fuzzy set theory</b>				
BT:	Set theory			
RT:	Fuzzy sets			
	Fuzzy systems			
	Power system faults			
	TOPSIS			



# 2018 IEEE Thesaurus

USE:	Legged locomotion		
<i>Gait disorders</i>		<b>Gallium nitride</b>	
USE:	Legged locomotion	BT:	Gallium compounds
<b>Gait recognition</b>		<i>Gallium-arsenide</i>	
BT:	Biometrics (access control)	USE:	Gallium arsenide
<i>Galerkin method</i>		<i>Gallium-arsenide (GaAs)</i>	
USE:	Method of moments	USE:	Gallium arsenide
<b>Gallbladder</b>		<b>Galois fields</b>	
BT:	Digestive system	UF:	Field multiplication
			Finite fields
		BT:	Abstract algebra
<b>Gallium</b>		<i>Galvanising</i>	
UF:	Ga	USE:	Galvanizing
BT:	Metals		
	Semiconductor materials	<b>Galvanizing</b>	
RT:	Epitaxial growth	UF:	Galvanising
	Gallium compounds	BT:	Surface treatment
	Molecular beam epitaxial	RT:	Corrosion
growth			Corrosion inhibitors
	Semiconductor thin films		Protection
NT:	Gallium alloys		
<b>Gallium alloys</b>		<b>Game theory</b>	
BT:	Gallium	BT:	Decision making
RT:	Alloying	RT:	Control systems
	Wide band gap		Games
semiconductors			Minimax techniques
			Oligopoly
<b>Gallium arsenide</b>			Optimal control
UF:	GaAs		Predator prey systems
	Gallium-arsenide	NT:	Nash equilibrium
	Gallium-arsenide (GaAs)		
BT:	Gallium compounds	<b>Games</b>	
	Semiconductor materials	UF:	Serious games
			Video games
<b>Gallium compounds</b>		BT:	Consumer products
UF:	Gallium devices	RT:	Entertainment industry
	Gallium materials		Game theory
BT:	Compounds	NT:	Cloud gaming
RT:	Alloying		
	Gallium	<i>Gaming on demand</i>	
NT:	Aluminum gallium nitride	USE:	Cloud gaming
	Gallium arsenide		
	Gallium nitride	<i>Gamma phase iron</i>	
	Indium gallium arsenide	USE:	Austenite
	Indium gallium nitride		
<i>Gallium devices</i>		<i>Gamma radiation detectors</i>	
USE:	Gallium compounds	USE:	Gamma-ray detectors
<i>Gallium materials</i>		<i>Gamma ray bursters</i>	
USE:	Gallium compounds	USE:	Gamma-ray bursts





# 2018 IEEE Thesaurus

## *Gamma ray bursts*

USE: Gamma-ray bursts

UF: Ganglion  
BT: Cells (biology)  
Nervous system

## *Gamma ray detection*

USE: Gamma-ray detection

## *Ganglion*

USE: Ganglia

## *Gamma ray detectors*

USE: Gamma-ray detectors

## *Garbage collection (computers)*

USE: Memory management

## *Gamma ray effects*

USE: Gamma-ray effects

## *Garment industry*

USE: Clothing industry

## *Gamma rays*

USE: Gamma-rays

## *Garments*

USE: Clothing

## **Gamma-ray bursts**

UF: Cosmic gamma ray bursts  
Gamma ray bursters  
Gamma ray bursts  
BT: Gamma-rays

## **Garnet films**

BT: Ferrimagnetic films  
Ferrimagnetic materials  
Films  
Garnets  
Magnetic films  
Magnetic materials

## **Gamma-ray detection**

UF: Gamma ray detection  
BT: Gamma-rays

## **Garnets**

BT: Ferrimagnetic materials  
Magnetic materials  
NT: Garnet films

## **Gamma-ray detectors**

UF: Gamma radiation detectors  
Gamma ray detectors  
BT: Radiation detectors  
RT: Astronomy  
Biomedical applications of

## **Gas appliances**

BT: Home appliances  
RT: Furnaces  
Space heating

radiation

X-ray detectors  
X-ray imaging

## **Gas chromatography**

BT: Measurement

## **Gamma-ray effects**

UF: Gamma ray effects  
BT: Gamma-rays  
Radiation effects

## **Gas detectors**

UF: Gas sensors  
BT: Chemical and biological

## *Gamma-ray imaging*

USE: Nuclear imaging

sensors

RT: Chemical transducers  
NT: Amperometric sensors

## **Gamma-rays**

UF: Gamma rays  
BT: Electromagnetic radiation  
Nuclear and plasma

## **Gas discharge devices**

BT: Nuclear and plasma

sciences

RT: Collimators  
Nuclear medicine  
NT: Gamma-ray bursts  
Gamma-ray detection  
Gamma-ray effects

sciences

RT: Discharges (electric)  
Electrophotography  
Gases  
Lighting  
Plasma devices  
Thyratrons  
NT: Glow discharge devices

## **Ganglia**



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# 2018 IEEE Thesaurus

<i>Gas discharges</i>	USE:	Discharges (electric)	technology	Gas lasers	Materials science and
<i>Gas flow</i>	USE:	Fluid flow	NT:	Natural gas	
<b>Gas industry</b>	BT:	Industries		Argon	
	RT:	Petroleum industry		Carbon emissions	
<i>Gas insulated switchgear</i>	USE:	Gas insulation		Coal gas	
				Exhaust gases	
				Flue gases	
				Helium	
				Hydrogen	
				Nitrogen	
				Oxygen	
				Syngas	
				Xenon	
<b>Gas insulated transmission lines</b>	UF:	GITL			
		Gas-insulated lines			
		Gas-insulated transmission			
	BT:	Power transmission lines	<b>Gaskets</b>	BT:	Seals
	RT:	Gas insulation		RT:	Engine cylinders
					Engines
					Pistons
<b>Gas insulation</b>	UF:	Gas insulated switchgear			
	BT:	Insulation	<i>Gasoline</i>	USE:	Petroleum
	RT:	Gas insulated transmission			
lines					
	NT:	Gases	<i>Gastroenterologists</i>	USE:	Gastroenterology
		Sulfur hexafluoride			
<b>Gas lasers</b>	UF:	Atomic lasers	<b>Gastroenterology</b>	UF:	Gastroenterologists
		Metal vapor lasers		BT:	Medical specialties
	BT:	Lasers			
	RT:	Atom lasers	<i>Gastrointestinal</i>	USE:	Gastrointestinal tract
		Chemical lasers			
		Gases			
<i>Gas platforms</i>	USE:	Offshore installations	<b>Gastrointestinal tract</b>	UF:	Gastrointestinal
				BT:	Digestive system
<i>Gas sensors</i>	USE:	Gas detectors	<b>Gate drivers</b>	BT:	Power electronics
				RT:	High power amplifiers
<i>Gas-insulated lines</i>	USE:	Gas insulated transmission			MOSFET
lines			<b>Gate leakage</b>	BT:	Leakage currents
					Solid state circuits
<i>Gas-insulated transmission</i>	USE:	Gas insulated transmission			Tunneling
lines			<i>Gate leakage current</i>	USE:	Leakage currents
<b>Gases</b>	BT:	Fluids	<i>GATT</i>	USE:	Trade agreements
	RT:	Discharges (electric)			
		Gas discharge devices			
		Gas insulation			



# 2018 IEEE Thesaurus

## Gaussian approximation

BT: Gaussian distribution

## Gaussian channels

BT: Communication channels  
RT: Intersymbol interference  
NT: AWGN channels

## Gaussian distribution

UF: Normal distribution  
BT: Statistical distributions  
NT: Gaussian approximation

## Gaussian mixture model

BT: Gaussian processes  
Statistics

## Gaussian noise

BT: Noise  
RT: Additive white noise  
Image denoising  
Signal processing  
TV interference  
NT: AWGN

## Gaussian processes

BT: Stochastic processes  
RT: Inference mechanisms  
Learning (artificial

intelligence)

Prediction methods  
NT: Gaussian mixture model

## Gaze tracking

BT: Control systems  
Human computer

interaction

RT: Assistive technology  
Computer vision  
Eyes  
Face recognition  
Motion measurement  
Position measurement  
User interfaces  
Video signal processing  
NT: Electrooculography

*GDP*

USE: Economic indicators

*Ge Si*

USE: Germanium silicon alloys

## Gears

UF: Bevel gears

Differential gears

Helical gears

Spur gears

Worm gears

BT: Machinery

Mechanical products

RT: Automotive components

Machine components

Machine tools

Mechanical power

transmission

Mechanical splines

Mechanical systems

Production equipment

Shafts

Torque converters

NT: Magnetic gears

## Gender equity

BT: Equal opportunities

## Gender issues

BT: Equal opportunities

RT: Digital divide

## Gene expression

BT: Gene therapy

## Gene therapy

BT: Genetics

NT: Gene expression

## General agreement on tariffs and trade

USE: Trade agreements

## Generation of electric power

USE: Power generation

## Generation Y

USE: Millennials

## Generators

UF: Dynamo

BT: Electric machines

Rotating machines

RT: Coils

Islanding

Power generation

NT: AC generators

DC generators

Electric generators

Standby generators

## Genetic algorithms

BT: Algorithms



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# 2018 IEEE Thesaurus

	Computational intelligence		BT:	Genetics
RT:	Job shop scheduling			Molecular biomarkers
	Pareto optimization			
	Search methods	<i>Geo tagging</i>	USE:	Location awareness
<b>Genetic communication</b>		<b>Geoacoustic inversion</b>		
BT:	Genetics	BT:		Sea measurements
	Information theory			
RT:	Biological information	<b>Geochemistry</b>		
theory		UF:		Hydrochemistry
	Biomedical engineering	BT:		Chemistry
	DNA			Geoscience
		RT:		Geophysics
				Salinity (geophysical)
<b>Genetic engineering</b>		<b>Geodesy</b>		
UF:	Genetically modified crops	BT:		Geophysical measurements
BT:	Engineering in medicine	RT:		Position measurement
and biology				Theodolites
RT:	Agriculture	NT:		Level measurement
	Biomedical engineering			
	Biotechnology	<b>Geodynamics</b>		
	Ethical aspects	BT:		Geophysics
	Genetics			
	Molecular biophysics	<b>Geoengineering</b>		
	Tissue engineering	UF:		Engineering geology
<b>Genetic expression</b>				Geological engineering
BT:	Genetics			Geotechnical engineering
<b>Genetic mutations</b>		BT:		Geoscience
BT:	DNA	RT:		Drilling
<b>Genetic programming</b>				Geology
BT:	Genetics			Geophysics
<i>Genetically modified crops</i>				Hydrological techniques
USE:	Genetic engineering			Mining industry
<b>Genetics</b>		<b>Geographic information systems</b>		
BT:	Biology	UF:		GIS
RT:	Amniocentesis	BT:		Geoscience and remote
	Genetic engineering	sensing		
	Memetics			Global communication
	Molecular biophysics	systems		Intelligent transportation
NT:	DNA	RT:		Image databases
	Gene therapy	NT:		Geospatial analysis
	Genetic communication			Gunshot detection systems
	Genetic expression	<b>Geography</b>		
	Genetic programming	BT:		Geoscience
	Genomics	RT:		Geospatial analysis
<i>Genomes</i>		NT:		Rural areas
USE:	Genomics			Urban areas
<b>Genomics</b>		<b>Geologic measurements</b>		
UF:	Genomes	BT:		Measurement



# 2018 IEEE Thesaurus

RT:	Geology Geophysical measurements Hyperspectral sensors Remote sensing Terrain mapping Theodolites	<b>Geophysical measurement techniques</b> BT: Geoscience and remote sensing RT: Laser radar Magnetoelectrical resistivity imaging technique Remote sensing Theodolites Tomography Vegetation mapping NT: Geophysical image processing
<i>Geological engineering</i>	USE: Geoengineering	<b>Geophysical measurements</b> UF: Geophysical techniques BT: Geoscience and remote sensing RT: Measurement Atmospheric measurements Buried object detection Geologic measurements Geomagnetism Geophysical signal processing Geophysics Gravity measurement Pressure gauges Remote sensing Soil measurements Terrain mapping NT: Geodesy Sea measurements Seismic measurements
<b>Geology</b>	BT: Geoscience RT: Geoengineering Geologic measurements Geophysics NT: Minerals Rocks	
<i>Geomagnetic navigation</i>	USE: Geomagnetism AND Navigation	
<b>Geomagnetism</b>	UF: Geomagnetic navigation Geomatics BT: Magnetic fields RT: Electromagnetic induction Geophysical measurements Geophysics Magnetosphere	
<i>Geomatics</i>	USE: Geomagnetism	
<b>Geometrical optics</b>	BT: Optics RT: Reflectivity NT: Ray tracing	<b>Geophysical signal processing</b> BT: Geoscience and remote sensing RT: Signal processing Geophysical measurements
<b>Geometry</b>	BT: Mathematics RT: Layout Shape NT: Computational geometry Elliptic curves Elliptic design Information geometry Projective geometry Surface topography	<i>Geophysical techniques</i> USE: Geophysical measurements <b>Geophysics</b> BT: Geoscience Physics RT: Earth Geochemistry Geoengineering Geology Geomagnetism Geophysical measurements Hydrologic measurements Hydrological techniques
<b>Geophysical image processing techniques</b>	BT: Geophysical measurement Image processing	



# 2018 IEEE Thesaurus

		Oceans			Geophysical measurement
		Terrestrial atmosphere		techniques	
NT:		EMTDC			Geophysical measurements
		Extraterrestrial phenomena			Geophysical signal
		Geodynamics		processing	
		Geophysics computing			Geoscience
		Meteorology			Land surface temperature
		Moisture			Photometry
		Seismology			Radar
		Surface waves			Radiometry
		Well logging			Remote sensing
<b>Geophysics computing</b>					Terrain mapping
	BT:	Geophysics			Terrestrial atmosphere
	RT:	Computer aided analysis			Vegetation mapping
<b>Geoscience</b>			<b>Geospatial analysis</b>		
	UF:	Earth science		BT:	Geographic information
	BT:	Geoscience and remote	systems	RT:	Geography
sensing					Software
		Science - general			
	RT:	Hydrological techniques			
	NT:	Antarctica			
		Arctic			
		Atmosphere			
		Biosphere			
		Continents			
		Cyclones			
		Earth			
		Earthquakes			
		Forestry			
		Geochemistry			
		Geoengineering			
		Geography			
		Geology			
		Geophysics			
		Ice			
		Lakes			
		Land surface			
		Levee			
		Meteorological factors			
		Oceanography			
		Oceans			
		Rivers			
		Sediments			
		Soil			
		Tornadoes			
		Tsunami			
		Volcanoes			
		Wetlands			
<b>Geoscience and remote sensing</b>			<b>Geotechnical engineering</b>		
	NT:	Environmental factors		USE:	Global Earth Observation
		Geographic information			
systems					



# 2018 IEEE Thesaurus

NT:	Germanium alloys	USE:	Structural beams
<b>Germanium alloys</b>		<i>GIS</i>	
BT:	Germanium	USE:	Geographic information
RT:	Alloying	systems	
NT:	Germanium silicon alloys	<i>GITL</i>	
<b>Germanium silicon alloys</b>		USE:	Gas insulated transmission
UF:	Ge Si	lines	
BT:	Germanium alloys	<b>Glands</b>	
	Silicon alloys	UF:	Endocrine glands
<i>Germs</i>			Exocrine glands
USE:	Pathogens	BT:	Biological tissues
<b>Gerontechnology</b>		NT:	Mammary glands
BT:	Biomedical equipment		Pituitary gland
	Gerontology		Salivary glands
RT:	Assistive technology		Sebaceous glands
			Sweat glands
<b>Gerontology</b>		<b>Glass</b>	
BT:	Medical specialties	BT:	Amorphous materials
RT:	Aging		Glass products
	Alzheimer's disease	RT:	Ceramics
	Geriatrics		Dielectric materials
	Senior citizens		Glass industry
NT:	Gerontechnology		Insulation
			Optical materials
<b>Gesture recognition</b>		<i>Glass bottles</i>	
BT:	Pattern recognition	USE:	Glass products
NT:	Sign language	<i>Glass ceramics</i>	
<b>Gettering</b>		USE:	Ceramics
UF:	Getters	<i>Glass furnaces</i>	
BT:	Vacuum systems	USE:	Glass manufacturing
RT:	Electron tubes	<b>Glass industry</b>	
	Integrated circuit	BT:	Manufacturing industries
manufacture		RT:	Glass
	Semiconductor device		Glass manufacturing
manufacture			Glass products
	Vacuum technology	<b>Glass manufacturing</b>	
<i>Getters</i>		UF:	Glass furnaces
USE:	Gettering	BT:	Manufacturing systems
<i>GHZ transverse electromagnetic cells</i>		RT:	Glass industry
USE:	TEM cells	<b>Glass products</b>	
<b>Giant magnetoresistance</b>		UF:	Glass bottles
BT:	Magnetoresistance	BT:	Manufactured products
RT:	Hard disks	RT:	Bottling
	Magnetoresistive devices		Ceramic products
	Thin film devices		Ceramics
<i>Girders</i>			



# 2018 IEEE Thesaurus

	Chemical products	Marine transportation
	Glass industry	Military satellites
	Windows	Road transportation
NT:	Glass	Satellite broadcasting
		Satellite communication
		Telecommunications
		Terrain mapping
<b>Glazes</b>		
BT:	Coatings	
RT:	Ceramics	
NT:	Ceramic glazes	
		<i>Global System for Mobile Communications</i>
		USE: GSM
<b>Glial cells</b>		
UF:	Neuroglia	
BT:	Cells (biology)	
	Nervous system	
		<i>Global teams</i>
		USE: Global communication
<b>Global communication</b>		
UF:	Global groups	
	Global teams	
BT:	Professional	
communication		
NT:	Cross-cultural	
communication		
	Geographic information	
systems		
		<b>Global warming</b>
		BT: Environmental factors
		Temperature measurement
		Terrestrial atmosphere
		RT: Air pollution
		Atmospheric
		measurements
		Carbon emissions
		Environmental
		management
		Greenhouse effect
		Land surface temperature
		Ocean temperature
		Thermal pollution
<b>Global Earth Observation System of Systems</b>		
UF:	GEOSS	
BT:	Earth Observing System	
		<i>Global groups</i>
		USE: Global communication
		<i>Global markets</i>
		USE: Globalization
<b>Global navigation satellite system</b>		
UF:	GNSS	
BT:	Satellite navigation systems	
RT:	Global Positioning System	
		<i>Globalisation</i>
		USE: Globalization
<b>Global Navigation satellite system</b>		
UF:	GNSS	
BT:	Satellite navigation systems	
RT:	Global Positioning System	
		<b>Globalization</b>
		UF: Global markets
		Globalisation
		BT: Social implications of
		technology
		RT: International collaboration
		International relations
		International trade
		Trade agreements
<i>Global Navigational Positioning System</i>		
USE:	Global Positioning System	
		<i>Glossaries</i>
		USE: Terminology
<b>Global Positioning System</b>		
UF:	DGPS	
	Differential GPS	
	GPS	
	Global Navigational	
Positioning System		
BT:	Satellite navigation systems	
RT:	Air transportation	
	Global navigation satellite	
system		
	Indoor navigation	
	Land transportation	
		<i>Glucose</i>





# 2018 IEEE Thesaurus

	USE:	Sugar	<b>Government policies</b>	
<b>Glycomics</b>			BT:	Government
			RT:	Censorship
	BT:	Molecular biomarkers		Public infrastructure
<i>GNP</i>			NT:	Public policy
	USE:	Economic indicators	<b>Governmental factors</b>	
<i>GNSS</i>			BT:	Management
			RT:	Government
	USE:	Global navigation satellite		Legal factors
system				Social factors
<i>Goggles</i>			NT:	Public finance
	USE:	Eye protection	<i>GPR</i>	
<b>Gold</b>			USE:	Ground penetrating radar
	UF:	Au	<i>GPS</i>	
	BT:	Metals	USE:	Global Positioning System
	NT:	Gold alloys		
<b>Gold alloys</b>			<i>GPU</i>	
			USE:	Graphics processing units
	BT:	Gold		
	RT:	Alloying	<b>Gradient methods</b>	
<b>Goniometers</b>			BT:	Mathematics
				Numerical analysis
	BT:	Meters		Optimization methods
<b>Google</b>			RT:	Level set
				Search methods
	BT:	Computer networks		
	RT:	Information retrieval	<i>Grain alcohol</i>	
		Information services	USE:	Ethanol
		Internet		
		Online services	<b>Grain boundaries</b>	
<i>Google Chrome</i>			BT:	Crystals
			RT:	Conductivity
	USE:	Browsers		Corrosion
<b>Government</b>				Grain size
				Thermal conductivity
	BT:	Organizations		
	RT:	Governmental factors	<b>Grain size</b>	
		Macroeconomics	BT:	Crystals
		Public finance	RT:	Grain boundaries
	NT:	Electronic government		
		Government policies	<b>Grammar</b>	
		Legislation	BT:	Professional
		Local government	communication	
		US Government		Writing
		Voting	RT:	Syntactics
<i>Government borrowing</i>			<b>Granular computing</b>	
	USE:	Public finance	BT:	Programming
<i>Government expenditure</i>			RT:	Concurrent computing
				Information processing
	USE:	Public finance		

## Granular superconductors



# 2018 IEEE Thesaurus

BT: Superconducting materials  
RT: High-temperature  
superconductors

## Graph theory

BT: Combinatorial mathematics  
Mathematics  
RT: Ant colony optimization  
Circuit topology  
Topology  
NT: Bipartite graph  
Optimal matching  
Reachability analysis  
Shortest path problem  
Tree graphs

## Graphene

BT: Graphite  
NT: Graphene devices

## Graphene devices

BT: Graphene  
RT: Field effect transistors  
Flexible electronics  
Molecular electronics  
Nanoelectronics

## Graphic user interfaces

USE: Graphical user interfaces

## Graphical models

BT: Modeling

## Graphical user interfaces

UF: GUI  
Graphic user interfaces  
BT: Product development  
User interfaces  
NT: Avatars

## Graphics

BT: Design methodology  
RT: Displays  
Technical drawing  
NT: Animation  
Art  
Character generation  
Computer graphics  
Engineering drawings  
Layout  
Shape  
Symbols  
Virtual reality  
Visualization

## Graphics processing units

UF: GPU  
VPU  
BT: Program processors  
RT: Computer graphics

## Graphite

UF: Black lead  
Plumbago  
BT: Minerals  
RT: Carbon  
Lead  
NT: Graphene

## Grasping

BT: Haptic interfaces

## Gratings

UF: Optical gratings  
Transient gratings  
BT: Periodic structures  
RT: Optical devices

## Gravimeter

USE: Gravity measurement

## Gravitational force

USE: Gravity

## Gravitometer

USE: Gravity measurement

## Gravity

UF: Gravitational force  
BT: Force  
RT: Acceleration  
Force measurement

## Gravity measurement

UF: Gravimeter  
Gravitometer  
BT: Force measurement  
RT: Astrophysics  
Geophysical measurements

## Gray codes

USE: Reflective binary codes

## Gray matter

USE: Grey matter

## Gray-scale

UF: Grayscale  
BT: Image processing



# 2018 IEEE Thesaurus

<i>Grayscale</i>	BT: Infrared heating
USE: Gray-scale	RT: Carbon emissions
	Environmental factors
<b>Greedy algorithms</b>	Global warming
BT: Computation theory	Pollution control
<b>Green buildings</b>	<b>Greenhouses</b>
BT: Construction	BT: Agriculture
Green products	Production facilities
RT: Environmental factors	RT: Crops
Green design	
<b>Green cleaning</b>	<i>Grey codes</i>
BT: Green products	USE: Reflective binary codes
<b>Green computing</b>	<b>Grey matter</b>
BT: Computer applications	UF: Gray matter
Energy conservation	BT: Central nervous system
Green design	
RT: Environmental factors	<b>Grid computing</b>
Sustainable development	UF: Grid maze
	BT: Metacomputing
<b>Green design</b>	<i>Grid maze</i>
UF: Environmental design	USE: Grid computing
Sustainable design	
BT: Design methodology	<b>Grinding machines</b>
RT: Green buildings	BT: Machine tools
NT: Ecodesign	
Green computing	<b>Grippers</b>
<i>Green function</i>	UF: Microgrippers
USE: Green's function methods	Worms
	BT: Materials handling
<b>Green products</b>	equipment
BT: Environmental factors	RT: End effectors
RT: Biohazards	Loading
Pollution	
NT: Green buildings	<i>Gross domestic product</i>
Green cleaning	USE: Economic indicators
<i>Green's function</i>	<i>Gross national product</i>
USE: Green's function methods	USE: Economic indicators
<b>Green's function methods</b>	<b>Ground penetrating radar</b>
UF: Green function	UF: GPR
Green's function	Ground-penetrating radar
Green's functions	BT: Imaging
BT: Modeling	Radar
RT: Failure analysis	RT: Buried object detection
Materials reliability	Radar detection
<i>Green's functions</i>	Radar imaging
USE: Green's function methods	Synthetic aperture radar
	Ultra wideband radar
<b>Greenhouse effect</b>	<i>Ground source heat pumps</i>
	USE: Heat pumps



# 2018 IEEE Thesaurus

## *Ground state*

USE: Stationary state

## **Ground support**

UF: Aerospace ground equipment

BT: Aerospace ground services

BT: Aerospace control

RT: Aircraft

RT: Military equipment

RT: Missiles

RT: Navigation

RT: Rockets

RT: Space vehicles

## *Ground temperature*

USE: Land surface temperature

## *Ground transportation*

USE: Land transportation

## *Ground vehicles*

USE: Land vehicles

## *Ground-penetrating radar*

USE: Ground penetrating radar

## **Grounding**

UF: earthing

BT: Electrical safety

RT: Circuit stability

RT: Electric shock

RT: Fault currents

RT: Power system protection

RT: Protection

## **Group technology**

BT: Production

RT: Product design

RT: Production control

## *Groupware*

USE: Collaborative work

## **GSM**

UF: Global System for Mobile Communications

BT: Wireless communication

RT: Dual band

RT: Roaming

## *GTEM cells*

USE: TEM cells

## *GUI*

USE: Graphical user interfaces

## *Guided electromagnetic wave propagation*

USE: Waveguide theory

## **Guidelines**

BT: Standardization

RT: IEEE Publishing activities

RT: ISO

RT: Publishing

## *Guideways (mechanical)*

USE: Mechanical guides

## **Gunn devices**

UF: Transferred electron devices

BT: Semiconductor devices

## **Guns**

BT: Weapons

## **Gunshot detection systems**

BT: Geographic information systems

RT: Sensor systems

## *Gynaecology*

USE: Gynecology

## **Gynecology**

UF: Gynaecology

BT: Medical specialties

## **Gyrators**

BT: Active circuits

RT: Active inductors

RT: Ferrite devices

## *Gyroklystrons*

USE: Klystrons

## **Gyromagnetism**

BT: Magnetism

RT: Faraday effect

RT: Ferrites

RT: Gyrotropism

## **Gyroscopes**

UF: Non-gyroscopes

UF: Nongyroscopes

BT: Level control

RT: Laser applications

RT: Ring lasers



# 2018 IEEE Thesaurus

<b>Gyrotrons</b>			Hair follicle
BT:	Masers	<b>Hair follicle</b>	
RT:	Electron beams	BT:	Hair
<b>Gyrotropism</b>		<i>Half-wave plates</i>	
BT:	Magneto optic effects	USE:	Optical retarders
RT:	Faraday effect Gyromagnetism	<b>Hall effect</b>	
<b>H infinity control</b>		UF:	Hall mobility
UF:	H-infinity control	BT:	Magnetoelectric effects
BT:	Optimization methods	RT:	Hall effect devices
RT:	Closed loop systems Control systems Intelligent control Optimal control	<b>Hall effect devices</b>	
<i>H-infinity control</i>		BT:	Semiconductor devices
USE:	H infinity control	RT:	Hall effect
<i>H2O</i>		<i>Hall mobility</i>	
USE:	Water	USE:	Hall effect
<i>Hacker</i>		<b>Ham radios</b>	
USE:	Computer hacking	BT:	Radio communication equipment
<i>Hacking</i>		<b>Hamming distance</b>	
USE:	Computer crime	BT:	Information theory
<i>Hacks</i>		<b>Hamming weight</b>	
USE:	Computer hacking	BT:	Information theory
<i>Haemorrhaging</i>		<i>HAMR</i>	
USE:	Hemorrhaging	USE:	Heat-assisted magnetic recording
<b>Hafnium</b>		<b>Hand tools</b>	
UF:	Hf	BT:	Tools
BT:	Chemical elements Metals	RT:	Machine tools
RT:	Nuclear physics	<b>Handheld computers</b>	
NT:	Hafnium compounds	UF:	BlackBerry Handheld devices Wireless handheld devices
<b>Hafnium compounds</b>		BT:	Portable computers
BT:	Hafnium	NT:	Personal digital assistants
RT:	Alloying	<i>Handheld devices</i>	
NT:	Hafnium oxide	USE:	Handheld computers
<b>Hafnium oxide</b>		<i>Handicapped aids</i>	
BT:	Hafnium compounds	USE:	Assistive technology
<b>Hair</b>		<b>Handover</b>	
BT:	Integumentary system	BT:	Communication switching Data transfer
NT:	Eyebrows Eyelashes	RT:	Cellular networks



# 2018 IEEE Thesaurus

signaling	Communication system	RT:	Giant magnetoresistance
	Satellite communication	<i>Hard-disc drives</i>	
<i>Handsets</i>		USE:	Hard disks
USE:	Telephone sets	<i>Hard-disc drives</i>	
		USE:	Hard disks
<b>Handwriting recognition</b>		<b>Hardware</b>	
UF:	Signature detection	UF:	Computer hardware
	Signature verification	BT:	Computers and information
	Written character	processing	
recognition		RT:	Firewalls (computing)
	Written characters		Ports (Computers)
	Written-character	NT:	Input devices
recognition			Open source hardware
BT:	Identification of persons		Reconfigurable devices
	Pattern recognition		Wireless access points
RT:	Biometrics (access control)		
NT:	Forgery		
<b>Haptic interfaces</b>		<i>Hardware description languages</i>	
UF:	Haptic systems	USE:	Hardware design
	Haptics	languages	
BT:	Computer interfaces	<b>Hardware design languages</b>	
RT:	Modeling	UF:	HDL
	Touch sensitive screens		Hardware description
NT:	Data gloves	languages	
	Force feedback		IEEE 1364
	Grasping	BT:	Computer languages
		RT:	Design automation
<i>Haptic systems</i>		<b>Hardware-in-the loop simulation</b>	
USE:	Haptic interfaces	UF:	HIL simulation
<i>Haptics</i>		BT:	Simulation
USE:	Haptic interfaces	RT:	Aerospace control
			Control engineering
<i>Hard amorphous carbon</i>		computing	
USE:	Diamond-like carbon		Control system synthesis
			Embedded systems
<i>Hard disc drives</i>			Real-time systems
USE:	Hard disks		Testing
			Vehicle dynamics
<i>Hard discs</i>		<b>Harmonic analysis</b>	
USE:	Hard disks	UF:	Harmonics
		BT:	Mathematics
<i>Hard disk drives</i>			Signal analysis
USE:	Hard disks	RT:	Fast Fourier transforms
			Fourier transforms
<b>Hard disks</b>			Spectral analysis
UF:	Hard disc drives		Wavelet transforms
	Hard discs		
	Hard disk drives	<b>Harmonic distortion</b>	
	Hard-disc drives	BT:	Nonlinear distortion
	Hard-disk drives		
BT:	Magnetic memory		



# 2018 IEEE Thesaurus

RT:	Power conversion			Pest control
harmonics				Rescue robots
NT:	Harmonics suppression			Working environment noise
	Total harmonic distortion		NT:	Biohazards
				Chemical hazards
<b>Harmonic filters</b>				Explosions
BT:	Filters			Fires
				Flammability
<i>Harmonic generation</i>				Floods
USE:	Frequency conversion			Hazardous areas
				Hazardous materials
<i>Harmonics</i>				Toxicology
USE:	Harmonic analysis			
		<i>Hazmat</i>		
<b>Harmonics suppression</b>		USE:		Hazardous materials
BT:	Harmonic distortion			
		<b>HbbTV Standards</b>		
<i>Harmonised index of consumer prices</i>		BT:		ETSI Standards
USE:	Economic indicators	RT:		Digital TV
				TV
<i>Harmonized index of consumer prices</i>				
USE:	Economic indicators	<i>HBT</i>		
		USE:		Heterojunction bipolar
<i>Hashtag</i>		transistors		
USE:	Tagging AND			
	Twitter	<i>HCCI engines</i>		
		USE:		Internal combustion
<b>Hazardous areas</b>		engines		
BT:	Hazards			
RT:	Accidents	<i>HCI</i>		
	Explosions	USE:		Human computer
	Fires	interaction		
	Hazardous materials			
	Industrial accidents	<i>HD</i>		
	Protection	USE:		High definition video
	Radioactive pollution			
	Radioactive waste	<i>HD video</i>		
	Safety	USE:		High definition video
	Surveillance			
		<i>HDL</i>		
<b>Hazardous materials</b>		USE:		Hardware design
UF:	Hazmat	languages		
BT:	Hazards			
	Materials	<b>HDTV</b>		
RT:	Chemical hazards	UF:		ATV
	Flammability			Advanced TV
	Hazardous areas			EDTV
	Radioactive waste			Extended definition TV
	Toxicology			High definition television
				High-definition TV
<b>Hazards</b>				IDTV
BT:	Safety			Improved definition TV
RT:	Contamination	BT:		Digital TV
	Explosion protection	NT:		UHDTV
	Occupational stress			



# 2018 IEEE Thesaurus

## Head

BT: Body regions  
 RT: Auditory system  
 Brain  
 Visual systems  
 NT: Cranium  
 Ear  
 Face  
 Forehead  
 Lips  
 Mouth  
 Nose  
 Scalp  
 Skull

## Head sets

USE: Headphones

## Head-mounted displays

UF: Helmet mounted displays  
 BT: Displays  
 Human computer

interaction

## Head-up displays

UF: Heads up displays  
 BT: Displays  
 Human computer

interaction

## Headphones

UF: Earphones  
 Head sets  
 Headsets  
 BT: Audio systems

## Heads up displays

USE: Head-up displays

## Headsets

USE: Headphones

## Health (occupational)

USE: Occupational health

## Health and safety

BT: Safety  
 RT: Environmental factors  
 NT: Occupational health  
 Occupational safety

## Health care

USE: Medical services

## Health information management

BT: Medical services

## Health physics

USE: Radiation monitoring

## Healthcare

USE: Medical services

## Hearing

USE: Auditory system

## Hearing aids

BT: Sensory aids  
 RT: Auditory system  
 Speech enhancement

## Heart

BT: Cardiovascular system  
 RT: Cardiology  
 NT: Fetal heart  
 Heart rate  
 Heart valves  
 Heart ventricles

## Heart arrest

USE: Cardiac arrest

## Heart attack

USE: Cardiac arrest

## Heart beat

UF: Heartbeat  
 BT: Heart rate

## Heart rate

UF: HR  
 BT: Heart  
 NT: Fetal heart rate  
 Heart beat  
 Heart rate detection  
 Heart rate interval  
 Heart rate measurement  
 Heart rate variability

## Heart rate detection

BT: Heart rate

## Heart rate interval

BT: Heart rate

## Heart rate measurement

BT: Heart rate  
 RT: Phonocardiography

## Heart rate variability





# 2018 IEEE Thesaurus

UF:	HRV		
BT:	Heart rate		
<b>Heart valves</b>		<b>Heat-assisted magnetic recording</b>	
BT:	Heart	UF:	HAMR
		BT:	Magnetic recording
<b>Heart ventricles</b>		<b>Heating systems</b>	
BT:	Heart	BT:	Temperature control
		RT:	Entropy
<i>Heartbeat</i>			Furnaces
USE:	Heart beat		High-temperature
<b>Heat engines</b>		techniques	
BT:	Engines		Laser applications
NT:	Steam engines		Rapid thermal processing
	Stirling engines	NT:	Thermal engineering
			Boilers
<i>Heat islands</i>			Cogeneration
USE:	Thermal pollution		Electromagnetic heating
<b>Heat pipes</b>			Heat pipes
BT:	Heating systems		Heat recovery
RT:	Cooling		Induction heating
	Heat transfer		Infrared heating
			Resistance heating
<b>Heat pumps</b>			Solar heating
UF:	Ground source heat pumps		Space heating
BT:	Pumps		Thermal energy
RT:	Refrigerants		Trigeneration
			Water heating
<b>Heat recovery</b>		<i>Heatsinks</i>	
UF:	Industrial heat recovery	USE:	Heat sinks
BT:	Heating systems	<i>Hebb's methods</i>	
RT:	Boilers	USE:	Hebbian theory
	Thermal engineering	<i>Hebb's rule</i>	
		USE:	Hebbian theory
<b>Heat sinks</b>		<i>Hebbian learning</i>	
UF:	Heatsinks	USE:	Hebbian theory
BT:	Cooling	<i>Hebbian principle</i>	
		USE:	Hebbian theory
<b>Heat transfer</b>		<b>Hebbian theory</b>	
BT:	Thermal conductivity	UF:	Hebb's methods
RT:	Heat pipes		Hebb's rule
NT:	Convection		Hebbian learning
			Hebbian principle
<b>Heat treatment</b>		BT:	Artificial neural networks
BT:	Materials processing		
RT:	Curing		
	Firing		
	Foundries		
	Kilns		
	Smelting	<b>Helical antennas</b>	
	Thermal factors	BT:	Antennas
NT:	Annealing	RT:	Electromagnetic
	Calcination	waveguides	
			Telecommunications



# 2018 IEEE Thesaurus

	Transmission lines		
	VHF circuits		
	Waveguide components		
<i>Helical gears</i>		<b>Heterogeneous networks</b>	
USE:	Gears	BT:	Computer networks
<b>Helicopters</b>		<b>Heterojunction bipolar transistors</b>	
BT:	Aircraft	UF:	HBT
		BT:	Transistors
		RT:	Heterojunctions
			Integrated optoelectronics
			Semiconductor devices
<b>Helium</b>		NT:	Double heterojunction
BT:	Chemical elements		bipolar transistors
	Gases		
<i>Helmet mounted displays</i>		<b>Heterojunctions</b>	
USE:	Head-mounted displays	BT:	Junctions
		RT:	Heterojunction bipolar
			transistors
<b>Hemodynamics</b>		<i>Heterostructure FETs</i>	
UF:	Hemorheology	USE:	HEMTs AND
BT:	Blood flow		MODFETs
<i>Hemorheology</i>			
USE:	Hemodynamics	<b>Heuristic algorithms</b>	
		UF:	Dynamic algorithms
<b>Hemorrhaging</b>		BT:	Algorithms
UF:	Bleeding		
	Haemorrhaging	<i>HEV</i>	
BT:	Medical conditions	USE:	Hybrid electric vehicles
<b>HEMTs</b>		<i>HEVC</i>	
UF:	Heterostructure FETs	USE:	High efficiency video coding
	High electron mobility		
transistors		<i>Hf</i>	
	High electron-mobility	USE:	Hafnium
transistors			
	High-electron mobility	<i>HFC</i>	
transistors		USE:	Hybrid fiber coaxial cables
	High-electron-mobility		
transistors		<i>Hg</i>	
BT:	Field effect transistors	USE:	Mercury (metals)
RT:	MODFETs		
NT:	D-HEMTs	<b>Hidden Markov models</b>	
	DH-HEMTs	BT:	Modeling
	PHEMTs	RT:	Markov processes
	mHEMTs		Pattern recognition
<b>Hepatectomy</b>		<b>Hierarchical systems</b>	
BT:	Medical treatment	BT:	Systems engineering and
	Surgery		theory
		NT:	Multilevel systems
<b>Hermetic seals</b>			
BT:	Seals	<i>High definition television</i>	
		USE:	HDTV
<b>Hetero-nanocrystal memory</b>			
BT:	Single electron memory	<b>High definition video</b>	



# 2018 IEEE Thesaurus

UF: HD  
HD video  
BT: Video recording  
NT: Ultra-high definition video

BT: Computer languages  
RT: Page description languages  
NT: Java  
Linux  
Parallel languages

## High efficiency video coding

UF: HEVC  
High-efficiency video  
coding  
BT: Video coding  
RT: MPEG 4 Standard

## High electron mobility transistors

USE: HEMTs

## High electron-mobility transistors

USE: HEMTs

## High energy physics

UF: Particle physics  
BT: Physics

## High energy physics instrumentation computing

BT: Computer applications  
Instrumentation and  
measurement  
Nuclear and plasma  
sciences  
RT: Data acquisition  
Elementary particles  
Nuclear electronics  
Particle measurements  
Particle tracking  
Position sensitive particle  
detectors  
Proton effects  
Radiation effects  
Real-time systems  
Synchrotrons  
NT: Linear particle accelerator

## High intensity discharge lamps

BT: Discharge lamps  
RT: Arc discharges  
Electrical ballasts  
Emergency lighting  
Light sources  
Lighting  
Lighting control

## High K

USE: High-k dielectric materials

## High level languages

## High level synthesis

BT: Circuit synthesis  
RT: Programmable logic  
devices

## High performance computing

UF: HPC  
High-performance  
computing  
BT: Computers and information  
processing

## High power amplifiers

BT: Power amplifiers  
RT: Gate drivers

## High power fiber lasers

UF: HPFL  
High-power fiber lasers  
BT: Fiber lasers

## High power microwave generation

UF: HPM generation  
High-power microwave  
generation  
BT: Microwave generation

## High resolution imaging

USE: High-resolution imaging

## High speed electronics

USE: High-speed electronics

## High speed integrated circuits

USE: High-speed integrated  
circuits

## High speed networking

USE: High-speed networks

## High speed networks

USE: High-speed networks

## High speed optical methods

USE: High-speed optical  
techniques

## High speed optical techniques



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# 2018 IEEE Thesaurus

USE: High-speed optical techniques

*High speed rail transportation*

USE: Rail transportation

*High speed techniques*

USE: High-speed electronics

*High  $T_c$  superconductors*

USE: High-temperature superconductors

*High  $T_c$  superconductors*

USE: High-temperature superconductors

*High temperature superconductors*

USE: High-temperature superconductors

*High-definition TV*

USE: HDTV

*High-efficiency video coding*

USE: High efficiency video coding

*High-electron mobility transistors*

USE: HEMTs

*High-electron-mobility transistors*

USE: HEMTs

*High-K*

USE: High-k dielectric materials

**High-k dielectric materials**

UF: High K

High-K

BT: Dielectric materials

RT: Semiconductor materials

**High-k gate dielectrics**

BT: Dielectric constant

Semiconductor device

manufacture

*High-performance computing*

USE: High performance computing

*High-power fiber lasers*

USE: High power fiber lasers

*High-power microwave generation*

USE: High power microwave generation

**High-resolution imaging**

UF: High resolution imaging

BT: Image resolution

**High-speed electronics**

UF: High speed electronics

High speed techniques

High-speed techniques

BT: Communications technology

NT: High-speed integrated circuits

High-speed networks

Ultrafast electronics

**High-speed integrated circuits**

UF: High speed integrated circuits

BT: High-speed electronics

RT: Integrated circuit technology

Microcontrollers

*High-speed networking*

USE: High-speed networks

**High-speed networks**

UF: High speed networking

High speed networks

High-speed networking

BT: High-speed electronics

RT: Long Term Evolution

*High-speed optical methods*

USE: High-speed optical techniques

**High-speed optical techniques**

UF: High speed optical methods

High speed optical

techniques

High-speed optical methods

BT: Optical design techniques

RT: Light fidelity

*High-speed rail transportation*

USE: Rail transportation

*High-speed techniques*

USE: High-speed electronics

*High- $T_c$  superconductors*



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# 2018 IEEE Thesaurus

USE: High-temperature  
superconductors

## *High-T<sub>c</sub> superconductors*

USE: High-temperature  
superconductors

## *High-temperature effects*

USE: Thermal factors

## **High-temperature superconductors**

UF: HTS  
High T<sub>c</sub>  
superconductors  
High T<sub>c</sub> superconductors  
High temperature  
superconductors  
High-T<sub>c</sub>  
superconductors  
High-T<sub>c</sub> superconductors  
Superconductors (high  
temperature)  
BT: Superconducting materials  
RT: Ceramics  
Granular superconductors  
Persistent currents  
Superconducting devices  
Superconducting films  
Superconducting transition  
temperature  
Surface impedance  
Surface resistance  
NT: Yttrium barium copper  
oxide

## **High-temperature techniques**

BT: Industry applications  
RT: Heating systems  
NT: Rapid thermal processing

## **High-voltage techniques**

BT: Power engineering  
RT: Power electronics  
Pulse power systems

## **Higher order statistics**

BT: Statistics  
RT: Differential equations

## *Highspeed rail transportation*

USE: Rail transportation

## *Highways*

USE: Road transportation

## *HIL simulation*

USE: Hardware-in-the loop  
simulation

## **Hilbert space**

BT: Euclidean distance

## *Hilbert?Huang transforms*

USE: Empirical mode  
decomposition

## **Hindbrain**

UF: Rhombencephalon  
BT: Brain  
RT: Forebrain  
Midbrain

## *Hinges*

USE: Fasteners

## **Hip**

BT: Extremities

## *Hip joint replacements*

USE: Prosthetics

## **Hippocampus**

BT: Temporal lobe  
RT: Alzheimer's disease

## **Histograms**

BT: Statistics

## **History**

BT: Science - general

## *HIV*

USE: Human immunodeficiency  
virus

## **Hobbing machines**

BT: Machining  
RT: Machine tools

## *Hoists*

USE: Lifting equipment

## *Hole carriers*

USE: Charge carrier processes

## **Holey fibers**

UF: Holey fibres  
BT: Photonic crystal fibers

## *Holey fibres*



# 2018 IEEE Thesaurus

USE:	Holey fibers	<b>Homeostasis</b>	BT:	Biology Control systems
<b>Hollow waveguides</b>		<b>Homopolar machines</b>	BT:	DC machines
BT:	Electromagnetic			
waveguides				
NT:	Liquid waveguides			
<b>Holmium</b>		<b>Honey pot (computing)</b>	BT:	Computer security
BT:	Chemical elements			
<b>Holographic optical components</b>		<b>Honeycomb structures</b>	BT:	Structural shapes
BT:	Optical devices	RT:	Lightweight structures	Sandwich structures
RT:	Holography		Structural panels	Thin wall structures
<b>Holography</b>				
BT:	Imaging			
RT:	Holographic optical			
components		<i>Hopfield networks</i>	USE:	Hopfield neural networks
	Image reconstruction			
	Laser applications	<b>Hopfield neural networks</b>	UF:	Hopfield networks
	Photorefractive materials	BT:	Recurrent neural networks	
<b>Home appliances</b>				
UF:	Appliances			
	Domestic appliances	<i>Hormones</i>	USE:	Biochemistry
	Domestic induction			
appliances		<b>Horn antennas</b>	BT:	Antennas
	Household appliances			
BT:	Consumer products			
NT:	Gas appliances	<b>Horses</b>	BT:	Animals
	Microwave ovens			
	Ovens			
	Refrigerators	<b>Hoses</b>	BT:	Mechanical products
	Washing machines	RT:	Automotive components	Rubber products
<b>Home automation</b>				
UF:	Home networks	<b>Hospitals</b>	BT:	Medical services
BT:	Consumer electronics			Medical treatment
RT:	Automation	RT:	Biomedical engineering	
	Service robots			
NT:	Portable media players	<b>Hot carrier effects</b>	BT:	Hot carriers
	Refrigerators			
	Smart homes	<b>Hot carrier injection</b>	UF:	Hot-carrier injection
	Washing machines	BT:	Hot carriers	
<b>Home computing</b>		NT:	Channel hot electron	
BT:	Consumer electronics	injection		Drain avalanche hot carrier
RT:	Computers and information	injection		Secondary generated hot
processing		electron injection		
	Firewire			
	Microcomputers			
<i>Home networks</i>				
USE:	Home automation			



# 2018 IEEE Thesaurus

injection	Substrate hot electron	<b>Human computer interaction</b>	UF: HCI
<b>Hot carriers</b>			Human-centered computing
BT: Charge carriers			Human-computer
RT: Semiconductor devices		interaction	Human-computer interfaces
NT: Hot carrier effects			User friendliness
Hot carrier injection		BT: User interfaces	
<i>Hot-carrier injection</i>		RT: Adaptive learning	
USE: Hot carrier injection			Cyber-physical systems
<i>Household appliances</i>			Human factors
USE: Home appliances		NT: Affective computing	Human-vehicle systems
<i>HPC</i>			Extended reality
USE: High performance			Gaze tracking
computing			Head-mounted displays
<i>HPFL</i>			Head-up displays
USE: High power fiber lasers			Telepresence
<i>HPM generation</i>			Telexistence
USE: High power microwave		<i>Human disease markers</i>	
generation		USE: Biomarkers	
<i>HR</i>		<i>Human engineering</i>	
USE: Heart rate		USE: Ergonomics	
<i>HRV</i>		<b>Human factors</b>	
USE: Heart rate variability		UF: Human factors engineering	
<b>HTML</b>		BT: Stress (psychological)	
BT: Markup languages		cybernetics	Systems, man, and
<i>HTS</i>		RT: Aerospace biophysics	
USE: High-temperature			Affective computing
superconductors			Androids
<b>Huffman coding</b>			Anthropometry
BT: Data compression			Behavioral sciences
Entropy coding			Cognitive science
RT: Algorithms			Ergonomics
Communication systems			Human computer
Multimedia communication		interaction	Man-machine systems
Multimedia databases			Persuasive systems
Multimedia systems			Problem-solving
Symbols		(security)	Productivity
<b>Human anatomy</b>			Social engineering
BT: Anatomy			Telerobotics
<i>Human cloning</i>			Anthropomorphism
USE: Cloning		<i>Human factors engineering</i>	
		USE: Ergonomics AND	
		Human factors	
		<b>Human immunodeficiency virus</b>	
		UF: HIV	



# 2018 IEEE Thesaurus

BT:	Diseases	BT:	IEEE Corporate activities
<b>Human resource management</b>		<i>Humanitarian aid</i>	
BT:	Management	USE:	Humanitarian activities
RT:	Industrial psychology	<b>Humanoid robots</b>	
NT:	Appraisal	BT:	Robots
	Continuing professional	RT:	Mobile robots
development		<i>HumanXR</i>	
	Employee welfare	USE:	Extended reality
	Employment	<b>Humidity</b>	
	Equal opportunities	BT:	Meteorology
	Incentive schemes	RT:	Humidity control
	Job specification		Humidity measurement
	Labor resources		Trees - insulation
	Multiskilling	<b>Humidity control</b>	
	Personnel	BT:	Moisture control
	Recruitment	RT:	Humidity
	Remuneration	<b>Humidity measurement</b>	
	Retirement	BT:	Moisture measurement
	Termination of employment	RT:	Humidity
	Unemployment	<b>Hurricanes</b>	
<i>Human robot interaction</i>		BT:	Cyclones
USE:	Human-robot interaction	<b>HVDC transmission</b>	
<b>Human voice</b>		BT:	Power transmission
BT:	Speech processing	RT:	Voltage-source converters
<i>Human-centered computing</i>		<i>Hybrid automobiles</i>	
USE:	Human computer	USE:	Hybrid electric vehicles
interaction		<i>Hybrid cars</i>	
<i>Human-computer interaction</i>		USE:	Hybrid electric vehicles
USE:	Human computer	<b>Hybrid electric vehicles</b>	
interaction		UF:	HEV
<i>Human-computer interfaces</i>			Hybrid automobiles
USE:	Human computer		Hybrid cars
interaction		BT:	Electric vehicles
<b>Human-robot interaction</b>		RT:	Battery powered vehicles
UF:	Human robot interaction		Charging stations
BT:	User interfaces		Energy storage
<i>Human-vehicle interaction</i>			Internal combustion
USE:	Human-vehicle systems	engines	
<b>Human-vehicle systems</b>			Traction motors
UF:	Human-vehicle interaction		Vehicle-to-grid
BT:	User interfaces	NT:	Plug-in hybrid electric
RT:	Human computer	vehicles	
interaction		<b>Hybrid fiber coaxial cables</b>	
<b>Humanitarian activities</b>			
UF:	Humanitarian aid		





# 2018 IEEE Thesaurus

UF: HFC  
Hybrid fibre coaxial cables  
BT: Coaxial cables

## *Hybrid fibre coaxial cables*

USE: Hybrid fiber coaxial cables

## **Hybrid integrated circuits**

BT: Circuits  
Integrated circuits  
RT: Thick film circuits  
Thin film circuits

## **Hybrid intelligent systems**

BT: Fuzzy systems  
RT: Intelligent systems

## **Hybrid junctions**

BT: Junctions  
RT: Directional couplers

## **Hybrid power systems**

BT: Power systems  
RT: Distributed power  
generation  
Photovoltaic systems

## **Hydraulic actuators**

BT: Actuators  
RT: Hydraulic drives

## **Hydraulic diameter**

BT: Fluid flow  
NT: Microchannels

## **Hydraulic drives**

BT: Drives  
RT: Hydraulic actuators

## **Hydraulic equipment**

BT: Hydraulic systems  
NT: Valves

## **Hydraulic fluids**

UF: Hydraulic liquids  
Hydraulic oils  
BT: Fluids  
Hydraulic systems  
RT: Production materials

## *Hydraulic fracking*

USE: Fracking

## *Hydraulic liquids*

USE: Hydraulic fluids

## *Hydraulic oils*

USE: Hydraulic fluids

## **Hydraulic systems**

UF: Hydraulics  
BT: Machinery  
RT: Fluid flow  
Irrigation  
NT: Electrohydraulics  
Hydraulic equipment  
Hydraulic fluids

## **Hydraulic turbines**

BT: Turbines  
RT: Hydroelectric power  
generation

## *Hydraulics*

USE: Hydraulic systems

## **Hydrocarbon reservoirs**

BT: Hydrocarbons

## **Hydrocarbons**

UF: Oil sands  
Oil shale  
BT: Organic chemicals  
Petroleum  
NT: Hydrocarbon reservoirs

## *Hydrochemistry*

USE: Geochemistry

## **Hydrodynamics**

UF: Smoothed particle  
hydrodynamics  
BT: Dynamics  
Mechanical factors  
RT: Fluid dynamics  
Fluid flow  
Microfluidics  
Water  
NT: Electrohydrodynamics  
Magnetohydrodynamics

## **Hydroelectric power generation**

UF: Hydroelectricity  
Hydropower  
Hydroelectric  
BT: Power generation  
RT: Hydraulic turbines  
NT: Hydroelectric-thermal  
power generation  
Microhydro power





# 2018 IEEE Thesaurus

## Hysteresis

BT: Materials science and technology  
RT: Damping  
Magnetic hysteresis  
Magnetization processes  
Spin valves

## Hysteresis motors

BT: AC motors  
Motors  
Rotating machines  
Synchronous machines  
Synchronous motors

## I/O programs

USE: Input-output programs

## IC

USE: Integrated circuits

## IC packaging

USE: Integrated circuit packaging

## Ice

BT: Geoscience  
RT: Meteorology  
Snow  
NT: Ice shelf  
Ice surface  
Ice thickness  
Sea ice

## Ice shelf

BT: Ice

## Ice surface

BT: Ice

## Ice thickness

BT: Ice

## ICP

USE: Iterative closest point algorithm

## ICs

USE: Integrated circuits

## ICT

USE: Information and communication technology

## ID-based encryption

USE: Identity-based encryption

## Identification of persons

BT: Systems, man, and cybernetics  
RT: Access control  
Palmprint recognition  
Security  
NT: Biometrics (access control)  
Face recognition  
Fingerprint recognition  
Handwriting recognition  
Speaker recognition  
Speech recognition

## Identity management systems

BT: Computer security  
Information systems

## Identity-based cryptography

USE: Identity-based encryption

## Identity-based encryption

UF: ID-based encryption  
Identity-based cryptography  
BT: Public key cryptography

## IDTV

USE: HDTV

## IEC

UF: International electrotechnical commission  
BT: Standards organizations  
RT: Communication standards  
Standardization  
Standards  
NT: Moving Pictures Experts Group

## IEC publications

USE: IEC Standards

## IEC Standards

UF: IEC publications  
BT: Standards publications  
RT: Common Information Model (electricity)  
NT: MPEG standards

## IEEE 1364

USE: Hardware design languages

## IEEE 1394 Standard

UF: P1394



# 2018 IEEE Thesaurus

BT: IEEE Standards  
 RT: Data buses  
 Data communication  
 Firewire  
 Machine vision  
 Video signal processing

Radio communication  
 Wireless LAN

## IEEE 802 LAN-MAN Standards

BT: IEEE Standards  
 NT: IEEE 802.11 Standard  
 IEEE 802.15 Standard  
 IEEE 802.16 Standard  
 IEEE 802.19 Standard  
 IEEE 802.22 Standard  
 IEEE 802.3 Standard

## IEEE 802.11n Standard

UF: 802.11n  
 BT: IEEE 802.11 Standard  
 RT: Antennas  
 Bluetooth  
 Communication channels  
 Computer networks  
 MIMO communication  
 Modulation  
 Protocols  
 Radio communication  
 Wireless LAN

## IEEE 802.11 Standard

UF: 802.11  
 P802.11  
 BT: IEEE 802 LAN-MAN  
 Standards  
 RT: Bluetooth  
 Butler matrices  
 Computer networks  
 MIMO communication  
 Modulation  
 Protocols  
 Radio communication  
 Wireless LAN  
 Wireless access points  
 Wireless communication  
 Wireless fidelity  
 NT: IEEE 802.11e Standard  
 IEEE 802.11g Standard  
 IEEE 802.11n Standard  
 IEEE 802.11p Standard

## IEEE 802.11p Standard

BT: IEEE 802.11 Standard  
 RT: Intelligent vehicles  
 Wireless Access in  
 Vehicular Environments  
 Wireless communication  
 Wireless networks

## IEEE 802.15 Standard

UF: 802.15  
 BT: IEEE 802 LAN-MAN  
 Standards  
 RT: Bluetooth  
 Light fidelity  
 Personal communication  
 networks  
 Radio communication  
 Wireless LAN  
 ZigBee

## IEEE 802.11e Standard

UF: 802.11e  
 BT: IEEE 802.11 Standard  
 RT: Communication channels  
 Protocols  
 Quality assurance  
 Quality control  
 Quality of service  
 Streaming media  
 Wireless LAN

## IEEE 802.16 Standard

UF: 802.16  
 BT: IEEE 802 LAN-MAN  
 Standards  
 RT: Broadband communication  
 Computer networks  
 Cross layer design  
 Internet  
 MIMO communication  
 Metropolitan area networks  
 Multimedia communication  
 WiMAX

## IEEE 802.11g Standard

UF: 802.11g  
 BT: IEEE 802.11 Standard  
 RT: Bluetooth  
 Computer networks  
 Modulation  
 Protocols

## IEEE 802.19 Standard

BT: IEEE 802 LAN-MAN  
 Standards

## IEEE 802.22 Standard



# 2018 IEEE Thesaurus

Standards  
 BT: IEEE 802 LAN-MAN  
 RT: Regional area networks  
 WRAN  
 Wireless communication  
 Wireless networks

## IEEE 802.3 Standard

Standards  
 UF: 802.3  
 BT: IEEE 802 LAN-MAN  
 RT: Communication switching  
 Computer networks  
 Ethernet  
 Local area networks  
 Packet switching  
 Switches  
 Wide area networks

## IEEE activities

UF: Activities  
 BT: IEEE organization  
 RT: IEEE Boards  
 NT: IEEE Awards activities  
 IEEE Conference activities  
 IEEE Corporate activities  
 IEEE Educational activities  
 IEEE Intersociety activities  
 IEEE Local activities  
 IEEE Member and  
 Geographic activities  
 IEEE Professional activities  
 IEEE Publishing activities  
 IEEE Standards activities  
 IEEE Student activities  
 IEEE Technical activities  
 IEEE United States  
 activities  
 IEEE Volunteer activities

## IEEE Associate Members

BT: IEEE members

## IEEE audio tapes

BT: IEEE products

## IEEE Awards activities

BT: IEEE activities  
 RT: IEEE Educational activities  
 IEEE Fellows  
 IEEE Foundation  
 IEEE Professional activities  
 IEEE Technical activities  
 IEEE United States

activities

NT: Prize Paper awards  
 Service awards  
 Student awards  
 Technical Field awards

## IEEE Boards

BT: IEEE entities  
 RT: IEEE activities

## IEEE books

BT: IEEE publications

## IEEE bylaws

BT: IEEE governance

## IEEE catalogs

BT: IEEE products

## IEEE Center for the History of Electrical Engineering

UF: IEEE History Center  
 BT: IEEE entities

## IEEE Chapter news

BT: IEEE news

## IEEE Chapters

BT: IEEE entities

## IEEE Committees

BT: IEEE entities

## IEEE Communities

BT: IEEE entities

## IEEE Computer Society Press

BT: IEEE entities  
 RT: IEEE Publishing activities

## IEEE Conference activities

BT: IEEE activities

## IEEE conference proceedings

BT: IEEE publications

## IEEE Constitution

BT: IEEE governance

## IEEE Corporate activities

BT: IEEE activities  
 RT: IEEE Professional activities  
 IEEE staff  
 Legal factors  
 NT: Humanitarian activities



# 2018 IEEE Thesaurus

## IEEE Councils

BT: IEEE entities

## IEEE directories

BT: IEEE publications

## IEEE Educational activities

BT: IEEE activities

RT: IEEE Awards activities

IEEE Foundation

IEEE Professional activities

## IEEE educational products

BT: IEEE products

## IEEE employees

USE: IEEE staff

## IEEE entities

BT: IEEE organization

NT: IEEE Boards

IEEE Center for the History

of Electrical Engineering

IEEE Chapters

IEEE Committees

IEEE Communities

IEEE Computer Society

Press

IEEE Councils

IEEE Foundation

IEEE Press

IEEE Regions

IEEE Sections

IEEE Societies

## IEEE Fellows

BT: IEEE members

RT: IEEE Awards activities

## IEEE Foundation

BT: IEEE entities

RT: IEEE Awards activities

IEEE Educational activities

## IEEE governance

BT: IEEE organization

NT: IEEE Constitution

IEEE bylaws

IEEE mission and vision

IEEE policy and procedures

IEEE staff

## IEEE History Center

USE: IEEE Center for the History  
of Electrical Engineering

## IEEE indexing

BT: IEEE organization

NT: Awards

Book reviews

CD-ROM reviews

Editorials

Interviews

Obituaries

Software reviews

Special issues and sections

Tutorials

Video reviews

## IEEE Intersociety activities

BT: IEEE activities

RT: IEEE Professional activities

## IEEE journals

BT: IEEE publications

## IEEE Life Members

BT: IEEE members

## IEEE Local activities

BT: IEEE activities

## IEEE magazines

BT: IEEE publications

## IEEE Member and Geographic activities

BT: IEEE activities

## IEEE members

BT: IEEE organization

RT: IEEE Volunteer activities

NT: IEEE Associate Members

IEEE Fellows

IEEE Life Members

IEEE Senior Members

IEEE Student Members

## IEEE merchandise

BT: IEEE products

## IEEE mission and vision

UF: Vision

BT: IEEE governance

## IEEE news

UF: Announcements

BT: IEEE organization

NT: IEEE Chapter news

IEEE Region news

IEEE Section news



# 2018 IEEE Thesaurus

	IEEE Society news	NT:	IEEE books IEEE conference
<b>IEEE newsletters</b>		proceedings	
BT:	IEEE publications		IEEE directories IEEE journals IEEE magazines IEEE newsletters IEEE online publications IEEE standards
<i>IEEE on-line publications</i>			
USE:	IEEE online publications		
<b>IEEE online publications</b>		publications	IEEE transactions Notice of Violation
UF:	Electronic publications IEEE on-line publications		
BT:	IEEE publications		
<b>IEEE organization</b>		<b>IEEE Publishing activities</b>	
NT:	IEEE activities IEEE entities IEEE governance IEEE indexing IEEE members IEEE news IEEE products	BT:	IEEE activities
		RT:	Guidelines IEEE Computer Society
		Press	IEEE Press
<b>IEEE policy and procedures</b>		<b>IEEE Region news</b>	
UF:	IEEE procedures	BT:	IEEE news
BT:	IEEE governance	RT:	IEEE Regions
<b>IEEE Press</b>		<b>IEEE Regions</b>	
BT:	IEEE entities	BT:	IEEE entities
RT:	IEEE Publishing activities	RT:	IEEE Region news
<i>IEEE procedures</i>		<b>IEEE Section news</b>	
USE:	IEEE policy and procedures	BT:	IEEE news
<b>IEEE products</b>		<b>IEEE Sections</b>	
BT:	IEEE organization	BT:	IEEE entities
NT:	IEEE Xplore IEEE audio tapes IEEE catalogs IEEE educational products IEEE merchandise IEEE publications	<b>IEEE Senior Members</b>	
		BT:	IEEE members
<b>IEEE Professional activities</b>		<b>IEEE Societies</b>	
UF:	Non-united-states activities	BT:	IEEE entities
BT:	IEEE activities	<b>IEEE Society news</b>	
RT:	IEEE Awards activities IEEE Corporate activities IEEE Educational activities IEEE Intersociety activities IEEE Technical activities IEEE United States	BT:	IEEE news
activities		<b>IEEE staff</b>	
<b>IEEE publications</b>		UF:	IEEE employees
BT:	IEEE products	BT:	IEEE governance
		RT:	IEEE Corporate activities
		<b>IEEE Standards</b>	
		BT:	Standards publications
		RT:	ANSI Standards IEEE Standards activities
		NT:	AIEE Standards IEEE 1394 Standard



# 2018 IEEE Thesaurus

Standards	IEEE 802 LAN-MAN		
	IRE Standards	IEL	
		UF:	IEEE/IEE Electronic Library
		BT:	IEEE Xplore
<b>IEEE Standards activities</b>		<b>Ignition</b>	
BT:	IEEE activities	BT:	Chemical reactors
RT:	IEEE Standards		Internal combustion
<b>IEEE Standards Association</b>		engines	
BT:	Standards organizations		Nuclear physics
			Plasma materials
<b>IEEE standards glossaries</b>		processing	
BT:	IEEE standards		
publications		<b>II-VI semiconductor materials</b>	
		BT:	Semiconductor materials
<b>IEEE standards publications</b>		<b>III-V semiconductor materials</b>	
BT:	IEEE publications	BT:	Semiconductor materials
NT:	IEEE standards glossaries	RT:	Aluminum gallium nitride
<b>IEEE Student activities</b>		<b>IIR filters</b>	
BT:	IEEE activities	UF:	Infinite impulse response
RT:	IEEE Student Members	filters	
<b>IEEE Student Members</b>		BT:	Filters
BT:	IEEE members	<i>Illumination</i>	
RT:	IEEE Student activities	USE:	Lighting
	Student awards	<i>Illumination control</i>	
<b>IEEE Technical activities</b>		USE:	Lighting control
BT:	IEEE activities	<i>Illumination gas</i>	
RT:	IEEE Awards activities	USE:	Coal gas
	IEEE Professional activities	<i>IM</i>	
	IEEE Volunteer activities	USE:	Instant messaging
<b>IEEE transactions</b>		<b>Image analysis</b>	
BT:	IEEE publications	UF:	Scene analysis
<b>IEEE United States activities</b>			Scene classification
UF:	US activities	BT:	Image processing
BT:	IEEE activities	RT:	Image recognition
RT:	IEEE Awards activities		Machine vision
	IEEE Professional activities	NT:	Image classification
<b>IEEE Volunteer activities</b>			Image motion analysis
BT:	IEEE activities		Image quality
RT:	IEEE Technical activities		Image sequence analysis
	IEEE members		Image texture analysis
<b>IEEE Xplore</b>			Object detection
BT:	IEEE products		Subtraction techniques
RT:	Information services	<b>Image annotation</b>	
NT:	IEL	UF:	Image tagging
<i>IEEE/IEE Electronic Library</i>			Linguistic indexing
USE:	IEL		Video annotation





# 2018 IEEE Thesaurus

intelligence)	BT:	Image processing	communication systems	Picture archiving and	
	RT:	Feature extraction			
		Image classification			
		Image retrieval			
		Learning (artificial			
				<i>Image compression</i>	
				USE:	Image coding
		Metadata			
		Video signal processing			
<b>Image capture</b>			<b>Image converters</b>		
BT:	Image processing	BT:	Imaging		
RT:	Cameras	RT:	Frequency conversion		
	Computer vision		Image sensors		
	Image sensors	NT:	Image intensifiers		
	Photography				
<b>Image classification</b>		<b>Image databases</b>			
BT:	Image analysis	BT:	Database systems		
RT:	Image annotation		Databases		
		RT:	Geographic information		
		systems			
			Image coding		
			Image storage		
			Video sequences		
		NT:	Image retrieval		
<b>Image coding</b>					
UF:	Image compression	<i>Image de-noising</i>			
BT:	Image processing	USE:	Image denoising		
RT:	Image communication				
	Image databases	<i>Image deblurring</i>			
	Image storage	USE:	Image restoration		
	MPEG standards				
	Rate distortion theory	<b>Image decomposition</b>			
	Transcoding	BT:	Image processing		
	Vector quantization				
	Video codecs	<b>Image denoising</b>			
	Video coding	UF:	Image de-noising		
<b>Image color analysis</b>		BT:	Image processing		
UF:	Image colour analysis	RT:	Diffusion processes		
BT:	Image processing		Gaussian noise		
RT:	Image filtering		Image enhancement		
			Image filtering		
<i>Image colour analysis</i>			Image reconstruction		
USE:	Image color analysis		Image resolution		
			Image restoration		
<b>Image communication</b>		<i>Image edge analysis</i>			
UF:	Image transmission	USE:	Image edge detection		
BT:	Communications				
technology	RT:	B-ISDN	<b>Image edge detection</b>		
		Cable TV	UF:	Edge detection	
		ISDN		Image edge analysis	
		Image coding	BT:	Image recognition	
		Motion compensation	RT:	Corner detection	
		TV		Feature extraction	
		Teleconferencing		Image segmentation	
		Videophone systems		Thresholding (Imaging)	
		Visual communication			
	NT:	Facsimile	<b>Image enhancement</b>		



# 2018 IEEE Thesaurus

BT:	Image processing		
RT:	Image denoising		<i>Image object recognition</i>
	Image intensifiers	USE:	Object recognition
	Image restoration		
<b>Image filtering</b>			<i>Image pattern recognition</i>
BT:	Filtering theory	USE:	Pattern recognition
	Image processing		
RT:	Image color analysis	<b>Image processing</b>	
	Image denoising	UF:	Picture processing
	Image segmentation	BT:	Computers and information
<b>Image forensics</b>		processing	
UF:	Forensic photography	RT:	Authentication
BT:	Forensics		Diffusion processes
	Photography		Gabor filters
RT:	Image processing		Image forensics
	Law enforcement		Multidimensional signal
	Visualization		
<b>Image fusion</b>			
BT:	Image processing		Optical projectors
		NT:	Time-frequency analysis
<b>Image generation</b>			Video sequences
UF:	Image synthesis		Vision sensors
BT:	Image processing		Active shape model
RT:	Animation		Blob detection
	Computer graphics		Corner detection
NT:	Plasma displays		Feature extraction
	Visual effects	processing	Fiducial markers
			Geophysical image
<b>Image intensifiers</b>			
BT:	Image converters		Gray-scale
RT:	Frequency conversion		Image analysis
	Image enhancement		Image annotation
	Image sensors		Image capture
<b>Image matching</b>			Image coding
UF:	Appearance matching		Image color analysis
	Fingerprint images		Image decomposition
BT:	Pattern matching		Image denoising
RT:	Fingerprint recognition		Image enhancement
	Image recognition		Image filtering
	Object detection		Image fusion
	Object recognition		Image generation
	Stereo vision		Image recognition
<b>Image motion analysis</b>			Image reconstruction
BT:	Image analysis		Image registration
RT:	Object tracking		Image representation
	Robotics and automation		Image resolution
NT:	Video tracking		Image restoration
			Image sampling
<i>Image object detection</i>			Image segmentation
USE:	Object detection		Image segmentation
			Image sequences
			Image texture
			Machine vision
			Morphological operations
			Optical feedback
			Saliency detection



# 2018 IEEE Thesaurus

	Smart pixels		<b>Image sampling</b>	
	Spatial coherence		BT:	Image processing
	Structure from motion			
	Table lookup		<b>Image segmentation</b>	
<b>Image quality</b>			BT:	Image processing
BT:	Image analysis		RT:	Image edge detection
RT:	Spatial resolution			Image filtering
				Mixture models
				Object tracking
<b>Image recognition</b>			<b>Image segmentaton</b>	
BT:	Image processing		BT:	Image processing
RT:	Emotion recognition		NT:	Thresholding (Imaging)
	Face recognition			
	Feature extraction			
	Image analysis		<b>Image sensors</b>	
	Image matching		UF:	Sensors (image)
	Machine vision		BT:	Imaging
	Object recognition		RT:	Cameras
	Video signal processing			Endoscopes
NT:	Image edge detection			Image capture
				Image converters
<b>Image reconstruction</b>				Image intensifiers
BT:	Image processing			Night vision
RT:	Holography			Optical sensors
	Image denoising			Photodetectors
	Inverse problems			Robot vision systems
	Magnetic resonance		NT:	Active pixel sensors
imaging				CCD image sensors
	Pattern clustering			CMOS image sensors
	Tomography			Charge-coupled image
			sensors	
<b>Image registration</b>				Infrared image sensors
BT:	Image processing			
<b>Image representation</b>			<b>Image sequence analysis</b>	
BT:	Image processing		BT:	Image analysis
<b>Image resolution</b>			<b>Image sequences</b>	
BT:	Image processing		BT:	Image processing
RT:	Image denoising			
	Visual communication		<b>Image storage</b>	
NT:	High-resolution imaging		BT:	Imaging
	Spatial resolution		RT:	Image coding
				Image databases
<b>Image restoration</b>				Photography
UF:	Image deblurring			Video recording
BT:	Image processing		<i>Image synthesis</i>	
RT:	Distortion		USE:	Image generation
	Image denoising			
	Image enhancement		<i>Image tagging</i>	
			USE:	Image annotation
<b>Image retrieval</b>			<b>Image texture</b>	
BT:	Image databases		BT:	Image processing
RT:	Image annotation			



# 2018 IEEE Thesaurus

## Image texture analysis

BT: Image analysis

## Image transmission

USE: Image communication

## Image watermarking

USE: Watermarking

## Imagimarkers

USE: Fiducial markers

## Imaging

RT: Color  
Motion pictures  
Radiometry  
Remote sensing  
Robot vision systems  
NT: Biomedical imaging  
Cameras  
Focusing  
Ground penetrating radar  
Holography  
Image converters  
Image sensors  
Image storage  
Infrared imaging  
Magnetic resonance

imaging

Magneto electrical

resistivity imaging technique

Microscopy  
Microwave imaging  
Multispectral imaging  
Nuclear imaging  
Optical imaging  
Photography  
Radiation imaging  
Radiography  
Stereo vision  
Tomography

## Imaging phantoms

BT: Biomedical image

processing

## Immersion cooling

BT: Cooling

## Immune system

UF: Immune systems  
BT: Anatomy  
RT: Biological control systems  
Biology  
Microorganisms

NT: Artificial immune systems

## Immune systems

USE: Immune system

## Immunity testing

BT: Electromagnetic  
compatibility  
Electronic equipment  
testing  
Electrostatic interference  
RT: Anechoic chambers  
Electromagnetic  
interference  
Open area test sites

## Impact ionisation

USE: Impact ionization

## Impact ionization

UF: Impact ionisation  
BT: Ionization  
RT: Charge carriers  
Conductivity  
Electrons  
Insulators

## Impedance

UF: Electric impedance  
BT: Electric variables  
RT: Admittance  
Damping  
Impedance matching  
Impedance measurement

## Impedance matching

BT: Electric variables  
RT: Circuits  
Equalizers  
Impedance  
NT: Baluns

## Impedance measurement

UF: Impedance methods  
Impedance performance  
BT: Electric variables  
measurement  
RT: Admittance measurement  
Impedance  
Transmission line  
measurements

## Impedance methods

USE: Impedance measurement



# 2018 IEEE Thesaurus

## *Impedance performance*

USE: Impedance measurement

## **Impellers**

BT: Machine components  
RT: Blades  
Propellers  
Pumps

## *Implantable biomedical devices*

USE: Implants

## *Implantable devices*

USE: Implants

## *Implantable electronics*

USE: Implants

## **Implants**

UF: Implantable biomedical  
devices  
Implantable devices  
Implantable electronics  
BT: Biomedical equipment  
NT: Auditory implants  
Brainstem implants  
Cochlear implants  
Microelectronic implants  
Neural implants

## *Importance sampling*

USE: Monte Carlo methods

## *Imposter signature generation*

USE: Forgery

## *Improved definition TV*

USE: HDTV

## *Impulse generation*

USE: Pulse generation

## *Impulse measurements*

USE: Pulse measurements

## **Impulse testing**

BT: Testing  
RT: Frequency response  
Insulation testing

## **Impurities**

BT: Materials science and  
technology  
RT: Contamination  
NT: Semiconductor impurities

## *IMT-2000*

USE: 3G mobile communication

## **In vitro**

BT: Medical services  
NT: In vitro fertilization

## **In vitro fertilization**

BT: In vitro

## **In vivo**

BT: Medical services

## **Incentive schemes**

UF: Bonuses  
Merit pay  
Performance related pay  
Profit sharing schemes  
BT: Human resource  
management  
Remuneration  
RT: Appraisal  
Employee welfare  
Productivity

## **Incineration**

UF: Afterburners  
Incinerators  
Refuse incineration  
Waste incineration  
BT: Waste disposal  
RT: Air pollution  
Ash  
Radioactive pollution  
Radioactive waste  
Radioactive waste disposal

## *Incinerators*

USE: Incineration

## **Independent component analysis**

BT: Numerical analysis  
RT: Artificial intelligence  
Blind source separation  
Computer aided analysis  
Feature extraction  
Principal component  
analysis  
Signal processing

## *Index of production*

USE: Economic indicators

## **Indexes**



# 2018 IEEE Thesaurus

BT:	Database systems	NT:	Indoor environments
RT:	Information retrieval		
	Information systems	<b>Indoor environments</b>	
NT:	Indexing	BT:	Indoor communication
	Machine assisted indexing		
	Spatial indexes	<b>Indoor navigation</b>	
<b>Indexing</b>		BT:	Navigation
UF:	Online indexing	RT:	Computer vision
BT:	Indexes		Global Positioning System
	Information analysis		Land mobile radio
RT:	Keyword search		Path planning
	Machine assisted indexing		Radio navigation
	Tagging		
<b>Indirect liquid cooling</b>		<i>Indoor radio</i>	
BT:	Liquid cooling	USE:	Indoor radio communication
<b>Indium</b>		<b>Indoor radio communication</b>	
BT:	Metals	UF:	Indoor radio
RT:	Indium compounds		Indoor radio
		communications	
		BT:	Radio communication
<b>Indium compounds</b>		<i>Indoor radio communications</i>	
BT:	Compounds	USE:	Indoor radio communication
RT:	Alloying		
	Indium	<b>Inductance</b>	
NT:	Indium gallium arsenide	BT:	Electric variables
	Indium tin oxide	RT:	Coils
			Inductance measurement
<b>Indium gallium arsenide</b>			Inductors
UF:	InGaAs		Transmission line theory
BT:	Gallium compounds	<b>Inductance measurement</b>	
	Indium compounds	BT:	Electric variables
	Semiconductor materials	measurement	
<b>Indium gallium nitride</b>		RT:	Inductance
BT:	Gallium compounds	<i>Induction (electromagnetic)</i>	
<b>Indium gallium zinc oxide</b>		USE:	Electromagnetic induction
BT:	Zinc oxide	<i>Induction (electrostatic)</i>	
<b>Indium phosphide</b>		USE:	Electrostatic induction
UF:	InP	<b>Induction generators</b>	
BT:	Semiconductor materials	BT:	AC generators
RT:	Phonons		Induction machines
<b>Indium tin oxide</b>		NT:	Doubly fed induction
BT:	Indium compounds	generators	
RT:	Optical materials	<b>Induction heating</b>	
<b>Indoor communication</b>		BT:	Heating systems
BT:	Communication systems	RT:	Electromagnetic heating
RT:	Mobile communication	<b>Induction machines</b>	
	Optical fiber communication	BT:	AC machines
	Optical modulation		



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	Rotating machines	Occupational safety
NT:	Induction generators	
	Induction motors	
<b>Induction motor drives</b>		<b>Industrial communication</b>
BT:	Induction motors	UF: Organizational
<b>Induction motors</b>		communication
BT:	AC motors	BT: Communication networks
	Induction machines	Industrial engineering
	Motors	RT: Business
	Rotating machines	Organizational aspects
RT:	Sensorless control	
NT:	Induction motor drives	
<b>Inductive charging</b>		<b>Industrial control</b>
UF:	Wireless charging	BT: Industrial electronics
BT:	Energy exchange	RT: Assembly systems
	Power supplies	Computer numerical control
RT:	Wireless communication	Field buses
<i>Inductive energy transfer</i>		Industrial engineering
USE:	Inductive power	Industrial plants
transmission		Manipulators
		Manufacturing automation
		Mobile robots
		Motor drives
		Programmable control
		Robots
		NT: Process control
		Production control
<b>Inductive power transmission</b>		<i>Industrial democracy</i>
UF:	Inductive energy transfer	USE: Industrial relations
BT:	Electromagnetic induction	
	Power transmission	<b>Industrial economics</b>
RT:	Inductors	UF: Manufacturing economics
	Sensorless control	Production economics
	Transformers	BT: Microeconomics
<b>Inductive transducers</b>		RT: Economies of scale
BT:	Transducers	Privatization
<b>Inductors</b>		<b>Industrial electronics</b>
UF:	Chokes	NT: Assembly systems
	Reactors	Computer aided
BT:	Electronic components	manufacturing
RT:	Coils	Cryogenic electronics
	Electrical ballasts	Industrial control
	Inductance	Integrated manufacturing
	Inductive power	systems
transmission		Machine control
	Magnetic cores	Manufacturing automation
devices	Tunable circuits and	Testing
NT:	Active inductors	<b>Industrial engineering</b>
	Thick film inductors	BT: Industry applications
	Thin film inductors	RT: Design methodology
<b>Industrial accidents</b>		Industrial control
BT:	Accidents	Industrial plants
RT:	Hazardous areas	Industrial training
		Precision engineering



# 2018 IEEE Thesaurus

	Production engineering	<b>Industrial training</b>	
	Production management	BT:	Training
	Research and development	RT:	Industrial engineering
NT:	Industrial communication		Multiskilling
<i>Industrial facilities</i>			On the job training
USE:	Industrial plants		Vocational training
<i>Industrial heat recovery</i>		<b>Industrial waste</b>	
USE:	Heat recovery	BT:	Waste materials
		RT:	Effluents
<b>Industrial plants</b>			Industrial pollution
UF:	Industrial facilities		Slurries
	Plants (industrial)		Waste heat
BT:	Production facilities	NT:	Wastewater
RT:	Industrial control		Ash
	Industrial engineering		Slag
	Industrial power systems	<b>Industries</b>	
	Industries	BT:	Industry applications
	Manufacturing	RT:	Business
	Paper mills		Industrial plants
	Production systems	NT:	Agriculture
<b>Industrial pollution</b>			Architecture
BT:	Pollution		Banking
RT:	Air pollution		Beverage industry
	Industrial waste		Chemical industry
	Land pollution		Coal industry
	Radioactive pollution		Communication industry
	Thermal pollution		Computer industry
	Water pollution		Construction
<b>Industrial power systems</b>			Construction industry
UF:	Commercial power systems		Defense industry
BT:	Power systems	industry	Electrical engineering
RT:	Buildings		Entertainment industry
	Cogeneration		Gas industry
	Industrial plants		Information industry
	Power distribution		Manufacturing industries
<b>Industrial psychology</b>			Metals industry
BT:	Psychology		Mining industry
RT:	Employee welfare		Natural gas industry
	Human resource		Petroleum industry
management			Power industry
	Productivity		Steel industry
	Psychometric testing		Sugar industry
<b>Industrial relations</b>			Textile technology
UF:	Collective bargaining		Toy industry
	Industrial democracy		Transportation industry
	Trade unions		Wood industry
BT:	Business	<b>Industry applications</b>	
RT:	Equal opportunities	NT:	Accident prevention
			Chemical technology
			Cryogenics
			Electrochemical devices





# 2018 IEEE Thesaurus

	Electrochemical processes		<i>Infinite impulse response filters</i>
	Electromechanical systems	USE:	IIR filters
	Electrostatic devices		
	Electrostatic precipitators		<i>Inflammability</i>
	Electrostatic processes	USE:	Flammability
	Engines		
	Environmental		
management			<b>Influenza</b>
	Food technology	BT:	Diseases
	High-temperature		Viruses (medical)
techniques			
	Industrial engineering		<b>Informatics</b>
	Industries	BT:	Information processing
	Inspection		Information systems
	Machinery	NT:	Biomedical informatics
	Manufacturing		Cognitive informatics
	Packaging		Neuroinformatics
	Paper technology		
	Production		<b>Information analysis</b>
	Safety	BT:	Professional
	Security	communication	
	Wine industry	RT:	Big Data applications
			Sentiment analysis
		NT:	Decision analysis
			Indexing
<b>Inertial confinement</b>			
BT:	Plasma confinement		
<b>Inertial navigation</b>			<b>Information and communication technology</b>
BT:	Navigation	UF:	ICT
		BT:	Communications
<i>Infant</i>		technology	
USE:	Pediatrics		Information technology
		NT:	Ambient assisted living
<i>Infants</i>			
USE:	Pediatrics		<b>Information architecture</b>
		BT:	Information systems
<b>Infectious diseases</b>		RT:	Database systems
UF:	Communicable disease		
	Transmissible disease		<b>Information entropy</b>
BT:	Diseases	BT:	Information theory
<b>Inference algorithms</b>			
BT:	Algorithms		<b>Information exchange</b>
		BT:	Data processing
<b>Inference mechanisms</b>			Information processing
UF:	Model-based reasoning	RT:	Common Information Model
BT:	Knowledge engineering	(computing)	
RT:	Cognitive science		Common Information Model
	Gaussian processes	(electricity)	
	Learning systems		Information management
NT:	Fuzzy reasoning		Information sharing
			Information systems
<b>Infinite horizon</b>			Ports (Computers)
BT:	Optimal control		
RT:	Markov processes		<i>Information extraction</i>
	Optimization methods	USE:	Information retrieval



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## Information filtering

BT: Filtering  
Information retrieval  
NT: Information filters  
Recommender systems

## Information filters

UF: Web filters  
BT: Information filtering  
RT: Information retrieval

## Information geometry

BT: Geometry  
RT: Probability

## Information industry

BT: Industries

## Information inequality

USE: Cramer-Rao bounds

## Information management

BT: Information systems  
Management  
RT: Big Data  
Data aggregation  
Information exchange  
Information services  
Knowledge management  
NT: Common Information Model  
(computing)  
(electricity)  
Common Information Model  
Competitive intelligence  
Digital preservation  
Document handling  
Information security  
Information sharing  
Knowledge transfer

## Information processing

BT: Information systems  
RT: Big Data  
Business data processing  
Data collection  
Granular computing  
Information sharing  
Software as a service  
Spectral efficiency  
WS-BPEL  
NT: Electronic healthcare  
Informatics  
Information exchange  
Sonification

## Information rates

UF: Throughput  
(communication systems)  
BT: Information retrieval

## Information representation

BT: Information technology  
RT: Visual analytics

## Information resources

BT: Professional  
communication  
RT: Information retrieval  
Information systems

## Information retrieval

UF: Information extraction  
BT: Professional  
communication  
RT: Abstracts  
Big Data  
Document handling  
Google  
Indexes  
Information filters  
Information resources  
Knowledge discovery  
Persistent identifiers  
Portals  
Ranking (statistics)  
Symbols  
Triples (Data structure)  
NT: Blogs  
Content-based retrieval  
Dimensionality reduction  
Hypertext systems  
Information filtering  
Information rates  
Music information retrieval  
Online services  
Search engines  
Search methods  
Social network services  
Tagging  
Taxonomy  
Terminology  
Video sharing  
Vocabulary  
Web sites

## Information science

BT: Professional  
communication

## Information security



# 2018 IEEE Thesaurus

	BT:	Information management		Database systems
		Security		Distributed information
	RT:	Data protection	systems	
		Internet security		Identity management
	NT:	Cyber espionage	systems	
		Intrusion detection		Informatics
		Phishing		Information architecture
		SQL injection		Information management
		Snake robots		Information processing
		Social engineering		Management information
(security)			systems	
				Medical information
<b>Information services</b>			systems	
	BT:	Professional		
communication			<b>Information technology</b>	
	RT:	Abstracts	BT:	Professional
		Google	communication	
		IEEE Xplore	RT:	Automation
		Information management		Biometrics (access control)
	NT:	Ask IEEE		Computer applications
		Dictionaries		Information systems
		Document delivery	NT:	Bring your own device
		Encyclopedias		Information and
		Libraries	communication technology	
		Teletext		Information representation
		Videotex		Printing
		Wikipedia		Semantic technology
				Service computing
<b>Information sharing</b>				Telematics
	BT:	Information management		Universal Serial Bus
	RT:	Collaboration		
		Information exchange	<b>Information theory</b>	
		Information processing	UF:	Coding theory
	NT:	Data dissemination		Information theoretic
			RT:	Bandwidth
<b>Information systems</b>				Code refractoring
	BT:	Professional		Communication systems
communication				Cybernetics
	RT:	Big Data applications		Cyclic redundancy check
		CD-ROMs		Econophysics
		Computers and information		Modulation coding
processing				Statistics
		Database machines		Teleportation
		Extranets		Viterbi algorithm
		File systems	NT:	Audio coding
		Indexes		Biological information
		Information exchange	theory	
		Information resources		Channel coding
		Information technology		Codes
base		Management information		Communication channels
				Decoding
		Multimedia computing		Encoding
		Office automation		Error compensation
		Strategic planning		Genetic communication
	NT:	Data systems		Hamming distance



# 2018 IEEE Thesaurus

	Hamming weight		Infrared imaging
	Information entropy		
	Mutual information	<i>InGaAs</i>	
	Network coding	USE:	Indium gallium arsenide
	Rate distortion theory	<b>Inhibitors</b>	
	Rate-distortion	BT:	Chemical products
	Source coding		Production materials
	Speech coding	RT:	Retardants
		NT:	Corrosion inhibitors
<i>Information theoretic</i>			
USE:	Information theory		
<i>Infrared communication</i>		<i>Inhomogeneous media</i>	
USE:	Optical fiber communication	USE:	Nonhomogeneous media
<b>Infrared detectors</b>		<i>Injected beams</i>	
BT:	Radiation detectors	USE:	Particle beam injection
RT:	Bolometers	<i>Injection lasers</i>	
	Infrared surveillance	USE:	Semiconductor lasers
	Photodetectors	<i>Injection locked oscillators</i>	
	Superconducting	USE:	Injection-locked oscillators
photodetectors		<i>Injection locking</i>	
<b>Infrared heating</b>		USE:	Injection-locked oscillators
BT:	Heating systems	<b>Injection molding</b>	
NT:	Greenhouse effect	UF:	Injection moulding
<b>Infrared image sensors</b>			Power injection molding
BT:	Image sensors		Power injection moulding
<b>Infrared imaging</b>		BT:	Production
BT:	Imaging	RT:	Compression molding
RT:	Biomedical optical imaging		Embossing
	Infrared surveillance	<i>Injection moulding</i>	
	Optical imaging	USE:	Injection molding
	Remote sensing	<b>Injection-locked oscillators</b>	
NT:	Night vision	UF:	Injection locked oscillators
<i>Infrared lasers</i>			Injection locking
USE:	Lasers	BT:	Oscillators
<i>Infrared propagation</i>		<b>Injuries</b>	
USE:	Optical propagation	UF:	Injury
<b>Infrared sensors</b>		BT:	Medical conditions
BT:	Sensors	NT:	Brain injuries
<b>Infrared spectra</b>			Pain
UF:	IR Spectra		Wounds
BT:	Spectral analysis	<i>Injury</i>	
RT:	Spectroscopy	USE:	Injuries
<b>Infrared surveillance</b>		<b>Ink</b>	
BT:	Surveillance	BT:	Production materials
RT:	Infrared detectors	RT:	Paints



# 2018 IEEE Thesaurus

	Printing		
NT:	Ink jet printing	<i>InP</i>	USE: Indium phosphide
<b>Ink jet printing</b>		<b>Input devices</b>	
UF:	Ink-jet printers	BT:	Computer interfaces
BT:	Ink-jet printing		Hardware
BT:	Ink		
RT:	Printing	<b>Input variables</b>	
RT:	Three-dimensional printing	UF:	Variable selection
		BT:	Modeling
<i>Ink-jet printers</i>		<b>Input-output programs</b>	
USE:	Ink jet printing	UF:	I/O programs
<i>Ink-jet printing</i>		BT:	Operating systems
USE:	Ink jet printing	RT:	Program processors
<i>Innovation</i>		NT:	Device drivers
USE:	Technological innovation		
<b>Innovation management</b>		<i>Insect control</i>	
BT:	Engineering management	USE:	Pest control
	Research and development		
management		<b>Insects</b>	
RT:	Entrepreneurship	BT:	Animals
	Technology management		
NT:	Creativity	<b>Insertion loss</b>	
		BT:	Propagation
<b>Inorganic chemicals</b>		RT:	Attenuation
BT:	Chemistry		
<b>Inorganic compounds</b>		<b>Inspection</b>	
BT:	Compounds	BT:	Industry applications
RT:	Metals	RT:	Coordinate measuring
	Organic inorganic hybrid	machines	
materials			Maintenance engineering
<i>Inorganic LEDs</i>			Testing
USE:	Inorganic light emitting	NT:	Automatic optical inspection
diodes		<b>Instant messaging</b>	
<b>Inorganic light emitting diodes</b>		UF:	IM
UF:	Inorganic LEDs	BT:	Electronic messaging
BT:	Light emitting diodes		Internet
<b>Inorganic materials</b>		<i>Instanton vacuum</i>	
BT:	Materials	USE:	Elementary particle vacuum
RT:	Soft electronics		
<i>Inorganic organic hybrid materials</i>		<i>Instruction repertory</i>	
USE:	Organic inorganic hybrid	USE:	Instruction sets
materials		<b>Instruction sets</b>	
<i>Inorganic-organic hybrid materials</i>		UF:	Instruction repertory
USE:	Organic inorganic hybrid	BT:	Program processors
materials		NT:	Out of order
			Prefetching
			Reduced instruction set
		computing	



# 2018 IEEE Thesaurus

## *Instructional aids*

USE: Educational technology

## **Instrument transformers**

BT: Transformers  
RT: Protective relaying  
NT: Voltage transformers

## **Instrumentation and measurement**

NT: Computerized  
instrumentation  
Electric variables  
High energy physics  
instrumentation computing  
Instruments  
Measurement  
Monitoring  
Testing

## *Instrumentation buses*

USE: Field buses

## **Instruments**

BT: Instrumentation and  
measurement  
RT: Design tools  
Measurement  
NT: Compass  
Medical instruments  
Meters  
Microscopy  
Oscilloscopes  
Pressure gauges  
Probes  
Telescopes  
Theodolites  
Tuners

## **Insulated gate bipolar transistors**

BT: Bipolar transistors

## **Insulation**

BT: Dielectrics and electrical  
insulation  
RT: Dielectric breakdown  
Dielectric losses  
Dielectric materials  
Glass  
Insulation life  
Insulation testing  
Oils  
Polymer foams  
Power transformer  
insulation  
Spark gaps

NT: Cable insulation  
Ceramics  
Gas insulation  
Insulators  
Isolation technology  
Oil insulation  
Plastic insulation

## **Insulation life**

BT: Insulation testing  
RT: Aging  
Insulation  
Life estimation  
Partial discharge

## measurement

Trees - insulation

## **Insulation testing**

BT: Insulator testing  
RT: Fault location  
Impulse testing  
Insulation  
Partial discharge  
measurement  
Pulsed electroacoustic

## methods

NT: Insulation life

## **Insulator testing**

BT: Testing  
RT: Insulators  
Surface discharges  
NT: Insulation testing

## **Insulators**

UF: Bushings  
BT: Insulation  
RT: Breakdown voltage  
Ceramic products  
Impact ionization  
Insulator testing  
Polymer foams  
Temperature distribution  
NT: Metal-insulator structures  
Plastic insulators  
Rubber  
Topological insulators  
Trees - insulation

## **Insulin**

BT: Drugs

## **Insulin pumps**

BT: Pumps  
RT: Biomedical equipment



# 2018 IEEE Thesaurus

## Insurance

BT: Financial management

## Intake systems

BT: Machine components

## Integer linear programming

BT: Programming

NT: Constraint theory  
Mixed integer linear

programming

## Integer programming

USE: Linear programming

## Integral equations

UF: Antiderivatives

BT: Calculus

RT: Boundary element methods  
Deconvolution  
Integrodifferential equations  
Inverse problems  
Method of moments  
Numerical analysis

NT: Probability density function

## Integrated circuit design

USE: Integrated circuit synthesis

## Integrated circuit interconnections

BT: Integrated circuits

## Integrated circuit layout

BT: Integrated circuit synthesis

RT: Layout  
Physical design  
Printed circuits

## Integrated circuit manufacture

BT: Components, packaging,  
and manufacturing technology

RT: Gettering  
Integrated circuits  
Microassembly  
Micromachining  
Silicon compiler

NT: Surface-mount technology

## Integrated circuit measurements

BT: Circuit testing

RT: Electric variables

measurement

## Integrated circuit metallisation

USE: Integrated circuit  
metallization

## Integrated circuit metallization

UF: Integrated circuit  
metallisation

BT: Metallization

## Integrated circuit modeling

UF: Integrated circuit modelling

BT: Integrated circuits  
Modeling

NT: Cutoff frequency

## Integrated circuit modelling

USE: Integrated circuit modeling

## Integrated circuit noise

BT: Integrated circuits

RT: Semiconductor device

noise

NT: Threshold voltage  
Optical noise

## Integrated circuit packaging

UF: IC packaging

BT: Components, packaging,  
and manufacturing technology

RT: Chip scale packaging  
Encapsulation  
Integrated circuits  
Plastic packaging  
Semiconductor device

packaging

NT: Multichip modules  
Plastic integrated circuit

packaging

## Integrated circuit reliability

BT: Reliability

RT: Integrated circuit testing  
Thermal stability

## Integrated circuit synthesis

UF: Integrated circuit design

BT: Circuit synthesis  
Integrated circuits

NT: Integrated circuit layout

## Integrated circuit technology

BT: Circuits and systems

RT: High-speed integrated  
circuits

NT: CMOS technology  
Moore's Law



# 2018 IEEE Thesaurus

## Integrated circuit testing

BT: Testing  
RT: Integrated circuit reliability  
NT: Integrated circuit yield  
Logic testing

## Integrated circuit yield

BT: Integrated circuit testing

## Integrated circuits

UF: IC  
ICs  
Microchips  
BT: Circuits  
RT: Active inductors  
Integrated circuit

manufacture

Integrated circuit packaging  
Integrated optoelectronics  
Memory modules  
Microelectronics  
Neural network hardware  
Planarization  
SPICE  
Semiconductor devices  
Semiconductor memory  
Silicon-on-insulator  
NT: Analog integrated circuits  
Analog-digital integrated

circuits

Application specific

integrated circuits

CMOS integrated circuits  
Coprocessors  
Current-mode circuits  
Digital integrated circuits  
FET integrated circuits  
Field programmable gate

arrays

Hybrid integrated circuits  
Integrated circuit

interconnections

Integrated circuit modeling  
Integrated circuit noise  
Integrated circuit synthesis  
Large scale integration  
MESFET integrated circuits  
Microprocessors  
Microwave integrated

circuits

Millimeter wave integrated

circuits

Mixed analog digital

integrated circuits

circuits

Monolithic integrated

Photonic integrated circuits  
Power integrated circuits  
Radiofrequency integrated

circuits

Submillimeter wave

integrated circuits

Superconducting integrated

circuits

Thick film circuits  
Thin film circuits  
Three-dimensional

integrated circuits

Through-silicon vias  
UHF integrated circuits  
Ultra large scale integration  
Very high speed integrated

circuits

Very large scale integration  
Wafer scale integration

## Integrated circuits industry

USE: Electronics industry

## Integrated control

USE: Centralized control

## Integrated design

BT: Design methodology  
Systems engineering and

theory

## Integrated manufacturing systems

BT: Industrial electronics  
Manufacturing systems  
RT: CAD/CAM  
Computer aided

manufacturing

System integration

## Integrated optics

BT: Optics  
RT: Arrayed waveguide gratings  
Distributed Bragg reflectors  
Electrooptic modulators  
Integrated optoelectronics  
Microoptics  
Optical films  
Optical waveguides  
Synapses  
Thermo-optical devices

## Integrated optoelectronics

BT: Optoelectronic devices





# 2018 IEEE Thesaurus

RT: Heterojunction bipolar transistors

Integrated circuits  
Integrated optics  
Liquid crystal on silicon  
Microoptics  
Microwave photonics  
Smart pixels

*Integrated services digital networks*

USE: ISDN

*Integrated services networks*

USE: Intserv networks

## Integrodifferential equations

BT: Equations  
RT: Differential equations  
Integral equations

## Integumentary system

BT: Anatomy  
NT: Hair  
Nails  
Skin

*Intellectual capital*

USE: Knowledge management

## Intellectual property

UF: IP rights  
IPR  
BT: Copyright protection  
RT: Cyberethics  
Notice of Violation  
Patents  
Software protection  
NT: Digital rights management

## Intelligent actuators

UF: Smart actuators  
BT: Actuators

## Intelligent agents

BT: Software agents

## Intelligent control

BT: Cybernetics  
RT: Context awareness  
H infinity control  
Mechatronics  
NT: Feedforward systems  
Neurocontrollers

*Intelligent databases*

USE: Deductive databases

## Intelligent manufacturing systems

BT: Manufacturing systems  
Production systems  
RT: Smart manufacturing

## Intelligent networks

BT: Telecommunication  
network topology  
RT: Software defined  
networking

## Intelligent robots

BT: Intelligent systems  
Robots  
RT: Autonomous robots  
Robot vision systems

## Intelligent sensors

UF: Smart sensors  
BT: Sensors  
RT: Electronic noses  
Mechatronics

## Intelligent structures

UF: Smart structures  
BT: Buildings  
RT: Intelligent systems  
Structural engineering  
NT: Smart cities

## Intelligent systems

BT: Artificial intelligence  
RT: Ambient intelligence  
Automata  
Collaborative intelligence  
Context awareness  
Expert systems  
Hybrid intelligent systems  
Intelligent structures  
Knowledge based systems  
Mobile agents  
Software agents  
NT: Autonomous systems  
Collective intelligence  
Intelligent robots

## Intelligent transportation systems

RT: Smart transportation  
NT: Automated highways  
Autonomous automobiles  
Geographic information

systems

Intelligent vehicles



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# 2018 IEEE Thesaurus

	Navigation Transportation		
<b>Intelligent vehicles</b>		<b>Interface management</b>	
systems	BT: Intelligent transportation	theory	BT: Management Systems engineering and
	RT: Vehicles		RT: Computer interfaces Network interfaces
systems	RT: Advanced driver assistance		
	IEEE 802.11p Standard	<b>Interface phenomena</b>	
	Smart transportation	BT: Computer interfaces	
	Vehicle routing	RT: Adsorption	
	Vehicular automation	NT: Network interfaces	
	Wireless Access in		
Vehicular Environments		<b>Interface states</b>	
NT: Autonomous vehicles		BT: Computer interfaces	
NT: Unmanned vehicles		MOSFET	
		RT: Silicon-on-insulator	
<b>Intensity modulation</b>			
BT: Optical modulation		<b>Interference</b>	
RT: Amplitude modulation		UF: Interference (signal)	
Electrooptic modulators		BT: Electromagnetic	
		compatibility and interference	
<b>Interactive systems</b>		RT: Coherence	
BT: Man-machine systems		Distortion	
RT: Authentication		Diversity schemes	
NT: External stimuli		Noise	
		NT: Clutter	
<i>Intercalibration</i>		Crosstalk	
USE: Calibration		Diffraction	
		Echo interference	
<b>Interchannel interference</b>		Electromagnetic	
UF: Adjacent channel		interference	
interference		interference	Electromagnetic radiative
	Co-channel interference		Electrostatic interference
	Cochannel interference		Interchannel interference
	Intersystem interference		Interference cancellation
BT: Interference			Interference channels
RT: Crosstalk			Interference constraints
			Interference elimination
<b>Interconnected systems</b>			Interference suppression
UF: Composite systems			Intersymbol interference
BT: System analysis and design			Rain fading
RT: Control systems			TV interference
NT: Botnet			Terrain factors
<i>Interconnection networks</i>		<i>Interference (signal)</i>	
USE: Multiprocessor		USE: Interference	
interconnection			
<b>Interest point detection</b>		<b>Interference cancellation</b>	
BT: Computer vision		BT: Interference	
<i>Interest rates</i>		<b>Interference channels</b>	
USE: Economic indicators		BT: Interference	



# 2018 IEEE Thesaurus

## Interference constraints

BT: Interference

UF: TAI

BT: Standards categories

RT: Atomic clocks

## Interference elimination

BT: Interference

## International collaboration

UF: Joint ventures

BT: Management

RT: Environmental factors  
Environmental

## Interference suppression

BT: Interference

management

## Interferometers

UF: Etalons

BT: Interferometry

NT: Mach-Zehnder

interferometers

Globalization

International relations

International trade

Research and development

Social factors

Standards

Trade agreements

## Interferometric lithography

BT: Lithography

## International electrotechnical commission

USE: IEC

## Interferometry

BT: Measurement

RT: Micrometers

Talbot effect

NT: Fabry-Perot

Interferometers

Optical interferometry

Phase shifting

interferometry

## International organization for standardization

USE: ISO

## International relations

BT: Social implications of  
technology

RT: Globalization  
International collaboration  
Social factors

## Interleaved codes

UF: Bit interleaved coded

Bit-interleaved coded

BT: Modulation coding

## International Space Station

BT: Space stations

## International standards organization

USE: ISO

## Intermetallic

BT: Alloying

## International Telecommunications Union

USE: ITU

## Intermodulation distortion

BT: Nonlinear distortion

## International trade

UF: Trade (international)

BT: Economics

RT: Business

Exchange rates

Globalization

International collaboration

Macroeconomics

Trade agreements

## Internal combustion engines

UF: HCCI engines

BT: Engines

RT: Automotive components

Exhaust gases

Hybrid electric vehicles

NT: Diesel engines

Ignition

## Internal stresses

BT: Stress

## Internet

BT: Communication systems

Computer networks

Digital systems

Distributed computing

## International Atomic Time



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# 2018 IEEE Thesaurus

switching	RT:	ARPANET Blogs Cyberspace Diffserv networks Electronic commerce Electronic learning Extranets Google IEEE 802.16 Standard IP networks IPTV Internetworking Intserv networks Multicast protocols Multiprotocol label	BT:	Internet
			RT:	Ambient intelligence Bar codes Cloud computing Cyber-physical systems Machine-to-machine
			communications	Middleware Object detection Protocols Radiofrequency
			identification	Tagging Virtual environments Watermarking Wireless sensor networks Smart cities
			NT:	
			<i>Internet Protocol networks</i>	
			USE:	IP networks
			<i>Internet protocol television</i>	
			USE:	IPTV
			<b>Internet security</b>	
NT:			BT:	Computer security Internet
			RT:	Information security
			<i>Internet services</i>	
			USE:	Web and internet services
			<b>Internet telephony</b>	
			UF:	IP telephony VOIP Voice over IP Voice over Internet protocol Voice-over-Internet protocol
			BT:	Internet
			<b>Internet topology</b>	
			BT:	Internet
			<b>Internetworking</b>	
<i>Internet banking</i>	USE:	Online banking	BT:	Telecommunication
			computing	
			RT:	Computer networks Internet Local area networks Metropolitan area networks Open systems Wide area networks
			NT:	Interoperability LAN interconnection
<i>Internet neutrality</i>	USE:	Network neutrality		
<i>Internet of Everything</i>	USE:	Internet of Things		
<b>Internet of Things</b>	UF:	IOT Internet of Everything		



# 2018 IEEE Thesaurus

## Interoperability

UF: Service composability  
BT: Internetworking  
RT: Collaboration  
Common Information Model

(electricity)

Open systems

## Interplanetary exploration

BT: Space exploration  
RT: Space missions

## Interpolating

USE: Interpolation

## Interpolation

UF: Interpolating  
BT: Approximation methods  
RT: Curve fitting  
Digital-analog conversion  
Radial basis function

networks

Statistics  
Surface fitting

## Interpreters (program)

USE: Program processors

## Interrupters

UF: Interruption  
BT: Switchgear  
RT: Circuit breakers  
Fuses

## Interruption

USE: Interrupters

## Interstellar chemistry

BT: Chemistry  
RT: Extraterrestrial

measurements

## Intersymbol interference

BT: Interference  
RT: AWGN channels  
Equalizers  
Gaussian channels

## Intersystem interference

USE: Interchannel interference

## Interviews

BT: IEEE indexing

## Intestines

BT: Digestive system

## Intracranial pressure sensors

BT: Biomedical equipment  
Sensors  
RT: Brain  
Neural engineering

## Intracranial system

BT: Cranial pressure

## Intrusion detection

BT: Information security  
RT: Network function  
virtualization

## Intserv networks

UF: Integrated services  
networks  
BT: Computer networks  
RT: Internet  
Multimedia communication

## Invasive software

BT: Software  
RT: Computer crime  
Computer security  
Unsolicited electronic mail  
NT: Computer viruses  
Computer worms

## Invention

USE: Technological innovation

## Inventory control

BT: Operations research  
RT: Control systems  
Production control  
Production management

## Inventory management

BT: Production management  
RT: Bar codes  
Production engineering  
NT: Bills of materials

## Inverse distortion

USE: Predistortion

## Inverse method

USE: Inverse problems

## Inverse methods

USE: Inverse problems



# 2018 IEEE Thesaurus

## *Inverse modeling*

USE: Inverse problems

## *Inverse problem*

USE: Inverse problems

## **Inverse problems**

UF: Inverse method  
Inverse methods  
Inverse modeling  
Inverse problem  
Inverse scattering  
BT: Modeling  
RT: Functional analysis  
Image reconstruction  
Integral equations  
Numerical analysis  
Signal reconstruction  
NT: Deconvolution

## *Inverse scattering*

USE: Inverse problems

## **Inverse synthetic aperture radar**

BT: Synthetic aperture radar

## *Inverse transforms*

USE: Laplace equations

## *Inverted classroom*

USE: Education AND  
Online services

## **Inverters**

BT: Power electronics  
RT: Maximum power point

## trackers

Zero current switching  
Zero voltage switching  
NT: Pulse inverters  
Resonant inverters

## **Investment**

BT: Financial management

## **Iodine**

BT: Chemical elements  
NT: Iodine compounds

## **Iodine compounds**

BT: Iodine

## **Ion accelerators**

BT: Particle accelerators  
RT: Ion beam effects

## Ion beams

## Ion sources

## Ions

## Proton accelerators

## **Ion beam applications**

BT: Nuclear and plasma  
sciences  
RT: Ion beams  
NT: Ion implantation

## **Ion beam effects**

BT: Ion beams  
RT: Aerospace safety  
Ion accelerators  
Ion emission

## **Ion beams**

BT: Particle beams  
RT: Electrodynamics  
Ion accelerators  
Ion beam applications  
Ion emission  
Ion sources  
Ions  
NT: Ion beam effects

## **Ion emission**

UF: Field ion emission  
Secondary ion emission  
BT: Nuclear and plasma  
sciences  
RT: Ion beam effects  
Ion beams  
Ion sources  
Ions  
Thermionic emission

## **Ion implantation**

BT: Ion beam applications  
Materials preparation  
RT: Plasma sources  
Semiconductor device  
manufacture  
NT: Plasma immersion ion  
implantation

## *Ion optics*

USE: Particle beam optics

## **Ion radiation effects**

BT: Radiation effects  
RT: Ionizing radiation  
Proton radiation effects



# 2018 IEEE Thesaurus

## Ion sources

BT: Ions  
Nuclear physics  
RT: Ion accelerators  
Ion beams  
Ion emission  
Plasma sources

## Ionisation

USE: Ionization

## Ionisation chambers

USE: Ionization chambers

## Ionising radiation

USE: Ionizing radiation

## Ionization

UF: Ionisation  
Photoionisation  
Photoionization  
BT: Ions  
RT: Discharges (electric)  
Plasmas  
Space radiation  
NT: Impact ionization  
Ionization chambers  
Ionizing radiation  
Single event transients  
Single event upsets

## Ionization chambers

UF: Ionisation chambers  
BT: Ionization  
RT: Ionizing radiation  
Smoke detectors

## Ionizing radiation

UF: Ionising radiation  
BT: Ionization  
RT: Ion radiation effects  
Ionization chambers  
Radiation hardening

(electronics)

Silicon radiation detectors

## Ionizing radiation sensors

BT: Sensors  
NT: Position sensitive particle

detectors

Radiation detectors  
X-ray detectors

## Ionomeric polymer-metal composite actuators

USE: Actuators

## Ionosphere

BT: Terrestrial atmosphere  
RT: Meteorology  
Plasmas

## Ions

BT: Elementary particles  
RT: Alpha particles  
Elementary particle

## exchange interactions

Ion accelerators  
Ion beams  
Ion emission  
Protons  
Storage rings  
NT: Ion sources  
Ionization

## IOT

USE: Internet of Things

## IP

USE: IP networks

## IP networks

UF: IP  
IP-networks  
Internet Protocol networks  
BT: Communication systems  
Computer networks  
Telecommunications  
RT: IPTV  
Internet  
Machine-to-machine

## communications

Next generation networking  
Quality of service  
Transport protocols  
NT: TCP/IP

## IP rights

USE: Intellectual property

## IP telephony

USE: Internet telephony

## IP-networks

USE: IP networks

## iPOD

USE: Portable media players

## IPR

USE: Intellectual property



# 2018 IEEE Thesaurus

## IPTV

UF: Internet protocol television  
BT: Digital TV  
RT: Broadband communication  
Computer networks  
IP networks  
Internet  
Local area networks  
Protocols  
Streaming media

## IR Spectra

USE: Infrared spectra

## IRE Standards

BT: IEEE Standards

## Iridium

BT: Chemical elements

## Iris

BT: Eyes

## Iris recognition

BT: Biometrics (access control)

## Irises

USE: Waveguide discontinuities

## Iron

UF: Fe  
BT: Metals  
NT: Cast iron  
Iron alloys

## Iron alloys

BT: Iron  
RT: Alloying  
Metallurgy  
NT: Austenite

## Irradiation

USE: Radiation effects

## Irrigation

BT: Agriculture  
RT: Agricultural products  
Crops  
Hydraulic systems

## Irtran 5

USE: Magnesium oxide

## Ischemic pain

BT: Pain

## ISDN

UF: Integrated services digital networks  
BT: Communication systems  
Digital communication  
Digital systems  
RT: Asynchronous transfer mode  
Data communication  
Frame relay  
Image communication  
Multimedia communication  
B-ISDN  
NT:

## Ishikawa diagrams

USE: Cause effect analysis

## Islanding

BT: Power supplies  
RT: Electrical safety  
Generators

## ISO

UF: International organization for standardization  
International standards  
organization  
BT: Standards organizations  
RT: Communication standards  
Guidelines  
ISO Standards  
Measurement standards  
Software standards  
Standardization  
Standards  
NT: Moving Pictures Experts Group

## ISO 9000

USE: Quality management

## ISO Standards

UF: X3D  
BT: Standards publications  
RT: ANSI Standards  
Communication standards  
ISO  
Quality management  
Software standards  
Standardization  
NT: MPEG standards

## Isobaric



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# 2018 IEEE Thesaurus

BT:	Thermodynamics		
<b>Isolation technology</b>		ITU	
BT:	Insulation	UF:	International
RT:	Vibration control	Telecommunications Union	
		BT:	Standards organizations
<b>Isolators</b>		<b>ITU Standards</b>	
BT:	Circuits	BT:	Standards publications
		RT:	UHDTV
<b>Isosurfaces</b>		<i>Jacks</i>	
BT:	Data visualization	USE:	Lifting equipment
RT:	Biomedical imaging		
	Computational fluid		
dynamics		<b>Jacobian matrices</b>	
<b>Isothermal processes</b>		UF:	Jacobian matrix
BT:	Thermodynamics	BT:	Matrices
<b>Isotopes</b>		<i>Jacobian matrix</i>	
BT:	Chemical elements	USE:	Jacobian matrices
	Nuclear physics		
RT:	Radioactive materials	<b>Jamming</b>	
<b>Itemsets</b>		BT:	Electronic warfare
BT:	Data analysis	RT:	Electronic countermeasures
	Transaction databases		Radar clutter
			Radar countermeasures
			Radio communication
<b>Iterative algorithms</b>		countermeasures	
BT:	Iterative methods	<b>Java</b>	
NT:	Belief propagation	BT:	High level languages
	Iterative closest point		
algorithm		<b>Jet engines</b>	
	Sum product algorithm	BT:	Engines
		RT:	Aircraft propulsion
<b>Iterative closest point algorithm</b>			Exhaust gases
UF:	ICP		Fans
BT:	Iterative algorithms	<b>JFET circuits</b>	
<b>Iterative decoding</b>		BT:	FET circuits
BT:	Parity check codes	NT:	JFET integrated circuits
<b>Iterative learning control</b>		<b>JFET integrated circuits</b>	
BT:	Control theory	BT:	JFET circuits
	Iterative methods	RT:	JFETs
RT:	Adaptive control	<b>JFETs</b>	
	Learning systems	UF:	Junction FETs
	Tracking	BT:	Field effect transistors
		RT:	JFET integrated circuits
<b>Iterative methods</b>		<i>Jigs</i>	
BT:	Mathematics	USE:	Fixtures
	Numerical analysis		
NT:	Expectation-maximization	<b>Jitter</b>	
algorithms		BT:	Distortion
	Iterative algorithms		
	Iterative learning control		



# 2018 IEEE Thesaurus

RT: Circuit stability  
NT: Timing jitter

## Job design

BT: Ergonomics

## Job production systems

UF: Bespoke production  
BT: Manufacturing systems

## Job rotation

USE: Multiskilling

## Job shop scheduling

BT: Scheduling  
RT: Genetic algorithms

## Job specification

BT: Human resource  
management  
RT: Multiskilling  
Recruitment

## Jobs listings

BT: Career development  
RT: Employment

## Johnson Nyquist noise

USE: Thermal noise

## Joining materials

BT: Production materials  
RT: Joining processes  
Soldering equipment  
NT: Filler metals  
Sealing materials

## Joining processes

UF: Connecting  
Coupling (process)  
Fastening  
Linking  
BT: Manufacturing systems  
Materials processing  
RT: Couplings  
Fasteners  
Joining materials  
Plasma welding  
Soldering equipment  
NT: Bonding processes  
Crimping  
Soldering  
Splicing  
Welding

## Joint ventures

USE: International collaboration

## Joints

BT: Skeleton

## Josephson devices

USE: Superconducting devices

## Josephson effect

BT: Tunneling  
RT: Josephson junctions

## Josephson junctions

UF: Josephson logic  
Superconducting junction  
devices  
BT: Superconducting devices  
RT: Josephson effect

## Josephson logic

USE: Josephson junctions

## JPEG

USE: Transform coding

## JPEG2000

USE: Transform coding

## Judd-Ofelt theory

BT: Spectral analysis  
RT: Fluorescence  
Photoluminescence

## Junction detectors

USE: Semiconductor counters

## Junction FETs

USE: JFETs

## Junction lasers

USE: Semiconductor lasers

## Junctionless nanowire transistors

BT: MOSFET  
Nanoelectronics  
RT: Nanowires  
Silicon-on-insulator

## Junctions

BT: Semiconductor devices  
NT: Heterojunctions  
Hybrid junctions  
P-n junctions  
Waveguide junctions



# 2018 IEEE Thesaurus

<i>Junk e-mail</i>		<b>Kerr effect</b>	
USE:	Unsolicited electronic mail	BT:	Electrooptic effects
		RT:	Magneto optic effects
<i>Junk email</i>		<b>Keyboards</b>	
USE:	Unsolicited electronic mail	BT:	Computer peripherals
		RT:	Ergonomics
<b>Jupiter</b>		<b>Keyways</b>	
BT:	Planets	BT:	Plugs
<i>k neighbor methods</i>		<b>Keyword search</b>	
USE:	Nearest neighbor methods	UF:	Keyword searches
<i>k neighbour methods</i>			Keyword searching
USE:	Nearest neighbor methods	BT:	Search methods
		RT:	Indexing
<b>K-band</b>		<i>Keyword searches</i>	
BT:	Microwave bands	USE:	Keyword search
<i>K-NN methods</i>		<i>Keyword searching</i>	
USE:	Nearest neighbor methods	USE:	Keyword search
<i>Kaizen</i>		<b>Kidney</b>	
USE:	Continuous improvement	BT:	Urogenital system
<i>Kalman filtering</i>		NT:	Kidney stones
USE:	Kalman filters	<b>Kidney stones</b>	
<b>Kalman filters</b>		UF:	Renal calculi
UF:	Kalman filtering		Urinary calculus
BT:	Filters	BT:	Kidney
RT:	Estimation		Medical conditions
	Nonlinear dynamical	RT:	Lithotripsy
systems		<b>Kilns</b>	
	Prediction methods	BT:	Furnaces
	Sensor fusion	RT:	Calcination
<i>Kaons</i>			Curing
USE:	Mesons		Firing
			Heat treatment
<b>Karhunen-Loeve transforms</b>		<i>Kindle</i>	
BT:	Transforms	USE:	Consumer electronics AND
<i>KBO</i>			Electronic publishing
USE:	Kuiper belt	<i>Kinematic analysis</i>	
<b>Kelvin</b>		USE:	Kinematics
BT:	Temperature measurement	<i>Kinematic faults</i>	
<b>Kernel</b>		USE:	Kinematics
BT:	Mathematics	<i>Kinematic model</i>	
	Operating systems	USE:	Kinematics
NT:	Null space	<i>Kinematic noise</i>	
	System kernels		



# 2018 IEEE Thesaurus

USE: Kinematics

## Kinematics

UF: Kinematic analysis  
Kinematic faults  
Kinematic model  
Kinematic noise  
BT: Mechanical factors  
NT: Motor coordination

## Kinetic energy

BT: Kinetic theory  
RT: Mechanical energy  
Potential energy  
Thermal energy

## Kinetic molecular theory

USE: Kinetic theory

## Kinetic theory

UF: Collision theory  
Kinetic molecular theory  
Kinetic-molecular theory  
Kinetics  
BT: Motion control  
Physics  
NT: Kinetic energy

## Kinetic-molecular theory

USE: Kinetic theory

## Kinetics

USE: Kinetic theory

## Kirchhoff approximation

USE: Kirchhoff's Law

## Kirchhoff current law

USE: Kirchhoff's Law

## Kirchhoff scattering

USE: Kirchhoff's Law

## Kirchhoff's Law

UF: Kirchhoff approximation  
Kirchhoff current law  
Kirchhoff scattering  
BT: Spectroscopy

## Kirk effect

USE: Kirk field collapse effect

## Kirk field collapse effect

UF: Kirk effect  
BT: Bipolar transistors

## Klystrons

UF: Gyroklystrons  
BT: Electron tubes  
RT: Amplifiers  
Cavity resonators  
Colliding beam accelerators  
Oscillators  
Relativistic effects

## Knee

BT: Extremities

## Knee joint replacements

USE: Prosthetics

## Knitted fabric composites

USE: Fabrics

## Knowledge acquisition

BT: Knowledge engineering  
RT: Context awareness  
Econophysics  
Expert systems  
Knowledge based systems  
Self-organizing feature

maps

## Knowledge based systems

UF: Knowledge systems  
Knowledge-based systems  
Rule based systems  
BT: Artificial intelligence  
RT: Decision support systems  
Deductive databases  
Intelligent systems  
Knowledge acquisition  
Knowledge representation  
Linked data  
Software agents  
NT: Expert systems  
Mobile agents

## Knowledge discovery

BT: Knowledge engineering  
RT: Data mining  
Data science  
Information retrieval  
Knowledge management

## Knowledge engineering

BT: Artificial intelligence  
RT: Knowledge management  
NT: Inference mechanisms  
Knowledge acquisition



# 2018 IEEE Thesaurus

Knowledge discovery		L-band	
Knowledge representation		BT:	Microwave bands
<b>Knowledge management</b>		<b>Lab-on-a-chip</b>	
UF:	Intellectual capital	BT:	System-on-chip
BT:	Computer applications	<i>Label swapping</i>	
	Management	USE:	Multiprotocol label
RT:	Competitive intelligence	switching	
	Information management	<b>Labeling</b>	
	Knowledge discovery	UF:	Labelling
	Knowledge engineering	BT:	Packaging
	Management information	RT:	Applicators
systems			Packaging machines
NT:	Semantic Web	<i>Labelling</i>	
	Knowledge transfer	USE:	Labeling
<b>Knowledge representation</b>		<i>Labor productivity</i>	
BT:	Knowledge engineering	USE:	Productivity
RT:	Expert systems	<b>Labor resources</b>	
	Formal concept analysis	UF:	Labor supply
	Knowledge based systems		Labour resources
	Linked data		Labour supply
	OWL		Manpower planning
NT:	Description logic	BT:	Human resource
	Ontologies	management	
	Thesauri	RT:	Personnel
<i>Knowledge systems</i>			Equal opportunities
USE:	Knowledge based systems		Recruitment
<b>Knowledge transfer</b>		<i>Labor supply</i>	
BT:	Information management	USE:	Labor resources
	Knowledge management	<b>Laboratories</b>	
<i>Knowledge-based systems</i>		BT:	Test facilities
USE:	Knowledge based systems	RT:	Engineering education
<i>Kohonen maps</i>			Research and development
USE:	Self-organizing feature		Student experiments
maps		NT:	Remote laboratories
<b>Krypton</b>		<i>Labour productivity</i>	
BT:	Chemical elements	USE:	Productivity
<b>Kuiper belt</b>		<i>Labour resources</i>	
UF:	KBO	USE:	Labor resources
	Kuiper belt objects	<i>Labour supply</i>	
	Kuiper belts	USE:	Labor resources
BT:	Solar system	<i>Lacquers</i>	
<i>Kuiper belt objects</i>		BT:	Chemical products
USE:	Kuiper belt		
<i>Kuiper belts</i>			
USE:	Kuiper belt		



# 2018 IEEE Thesaurus

	Coatings	BT:	Optical fiber networks
	Materials		
RT:	Paints	<b>LAN interconnection</b>	
<i>Lagrange duality</i>		BT:	Internetworking
USE:	Lagrangian functions	RT:	Computer networks
			Local area networks
<i>Lagrange functions</i>			Metropolitan area networks
USE:	Lagrangian functions		Wide area networks
			Wireless LAN
<i>Lagrange relaxation</i>		<i>Land mine detection</i>	
USE:	Lagrangian functions	USE:	Landmine detection
<b>Lagrangian functions</b>		<i>Land mines</i>	
UF:	Lagrange duality	USE:	Landmine detection
	Lagrange functions		
	Lagrange relaxation	<b>Land mobile radio</b>	
BT:	Quantum mechanics	UF:	Land-mobile radio
			Mobile radio
<b>Lakes</b>		BT:	Mobile communication
BT:	Geoscience		Radio communication
RT:	Reservoirs	RT:	5G mobile communication
	Rivers		Ad hoc networks
	Sediments		Bluetooth
	Water		Channel estimation
	Water pollution		Indoor navigation
	Water resources		Land mobile radio
	Water storage	equipment	
	Wetlands		Location awareness
			Mobile antennas
<b>Laminates</b>			Mobile handsets
BT:	Materials		Multiuser detection
RT:	Lamination		Personal area networks
			Radio access networks
<b>Lamination</b>			Routing protocols
BT:	Materials processing		Software radio
RT:	Laminates	NT:	Land mobile radio cellular
		systems	
<b>Lamps</b>		<b>Land mobile radio cellular systems</b>	
BT:	Lighting	UF:	Cellular land mobile radio
RT:	Light sources		Cellular radio
	Lighting control		Land-mobile radio cellular
	Ultraviolet sources	systems	
NT:	Discharge lamps		
	Electrodeless lamps	BT:	Land mobile radio
	Filament lamps	RT:	3G mobile communication
	Fluorescent lamps		4G mobile communication
	LED lamps		5G mobile communication
			Bluetooth
<i>LAN</i>			Channel estimation
USE:	Local area networks		Code division multiplexing
			Cross layer design
<b>LAN emulation</b>			Digital multimedia
UF:	Local area network	broadcasting	
emulation			Downlink



# 2018 IEEE Thesaurus

resonators	Film bulk acoustic	RT:	Global Positioning System
	Location awareness		Land vehicles
	Multiuser detection	NT:	Rail transportation
	Network resource		Road transportation
management	Personal communication	<b>Land use planning</b>	
networks	Software radio	BT:	Environmental
	Time division synchronous	management	
code division multiple access		RT:	Floods
NT:	Cellular networks		Land pollution
	Paging strategies		Reservoirs
			Water storage
<b>Land mobile radio equipment</b>		<b>Land vehicles</b>	
UF:	Land-mobile radio	UF:	Flexible fuel vehicles
equipment			Ground vehicles
BT:	Radio communication	BT:	Vehicles
equipment		RT:	Land transportation
	Vehicular and wireless		Rail transportation
technologies		NT:	Bicycles
RT:	Land mobile radio		Electric vehicles
	Telephone equipment		Road vehicles
	Transceivers		
NT:	Mobile antennas	<i>Land-mobile radio</i>	
		USE:	Land mobile radio
<b>Land pollution</b>		<i>Land-mobile radio cellular systems</i>	
BT:	Pollution	USE:	Land mobile radio cellular
RT:	Industrial pollution	systems	
	Land use planning	<i>Land-mobile radio equipment</i>	
	Oil pollution	USE:	Land mobile radio
	Radioactive pollution	equipment	
NT:	Soil pollution		
<b>Land surface</b>		<b>Landmine detection</b>	
BT:	Geoscience	UF:	Land mine detection
RT:	Land surface temperature		Land mines
			Landmines
<b>Land surface temperature</b>		BT:	Buried object detection
UF:	Ground temperature	RT:	Military equipment
	Land temperature		Radar imaging
BT:	Geoscience and remote		Remote sensing
sensing		<i>Landmines</i>	
RT:	Global warming	USE:	Landmine detection
	Land surface		
	Ocean temperature	<b>Lanthanum</b>	
	Remote sensing	BT:	Metals
<i>Land temperature</i>		NT:	Lanthanum compounds
USE:	Land surface temperature	<b>Lanthanum compounds</b>	
		BT:	Lanthanum
<b>Land transportation</b>		<b>Laparoscopes</b>	
UF:	Ground transportation	BT:	Surgical instruments
	Planetary landers		
BT:	Transportation		



# 2018 IEEE Thesaurus

RT: Minimally invasive surgery	<i>Large-screen displays</i>
<i>Laparoscopic surgery</i>	USE: Large screen displays
USE: Minimally invasive surgery	<b>Larynx</b>
<b>Laplace equations</b>	UF: Voice tract
UF: Inverse transforms	BT: Respiratory system
Laplace operator	<b>Laser ablation</b>
Laplace transform	BT: Laser applications
Laplacian	<b>Laser applications</b>
BT: Mathematics	BT: Lasers
<i>Laplace operator</i>	RT: CD recording
USE: Laplace equations	Endoscopes
<i>Laplace transform</i>	Gyroscopes
USE: Laplace equations	Heating systems
<i>Laplacian</i>	Holography
USE: Laplace equations	Measurement by laser
<b>Lapping</b>	beam
BT: Machining	Optical recording
RT: Surface finishing	Photoacoustic effects
<i>Laptops</i>	Stereolithography
USE: Microcomputers AND	NT: Dark states
Portable computers	Distributed feedback
<b>Large Hadron Collider</b>	devices
UF: LHC	Laser ablation
BT: Test facilities	Laser beam cutting
RT: Particle accelerators	Laser fusion
<b>Large scale integration</b>	Laser theory
UF: LSI	Magneto optic recording
Large-scale integration	<b>Laser beam cutting</b>
BT: Circuits	BT: Laser applications
Integrated circuits	<b>Laser beams</b>
NT: Ultra large scale integration	UF: Laser guide stars
Very large scale integration	BT: Beams
Wafer scale integration	RT: Bragg gratings
<b>Large screen displays</b>	Electrooptic modulators
UF: Large-screen displays	Laser theory
BT: TV equipment	Lasers
<i>Large-scale integration</i>	Optical beams
USE: Large scale integration	Optical vortices
<b>Large-scale systems</b>	Refractive index
BT: System analysis and design	Supercontinuum generation
RT: Complex systems	Thermal lensing
Fuzzy systems	<b>Laser cavity resonators</b>
<i>Laser diodes</i>	BT: Cavity resonators
USE: Diode lasers AND	RT: Optical resonators
Semiconductor lasers	Surface emitting lasers





# 2018 IEEE Thesaurus

## Laser excitation

UF: Electron beam pumping  
Excitation of lasers  
Pumping of lasers  
BT: Lasers  
NT: Optical pumping

## Laser feedback

BT: Laser noise

## Laser fusion

BT: Laser applications

## Laser guide stars

USE: Laser beams

## Laser mode locking

BT: Laser modes

## Laser modes

BT: Lasers  
NT: Laser mode locking

## Laser noise

BT: Noise  
Optical signal processing  
RT: Lasers and electrooptics  
NT: Laser feedback

## Laser physics

USE: Laser theory

## Laser radar

UF: Lidar  
Optical radar  
BT: Radar  
RT: Geophysical measurement

## techniques

Optical scattering

## Laser science

USE: Laser theory

## Laser sintering

UF: Selective laser sintering  
BT: Materials preparation  
RT: Design automation  
Prototypes  
Stereolithography

## Laser stability

BT: Lasers  
RT: Stability analysis

## Laser surgery

BT: Surgery

## Laser theory

UF: Laser physics  
Laser science  
BT: Laser applications  
RT: Laser beams  
Lasers  
Optical beams  
Optical design  
Optics  
Particle beams  
Quantum mechanics

## Laser transitions

BT: Lasers

## Laser tuning

BT: Semiconductor lasers  
Tuning  
RT: Optical tuning

## Laser velocimetry

BT: Measurement by laser beam

## Lasers

UF: Infrared lasers  
BT: Lasers and electrooptics  
RT: Laser beams  
Laser theory  
Light sources  
Optical distortion  
Oscillators  
Stereolithography  
Stimulated emission  
Superluminescent diodes  
Threshold current  
Ultraviolet sources  
Waveguide lasers  
NT: Atom lasers  
Chemical lasers  
Diode lasers  
Free electron lasers  
Gas lasers  
Laser applications  
Laser excitation  
Laser modes  
Laser stability  
Laser transitions  
Power lasers  
Pump lasers  
Quantum well lasers  
Ring lasers



# 2018 IEEE Thesaurus

Semiconductor lasers  
Solid lasers  
Surface emitting lasers  
X-ray lasers

RT: Censorship  
Image forensics  
Legal factors

## Lasers and electrooptics

RT: Erbium  
Laser noise  
NT: Electrooptic devices  
Electrooptic effects  
Lasers  
Optics  
Optoelectronic devices  
Photonics

## Latches

BT: Bistable circuits

## Lattice Boltzmann

USE: Lattice Boltzmann methods

## Lattice Boltzmann methods

UF: Lattice Boltzmann  
BT: Boltzmann distribution  
Lattices  
RT: Fluid dynamics

## Lattices

UF: Optical lattices  
BT: Mathematics  
NT: Lattice Boltzmann methods

## Launching (electromagnetic)

USE: Electromagnetic launching

## Launching (electrothermal)

USE: Electrothermal launching

## Law

UF: Legal aspects  
BT: Legal factors  
NT: Censorship  
Commercial law  
Consumer protection  
Contract law  
Criminal law  
Employment law  
Forensics  
Law enforcement  
Patent law  
Trademarks

## Law enforcement

UF: Police  
BT: Law

## Layered manufacturing

BT: Manufacturing systems  
RT: Computational geometry  
Stereolithography

## Layered media

USE: Nonhomogeneous media

## Layout

BT: Graphics  
RT: Art  
Geometry  
Integrated circuit layout  
Wiring

## LCD

USE: Liquid crystal displays

## LCDs

USE: Liquid crystal displays

## Lcos

USE: Liquid crystal on silicon

## LDPA

USE: Log-periodic dipole

## antennas

## LDPC

USE: Parity check codes

## Ldpc codes

USE: Parity check codes

## Leaching

BT: Chemical processes

## Lead

UF: Pb  
BT: Metals  
RT: Graphite  
Lead compounds  
NT: Lead isotopes

## Lead acid batteries

BT: Batteries

## Lead compounds

BT: Compounds  
RT: Lead



# 2018 IEEE Thesaurus

## Lead isotopes

BT: Lead

Management  
Training

## Lead time reduction

BT: Production management  
RT: Production planning  
Project management

## Learning mechanisms

USE: Learning systems

## Learning methods

USE: Learning systems

## Leak detection

BT: Sensor systems and  
applications  
RT: Packaging  
Testing  
Vacuum systems

## Learning systems

UF: Learning mechanisms  
Learning methods  
Learning-based method  
BT: Artificial intelligence  
RT: Adaptive systems  
Context awareness  
Cybernetics  
Inference mechanisms  
Iterative learning control  
Mobile agents  
Pattern recognition  
Software agents  
White matter  
NT: Backpropagation  
Cognitive systems  
Learning automata  
Learning management

## Leakage currents

UF: Gate leakage current  
BT: Current  
RT: Electron traps  
Fault currents  
NT: Gate leakage

## Leaky wave antennas

UF: Leaky-wave antennas  
BT: Antennas

## Leaky-wave antennas

USE: Leaky wave antennas

systems

## Lean production

BT: Manufacturing systems  
Production systems  
RT: Production management

Semisupervised learning  
Supervised learning  
Unsupervised learning

## Learning-based method

USE: Learning systems

## Learning (artificial intelligence)

UF: Reinforcement learning  
BT: Artificial intelligence  
RT: Gaussian processes  
Image annotation  
NT: Distance learning  
Electronic learning  
Nearest neighbor methods

## Least mean squares methods

BT: Least squares  
approximation  
Mean square error methods

## Learning automata

UF: Learning automaton  
BT: Learning systems

## Least squares approximation

BT: Numerical analysis  
RT: Approximation methods  
Curve fitting  
Mean square error methods  
Optimization  
Recursive estimation  
NT: Least mean squares

## Learning automaton

USE: Learning automata

methods

## Learning management systems

BT: Computer aided instruction  
Learning systems  
RT: Computer applications  
Electronic learning

## LED

USE: Light emitting diodes

## LED lamps



# 2018 IEEE Thesaurus

lamps  
UF: AC light emitting diode  
AC-LED lamps  
Light emitting diode lamps  
BT: Lamps  
Light emitting diodes  
RT: Light sources

*LEDs*  
USE: Light emitting diodes

*Left handed materials*  
USE: Metamaterials

*Left-handed materials*  
USE: Metamaterials

**Leg**  
BT: Extremities

*Legal aspects*  
USE: Law

**Legal factors**  
BT: Engineering management  
RT: Censorship  
Ethical aspects  
Governmental factors  
IEEE Corporate activities  
Law enforcement  
NT: Copyright protection  
Law  
Patents  
Product liability  
Software protection  
Trademarks

**Legged locomotion**  
UF: Biped locomotion  
Gait assessment  
Gait control  
Gait disorders  
Walking  
BT: Mobile robots  
RT: Biological control systems  
Control systems  
Motion control

**Legislation**  
BT: Government

**Length measurement**  
BT: Measurement  
RT: Micrometers  
Size measurement

*Lens*  
USE: Lenses

**Lenses**  
UF: Lens  
BT: Optical devices  
RT: Focusing  
Optical materials

*LEO*  
USE: Low earth orbit satellites

**Lesions**  
BT: Tumors  
NT: Tissue damage

**Levee**  
UF: Dike  
Levee system  
BT: Geoscience

*Levee system*  
USE: Levee

**Level control**  
UF: Liquid level control  
BT: Mechanical variables  
control  
NT: Gyroscopes

**Level measurement**  
UF: Liquid level measurement  
BT: Geodesy

**Level set**  
BT: Calculus  
RT: Gradient methods

*Levels, energy*  
USE: Energy states

**Levitation**  
BT: Physics  
NT: Electrostatic levitation  
Magnetic levitation

*LF noise*  
USE: Low-frequency noise

*LHC*  
USE: Large Hadron Collider

*Li*  
USE: Lithium



# 2018 IEEE Thesaurus

<i>li-fi</i>	USE: Light fidelity	UF: Lifetime measurement Lifetime tests BT: Measurement
<i>Li-ion batteries</i>	USE: Lithium-ion batteries	<i>Lifetime measurement</i> USE: Lifetime estimation
<b>Libraries</b>	BT: Information services NT: Software libraries	<i>Lifetime tests</i> USE: Lifetime estimation
<i>Licence</i>	USE: Licenses	<i>lifi</i> USE: Light fidelity
<b>Licenses</b>	UF: Licence Licensing BT: Contracts	<b>Lifting equipment</b> UF: Hoists Jacks BT: Materials handling equipment RT: Freight handling Materials handling Pulleys Winches NT: Cranes
<i>Licensing</i>	USE: Licenses	<b>Ligaments</b> BT: Musculoskeletal system
<i>Licensing (nuclear facilities)</i>	USE: Nuclear facility regulation	<i>Light attenuation</i> USE: Attenuation
<i>Lidar</i>	USE: Laser radar	<b>Light deflectors</b> BT: Optical devices RT: Bragg gratings
<b>Life estimation</b>	UF: Accelerated testing BT: Estimation RT: Aging Failure analysis Fatigue Insulation life	<i>Light emitters</i> USE: Light emitting diodes
<i>Life long learning</i>	USE: Continuing professional development	<i>Light emitting diode lamps</i> USE: LED lamps
<b>Life sciences</b>	UF: Computational life sciences BT: Science - general RT: Animals Biology Plants (biology)	<b>Light emitting diodes</b> UF: LED LEDs Light emitters Light-emitting diodes BT: Optoelectronic devices RT: Microcavities Molecular beam applications P-n junctions Visible light communication NT: Inorganic light emitting diodes LED lamps
<i>Life sciences computing</i>	USE: Computational modeling	
<b>Life testing</b>	BT: Testing RT: Reliability	
<b>Lifetime estimation</b>		



# 2018 IEEE Thesaurus

diodes	Organic light emitting	Fast light	
	Superluminescent diodes	Luminescent devices	
<b>Light fidelity</b>		Phosphors	
		Slow light	
		Stray light	
	UF:	Superluminescent diodes	
		Ultraviolet sources	
	li-fi		
	lifi		
	BT:	Wireless LAN	
	RT:	High-speed optical	
techniques		<b>Light trapping</b>	
		UF:	Plasmonic solar cells
		BT:	Photovoltaic cells
		RT:	Reflectivity
		<i>Light-emitting diodes</i>	
		USE:	Light emitting diodes
		<b>Lighting</b>	
		UF:	Arc lamps
<i>Light interferometry</i>			Illumination
USE:	Optical interferometry		
		BT:	Optical devices
<i>Light polarisation</i>		RT:	Building services
USE:	Optical polarization		Buildings
			Filament lamps
<i>Light polarization</i>			Fluorescent lamps
USE:	Optical polarization		Gas discharge devices
			High intensity discharge
<b>Light rail systems</b>		lamps	
UF:	Light railways		Light sources
	Streetcars		Lighting control
BT:	Rail transportation		Photometry
RT:	Public transportation		Visible light communication
		NT:	Daylighting
<i>Light railways</i>			Electrical ballasts
USE:	Light rail systems		Emergency lighting
			Lamps
			Solid state lighting
<b>Light scattering</b>			
BT:	Scattering		
RT:	Optical scattering	<b>Lighting control</b>	
	Resonance light scattering	UF:	Illumination control
		BT:	Optical control
<b>Light sources</b>		RT:	High intensity discharge
BT:	Optics	lamps	
RT:	Arc discharges		Lamps
	Glow discharge devices		Light sources
	High intensity discharge		Lighting
lamps			
	LED lamps	<b>Lightning</b>	
	Lamps	BT:	Meteorology
	Lasers	RT:	Dielectric breakdown
	Lighting		Electrostatic processes
	Lighting control		Storms
	Photometry	NT:	Lightning protection
	Supercontinuum generation		
	Synchrotron radiation		
	Electroluminescent devices	<b>Lightning protection</b>	
NT:		BT:	Lightning



# 2018 IEEE Thesaurus

	Protection	BT:	Algebra
		RT:	Eigenvalues and
<b>Lightweight structures</b>		eigenfunctions	
BT:	Structural shapes	NT:	Linear programming
RT:	Aerospace engineering		Matrices
	Aerospace industry		Vectors
	Aerospace materials		
	Honeycomb structures	<b>Linear antenna arrays</b>	
	Metal foam	BT:	Antenna arrays
	Sandwich structures		
	Thin wall structures	<b>Linear approximation</b>	
<b>Limbic system</b>		BT:	Approximation methods
BT:	Brain	RT:	Nonlinear equations
			Nonlinear systems
<i>Limit cycle</i>		<b>Linear circuits</b>	
USE:	Limit-cycles	BT:	Circuits
		RT:	Ohmic contacts
<i>Limit-cycle</i>		<b>Linear codes</b>	
USE:	Limit-cycles	BT:	Block codes
		RT:	Error correction
<b>Limit-cycles</b>		<b>Linear discriminant analysis</b>	
UF:	Limit cycle	UF:	Linear discriminant
	Limit-cycle	classification	
BT:	Mathematics	BT:	Statistics
		RT:	Machine learning
<b>Limiting</b>		<i>Linear discriminant classification</i>	
BT:	Signal processing	USE:	Linear discriminant analysis
RT:	Nonlinear distortion		
	Voltage control	<b>Linear feedback control systems</b>	
<i>Linac</i>		BT:	Control systems
USE:	Linear particle accelerator		Cybernetics
		RT:	Linear systems
<i>LINACS</i>		NT:	Frequency locked loops
USE:	Linear accelerators		Phase locked loops
			State feedback
<b>Line enhancers</b>			Tracking loops
BT:	Adaptive systems	<b>Linear feedback shift registers</b>	
RT:	Digital filters	BT:	Shift registers
	Filtering theory		
<i>Line output transformer</i>		<i>Linear filtering</i>	
USE:	Flyback transformers	USE:	Maximum likelihood
		detection	
<b>Line-of-sight propagation</b>		<i>Linear frequency modulation</i>	
BT:	Electromagnetic radiation	USE:	Chirp modulation
		<i>Linear integrated circuits</i>	
<b>Linear accelerators</b>		USE:	Analog integrated circuits
UF:	LINACS		
BT:	Particle accelerators	<b>Linear matrix inequalities</b>	
RT:	Collimators		
<b>Linear algebra</b>			
UF:	Linear systems (algebraic)		



# 2018 IEEE Thesaurus

BT: Mathematics  
RT: Linear systems  
Uncertain systems

*Linear parameter varying systems*  
USE: Linear systems

## Linear particle accelerator

UF: Linac  
Particle accelerator  
BT: High energy physics  
instrumentation computing

## Linear predictive coding

BT: Prediction methods

## Linear programming

UF: Integer programming  
Linear-programming  
BT: Linear algebra  
RT: Algorithms  
Microeconomics  
Operations research  
Optimization methods  
NT: Data envelopment analysis

## Linear regression

BT: Regression analysis  
NT: Maximum likelihood linear  
regression

## Linear systems

UF: Linear parameter varying  
systems  
BT: Mathematics  
RT: Control systems  
Linear feedback control  
systems  
Linear matrix inequalities  
Principal component  
analysis  
Transfer functions

*Linear systems (algebraic)*  
USE: Linear algebra

*Linear-programming*  
USE: Linear programming

*Linearisation techniques*  
USE: Linearization techniques

## Linearity

BT: Electromagnetic  
measurements

## Linearization techniques

UF: Linearisation techniques  
BT: Mathematics  
RT: Control system synthesis  
Control systems  
MOSFET circuits  
Modulation  
Operational amplifiers  
Transmitters

## Linguistic indexing

USE: Image annotation

## Linguistics

USE: Pragmatics

## Linkages

USE: Couplings

## Linked data

BT: Internet  
RT: Big Data  
Database systems  
Knowledge based systems  
Knowledge representation  
Metadata  
NoSQL databases  
Ontologies  
Query processing  
Semantic Web

## LinkedIn

BT: Social network services

## Linking

USE: Joining processes

## Linux

BT: High level languages

## Lipid bilayers

USE: Lipidomics

## Lipidomics

UF: Lipid bilayers  
Lipids  
BT: Molecular biomarkers  
RT: Fats

## Lipids

USE: Lipidomics

## Lips

BT: Head





# 2018 IEEE Thesaurus

RT: Stomatognathic system

BT: Hollow waveguides

## Liquefied natural gas

UF: LNG

BT: Natural gas

## Liquid cooling

BT: Cooling

NT: Indirect liquid cooling

## Liquid crystal devices

UF: Liquid-crystal devices

BT: Displays

RT: Electrooptic devices

Liquid crystals

Microdisplays

Thin film transistors

NT: Liquid crystal displays

Liquid crystal on silicon

## Liquid crystal displays

UF: LCD

LCDs

Liquid-crystal displays

BT: Liquid crystal devices

NT: Active matrix liquid crystal

displays

## Liquid crystal on silicon

UF: Lcos

BT: Liquid crystal devices

RT: Integrated optoelectronics

Microdisplays

## Liquid crystal polymers

UF: Liquid-crystal polymers

BT: Polymers

## Liquid crystals

BT: Crystals

RT: Liquid crystal devices

## Liquid flow

USE: Fluid flow

## Liquid insulation

USE: Dielectric liquids

## Liquid level control

USE: Level control

## Liquid level measurement

USE: Level measurement

## Liquid waveguides

## Liquid-crystal devices

USE: Liquid crystal devices

## Liquid-crystal displays

USE: Liquid crystal displays

## Liquid-crystal polymers

USE: Liquid crystal polymers

## Liquids

BT: Fluids

RT: Aerosols

Electrohydraulics

Materials science and

technology

Spraying

NT: Water

## LiquiFerrofluid

USE: Ferrofluid

## Lithium

UF: Li

BT: Metals

RT: Alloying

Batteries

NT: Lithium compounds

## Lithium batteries

BT: Batteries

Lithium compounds

## Lithium compounds

BT: Lithium

RT: Alloying

Batteries

NT: Lithium batteries

Lithium niobate

## Lithium niobate

BT: Lithium compounds

## Lithium-ion batteries

UF: Li-ion batteries

BT: Batteries

## Lithography

UF: Photolithography

BT: Manufacturing

RT: Nanotechnology

Printing

Proximity effects

NT: Colloidal lithography



# 2018 IEEE Thesaurus

lithography	Extreme ultraviolet	BT:	Power system control
		NT:	Power factor correction
	Interferometric lithography		
	Nanolithography		
	Soft lithography		
<b>Lithotripsy</b>	Stereolithography	<b>Load forecasting</b>	
	X-ray lithography	BT:	Power demand
		RT:	Load management
		<b>Load management</b>	
		UF:	Load balancing
<b>Lithotriptors</b>	Medical treatment		Load compensation
	Kidney stones		Load composition
	Lithotriptors		Load variations
		BT:	Energy management
		RT:	Energy storage
<b>Liver</b>	Biomedical equipment		Load forecasting
	Lithotripsy		Pallets
			Power demand
			Vehicle-to-grid
	Digestive system	<b>Load modeling</b>	
<b>Liver diseases</b>	Liver diseases	BT:	Modeling
			Power system modeling
		RT:	Power demand
<b>Liver neoplasms</b>	Neoplasms	<i>Load tap changers</i>	
		USE:	On load tap changers
<i>Livestock</i>	Agriculture	<i>Load variations</i>	
		USE:	Load management
<i>LNG</i>	Liquefied natural gas	<b>Loaded antennas</b>	
		BT:	Antennas
<i>Load balancing</i>	Load management	<b>Loaded waveguides</b>	
		BT:	Electromagnetic
		waveguides	
		RT:	Dielectric materials
			Waveguide discontinuities
<i>Load compensation</i>	Load management	<b>Loading</b>	
		BT:	Freight handling
		RT:	Containers
			Filling
			Grippers
<i>Load composition</i>	Load management		Pulleys
<b>Load flow</b>	Power flow	<b>Loans and mortgages</b>	
	Power system management	UF:	Mortgages
	Load flow analysis	BT:	Financial management
<b>Load flow analysis</b>	Power flow analysis	<i>Local area network emulation</i>	
	Load flow	USE:	LAN emulation
	Power system security		
	Power transmission		
<b>Load flow control</b>	Power flow control	<b>Local area networks</b>	
		UF:	LAN



# 2018 IEEE Thesaurus

BT:	Communication systems	USE:	Location awareness
RT:	Digital systems		
	Distributed computing	<i>Location metadata</i>	
	Ethernet	USE:	Location awareness
	FDDI		
	Field buses	<i>Log normal distribution</i>	
	File servers	USE:	Log-normal distribution
	IEEE 802.3 Standard		
	IPTV	<b>Log periodic antennas</b>	
	Internetworking	BT:	Antenna arrays
	LAN interconnection		
	Media Access Protocol	<b>Log-normal distribution</b>	
	Multiprocessor	UF:	Log normal distribution
interconnection		BT:	Probability distribution
	Office automation		
	Open systems	<b>Log-periodic dipole antennas</b>	
	Protocols	UF:	LDPA
	Regional area networks	BT:	Antennas
	Storage area networks		
	Token networks	<b>Logic</b>	
	Virtual private networks	UF:	Formal logic
NT:	Wireless LAN	BT:	Computational and artificial intelligence
<i>Local authorities</i>		RT:	Boolean algebra
USE:	Local government		Cognitive science
			Computer science
<b>Local government</b>			Logic circuits
UF:	Local authorities		Logic functions
BT:	Government	NT:	Fuzzy logic
			Multivalued logic
<b>Local oscillators</b>			Probabilistic logic
BT:	Oscillators		Sufficient conditions
		<b>Logic arrays</b>	
<b>Location awareness</b>		BT:	Circuits
UF:	Geo tagging		Logic circuits
	Location based services	NT:	Programmable logic arrays
	Location metadata		
	Mobile location	<i>Logic CAD</i>	
management		USE:	Logic design
	Mobile radio mobility		
management		<i>Logic circuit testing</i>	
BT:	Mobile communication	USE:	Logic testing
RT:	Land mobile radio		
	Land mobile radio cellular		
systems		<b>Logic circuits</b>	
	Mobile computing	BT:	Circuits
	Navigation		Switching circuits
	Personal communication	RT:	Adders
networks			Computers and information processing
	Position measurement		Counting circuits
	Wireless communication		Digital circuits
NT:	Network location		Digital integrated circuits
awareness			Flip-flops
			Logic
<i>Location based services</i>			



# 2018 IEEE Thesaurus

	Logic design		
	Logic devices		<i>Logical decomposition</i>
	Logic functions	USE:	System analysis and design
	Multiplying circuits		
	Pulse inverters		
	Shift registers		
NT:	Combinational circuits	<b>Logistics</b>	
	Logic arrays	UF:	Physical distribution
	Programmable logic arrays	management	
	Superconducting logic	BT:	Production management
		RT:	Procurement
		NT:	Reverse logistics
circuits			Supply chains
<b>Logic design</b>		<b>Long Term Evolution</b>	
UF:	Circuit design (logic)	UF:	LTE
	Logic CAD		LTE advanced
BT:	Design automation	BT:	3GPP Standards
RT:	Circuit synthesis		Communication standards
	Design for testability	RT:	4G mobile communication
	Design methodology		High-speed networks
	Engineering education		Mobile communication
	Logic circuits		Mobile handsets
	Timing		Wireless communication
NT:	Reconfigurable logic		
<b>Logic devices</b>		<i>Look-up table</i>	
BT:	Circuits and systems	USE:	Table lookup
RT:	Logic circuits		
NT:	Logic gates	<i>Lookup table</i>	
	Programmable logic	USE:	Table lookup
devices			
		<i>Loop-filtering algorithm</i>	
		USE:	Filtering algorithms
<b>Logic functions</b>			
BT:	Boolean functions	<i>LOPT</i>	
RT:	Logic	USE:	Flyback transformers
	Logic circuits		
	Multivalued logic	<i>Loran</i>	
		USE:	Radio navigation
<b>Logic gates</b>			
BT:	Logic devices	<b>Lorentz covariance</b>	
RT:	Boolean algebra	UF:	Lorentz force
			Lorentz invariance
<i>Logic inverters</i>		BT:	Physics
USE:	Pulse inverters		
		<i>Lorentz force</i>	
<b>Logic programming</b>		USE:	Lorentz covariance
BT:	Programming		
		<i>Lorentz invariance</i>	
<i>Logic test</i>		USE:	Lorentz covariance
USE:	Logic testing		
		<b>Loss measurement</b>	
<b>Logic testing</b>		BT:	Measurement
UF:	Logic circuit testing	RT:	Attenuation measurement
	Logic test		Magnetic losses
BT:	Integrated circuit testing		Optical losses
RT:	Design for testability	NT:	Packet loss



# 2018 IEEE Thesaurus

<b>Lot sizing</b>	USE: Low voltage	
BT: Production control		<i>LSI</i>
RT: Materials requirements	USE: Large scale integration	
planning		<i>LTE</i>
<b>Loudspeakers</b>	USE: Long Term Evolution	
BT: Audio systems		<i>LTE advanced</i>
RT: Acoustic distortion	USE: Long Term Evolution	
<i>Low density parity check codes</i>		<b>Lubricants</b>
USE: Parity check codes		UF: Cutting fluids
<b>Low earth orbit satellites</b>		BT: Production materials
UF: LEO		RT: Lubrication
Low-earth-orbit		<b>Lubricating oils</b>
BT: Artificial satellites		UF: Oil filters
<i>Low frequency noise</i>		Oiling (lubrication)
USE: Low-frequency noise		BT: Oils
<i>Low noise amplifiers</i>		<b>Lubrication</b>
USE: Low-noise amplifiers		BT: Mechanical factors
<b>Low pass filters</b>		RT: Friction
BT: Filters		Lubricants
<i>Low power electronics</i>		Mechanical bearings
USE: Low-power electronics		<b>Luminescence</b>
<b>Low voltage</b>		BT: Optics
UF: Low-voltage		RT: Luminescent devices
BT: Voltage measurement		Muon colliders
<i>Low-earth-orbit</i>		Scintillators
USE: Low earth orbit satellites		NT: Bioluminescence
<b>Low-frequency noise</b>		Electroluminescence
UF: LF noise		Fluorescence
Low frequency noise		Phosphorescence
BT: Noise		Photoluminescence
<b>Low-noise amplifiers</b>		Thermoluminescence
UF: Low noise amplifiers		<b>Luminescent devices</b>
BT: Amplifiers		BT: Light sources
<b>Low-power electronics</b>		Optical devices
UF: Low power electronics		RT: Luminescence
Ultra low power*		Muon colliders
Ultra-low power*		NT: Electroluminescent devices
BT: Consumer electronics		<i>Lunar</i>
RT: Electronic equipment		USE: Moon
Nanogenerators		<b>Lung</b>
<i>Low-voltage</i>		BT: Respiratory system
		<b>Lung neoplasms</b>
		BT: Neoplasms



# 2018 IEEE Thesaurus

## *LUT*

USE: Table lookup

## *Lutecium*

USE: Lutetium

## **Lutetium**

UF: Lutecium

BT: Chemical elements

## *Lyapunov function*

USE: Lyapunov methods

## **Lyapunov methods**

UF: Lyapunov function

Lyapunov stability

BT: System analysis and design

RT: Control design

Functional analysis

Stability

## *Lyapunov stability*

USE: Lyapunov methods

## **Lymph nodes**

BT: Lymphatic system

## **Lymphatic system**

BT: Anatomy

NT: Lymph nodes

## *M2M*

USE: Machine-to-machine  
communications

## *MAC*

USE: Media Access Protocol

## *MAC protocol*

USE: Media Access Protocol

## **Mach-Zehnder interferometers**

UF: Mach-Zehnder modulation

BT: Interferometers

## *Mach-Zehnder modulation*

USE: Mach-Zehnder  
interferometers

## *Machine added indexing*

USE: Machine assisted indexing

## *Machine aided indexing*

USE: Machine assisted indexing

## **Machine assisted indexing**

UF: Automated indexing

Automatic indexing

MAI

Machine added indexing

Machine aided indexing

Machine indexing

Machine-added indexing

Machine-aided indexing

Machine-assisted indexing

BT: Indexes

RT: Indexing

## **Machine components**

BT: Machinery

Mechanical products

RT: Couplings

Engines

Gears

Turbomachinery

Wheels

NT: Air cleaners

Belts

Cams

Engine cylinders

Exhaust systems

Impellers

Intake systems

Manifolds

Mechanical splines

Pistons

Rotors

Shafts

Valves

## **Machine control**

BT: Industrial electronics

NT: Machine vector control

## *Machine indexing*

USE: Machine assisted indexing

## **Machine intelligence**

BT: Computational and artificial  
intelligence

RT: Machine-to-machine  
communications

NT: Pattern analysis

## **Machine learning**

UF: Deep learning

Deep reinforcement

learning

BT: Dictionary learning

Artificial intelligence



# 2018 IEEE Thesaurus

networks	RT:	Cognitive systems	UF:	Vision systems
		Convolutional neural	(nonbiological)	
			BT:	Image processing
		Linear discriminant analysis	RT:	Automatic optical inspection
	NT:	Boosting		IEEE 1394 Standard
			Image analysis	
		Dimensionality reduction	Image recognition	
		Robot learning	Manufacturing automation	
		Statistical learning	Observers	
<b>Machine learning algorithms</b>			Pattern recognition	
	BT:	Algorithms	Stereo vision	
<b>Machine shops</b>			Visual systems	
			Object recognition	
	BT:	Production facilities	Object segmentation	
	RT:	Machine tools		
		Machinery production		
industries			<b>Machine windings</b>	
			BT:	Windings
		Machining		
<b>Machine tool spindles</b>			<i>Machine-added indexing</i>	
	UF:	Spindle bearings	USE:	Machine assisted indexing
	BT:	Machine tools		
	RT:	Mechanical splines	<i>Machine-aided indexing</i>	
		Shafts	USE:	Machine assisted indexing
<b>Machine tools</b>			<i>Machine-assisted indexing</i>	
			USE:	Machine assisted indexing
	BT:	Production equipment		
	RT:	Clamps	<b>Machine-to-machine communications</b>	
		Coordinate measuring	UF:	M2M
machines			BT:	Communication systems
		Cutting tools	RT:	IP networks
		Fixtures		Internet of Things
		Gears		Machine intelligence
		Hand tools		Remote monitoring
		Hobbing machines		Wireless communication
		Machine shops		Wireless sensor networks
		Machining		
		Manufacturing	<b>Machinery</b>	
		Mechanical guides	BT:	Industry applications
		Turning	RT:	Machinery production
	NT:	Dies	industries	
		Drilling machines		Machining
		Grinding machines		Materials handling
		Machine tool spindles	equipment	
		Metalworking machines		Production equipment
		Milling machines	NT:	Agricultural machinery
		Presses		Ball bearings
		Sawing machines		Belts
<b>Machine vector control</b>				Drives
	BT:	Machine control		Electric machines
	RT:	AC-DC power converters		Fans
		DC-DC power converters		Furnaces
<b>Machine vision</b>				Gears
				Hydraulic systems
				Machine components



# 2018 IEEE Thesaurus

Motors  
Printing machinery  
Pumps  
Textile machinery

BT: Magnesium  
NT: Magnesium oxide

## Machinery production industries

BT: Manufacturing industries  
RT: Machine shops  
Machinery

## Magnesium oxide

UF: Irtran 5  
MgO  
BT: Magnesium compounds  
RT: Ceramics  
Optical materials

## Machining

BT: Materials processing  
RT: Burnishing  
Clamps  
Deburring  
Finishing  
Machine shops  
Machine tools  
Machinery  
Manufacturing  
NT: Boring  
Drilling  
Electrochemical machining  
Hobbing machines  
Lapping  
Milling  
Planing  
Sawing  
Turning  
Virtual machining

## Magnetic analysis

BT: Magnetics  
RT: Electromagnetic analysis  
Magnetic fields  
NT: Magnetization

## Magnetic anisotropy

BT: Magnetics  
NT: Magnetic domain walls  
Magnetic domains  
Magnetic moments  
Perpendicular magnetic

anisotropy

## Magnetic anomaly detection

BT: Magnetic variables  
measurement  
RT: Magnetic fields  
Object detection

## Magnetic anomaly detectors

BT: Magnetometers  
RT: Magnetic fields  
Military equipment  
Object detection

## Macrocell networks

UF: Macrocells  
BT: Cellular networks  
RT: Rural areas

## Macrocells

USE: Macrocell networks

## Magnetic bearings

USE: Magnetic levitation

## Macroeconomics

BT: Economics  
RT: Government  
International trade  
Public finance  
NT: Privatization

## Magnetic circuits

BT: Circuits  
RT: Coils  
Magnetic devices  
Windings

## Maglev

USE: Magnetic levitation

## Magnetic confinement

BT: Plasma confinement  
RT: Electromagnets  
Fusion power generation  
Tokamak devices  
Tokamaks

## Magnesium

UF: Mg  
BT: Metals  
NT: Magnesium compounds

## Magnetic core losses

USE: Magnetic losses

## Magnesium compounds



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# 2018 IEEE Thesaurus

## Magnetic cores

BT: Magnetic devices  
RT: Inductors  
NT: Transformer cores

detectors  
measurement

Magnetic anomaly

Magnetic field

Maxwell equations

Remanence

SQUID magnetometers

Synchrotrons

Geomagnetism

Magnetic reconnection

Magnetic separation

Magnetostatics

Toroidal magnetic fields

## Magnetic devices

BT: Magnetics  
RT: Magnetic circuits  
Magnetic materials  
NT: Accelerator magnets  
Ferrite devices  
Magnetic cores  
Magnetic gears  
Magnetic heads  
Magnetic memory  
Magnetic modulators  
Magneto optic devices  
Magnetoresistive devices  
Magnetostrictive devices  
Solenoids  
Transformer cores  
Undulators

NT:

## Magnetic films

UF: Magnetic thin films  
BT: Films  
Magnetic materials  
RT: Thin films  
NT: Ferrimagnetic films  
Ferrite films  
Garnet films

## Magnetic domain walls

BT: Magnetic anisotropy

## Magnetic filters

USE: Magnetic separation

## Magnetic domains

BT: Magnetic anisotropy

## Magnetic fluids

USE: Magnetic liquids

## Magnetic field induced strain

BT: Magnetomechanical effects  
RT: Ferroelectric films  
Ferroelectric materials  
MISFETs  
Semiconductor diodes  
Semiconductor films  
Semiconductor-metal

## Magnetic flux

BT: Magnetics  
RT: Remanence  
NT: Flux pinning  
Magnetic flux density  
Magnetic flux leakage

interfaces

## Magnetic flux density

BT: Magnetic flux

## Magnetic field measurement

BT: Magnetic variables  
measurement  
RT: Magnetic fields

## Magnetic flux leakage

BT: Magnetic flux  
Nondestructive testing  
RT: Corrosion  
Pipelines

## Magnetic fields

BT: Magnetics  
RT: Biomagnetics  
Compass  
Critical current density

(superconductivity)

Electromagnetic fields  
Magnetic analysis  
Magnetic anomaly

## Magnetic force microscopy

BT: Magnetics  
RT: Atomic force microscopy  
Magnetic forces

detection

## Magnetic forces

BT: Magnetics  
RT: Electromagnetic forces  
Force  
Magnetic force microscopy



# 2018 IEEE Thesaurus

	Magnetic levitation	Diamagnetic materials
NT:	Coercive force	Ferrimagnetic films
		Ferrimagnetic materials
<b>Magnetic gears</b>		Ferrite films
BT:	Gears	Ferrites
	Magnetic devices	Ferrofluid
RT:	Electromagnetic devices	Garnet films
	Magnetic levitation	Garnets
	Permanent magnets	Magnetic films
	Power transmission	Magnetic liquids
	Variable speed drives	Magnetic semiconductors
		Magnetic superlattices
		Paramagnetic materials
		Soft magnetic materials
<b>Magnetic heads</b>		
BT:	Magnetic devices	
RT:	Magnetic recording	
	Magnetoresistive devices	
<b>Magnetic hysteresis</b>		<i>Magnetic measurements</i>
BT:	Magnetics	USE: Magnetic variables
RT:	Hysteresis	measurement
	Remanence	
<b>Magnetic levitation</b>		<b>Magnetic memory</b>
UF:	Maglev	UF: Magnetic storage
	Magnetic bearings	BT: Magnetic devices
BT:	Levitation	Memory
	Magnetics	RT: Magnetic recording
RT:	Electromagnets	NT: Floppy disks
	Magnetic forces	Hard disks
	Magnetic gears	
	Rail transportation	
<b>Magnetic liquids</b>		<b>Magnetic modulators</b>
UF:	Magnetic fluids	BT: Magnetic devices
BT:	Magnetic materials	Modulation
<b>Magnetic losses</b>		<b>Magnetic moments</b>
UF:	Magnetic core losses	BT: Magnetic anisotropy
BT:	Magnetics	
RT:	Eddy currents	<b>Magnetic multilayers</b>
	Loss measurement	BT: Magnetics
		RT: Coatings
<b>Magnetic materials</b>		<b>Magnetic nanoparticles</b>
UF:	Ferromagnetic materials	BT: Nanoparticles
BT:	Magnetics	
	Materials	<b>Magnetic noise</b>
RT:	Biomagnetics	BT: Magnetic recording
	Boron alloys	
	Magnetic devices	<b>Magnetic particles</b>
	Magnetoelasticity	BT: Magnetics
	Magnetostriction	RT: Biomagnetics
	Permeability	Microelectromechanical
NT:	Amorphous magnetic	devices
materials		<i>Magnetic permeability</i>
	Antiferromagnetic materials	USE: Permeability
		<b>Magnetic properties</b>
		BT: Magnetics



# 2018 IEEE Thesaurus

## Magnetic reconnection

BT: Magnetic fields

## Magnetic recording

UF: Perpendicular recording  
BT: Recording  
RT: Magnetic heads  
Magnetic memory  
NT: Digital magnetic recording  
Heat-assisted magnetic

recording

Magnetic noise  
Magneto optic recording  
Microwave-assisted

magnetic recording

recording Perpendicular magnetic

## Magnetic resonance

UF: FMR  
Ferromagnetic resonance  
BT: Resonance  
Resonant frequency  
RT: Ferroresonance  
Magnetic resonance

imaging

NT: Nuclear magnetic

resonance

Paramagnetic resonance

## Magnetic resonance elastography

BT: Magnetic resonance

imaging

## Magnetic resonance imaging

UF: Biomedical MRI  
MRI  
NMR imaging  
Nuclear magnetic

resonance imaging

BT: Imaging  
RT: Diagnostic radiography  
Image reconstruction  
Magnetic resonance

NT: Diffusion tensor imaging  
Functional magnetic

resonance imaging

elastography Magnetic resonance

## Magnetic semiconductors

BT: Magnetic materials  
Semiconductor materials

## Magnetic sensors

BT: Magnetics  
Sensors  
NT: Spin valves

## Magnetic separation

UF: Magnetic filters  
BT: Magnetic fields  
RT: Particle separators

## Magnetic shielding

BT: Electromagnetic shielding

## Magnetic stimulation

BT: Medical treatment

## Magnetic storage

USE: Magnetic memory

## Magnetic superlattices

BT: Magnetic materials  
Superlattices

## Magnetic susceptibility

BT: Magnetics

## Magnetic switching

BT: Magnetics

## Magnetic thin films

USE: Magnetic films

## Magnetic tunnel junctions

USE: Magnetic tunneling

## Magnetic tunneling

UF: Magnetic tunnel junctions  
Magnetic tunnelling  
Spin-dependent tunneling  
Spin-dependent tunnelling  
BT: Magnetoelectric effects  
Tunneling  
RT: Magnetoelectronics  
Spin polarized transport

## Magnetic tunnelling

USE: Magnetic tunneling

## Magnetic variables control

BT: Control systems

## Magnetic variables measurement

UF: Magnetic measurements  
BT: Measurement



# 2018 IEEE Thesaurus

NT: Magnetic anomaly  
detection  
Magnetic field  
measurement  
Magnetometers  
Permeability measurement

## Magnetics

NT: Biomagnetics  
Demagnetization  
Gyromagnetism  
Magnetic analysis  
Magnetic anisotropy  
Magnetic devices  
Magnetic fields  
Magnetic flux  
Magnetic force microscopy  
Magnetic forces  
Magnetic hysteresis  
Magnetic levitation  
Magnetic losses  
Magnetic materials  
Magnetic multilayers  
Magnetic particles  
Magnetic properties  
Magnetic sensors  
Magnetic susceptibility  
Magnetic switching  
Magnetization processes  
Magnetoelectric effects  
Magnetomechanical effects  
Magnetooptic effects  
Magnets  
Magnonics  
Microwave magnetics  
Nonlinear magnetics  
Remanence

## Magnetisation

USE: Magnetization

## Magnetisation processes

USE: Magnetization processes

## Magnetisation reversal

USE: Magnetization reversal

## Magnetization

UF: Magnetisation  
BT: Magnetic analysis

## Magnetization processes

UF: Magnetisation processes  
BT: Magnetics

RT: Hysteresis  
NT: Magnetization reversal  
Saturation magnetization

## Magnetization reversal

UF: Magnetisation reversal  
BT: Magnetization processes

## Magneto electrical resistivity imaging technique

UF: MERIT  
BT: Imaging  
RT: Geophysical measurement

techniques

## Magnetoacoustic effects

UF: Acoustomagnetic effects  
BT: Magnetics  
RT: Acoustics  
Magnetomechanical effects

## Magnetoelasticity

BT: Magnetomechanical effects  
RT: Magnetic materials  
NT: Magnetostriction

## Magnetoelectric effects

BT: Magnetics  
NT: Hall effect  
Magnetic tunneling  
Magnetoelectronics  
Magnetoresistance  
Spintronics

## Magnetoelectronic devices

USE: Magnetoelectronics

## Magnetoelectronics

UF: Magnetoelectronic devices  
BT: Magnetoelectric effects  
RT: Magnetic tunneling  
Magnetoresistive devices  
NT: Spin polarized transport

## Magnetoencephalography

BT: Biomagnetics  
RT: Biomedical image

processing

Brain

## Magnetofluid dynamics

USE: Magnetohydrodynamics

## Magnetofluid dynamics

USE: Magnetohydrodynamics



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# 2018 IEEE Thesaurus

## Magnetohydrodynamic power generation

BT: Power generation  
RT: Magnetohydrodynamics

## Magnetohydrodynamics

UF: Hydromagnetics  
MHD  
Magnetofluid dynamics  
Magnetofluidynamics  
BT: Dynamics  
Hydrodynamics  
Mechanical factors  
RT: Electrohydraulics  
Fluid flow  
Magnetohydrodynamic

power generation

## Magnetomechanical effects

UF: Piezomagnetic effects  
BT: Magnetics  
RT: Magnetoacoustic effects  
Mechanical factors  
Stress  
NT: Magnetic field induced

strain

Magnetoelasticity  
Magnetostriction

## Magnetometers

UF: Magnetometry  
BT: Magnetic variables  
NT: Magnetic anomaly

measurement

detectors

SQUID magnetometers

## Magnetometry

USE: Magnetometers

## Magneto optic devices

UF: Photomagnetic devices  
BT: Magnetic devices  
RT: Magneto optic effects

## Magneto optic effects

UF: Photomagnetic effects  
BT: Magnetics  
RT: Kerr effect  
Magneto optic devices  
Magneto optic recording  
Optics  
NT: Faraday effect  
Gyrotropism

## Magneto optic recording

BT: Laser applications  
Magnetic recording  
RT: Magneto optic effects

## Magnetoresistance

UF: Magnetoresistivity  
BT: Magnetoelectric effects  
RT: Magnetoresistive devices  
Nanocontacts  
Spin polarized transport  
NT: Anisotropic

magnetoresistance

Ballistic magnetoresistance  
Colossal

magnetoresistance

Enhanced

magnetoresistance

Extraordinary

magnetoresistance

Giant magnetoresistance  
Ordinary

magnetoresistance

Tunneling

magnetoresistance

## Magnetoresistive devices

UF: Magnetoresistors  
BT: Magnetic devices  
RT: Giant magnetoresistance  
Magnetic heads  
Magnetoelectronics  
Magnetoresistance  
Tunneling

magnetoresistance

## Magnetoresistivity

USE: Magnetoresistance

## Magnetoresistors

USE: Magnetoresistive devices

## Magnetosphere

UF: Magnetotail  
BT: Terrestrial atmosphere  
RT: Geomagnetism

## Magnetostatic waves

BT: Waves  
RT: Electromagnetic  
propagation  
Magnetostatics

## Magnetostatics

BT: Magnetic fields



# 2018 IEEE Thesaurus

RT:	Magnetostatic waves	Predictive maintenance
		Preventive maintenance
		Systems support
<b>Magnetostriction</b>		
BT:	Magnetoelasticity	
	Magnetomechanical effects	
RT:	Magnetic materials	<b>Maintenance management</b>
	Magnetostrictive devices	BT: Maintenance engineering
		Technical management
<b>Magnetostrictive devices</b>		
BT:	Magnetic devices	
RT:	Magnetostriction	
	Sensors	
<i>Magnetotail</i>		
USE:	Magnetosphere	
<b>Magnetrons</b>		
BT:	Electron tubes	
RT:	Relativistic effects	
	Sputtering	
<b>Magnets</b>		
BT:	Magnetics	
RT:	Cobalt	
NT:	Electromagnets	
	Micromagnetics	
	Permanent magnets	
<b>Magnonics</b>		
BT:	Magnetics	
<i>MAI</i>		
USE:	Machine assisted indexing	
<i>Mail</i>		
USE:	Postal services	
<i>Mail (electronic)</i>		
USE:	Electronic mail	
<b>Maintenance</b>		
BT:	Reliability	
<b>Maintenance engineering</b>		
UF:	Repair	
BT:	Engineering - general	
RT:	Automatic testing	
	Availability	
	Configuration management	
	Fault diagnosis	
	Inspection	
	Monitoring	
	Remaining life assessment	
	Testing	
NT:	Maintenance management	
		<b>Maldistribution</b>
		BT: Reliability
		<i>Malignancy</i>
		USE: Cancer
		<i>Malignant</i>
		USE: Cancer
		<b>Malignant tumors</b>
		UF: Melanoma
		BT: Tumors
		<b>Malware</b>
		UF: Ransomware
		BT: Computer viruses
		RT: Anti-virus software
		Cyber espionage
		Privacy
		Security
		NT: Spyware
		Trojan horses
		<b>Mammary glands</b>
		BT: Glands
		<i>Mammary neoplasms</i>
		USE: Breast neoplasms
		<b>Mammography</b>
		BT: Biomedical imaging
		RT: Medical tests
		<i>Man machine systems</i>
		USE: Man-machine systems
		<i>Man-machine interfaces</i>
		USE: User interfaces
		<b>Man-machine systems</b>
		UF: Cyborgs
		Man machine systems
		BT: Systems, man, and
		cybernetics
		RT: Androids
		Cybernetics
		Ergonomics



# 2018 IEEE Thesaurus

	Human factors		Project management
	Persuasive systems		Public relations
NT:	Extended reality		Quality management
	Interactive systems		Requirements management
			Research and development
<b>Management</b>		management	
UF:	Reliability management		Resource management
BT:	Business		Risk analysis
RT:	Analytic hierarchy process		Safety management
	Company reports		Security management
	Ethical aspects		Storage management
	Learning management		Supply chain management
systems			Technical management
systems	Management information		Technology management
	Management training	<b>Management accounting</b>	
	Operations research	BT:	Financial management
	Personnel	RT:	Company reports
	Productivity	NT:	Cost accounting
NT:	Asset management		
	Best practices	<b>Management information base</b>	
	Business continuity	UF:	MIB
	Business process	BT:	Computer network
management		management	
	Business process re-	RT:	Information systems
engineering			Telecommunication
	Communication system		
operations and management		network management	Virtual environments
	Conference management	<b>Management information systems</b>	
	Content management	BT:	Information systems
	Contingency management	RT:	Customer relationship
	Contract management	management	
	Contracts		Knowledge management
management	Customer relationship		Management
	Decision making		Supply chain management
	Dependability management	NT:	Portals
	Distributed management		
planning	Enterprise resource	<b>Management training</b>	
	Facilities management	BT:	Training
	Financial management	RT:	Continuing education
	Governmental factors		Management
	Human resource	<b>MANET</b>	
management		USE:	Mobile ad hoc networks
	Information management	<b>Manganese</b>	
	Interface management	UF:	Mn
	International collaboration	BT:	Metals
	Knowledge management	NT:	Manganese alloys
	Marketing management	<b>Manganese alloys</b>	
	Organizational aspects	BT:	Manganese
	Outsourcing		
	Process planning	<b>Manifolds</b>	
	Production management		
	Program management		





# 2018 IEEE Thesaurus

UF: Exhaust manifolds  
BT: Machine components  
RT: Engines  
Exhaust systems  
Valves

RT: Product customization  
Product design  
Product development

NT: Ceramic products  
Chemical products  
Consumer products  
Electrical products  
Food products  
Fuels  
Glass products  
Mechanical products  
Metal products  
Paper products  
Paper pulp  
Plastic products  
Rubber products  
Sports equipment  
Textile products  
Tools  
Windows

## Manipulator dynamics

BT: Manipulators

## Manipulator sensing systems

USE: Robot sensing systems

## Manipulator vision systems

USE: Robot vision systems

## Manipulators

UF: Arms (robotic)  
BT: Robots  
RT: Assembly  
Assembly systems  
Control equipment  
Control systems  
Industrial control  
Manufacturing automation  
Materials handling  
Mechanical variables

control

Motion control  
Nonlinear systems  
Position control  
Service robots  
Servomechanisms  
Servosystems  
Telerobotics  
NT: End effectors  
Manipulator dynamics  
Micromanipulators

## Manipulators (nonrobotic)

USE: Remote handling

## Manpower planning

USE: Labor resources

## Manuals

UF: Technical manuals  
BT: Professional  
communication  
RT: Documentation  
Training  
Writing

## Manufacturing

BT: Industry applications  
RT: Bonding  
Business  
Discrete-event systems  
Industrial plants  
Machine tools  
Machining  
Materials handling  
Materials processing  
Production control  
Production engineering  
Production facilities  
Production systems  
Productivity  
Soldering  
Stereolithography  
Welding  
Wheels  
Wire drawing  
NT: Assembly  
Assembly systems  
Embossing  
Fabrication  
Lithography  
Manufactured products  
Manufacturing systems  
Mass customization  
Smart manufacturing  
Tolerance analysis

## Manufactured products

UF: Counterfeit goods  
BT: Manufacturing

## Manufacturing automation

UF: Factory automation  
BT: Automation



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# 2018 IEEE Thesaurus

		Industrial electronics		Froth flotation
RT:	Assembly			Manufacturing process
	Assembly systems		BT:	Manufacturing systems
	Automatic optical inspection		RT:	Rapid prototyping
	Industrial control			
	Machine vision			
	Manipulators		<b>Manufacturing systems</b>	
	Mobile robots		BT:	Manufacturing
	Process control			Production systems
	Programmable control		RT:	Bleaching
	Robots			Production engineering
NT:	Computer aided		NT:	Agile manufacturing
manufacturing				Automobile manufacture
	Computer integrated			Batch production systems
manufacturing				Blanking
	Computer numerical control			Cellular manufacturing
	Flexible manufacturing			Flow production systems
systems				Food manufacturing
				Forging
				Glass manufacturing
<i>Manufacturing economics</i>				Integrated manufacturing
USE:	Industrial economics		systems	
<i>Manufacturing facilities</i>				Intelligent manufacturing
USE:	Production facilities		systems	
				Job production systems
<b>Manufacturing industries</b>				Joining processes
BT:	Industries			Layered manufacturing
NT:	Aerospace industry			Lean production
	Cement industry			Manufacturing processes
	Ceramics industry			Mass production
	Clothing industry			Melt processing
	Electrical products industry			Pulp manufacturing
	Electronics industry			Sheet metal processing
	Food industry			Thermoforming
	Footwear industry			Three-dimensional printing
	Fuel processing industries			
	Glass industry		<i>Many valued logic</i>	
	Machinery production		USE:	Multivalued logic
industries				
			<b>Marine accidents</b>	
	Metal product industries		BT:	Accidents
	Plastics industry		RT:	Marine pollution
	Pulp and paper industry			Marine safety
	Rubber industry			Marine vehicles
	Shipbuilding industry			
	Textile industry			
	Toy manufacturing industry		<b>Marine animals</b>	
			UF:	Ocean animals
				Sea animals
<i>Manufacturing management</i>			BT:	Animals
USE:	Production management		RT:	Aquaculture
			NT:	Dolphins
<i>Manufacturing process</i>				Whales
USE:	Manufacturing processes			
			<i>Marine cables</i>	
<b>Manufacturing processes</b>			USE:	Underwater cables
UF:	Compliant mechanisms			



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# 2018 IEEE Thesaurus

## Marine equipment

BT: Marine technology

NT: Propellers  
Boats  
Underwater vehicles

## Marine navigation

BT: Navigation  
Oceanic engineering and

marine technology

RT: Sea state

## Market opportunities

BT: Marketing management  
RT: Consumer behavior  
Customer profiles

## Marine pollution

BT: Water pollution  
RT: Marine accidents  
Oil pollution  
Oils  
Thermal pollution

## Market research

BT: Customer relationship  
management  
RT: Engineering management  
Brand management  
Competitive intelligence  
Consumer products  
Customer satisfaction

## Marine safety

BT: Safety  
RT: Marine accidents  
Marine technology  
Marine vehicles

## Marketing management

BT: Management  
RT: Electronic commerce  
Public relations  
NT: Advertising  
Brand management  
Distribution strategy  
Market opportunities  
Mass customization  
Promotion - marketing

## Marine science

USE: Oceanography

## Marine technology

UF: Ocean technology  
BT: Oceanic engineering and

marine technology

RT: Marine safety  
Oceans  
Underwater vehicles  
NT: Marine equipment  
Marine transportation  
Underwater cables  
Underwater communication  
Underwater equipment  
Underwater structures  
Underwater technology

## Markov decision processes

USE: Markov processes

## Markov network

USE: Markov random fields

## Markov processes

UF: Markov decision processes  
BT: Stochastic processes  
RT: Dynamic programming  
Hidden Markov models  
Infinite horizon  
NT: Markov random fields

## Marine transportation

BT: Marine technology  
RT: Global Positioning System  
NT: Marine vehicles

## Markov random fields

UF: Markov network  
BT: Markov processes

## Marine vegetation

UF: Ocean vegetation  
Sea vegetation  
BT: Vegetation

## Markup languages

BT: Computer languages  
RT: Cascading style sheets  
Semantic Web  
NT: HTML  
OWL  
Page description languages  
SGML

## Marine vehicles

UF: Ships  
BT: Marine transportation  
RT: Marine accidents  
Marine safety



# 2018 IEEE Thesaurus

	XML	BT:	Stomatognathic system
<b>Mars</b>		<b>Matched filters</b>	
	BT: Planets	BT: Filters	
		RT: Filtering theory	
<b>Martensite</b>		<b>Matching pursuit algorithms</b>	
	BT: Crystalline materials	BT: Algorithms	
	Steel		
	RT: Smart materials		
<b>Masers</b>		<b>Material properties</b>	
	UF: Microwave lasers	BT: Materials	
	BT: Microwave devices	NT: Creep	
		Elasticity	
		Resilience	
	RT: Atomic clocks		
	Relativistic effects		
	Stimulated emission		
	NT: Gyrotrons	<b>Material storage</b>	
		BT: Materials, elements, and compounds	
<i>MASH</i>		RT: Canning	
	USE: Multi-stage noise shaping	NT: Energy storage	
		Bulk storage	
<i>Mashing</i>		Containers	
	USE: Mashups	Fuel storage	
		Secure storage	
<b>Mashups</b>		Stacking	
	UF: Mashing	Storage automation	
	BT: Web services	Warehousing	
	World Wide Web	Water storage	
<b>Masking threshold</b>		<b>Materials</b>	
	BT: Psychoacoustic models	BT: Materials, elements, and compounds	
<b>Mass customization</b>		RT: Materials handling	
	BT: Manufacturing	Oxidation	
	Marketing management	NT: Acoustic materials	
<b>Mass production</b>		Additives	
	BT: Manufacturing systems	Aggregates	
	RT: Production management	Amorphous materials	
<i>Mass spectrometry</i>		Auxetic materials	
	USE: Mass spectroscopy	Biological materials	
		Biomedical materials	
<b>Mass spectroscopy</b>		Building materials	
	UF: Mass spectrometry	Ceramics	
	BT: Spectroscopy	Composite materials	
<b>Master-slave</b>		Conducting materials	
	BT: Protocols	Corrosion inhibitors	
<i>Mastercard</i>		Crystalline materials	
		Crystals	
		Dielectric materials	
<b>Masticatory muscles</b>		Films	
		Fluids	
		Hazardous materials	
		Inorganic materials	
		Lacquers	
		Laminates	



# 2018 IEEE Thesaurus

materials	Magnetic materials		Radioactive waste disposal
	Material properties		Robots
	Media		Stacking
	Mesoporous materials	NT:	Cleaning
	Metal foam		Decontamination
	Metallic materials		Freight handling
	Metamaterials		Materials handling
	Nanostructured materials	equipment	
	Oils		Pallets
	Optical materials		Remote handling
	Organic inorganic hybrid		
	Organic materials		
	Paints	BT:	Materials handling
	Paper pulp	RT:	Machinery
	Petrochemicals		Production equipment
	Phase change materials		Waste handling equipment
	Photoconducting materials	NT:	Containers
	Plastics		Grippers
	Polymer foams		Lifting equipment
	Polymer gels		Pulleys
	Polymers	equipment	Remote handling
	Production materials		
	Radioactive materials		Winches
	Raw materials		
	Resins		
	Resists		
	Semiconductor materials		
	Sheet materials		
	Smart materials		
	Solids		
	Superconducting materials		
	Surfactants		
	Terahertz materials		
	Textiles		
	Thermoelectric materials		
	Waste materials		
	Wire		
<b>Materials handling</b>			
technology	UF:	Materials handling systems	
		Scrubbers	
	BT:	Materials science and	
	RT:	Canning	
		Compaction	
		Die casting	
		Dispatching	
		Lifting equipment	
		Manipulators	
		Manufacturing	
		Materials	
		Mobile robots	
		Pipelines	
		Radioactive waste	
<b>Materials handling equipment</b>			
	BT:	Materials handling	
	RT:	Machinery	
		Production equipment	
		Waste handling equipment	
	NT:	Containers	
		Grippers	
		Lifting equipment	
		Pulleys	
		Remote handling	
	equipment		
		Winches	
<b>Materials handling systems</b>			
	USE:	Materials handling	
<b>Materials preparation</b>			
technology	UF:	Atmospheric sintering	
	BT:	Materials science and	
	RT:	Corrosion inhibitors	
		Flame retardants	
	NT:	Doping	
		Firing	
		Ion implantation	
		Laser sintering	
		Sputtering	
<b>Materials processing</b>			
technology	UF:	Mineral processing	
	BT:	Production	
	RT:	Bonding	
		Canning	
		Corrosion inhibitors	
		Fabrication	
		Finishing	
		Foundries	
		Manufacturing	
		Materials science and	
		Metalworking machines	
		Plasma welding	
		Soldering	
		Welding	



# 2018 IEEE Thesaurus

processing	NT:	Annealing			Contamination
		Bleaching			Degradation
		Casting			Filtration
		Coatings			Hysteresis
		Curing			Impurities
		Etching			Materials handling
		Heat treatment			Materials preparation
		Joining processes			Materials reliability
		Lamination			Materials testing
		Machining			Metallurgy
		Melt processing			Microstructure
		Plasma materials			Periodic structures
					Pigmentation
		Plating			Separation processes
		Pressing			Surface engineering
	Punching			Surfaces	
	Refining				
	Shearing				
	Smelting				
	Softening				
	Swaging				
<b>Materials testing</b>					
			BT:	Materials science and	
			technology		
			NT:	Testing	
				Accelerated aging	
				Acoustic testing	
				Adhesive strength	
				Bonding forces	
				Delamination	
				Elastic recovery	
				Nondestructive testing	
<b>Materials reliability</b>					
			BT:	Materials science and	
			technology		
			RT:	Reliability	
				Green's function methods	
<b>Materials requirements planning</b>					
			UF:	MRP	
			BT:	Production planning	
			RT:	Lot sizing	
				Scheduling	
				Supply chain management	
				Supply chains	
			NT:	Bills of materials	
<b>Materials, elements, and compounds</b>					
			NT:	Chemical elements	
				Compounds	
				Material storage	
				Materials	
				Materials science and	
			technology		
				Metals	
<i>Materials science</i>					
			USE:	Materials science and	
			technology		
<b>Materials science and technology</b>					
			UF:	Materials science	
			BT:	Materials, elements, and	
			compounds		
			RT:	Austenite	
				Crystals	
				Gases	
				Liquids	
				Materials processing	
				Solid-state physics	
				Solids	
			NT:	Absorption	
				Aging	
				Chemical analysis	
<b>Maternity benefits</b>					
			USE:	Employee welfare	
<b>Mathematical analysis</b>					
			BT:	Mathematical model	
			NT:	Formal concept analysis	
				Fractional calculus	
				Modal analysis	
<b>Mathematical model</b>					
			BT:	Mathematics	
			RT:	Artificial neural networks	
			NT:	Mathematical analysis	
<b>Mathematical programming</b>					
			BT:	Mathematics	
				Optimization methods	



# 2018 IEEE Thesaurus

## Mathematics

RT: Econometrics  
Maximum likelihood

detection

STEM  
Viterbi algorithm  
Waveguide theory

NT: Accuracy  
Algebra  
Algorithm design and

analysis

Algorithms  
Arithmetic  
Azimuth  
Boundary value problems  
Calculus  
Closed-form solutions  
Combinatorial mathematics  
Computational efficiency  
Conformal mapping  
Convergence  
Convex functions  
Cyclic redundancy check  
Eigenvalues and

eigenfunctions

Equations  
Estimation  
Euclidean distance  
Finite difference methods  
Finite element analysis  
Fourier series  
Functional analysis  
Geometry  
Gradient methods  
Graph theory  
Harmonic analysis  
Iterative methods  
Kernel  
Laplace equations  
Lattices  
Limit-cycles  
Linear matrix inequalities  
Linear systems  
Linearization techniques  
Mathematical model  
Mathematical programming  
Method of moments  
Minimization  
Mode matching methods  
Network theory (graphs)  
Nonlinear equations  
Nonlinear systems  
Numerical analysis  
Optimization

Piecewise linear techniques  
Predator prey systems  
Probability  
Quaternions  
Random processes  
Root mean square  
Sequences  
Set theory  
Simulated annealing  
Smoothing methods  
Spirals  
Statistics  
Stochastic processes  
Taylor series  
Topology  
Transforms  
Transmission line matrix

Uncertain systems  
Utility theory

## methods

## Mathematics computing

BT: Computer applications  
NT: Matlab

## Matlab

UF: Matrix laboratory  
BT: Mathematics computing  
RT: Computer aided instruction  
Numerical analysis  
Simulation  
Software libraries

## Matrices

UF: Matrix algebra  
BT: Linear algebra  
RT: Method of moments  
Mode matching methods  
NT: Jacobian matrices  
Matrix decomposition  
Singular value

## decomposition

## Matrix algebra

USE: Matrices

## Matrix converters

UF: Matrix convertors  
BT: Power conversion  
RT: Power electronics

## Matrix convertors

USE: Matrix converters

## Matrix decomposition





# 2018 IEEE Thesaurus

<i>MDDI</i>				Geologic measurements
USE:	Musical instrument digital			Geophysical measurements
interfaces				Interferometry
				Length measurement
				Lifetime estimation
				Loss measurement
				Magnetic variables
<b>Mean square error methods</b>				
BT:	Approximation methods			
RT:	Error analysis			
	Estimation theory	measurement		
	Least squares			Measurement by laser
approximation		beam		
NT:	Least mean squares			Measurement errors
methods				Measurement techniques
				Measurement uncertainty
				Measurement units
				Mechanical variables
<b>Measurement</b>				
UF:	Metrics			
	Performance measurement	measurement		
	Performance metrics			Micrometers
BT:	Instrumentation and			Moisture measurement
measurement				Noise measurement
RT:	Containers			Nuclear measurements
	Data acquisition			Optical variables
	Instruments	measurement		
	Measurement standards			Particle beam
	Phase frequency detector	measurements		
	Telemetry			Particle measurements
	Testing			Performance evaluation
	Transducers			Phase measurement
NT:	Accelerometers			Plasma measurements
	Acoustic measurements			Plethysmography
	Antenna measurements			Pollution measurement
	Anthropometry			Pressure measurement
	Area measurement			Pulse measurements
	Atmospheric			Reflectometry
measurements				Reproducibility of results
	Atomic measurements			Scintillation counters
	Biomedical measurement			Sea state
	Calorimetry			Semiconductor device
	Coordinate measuring	measurement		
machines				Sensitivity
	Density measurement			Shape measurement
	Distance measurement			Size measurement
	Distortion measurement			Software measurement
	Doppler measurement			Soil measurements
	Dosimetry			Spectral efficiency
	Dynamic range			Spectroscopy
	Electric variables	measurement		Thermal variables
measurement				
	Electromagnetic			Time measurement
measurements				UHF measurements
	Extraterrestrial			Ultrasonic variables
measurements		measurement		
	Fluid flow measurement			Viscosity
	Frequency measurement			Wavelength measurement
	Gain measurement			Wide area measurements
	Gas chromatography			pH measurement





# 2018 IEEE Thesaurus

## Measurement by laser beam

BT: Measurement  
RT: Laser applications  
NT: Laser velocimetry

## Measurement errors

BT: Measurement  
RT: Error analysis  
Statistical analysis

## Measurement standards

BT: Standards categories  
RT: ISO  
Measurement  
Measurement units

## Measurement techniques

BT: Measurement  
RT: Measurement uncertainty  
NT: Calibration  
Dynamic equilibrium

## Measurement uncertainty

BT: Measurement  
RT: Estimation  
Measurement techniques

## Measurement units

UF: Units (measurement)  
BT: Measurement  
RT: Measurement standards  
NT: Nanometers

## Mechanical bearings

BT: Friction  
RT: Ball bearings  
Lubrication  
Mechanical factors  
NT: Rolling bearings

## Mechanical cables

UF: Cables (mechanical)  
BT: Cables

## Mechanical energy

BT: Mechanical systems  
RT: Kinetic energy  
Potential energy

## Mechanical engineering

BT: Engineering - general  
RT: Mechanical products  
Precision engineering  
Pressure vessels

NT: Mechanical power  
transmission  
Mechanical systems

## Mechanical factors

UF: Mechanical properties  
BT: Physics  
RT: Acoustic noise  
Electrostriction  
Magnetomechanical effects  
Mechanical bearings  
Mechanical variables

## control

Oils  
Structural engineering  
NT: Acceleration  
Aerodynamics  
Biomechanics  
Damping  
Dynamics  
Fatigue  
Force  
Friction  
Hydrodynamics  
Kinematics  
Lubrication  
Magnetohydrodynamics  
Photoelasticity  
Pressure effects  
Shock (mechanics)  
Strain  
Stress  
Surface cracks  
Torque  
Vibrations  
Volume relaxation  
Workability

## Mechanical guides

UF: Guideways (mechanical)  
Slideways (mechanical)  
BT: Mechanical products  
RT: Machine tools  
Position control

## Mechanical power transmission

UF: Continuously variable  
transmission  
Powertrain  
BT: Mechanical engineering  
RT: Cams  
Drives  
Engines  
Gears  
Oils



# 2018 IEEE Thesaurus

	Power systems		Microelectromechanical
	Shafts	devices	
NT:	Torque converters		Pneumatic systems
			Turbomachinery
<b>Mechanical products</b>		NT:	Mechanical energy
UF:	Ball screws		Micromechanical devices
BT:	Manufactured products		
	Production	<b>Mechanical variables control</b>	
RT:	Mechanical engineering	BT:	Control systems
	Structural rings	RT:	Flexible structures
NT:	Automotive components		Frequency control
	Axles		Manipulators
	Bellows		Mechanical factors
	Blades		Mobile robots
	Brakes		Motor drives
	Couplings		Robots
	Fasteners	NT:	Displacement control
	Flanges		Force control
	Gears		Level control
	Hoses		Motion control
	Machine components		Pitch control (position)
	Mechanical guides		Position control
	Needles		Shape control
	Orifices		Size control
	Pistons		Strain control
	Pressure vessels		Stress control
	Seals		Thickness control
	Springs		Torque control
	Steering systems		Velocity control
	Structural shapes		Vibration control
	Suspensions		Weight control
	Tires		
	Vents	<b>Mechanical variables measurement</b>	
	Wheels	BT:	Measurement
		RT:	Frequency measurement
<i>Mechanical properties</i>			Transducers
USE:	Mechanical factors	NT:	Angular velocity
			Displacement
<b>Mechanical sensors</b>		measurement	
BT:	Sensors		Force measurement
NT:	Capacitive sensors		Motion measurement
			Position measurement
<b>Mechanical splines</b>			Rotation measurement
BT:	Machine components		Strain measurement
RT:	Gears		Stress measurement
	Machine tool spindles		Thickness measurement
	Shafts		Torque measurement
			Velocity measurement
<i>Mechanical stress</i>			Vibration measurement
USE:	Stress		Volume measurement
			Weight measurement
<b>Mechanical systems</b>		<i>Mechanical vibrations</i>	
BT:	Mechanical engineering	USE:	Vibrations
RT:	Gears		
	Mechatronics		



# 2018 IEEE Thesaurus

## **Mechatronics**

BT: Electron devices  
RT: Autonomous vehicles  
Control equipment  
Intelligent control  
Intelligent sensors  
Mechanical systems  
Microelectromechanical

devices

Microelectromechanical

systems

Robots  
Vehicular automation  
NT: Biomechatronics

## **Media**

BT: Materials  
RT: Design tools  
NT: Nonhomogeneous media  
Random media

*Media access control*

USE: Media Access Protocol

## **Media Access Protocol**

UF: MAC  
MAC protocol  
Media access control  
Medium access control  
BT: Access protocols  
RT: Local area networks  
Metropolitan area networks

*Media streaming*

USE: Streaming media

## **Mediation**

BT: Middleware

*Medical computing*

USE: Biomedical computing

## **Medical conditions**

UF: Medical disorders  
BT: Medical services  
NT: Aneurysm  
Atrophy  
Autism  
Blindness  
Cataracts  
Deafness  
Diabetes  
Diseases  
Hemorrhaging  
Hypertension

Hyperthermia  
Injuries  
Kidney stones  
Obesity  
Pregnancy  
Sleep apnea  
Thrombosis  
Tumors

## **Medical control systems**

BT: Control systems  
RT: Assistive technology  
Biomedical equipment  
Orthotics  
Prosthetics

## **Medical diagnosis**

UF: Diagnosis (medical)  
Patient diagnosis  
BT: Medical services  
RT: Biomedical imaging  
Diagnostic radiography  
Diseases  
Electroencephalography  
Medical expert systems  
Occupational medicine  
Radiography  
NT: Autopsy  
Bronchoscopy  
Colonography  
Computer aided diagnosis  
Medical signal detection  
Nanomedicine  
Plethysmography  
Sensitivity and specificity

## **Medical diagnostic imaging**

BT: Biomedical imaging  
RT: Cancer  
Positron emission

tomography

Solid scintillation detectors  
Tumors  
NT: Anatomical structure

*Medical disorders*

USE: Medical conditions

*Medical equipment*

USE: Biomedical equipment AND  
Medical instruments

## **Medical expert systems**

BT: Biomedical computing  
Expert systems



# 2018 IEEE Thesaurus

RT:	Medical diagnosis Medical treatment	Medical diagnosis Medical tests Medical treatment Occupational medicine Prosthetics Public healthcare Sensory aids Vaccines X-rays
<i>Medical image processing</i>		
USE:	Biomedical image processing	
<i>Medical imaging</i>		
USE:	Biomedical imaging	
<b>Medical information systems</b>		<b>Medical signal detection</b>
BT:	Biomedical computing Computer applications Information systems	BT: Medical diagnosis
NT:	Electronic medical records	<b>Medical simulation</b>
		BT: Simulation
<b>Medical instruments</b>		<b>Medical specialties</b>
UF:	Medical equipment	BT: Engineering in medicine and biology
BT:	Biomedical equipment Instruments	NT: Cardiology Dermatology Gastroenterology Gerontology Gynecology Neonatology Neurology Oncology Pathology Pediatrics
<b>Medical robotics</b>		
UF:	Medical robots Surgical robots	
BT:	Robots	
RT:	Biomedical equipment	
NT:	Rehabilitation robotics	
<i>Medical robots</i>		
USE:	Medical robotics	
<b>Medical services</b>		<b>Medical tests</b>
UF:	Doctor Emergency medical services	BT: Medical services RT: Mammography NT: Amniocentesis Biopsy Cancer detection Colonoscopy Pregnancy test
	Health care Healthcare Nursing Physician	
BT:	Engineering in medicine	<b>Medical treatment</b>
and biology		UF: Patient identification Patient treatment Therapy
RT:	Behavioral sciences Chemotherapy Emergency services	BT: Medical services RT: Biohazards Biomedical applications of radiation
NT:	Assisted living Catheterization Clinical diagnosis Cybercare Electronic healthcare Health information	
management	Hospitals In vitro In vivo Medical conditions	NT: Anesthesia Angioplasty Brachytherapy Brain stimulation Chemotherapy



# 2018 IEEE Thesaurus

prescriptions	Clinical trials				Mel-frequency cepstral
	Cryotherapy		coefficient		
	Defibrillation		BT:		Cepstral analysis
	Dentistry				
	Electrical stimulation		<i>Mel-frequency cepstral coefficient</i>		
	Electronic medical		USE:		Mel frequency cepstral
			coefficient		
	Embolization				
	Fibrillation		<i>Melanoma</i>		
	Geriatrics		USE:		Malignant tumors
	Hepatectomy				
	Hospitals		<b>Melt processing</b>		
	Hyperthermia		BT:		Manufacturing systems
	Lithotripsy				Materials processing
	Magnetic stimulation		RT:		Die casting
	Neuromuscular stimulation				Smelting
	Neutron capture therapy		NT:		Vacuum arc remelting
	Noninvasive treatment				
	Orthopedic procedures		<i>Membranes</i>		
	Orthotics		USE:		Biomembranes
	Patient rehabilitation				
	Pharmaceuticals		<b>Memetics</b>		
	Proton therapy		BT:		Evolution (biology)
	Surgery		RT:		Cultural differences
					Genetics
	<i>Medium access control</i>				
	USE:		<i>Memoirs</i>		
	Media Access Protocol		USE:		Autobiographies
	<i>Medium resolution imaging spectrometer</i>				
	USE:		<b>Memory</b>		
	MERIS		UF:		Data storage
<b>Medium voltage</b>			BT:		Computers and information
UF:	Medium-voltage		processing		
BT:	Voltage measurement		RT:		CMOS memory circuits
					Memory architecture
<i>Medium-voltage</i>					Phase change materials
USE:	Medium voltage				Recording
			NT:		Analog memory
<b>Meeting planning</b>					Associative memory
BT:	Planning				Buffer storage
					Cache memory
<b>Meetings</b>					Content addressable
UF:	Technical meetings		storage		
BT:	Professional				Flash memories
communication					Magnetic memory
RT:	Public speaking				Memory management
	Teleconferencing				Nonvolatile memory
NT:	Conferences				Phase change memory
					Random access memory
<i>Meetings (technical)</i>					Read only memory
USE:	Conferences				Read-write memory
					Registers
<b>Mel frequency cepstral coefficient</b>					Scanning probe data
UF:	MFCC		storage		
					Semiconductor memory



# 2018 IEEE Thesaurus

## Memory architecture

BT: Computer architecture  
RT: Memory  
Memory management

## Memory management

UF: Garbage collection  
(computers)  
BT: Computer architecture  
Memory  
RT: Memory architecture  
Memory modules  
Storage management

## Memory modules

BT: Printed circuits  
RT: Integrated circuits  
Memory management

## Memory resistors

USE: Memristors

## Memoryless channel

USE: Memoryless systems

## Memoryless systems

UF: Memoryless channel  
BT: Probability

## Memristor circuits

USE: Memristors

## Memristors

UF: Memory resistors  
Memristor circuits  
BT: Resistors  
RT: Resistive RAM

## MEMS

USE: Microelectromechanical  
systems

## MEMS switches

USE: Microswitches

## Mental disorders

UF: Mental illness  
BT: Psychiatry

## Mental illness

USE: Mental disorders

## Mental models

USE: Cognitive science

## Mentoring

BT: Career development  
RT: Training

## Mercury (metals)

UF: Hg  
BT: Chemical elements  
Metals

## Mercury (planets)

BT: Planets

## Mergers

USE: Corporate acquisitions

## Merging

BT: Data handling  
RT: Sorting

## MERIS

UF: Medium resolution imaging  
spectrometer  
BT: Spectroscopy

## MERIT

USE: Magneto electrical  
resistivity imaging technique

## Merit pay

USE: Incentive schemes

## Mesencephalon

USE: Midbrain

## MESFET circuits

BT: FET circuits  
RT: MESFETs  
NT: MESFET integrated circuits

## MESFET integrated circuits

BT: FET integrated circuits  
Integrated circuits  
MESFET circuits  
RT: MESFETs  
NT: Microwave FET integrated  
circuits

## MESFETs

UF: Schottky FETs  
BT: Field effect transistors  
RT: MESFET circuits  
MESFET integrated circuits  
Schottky barriers  
NT: Microwave FETs



# 2018 IEEE Thesaurus

## Mesh generation

BT: Computer displays  
RT: Computer graphics

## Mesh networks

BT: Ad hoc networks

## Mesomycetozoea

BT: Organisms

## Mesons

UF: Kaons  
Muons  
Pions  
BT: Elementary particles  
RT: Cosmic rays

## Mesoporous

USE: Mesoporous materials

## Mesoporous materials

UF: Mesoporous  
BT: Materials

## Message authentication

BT: Data security  
RT: Cryptography  
Digital signatures  
Message systems  
NT: Steganography

## Message passing

BT: Distributed processing

## Message service

UF: Messaging service  
BT: Web services

## Message systems

BT: Communications technology  
RT: Digital signatures  
Message authentication  
NT: Electronic mail  
Electronic messaging  
Postal services  
Publish subscribe systems  
Voice mail

## Message-oriented middleware

BT: Middleware

## Messaging service

USE: Message service

## Meta data

USE: Metadata

## Meta search

USE: Metasearch

## Meta-modeling

USE: Metamodeling

## Meta-search

USE: Metasearch

## Metabolic networks

USE: Biochemistry

## Metabolism

USE: Biochemistry

## Metabolomics

BT: Molecular biomarkers

## Metacomputing

BT: Distributed computing  
NT: Grid computing

## Metadata

UF: Meta data  
BT: Data models  
RT: Image annotation  
Linked data

## Metal foam

BT: Materials  
RT: Lightweight structures  
Metals  
Polymer foams

## Metal oxide semiconductor heterojunction FETs

USE: MOSHFETs

## Metal product industries

BT: Manufacturing industries  
RT: Metal products

## Metal products

BT: Manufactured products  
RT: Ball bearings  
Blanking  
Metal product industries  
Metals industry  
Swaging

## Metal vapor lasers

USE: Gas lasers



# 2018 IEEE Thesaurus

## Metal-insulator structures

BT: Insulators  
RT: Electrodes  
MIS devices  
MOS integrated circuits  
NT: MIM capacitors  
MIM devices

## Metal-insulator-metal capacitors

USE: MIM capacitors

## Metal-insulator-metal devices

USE: MIM devices

## Metal-insulator-semiconductor devices

USE: MIS devices

## Metal-oxide semiconductor field effect transistor

USE: MOSFET circuits

## Metal-oxide semiconductors

USE: MOS devices

## Metal-oxide-nitride-oxide-semiconductors

USE: MONOS devices

## Metal-oxide-nitride-oxide-silicon

USE: MONOS devices

## Metal-oxide-semiconductor devices

USE: MOS devices

## Metal-semiconductor interfaces

USE: Semiconductor-metal  
interfaces

## Metallic materials

BT: Materials  
RT: Cermet

## Metallic superlattices

BT: Superlattices

## Metallisation

USE: Metallization

## Metallization

UF: Metallisation  
BT: Metals  
RT: Wiring  
NT: Integrated circuit  
metallization

## Metallurgy

BT: Materials science and  
technology

RT: Iron alloys  
Metals

## Metalorganic vapor deposition

USE: MOCVD

## Metals

UF: Alloys  
BT: Materials, elements, and  
compounds

RT: Blanking  
Die casting  
Filler metals  
Inorganic compounds  
Metal foam  
Metallurgy  
Metalworking machines

NT: Alloying  
Aluminum  
Barium  
Bismuth  
Boron  
Cadmium  
Calcium  
Chromium  
Cobalt  
Copper  
Digital alloys  
Erbium  
Gallium  
Germanium  
Gold  
Hafnium  
Indium  
Iron  
Lanthanum  
Lead  
Lithium  
Magnesium  
Manganese  
Mercury (metals)  
Metallization  
Neodymium  
Nickel  
Niobium  
Palladium  
Platinum  
Rare earth metals  
Samarium  
Silver  
Steel  
Strontium  
Tin





# 2018 IEEE Thesaurus

	Titanium		
	Tungsten		
	Yttrium		
	Zinc		
<b>Metals industry</b>		<i>Metastatic disease</i>	
UF:	Aluminium industry	USE:	Metastasis
	Aluminum industry		
BT:	Industries	<b>Meteorological factors</b>	
RT:	Metal products	BT:	Geoscience
	Smelting	RT:	Fading channels
			Multipath channels
<b>Metalworking machines</b>		<b>Meteorological radar</b>	
BT:	Machine tools	BT:	Radar
RT:	Cutting tools	RT:	Backscatter
	Materials processing		Radar imaging
	Metals		
<i>Metamaterial cloaking</i>		<b>Meteorology</b>	
USE:	Optical cloaking	UF:	Climate
			Weather
<b>Metamaterials</b>		BT:	Geophysics
UF:	Acoustic metamaterials	RT:	Air pollution
	Left handed materials		Atmosphere
	Left-handed materials		Atmospheric
	Microwave metamaterials		
BT:	Materials	measurements	Data assimilation
RT:	Nanocomposites		Environmental factors
	Optical materials		Ice
	Refractive index		Ionosphere
	Smart materials		Pressure effects
NT:	Electromagnetic		Remote sensing
metamaterials		NT:	Terrestrial atmosphere
	Optical cloaking		Humidity
	Optical metamaterials		Lightning
			Monsoons
<b>Metamodeling</b>			Rain
UF:	Meta-modeling		Snow
BT:	Modeling		Storms
			Weather forecasting
<i>Metamorphic HEMTs</i>			Wind
USE:	mHEMTs	<b>Meter reading</b>	
		BT:	Power system
<b>Metasearch</b>		measurements	
UF:	Federated search	NT:	Automatic meter reading
	Federated searching		Smart meters
	Meta search		
	Meta-search	<b>Meters</b>	
BT:	Search methods	BT:	Instruments
RT:	Triples (Data structure)	NT:	Dynamometers
			Flowmeters
<b>Metastasis</b>			Goniometers
UF:	Metastatic disease		Potentiometers
BT:	Cancer		Radiometers
RT:	Diseases		Tachometers
			Vibrometers
			Voltmeters
			Watt-hour meters



# 2018 IEEE Thesaurus

	Wattmeters		Multiprocessor
<b>Methane</b>		interconnection	
BT:	Natural gas		Open systems
RT:	Carbon emissions		Protocols
			Regional area networks
			Token networks
<b>Methanol</b>		<i>Metropolitan areas</i>	
UF:	Carbinol	USE:	Urban areas
	Methyl alcohol		
	Wood alcohol		
	Wood naphtha	<i>MFCC</i>	
	Wood spirits	USE:	Mel frequency cepstral
BT:	Chemical compounds	coefficient	
RT:	Anti-freeze		
	Fuels	<i>Mg</i>	
	Solvents	USE:	Magnesium
<b>Method of moments</b>		<i>MgO</i>	
UF:	Galerkin method	USE:	Magnesium oxide
	Method-of-moments		
	MoM	<i>MHD</i>	
	Moment methods	USE:	Magnetohydrodynamics
BT:	Mathematics		
	Numerical analysis	<b>mHEMTs</b>	
RT:	Boundary element methods	UF:	Metamorphic HEMTs
	Integral equations	BT:	HEMTs
	Matrices		
<i>Method-of-moments</i>		<i>MIB</i>	
USE:	Method of moments	USE:	Management information
<i>Methyl alcohol</i>		base	
USE:	Methanol	<i>MIC</i>	
		USE:	Microwave integrated
<i>Metrics</i>		circuits	
USE:	Measurement	<b>Mice</b>	
		UF:	Mouse
<i>Metro area networks</i>		BT:	Animals
USE:	Metropolitan area networks		
<b>Metrology</b>		<i>Mice flows</i>	
BT:	Science - general	USE:	Communication system
NT:	Optical metrology	traffic AND	
			Computer networks
<b>Metropolitan area networks</b>		<i>Micro computers</i>	
UF:	Metro area networks	USE:	Microcomputers
BT:	Communication systems		
	Computer networks	<i>Micro-computers</i>	
	Digital systems	USE:	Microcomputers
RT:	Distributed computing		
	IEEE 802.16 Standard	<i>Micro-electro-mechanical devices</i>	
	Internetworking	USE:	Microelectromechanical
	LAN interconnection	devices	
	Media Access Protocol		
		<i>Micro-electro-mechanical systems</i>	



# 2018 IEEE Thesaurus

USE: Microelectromechanical  
systems

*Micro-electromechanical devices*

USE: Microelectromechanical  
devices

*Micro-electromechanical systems*

USE: Microelectromechanical  
systems

*Micro-hydro*

USE: Microhydro power

*Micro-optical components*

USE: Microoptics

*Micro-opticalmechanical devices*

USE: Microoptics

## Microactuators

BT: Actuators  
Microelectromechanical

devices

RT: Microrelays

## Microarchitecture

BT: Software architecture

## Microassembly

UF: Die attach  
Die bonding  
BT: Assembly  
RT: Flip-chip devices  
Integrated circuit

manufacture

Micromachining  
Semiconductor device

manufacture

*Microbial eletrolysis cells*

USE: Fuel cells

*Microbial fuel cells*

USE: Fuel cells

## Microcavities

BT: Optical resonators  
Cavity resonators  
Light emitting diodes  
Microoptics  
Photoluminescence  
Spontaneous emission  
Whispering gallery modes

## Microcell networks

UF: Microcells  
Small cell networks  
BT: Cellular networks

*Microcells*

USE: Microcell networks

## Microchannels

BT: Hydraulic diameter

## Microchip lasers

BT: Solid lasers

*Microchips*

USE: Integrated circuits

## Microcomputers

UF: Laptops  
Micro computers  
Micro-computers  
Minicomputers  
Personal computers  
BT: Computers  
RT: Consumer electronics  
Home computing  
Microprocessors  
Office automation  
NT: Portable computers  
Workstations

*Microcontact printing*

USE: Soft lithography

## Microcontrollers

BT: Control equipment  
Microprocessors  
RT: CMOS technology  
Control systems  
High-speed integrated

circuits

Neurocontrollers  
System-on-chip

## Microdisplays

BT: Displays  
RT: Liquid crystal devices  
Liquid crystal on silicon  
Microoptics

## Microeconomics

BT: Economics  
RT: Linear programming  
Monopoly  
Oligopoly



# 2018 IEEE Thesaurus

	NT:	Supply and demand Economies of scale Industrial economics			Nanotechnology
<b>Microelectrodes</b>			<b>Microfiltration</b>	BT:	Filtration
BT:		Electrodes	RT:		Contamination
RT:		Neurophysiology Neurostimulation	<b>Microfluidics</b>	BT:	Electron devices Fluidics
<b>Microelectromechanical devices</b>	UF:	Micro-electro-mechanical devices	RT:		Biomedical engineering Fluidic microsystems Hydrodynamics
devices		Micro-electromechanical	<b>Microgrids</b>	BT:	Power grids
devices	BT:	Microelectromechanical	RT:		Distributed power
systems	RT:	Magnetic particles Mechanical systems Mechatronics Micromachining Microsensors	generation		Power generation Power system management Power system reliability Smart grids
	NT:	Microactuators Micromotors Micropumps Microvalves	<i>Microgrippers</i>	USE:	Grippers
<b>Microelectromechanical systems</b>			<b>Microhydro power</b>	UF:	Micro-hydro
UF:		MEMS Micro-electro-mechanical	BT:		Hydroelectric power
systems		Micro-electromechanical	generation	RT:	Appropriate technology
systems	BT:	Electron devices	<b>Microinjection</b>	BT:	Biology
	RT:	Mechatronics Nanoelectromechanical	<b>Micromachining</b>	BT:	Electronic equipment
systems	NT:	Microelectromechanical	manufacture	RT:	Electrochemical machining Embossing Etching Integrated circuit
devices		Radiofrequency	manufacture		Microassembly Microelectromechanical
microelectromechanical systems			devices		Semiconductor device
<b>Microelectronic implants</b>	BT:	Implants	manufacture		
<i>Microelectronic stimulation</i>	USE:	Electrical stimulation	<b>Micromagnetics</b>	BT:	Magnets
<b>Microelectronics</b>			<b>Micromanipulators</b>	BT:	Manipulators
BT:		Electronic equipment	<b>Micromechanical devices</b>		
RT:		Integrated circuits			
<b>Microfabrication</b>					
BT:		Fabrication Micromechanical devices			
RT:		Fiducial markers			



# 2018 IEEE Thesaurus

UF: Micromechanical systems  
 BT: Electron devices  
 Mechanical systems  
 RT: Microoptics  
 Nanogenerators  
 NT: Biomedical  
 microelectromechanical systems  
 Fluidic microsystems  
 Microfabrication

## *Micromechanical systems*

USE: Micromechanical devices

## **Micrometers**

UF: Micrometres  
 Micrometry  
 Microns  
 BT: Measurement  
 RT: Distance measurement  
 Interferometry  
 Length measurement  
 Strain measurement  
 Thickness measurement

## *Micrometres*

USE: Micrometers

## *Micrometry*

USE: Micrometers

## **Micromirrors**

UF: Digital micromirror devices  
 BT: Microoptics  
 Mirrors  
 RT: Optical arrays  
 Optical projectors

## **Micromotors**

BT: Microelectromechanical  
 devices  
 Motors  
 Rotating machines

## *Microns*

USE: Micrometers

## *Microoptical components*

USE: Microoptics

## **Microoptics**

UF: Micro-optical components  
 Micro-opticalmechanical  
 devices  
 BT: Microoptical components  
 Optics

RT: Integrated optics  
 Integrated optoelectronics  
 Microcavities  
 Microdisplays  
 Micromechanical devices  
 Microswitches  
 NT: Micromirrors

## **Microorganisms**

UF: Bacteria  
 Bacterial content  
 Viruses (microorganisms)  
 BT: Organisms  
 RT: Biological cells  
 Immune system  
 Molecular biophysics  
 NT: Adenoviruses

## **Microphone arrays**

BT: Microphones

## **Microphones**

BT: Audio systems  
 NT: Microphone arrays

## **Microprocessor chips**

BT: Microprocessors  
 RT: Flip-chip devices  
 Substrates  
 Yield estimation

## **Microprocessors**

BT: Circuits  
 Integrated circuits  
 RT: CMOS technology  
 Embedded systems  
 Flip-chip devices  
 Microcomputers  
 Processor scheduling  
 System-on-chip  
 NT: Automatic logic units  
 Biomimetics  
 Coprocessors  
 Microcontrollers  
 Microprocessor chips  
 Vector processors

## **Microprogramming**

UF: Firmware  
 BT: Programming  
 RT: Computer architecture  
 Software

## **Micropumps**



# 2018 IEEE Thesaurus

BT: Microelectromechanical  
devices  
Pumps

## Microrelays

BT: Relays  
RT: Microactuators

## Microscopy

BT: Imaging  
Instruments  
RT: Optical imaging  
NT: Atomic force microscopy  
Electron microscopy  
Scanning microwave

microscopy

Scanning probe microscopy

## Microsensors

BT: Electromechanical sensors  
RT: Control systems  
Microelectromechanical

devices

Wireless sensor networks

*Microsoft Excel*

USE: Spreadsheet programs

## Microsoft Windows

BT: Operating systems

## Microstrip

UF: Microstrip lines  
BT: Planar transmission lines  
RT: Broadband antennas  
NT: Microstrip components

## Microstrip antenna arrays

UF: Microstrip arrays  
BT: Antenna arrays  
RT: Antennas  
Aperture coupled antennas  
Microstrip antennas

## Microstrip antennas

BT: Antennas  
RT: Aperture coupled antennas  
Microstrip antenna arrays  
Patch antennas

*Microstrip arrays*

USE: Microstrip antenna arrays

## Microstrip components

BT: Microstrip

RT: Power combiners  
Power dividers  
Thick film inductors  
NT: Microstrip resonators

## Microstrip filters

BT: Filters  
RT: Microwave communication

*Microstrip lines*

USE: Microstrip

## Microstrip resonators

BT: Microstrip components  
RT: Resonance

## Microstructure

BT: Materials science and  
technology  
RT: Crystal microstructure

*Microstructured fibers*

USE: Photonic crystal fibers

*Microstructured fibres*

USE: Photonic crystal fibers

## Microsurgery

BT: Surgery

## Microswitches

UF: MEMS switches  
BT: Switches  
RT: Microoptics

## Microvalves

BT: Microelectromechanical  
devices  
Valves

## Microwave amplifiers

BT: Microwave devices

## Microwave antenna arrays

BT: Antenna arrays

## Microwave antennas

BT: Antennas

## Microwave bands

BT: Microwave technology  
NT: C-band  
K-band  
L-band



# 2018 IEEE Thesaurus

## Microwave circuits

BT: Circuits  
Microwave technology  
RT: Analog circuits  
Distributed parameter  
circuits  
Microwave devices  
Microwave integrated  
circuits  
Microwave photonics

## Microwave communication

BT: Communication systems  
Microwave technology  
RT: Microstrip filters  
Microwave photonics  
NT: Rectennas

## Microwave devices

BT: Microwave technology  
RT: Electromagnetic  
waveguides  
Microwave circuits  
Microwave photonics  
Photonic crystals  
Superconducting  
microwave devices  
NT: Masers  
Microwave amplifiers  
Microwave filters  
Microwave transistors

## Microwave FET integrated circuits

BT: MESFET integrated circuits  
RT: Microwave FETs

## Microwave FETs

BT: MESFETs  
Microwave transistors  
RT: Microwave FET integrated  
circuits

## Microwave filters

BT: Microwave devices

## Microwave frequencies

BT: Microwave measurement

## Microwave generation

BT: Microwave technology  
NT: High power microwave  
generation

## Microwave heating

USE: Electromagnetic heating

## Microwave imaging

BT: Imaging  
RT: Remote sensing

## Microwave integrated circuits

UF: MIC  
BT: Integrated circuits  
RT: Analog integrated circuits  
Microwave circuits  
NT: MMICs

## Microwave lasers

USE: Masers

## Microwave magnetics

BT: Magnetics

## Microwave measurement

BT: Electromagnetic  
measurements  
RT: Microwave technology  
NT: Microwave frequencies

## Microwave metamaterials

USE: Metamaterials

## Microwave oscillators

BT: Oscillators

## Microwave ovens

BT: Consumer electronics  
Consumer products  
Home appliances  
Ovens

## Microwave photonics

BT: Microwave technology  
Photonics  
RT: Electrooptic modulators  
Elementary particles  
Integrated optoelectronics  
Microwave circuits  
Microwave communication  
Microwave devices  
Optical modulation

## Microwave propagation

BT: Electromagnetic  
propagation  
RT: Broadband antennas  
Electromagnetic  
waveguides

## Microwave radar



# 2018 IEEE Thesaurus

USE:	Radar		Internet of Things
<b>Microwave radiometry</b>		NT:	Publish subscribe systems
BT:	Radiometry		Mediation
			Message-oriented
<b>Microwave sensors</b>		middleware	Web services
BT:	Microwave technology	<b>Mie scattering</b>	
<b>Microwave technology</b>		BT:	Electromagnetic scattering
BT:	Microwave theory and techniques	RT:	Electromagnetic analysis
RT:	Microwave measurement		Electromagnetic fields
	Radar		Electromagnetic forces
NT:	Baluns		Electromagnetic
	Beam steering	measurements	Electromagnetic
	Circulators	propagation	
	Masers	<i>Mil standards</i>	
	Microwave bands	USE:	Military standards
	Microwave circuits	<b>Military aircraft</b>	
	Microwave communication	BT:	Military equipment
	Microwave devices	RT:	Aircraft
	Microwave generation		Hyperspectral sensors
	Microwave photonics	NT:	Payloads
	Microwave sensors		
<b>Microwave theory and techniques</b>		<i>Military command and control</i>	
NT:	Microwave technology	USE:	Command and control
	Millimeter wave technology	systems	
	Submillimeter wave	<b>Military communication</b>	
technology		BT:	Communication systems
<b>Microwave transistors</b>		RT:	Command and control
BT:	Microwave devices	systems	
NT:	Microwave FETs		Cross layer design
<b>Microwave-assisted magnetic recording</b>			Electronic countermeasures
BT:	Magnetic recording		Hyperspectral sensors
<b>Midbrain</b>			Military satellites
UF:	Mesencephalon		Ultra wideband
BT:	Brain	communication	
	Central nervous system	NT:	Reconnaissance
RT:	Forebrain	<b>Military computing</b>	
	Hindbrain	BT:	Computer applications
<b>Middleboxes</b>		RT:	Mobile computing
BT:	Computer network	<b>Military equipment</b>	
management	Internet	BT:	Aerospace and electronic
<b>Middleware</b>		systems	
BT:	Client-server systems	RT:	Defense industry
	Software		Explosion protection
RT:	Computer applications		Ground support
	Computer networks		Landmine detection
		detectors	Magnetic anomaly





# 2018 IEEE Thesaurus

	Night vision		Millimeter wave integrated
	Open area test sites	circuits	
NT:	Military aircraft	NT:	Millimeter wave transistors
	Military satellites		
	Military vehicles	<b>Millimeter wave integrated circuits</b>	
	Weapons	UF:	Millimeter-wave integrated
		circuits	
<b>Military satellites</b>		BT:	Circuits
BT:	Artificial satellites		Integrated circuits
	Military equipment		Millimeter wave circuits
RT:	Global Positioning System		Millimeter wave technology
	Hyperspectral sensors	RT:	Analog integrated circuits
	Military communication		Millimeter wave devices
		NT:	MIMICs
<b>Military standards</b>			
UF:	Mil standards	<b>Millimeter wave measurements</b>	
BT:	Standards categories	UF:	Millimeter-wave
		measurements	
<b>Military vehicles</b>		BT:	Electromagnetic
BT:	Military equipment	measurements	
	Vehicles	RT:	Millimeter wave technology
<i>Milk</i>		<i>Millimeter wave monolithic integrated circuits</i>	
USE:	Dairy products	USE:	MIMICs
<i>Millennial generation</i>		<b>Millimeter wave propagation</b>	
USE:	Millennials	UF:	Millimeter-wave
		propagation	
<b>Millennials</b>		BT:	Electromagnetic
UF:	Generation Y	propagation	
	Millennial generation	RT:	Millimeter wave
BT:	Social groups	communication	
<b>Millimeter wave circuits</b>		<b>Millimeter wave radar</b>	
UF:	Millimeter-wave circuits	UF:	Millimeter-wave radar
BT:	Circuits	BT:	Millimeter wave technology
	Millimeter wave technology		Radar
RT:	Analog circuits		
	Distributed parameter	<b>Millimeter wave technology</b>	
circuits		UF:	Millimeter-wave technology
	Millimeter wave devices	BT:	Microwave theory and
NT:	Millimeter wave integrated	techniques	
circuits		RT:	Millimeter wave
		measurements	
<b>Millimeter wave communication</b>		NT:	Millimeter wave circuits
UF:	Millimeter-wave		Millimeter wave devices
communication			Millimeter wave integrated
BT:	Radio communication	circuits	
RT:	Millimeter wave		Millimeter wave radar
propagation			
		<b>Millimeter wave transistors</b>	
<b>Millimeter wave devices</b>		UF:	Millimeter-wave transistors
UF:	Millimeter-wave devices	BT:	Millimeter wave devices
BT:	Millimeter wave technology		Transistors
RT:	Millimeter wave circuits		



# 2018 IEEE Thesaurus

## *Millimeter-wave circuits*

USE: Millimeter wave circuits

## *Millimeter-wave communication*

USE: Millimeter wave communication

## *Millimeter-wave devices*

USE: Millimeter wave devices

## *Millimeter-wave integrated circuits*

USE: Millimeter wave integrated circuits

## *Millimeter-wave measurements*

USE: Millimeter wave measurements

## *Millimeter-wave monolithic integrated circuits*

USE: MIMICs

## *Millimeter-wave propagation*

USE: Millimeter wave propagation

## *Millimeter-wave radar*

USE: Millimeter wave radar

## *Millimeter-wave technology*

USE: Millimeter wave technology

## *Millimeter-wave transistors*

USE: Millimeter wave transistors

## *Millimicron*

USE: Nanometers

## **Milling**

BT: Machining  
RT: Boring  
Milling machines

## **Milling machines**

BT: Machine tools  
RT: Ball milling  
Cutting tools  
Milling

## **MIM capacitors**

UF: Metal-insulator-metal capacitors

BT: Metal-insulator structures

## **MIM devices**

UF: Metal-insulator-metal devices

BT: Metal-insulator structures

RT: Semiconductor-insulator interfaces

## **MIMICs**

UF: Millimeter wave monolithic integrated circuits

BT: Millimeter wave integrated circuits

BT: Millimeter wave integrated circuits

Monolithic integrated circuits

RT: MMICs  
Radiofrequency integrated circuits

## **MIMO communication**

UF: MIMO systems  
Multiple input multiple

output  
Multiple input multiple

output systems  
Multiple-input multiple-

output  
Multiple-input multiple-

output systems  
Multiple-input-multiple-

output  
Multivariable systems  
Communication systems  
3G mobile communication

BT: Control systems

RT: IEEE 802.11 Standard

IEEE 802.11n Standard

IEEE 802.16 Standard

MISO communication

Multipath channels

NOMA

OFDM

Optimization methods

Radio communication

SIMO communication

SISO communication

NT: Rician channels

## **MIMO radar**

BT: Multistatic radar

## *MIMO systems*

USE: MIMO communication

## *Mind-machine interfaces*



# 2018 IEEE Thesaurus

USE: Brain-computer interfaces

## *Mineral processing*

USE: Materials processing

## **Mineral resources**

BT: Minerals

## **Mineralization**

BT: Minerals

## **Minerals**

BT: Geology  
NT: Diamond  
Graphite  
Mineral resources  
Mineralization  
Ores

## *Minicomputers*

USE: Microcomputers

## **Minimally invasive surgery**

UF: Laparoscopic surgery  
BT: Surgery  
RT: Laparoscopes

## **Minimax techniques**

UF: Minimax techniques  
BT: Statistics  
RT: Artificial intelligence  
Game theory  
Minimization methods

## *Minimisation*

USE: Minimization

## *Minimisation methods*

USE: Minimization methods

## **Minimization**

UF: Minimisation  
BT: Mathematics  
RT: Optimization  
NT: Minimization methods

## **Minimization methods**

UF: Minimisation methods  
BT: Minimization  
RT: Approximation methods  
Minimax techniques

## *Minimum analog-digital integrated circuits*

USE: Analog-digital integrated circuits

## **Mining equipment**

BT: Production equipment  
RT: Mining industry

## **Mining industry**

BT: Industries  
RT: Fracking  
Fuel processing industries  
Geoengineering  
Hyperspectral sensors  
Mining equipment  
Raw materials  
NT: Coal mining

## *Minimax techniques*

USE: Minimax techniques

## **Mirrors**

BT: Optical devices  
RT: Optical materials  
Optical reflection  
Reflection  
NT: Distributed Bragg reflectors  
Micromirrors

## **MIS devices**

UF: Metal-insulator-semiconductor devices  
BT: Semiconductor devices  
RT: Metal-insulator structures  
Semiconductor-insulator  
interfaces  
NT: Charge coupled devices  
MOS devices

## **MISFETs**

BT: Field effect transistors  
RT: CMOSFET logic devices  
Magnetic field induced

## strain

## **MISO communication**

UF: multiple input single-output  
multiple-input single output  
multiple-input single-output  
BT: Communication systems  
RT: MIMO communication  
SIMO communication  
SISO communication

## **Missiles**

UF: Torpedoes  
BT: Weapons  
RT: Aerospace control



# 2018 IEEE Thesaurus

Ground support			Monolithic integrated
<b>Mission critical systems</b>		circuits	
UF: Mission-critical systems		RT: Analog integrated circuits	
BT: Contingency management		MIMICs	
		Radiofrequency integrated	
<i>Mission-critical systems</i>		circuits	
USE: Mission critical systems		<i>Mn</i>	
		USE: Manganese	
<b>Mixed analog digital integrated circuits</b>		<i>MNN</i>	
BT: Integrated circuits		USE: Multi-layer neural network	
RT: Analog processing circuits			
System-on-chip			
<i>Mixed convection</i>		<b>Mobile ad hoc networks</b>	
USE: Convection		UF: MANET	
		Wireless ad hoc network	
		BT: Ad hoc networks	
<b>Mixed integer linear programming</b>		<b>Mobile agents</b>	
UF: Mixed-integer linear		BT: Knowledge based systems	
programming		RT: Computer applications	
BT: Integer linear programming		Distributed computing	
		Intelligent systems	
<i>Mixed reality</i>		Learning systems	
USE: Virtual reality		Mobile computing	
		Software agents	
<i>Mixed-integer linear programming</i>		<b>Mobile antennas</b>	
USE: Mixed integer linear		BT: Antennas	
programming		Land mobile radio	
<b>Mixers</b>		equipment	
BT: Frequency conversion		RT: Land mobile radio	
RT: Demodulation			
Modulation			
Nonlinear circuits			
<b>Mixture models</b>		<i>Mobile application development</i>	
BT: Statistics		USE: Application programming	
RT: Feature extraction		interfaces	
Image segmentation			
Probabilistic logic		<b>Mobile applications</b>	
<i>MLE</i>		BT: Computer applications	
USE: Maximum likelihood		RT: Mobile communication	
estimation		Mobile handsets	
<b>MLFMA</b>		Wireless communication	
UF: Multilevel fast multipole		<b>Mobile communication</b>	
algorithm		BT: Communication systems	
BT: Algorithms		Near field communication	
		Acoustic communication	
<b>MMICs</b>		(telecommunication)	
UF: Monolithic microwave		Block codes	
integrated circuits		Film bulk acoustic	
BT: Microwave integrated		resonators	
circuits		Indoor communication	
		Long Term Evolution	
		Mobile applications	
		Mobile handsets	



# 2018 IEEE Thesaurus

management	Multiuser detection		Tablet computers
	Network resource		Transceivers
	Radio communication	NT:	UHF communication
	Routing protocols		Smart phones
	Time-varying channels		
	Transceivers	<b>Mobile learning</b>	
NT:	Vehicular ad hoc networks	BT:	Electronic learning
	3G mobile communication		Mobile communication
	4G mobile communication	RT:	Distance learning
	5G mobile communication		Mobile computing
	Ambient networks		
	Dual band	<i>Mobile location management</i>	
	Land mobile radio	USE:	Location awareness
	Location awareness		
	Mobile learning	<b>Mobile nodes</b>	
	Mobile nodes	BT:	Mobile communication
	Mobile security		Telecommunication
	Software radio	network management	
<b>Mobile computing</b>		<i>Mobile office</i>	
BT:	Computers and information	USE:	Teleworking
processing		<i>Mobile phones</i>	
RT:	Ad hoc networks	USE:	Mobile handsets
	Bring your own device		
	Crowdsourcing	<i>Mobile radio</i>	
	Data dissemination	USE:	Land mobile radio
	Edge computing		
	Location awareness	<i>Mobile radio mobility management</i>	
	Military computing	USE:	Location awareness
	Mobile agents		
	Mobile learning	<i>Mobile robot sensing systems</i>	
	Software defined	USE:	Robot sensing systems
networking		<i>Mobile robot vision systems</i>	
	Telecommunication	USE:	Robot vision systems
computing		<b>Mobile robots</b>	
NT:	Wireless access points	BT:	Robots
		RT:	Assembly systems
<i>Mobile device security</i>			Control systems
USE:	Mobile security		Humanoid robots
<i>Mobile devices</i>			Industrial control
USE:	Mobile handsets		Manufacturing automation
			Materials handling
<b>Mobile handsets</b>			Mechanical variables
UF:	Mobile devices	control	
	Mobile phones		
BT:	Telephone sets		Motion control
RT:	Dual band		Nonlinear systems
	Land mobile radio		Service robots
	Long Term Evolution		Telerobotics
	Mobile applications		Unmanned aerial vehicles
	Mobile communication		Vehicles
	Personal communication		Vehicular automation
networks		NT:	Autonomous automobiles



# 2018 IEEE Thesaurus

Climbing robots  
Legged locomotion

## Model-driven engineering

USE: Model driven engineering

## Mobile security

UF:	Mobile device security
BT:	Computer security
	Mobile communication

### Mobile television

USE: TV

## Mobile TV

BT: TV

## MOCVD

UF:	Metalorganic vapor
deposition	
BT:	Chemical vapor deposition

## Modal analysis

BT: Mathematical analysis  
RT: Vibration measurement

## Mode matching methods

BT:	Mathematics
	Numerical analysis
	Statistical analysis
RT:	Antenna theory
	Matrices
	Waveguide theory

## Model checking

BT:	System testing
RT:	Algorithms
	Concurrent computing
	Formal verification
	Static analysis

## Model driven engineering

UF:	Model-driven engineering
BT:	Software design

### Model predictive control

USE: Predictive control

### Model reduction

USE: Reduced order systems

### Model-based reasoning

USE: Inference mechanisms

## Model-driven development

BT: Software development management

### Model-predictive control

USE: Predictive control

## Modeling

UF:	Modelling
	System modeling
BT:	Systems engineering and

theory

RT:      Computer graphics  
         Data visualization  
         Digital simulation  
         Haptic interfaces  
         Monte Carlo methods  
         Numerical simulation  
         Petri nets  
         Plasma simulation  
         Power system analysis

computing

Language

NT:

- Time series analysis
- Analytical models
- Atmospheric modeling
- Brain modeling
- Computational modeling
- Context modeling
- Data models
- Deformable models
- Digital elevation models
- Emulation
- Graphical models
- Green's function methods
- Hidden Markov models
- Input variables
- Integrated circuit modeling
- Inverse problems
- Load modeling
- Metamodeling
- Numerical models
- Object oriented modeling
- Power system modeling
- Process modeling
- Semiconductor device

## modeling

## modeling

## Semiconductor process

- Signal representation
- Simulation
- Solid modeling
- System identification
- Systems modeling



# 2018 IEEE Thesaurus

## Modelling

USE: Modeling

USE: Modular multilevel  
converters AND  
Voltage-source converters

## Modems

UF: Modulator-demodulators  
BT: Communication equipment  
Computer peripherals  
RT: Data communication  
Demodulation  
Modulation

## Modular multilevel converters

UF: Modular multi-level  
converters  
BT: Converters

## Moderate resolution imaging spectroradiometer

USE: MODIS

## Moderate-resolution Imaging Spectroradiometer

USE: MODIS

## MODFET circuits

BT: FET circuits  
RT: MODFETs  
Rail to rail amplifiers  
Rail to rail operation  
NT: MODFET integrated circuits

## MODFET integrated circuits

BT: MODFET circuits  
RT: MODFETs

## MODFETs

UF: Heterostructure FETs  
SDHTs  
Selectively doped

## heterojunction transistors

TEGFETs  
Two-dimensional electron

## gas FETs

BT: Field effect transistors  
RT: HEMTs  
MODFET circuits  
MODFET integrated circuits

## MODIS

UF: Moderate resolution  
imaging spectroradiometer  
Moderate-resolution

## Imaging Spectroradiometer

BT: Payloads  
Spectroradiometers

## Modular construction

BT: Construction  
RT: Buildings  
Prefabricated construction

## Modular multi-level converters

## Modulation

UF: Modulation format  
Modulation index  
Modulation-coding  
Modulators  
BT: Communications  
technology  
Signal processing  
RT: Direct sequence spread  
spectrum communication  
Encoding  
IEEE 802.11 Standard  
IEEE 802.11g Standard  
IEEE 802.11n Standard  
Linearization techniques  
Mixers  
Modems  
OFDM  
Phase locked loops  
Tracking loops  
Transmitters  
NT: Amplitude modulation  
Chirp modulation  
Demodulation  
Digital modulation  
Frequency modulation  
Magnetic modulators  
Modulation coding  
Optical modulation  
Phase modulation  
Pulse modulation  
Pulse width modulation

## Modulation coding

BT: Modulation  
RT: Encoding  
Information theory  
NT: Interleaved codes

## Modulation format

USE: Modulation

## Modulation index

USE: Modulation

## Modulation-coding



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# 2018 IEEE Thesaurus

USE: Modulation	BT: Biomarkers
<i>Modulator-demodulators</i>	RT: Drugs
USE: Modems	NT: Genomics
<i>Modulators</i>	Glycomics
USE: Modulation	Lipidomics
	Metabolomics
	Proteomics
<b>Modules (abstract algebra)</b>	<b>Molecular biophysics</b>
BT: Abstract algebra	UF: Biological macromolecules
<b>Moisture</b>	Biomolecules
BT: Geophysics	BT: Biophysics
RT: Moisture control	RT: Biochemistry
Moisture measurement	Biomedical equipment
Trees - insulation	Biomedical imaging
	Biomedical materials
	Cellular biophysics
<b>Moisture control</b>	DNA
BT: Control systems	Genetic engineering
RT: Moisture	Genetics
NT: Humidity control	Microorganisms
<b>Moisture measurement</b>	<i>Molecular clones</i>
BT: Measurement	USE: Cloning
RT: Moisture	
Soil measurements	<b>Molecular communication</b>
NT: Humidity measurement	BT: Biological systems
	Communication systems
<b>Molding equipment</b>	
UF: Moulding equipment	<b>Molecular computing</b>
BT: Production equipment	UF: Biocomputing
	BT: Computers and information
<b>Molecular beam applications</b>	processing
BT: Molecular beams	Nanotechnology
RT: Light emitting diodes	RT: DNA computing
Semiconductor devices	
Semiconductor lasers	<b>Molecular electronics</b>
	UF: Biomolecular electronics
<b>Molecular beam epitaxial growth</b>	BT: Nanotechnology
BT: Epitaxial growth	RT: Graphene devices
RT: Crystals	Nanoelectronics
Gallium	Organic light emitting
Thin films	diodes
<b>Molecular beams</b>	<b>Molecular imaging</b>
BT: Beams	BT: Biomedical imaging
RT: Epitaxial growth	
Thin films	<b>Molecular sieves</b>
NT: Molecular beam	BT: Chemical processes
applications	RT: Adsorption
<b>Molecular biology</b>	<b>Molybdenum</b>
BT: Biological processes	BT: Chemical elements
<b>Molecular biomarkers</b>	<i>MoM</i>





# 2018 IEEE Thesaurus

USE:	Method of moments		Monte-Carlo simulations
<i>Moment methods</i>		BT:	Statistical analysis
USE:	Method of moments	RT:	Computational
		electromagnetics	
<i>Money management</i>			Modeling
USE:	Financial management		Probability
			Simulated annealing
			Simulation
<b>Monitoring</b>			
BT:	Instrumentation and	<i>Monte Carlo simulations</i>	
measurement		USE:	Monte Carlo methods
RT:	Alarm systems	<i>Monte-Carlo methods</i>	
	Maintenance engineering	USE:	Monte Carlo methods
	Power system management	<i>Monte-Carlo simulations</i>	
NT:	Computerized monitoring	USE:	Monte Carlo methods
	Environmental monitoring		
	Patient monitoring		
	Radiation monitoring		
	Remote monitoring		
	Surveillance		
<b>Monolithic integrated circuits</b>		<b>Mood</b>	
UF:	Monolithic integration	BT:	Psychology
BT:	Circuits		
	Integrated circuits	<b>Moon</b>	
NT:	MIMICs	UF:	Lunar
	MMICs	BT:	Satellites
<i>Monolithic integration</i>		<b>Moore's Law</b>	
USE:	Monolithic integrated	BT:	Integrated circuit
circuits		technology	
<i>Monolithic microwave integrated circuits</i>		<i>Mopeds</i>	
USE:	MMICs	USE:	Motorcycles
		<i>Morals</i>	
		USE:	Ethics
<b>Monopoly</b>		<b>Morphological operations</b>	
BT:	Economics	BT:	Image processing
RT:	Microeconomics	RT:	Topology
<b>MONOS devices</b>		<b>Morphology</b>	
UF:	Metal-oxide-nitride-oxide-	BT:	Natural language
semiconductors		processing	
	Metal-oxide-nitride-oxide-	<b>Mortar</b>	
silicon		BT:	Building materials
BT:	Semiconductor devices	RT:	Chemical products
			Construction industry
<b>Monsoons</b>		<i>Mortgages</i>	
BT:	Meteorology	USE:	Loans and mortgages
RT:	Rain		
	Storms		
<b>Monte Carlo methods</b>		<b>MOS capacitors</b>	
UF:	Importance sampling	BT:	MOS devices
	Monte Carlo simulations	RT:	Capacitors
	Monte-Carlo methods		



# 2018 IEEE Thesaurus

## MOS devices

UF: Metal-oxide  
semiconductors  
Metal-oxide-semiconductor  
devices  
BT: MIS devices  
RT: Semiconductor-insulator  
interfaces  
NT: MOS capacitors  
MOSFET  
Negative bias temperature  
instability

## MOS integrated circuits

BT: MOSFET circuits  
RT: Metal-insulator structures

## MOS transistors

USE: MOSFET

## MOSFET

UF: MOS transistors  
nMOSFETs  
pMOSFETs  
BT: Field effect transistors  
MOS devices  
RT: CMOS technology  
CMOSFET logic devices  
Gate drivers  
TFETs  
NT: CMOSFETs  
FinFETs  
Interface states  
Junctionless nanowire

transistors

## MOSFET circuits

UF: Metal-oxide semiconductor  
field effect transistor  
BT: Circuits  
FET circuits  
RT: Active inductors  
Linearization techniques  
Operational amplifiers  
Power dissipation  
Rail to rail amplifiers  
Rail to rail operation  
Threshold voltage  
NT: CMOSFET circuits  
MOS integrated circuits  
Power MOSFET

## MOSHFETs

UF: Metal oxide semiconductor  
heterojunction FETs

BT: Field effect transistors

## Motion analysis

BT: Robot kinematics  
NT: Active contours  
Motion segmentation  
Robot localization

## Motion artifacts

BT: Biomedical image  
processing  
Video signal processing

## Motion compensation

BT: Control systems  
RT: Image communication

## Motion control

BT: Mechanical variables  
control  
RT: Aerospace control  
Legged locomotion  
Manipulators  
Mobile robots  
Motor coordination  
Servosystems  
Structure from motion  
Trajectory  
Trajectory tracking  
Velocity control  
NT: Collision avoidance  
Collision mitigation  
Kinetic theory  
Motion planning  
Path planning  
Visual servoing

## Motion detection

BT: Signal detection  
RT: Corner detection

## Motion estimation

BT: Parameter estimation  
RT: Object tracking

## Motion measurement

BT: Mechanical variables  
measurement  
RT: Doppler measurement  
Gaze tracking  
Velocity measurement  
NT: Tracking  
Tribology

## Motion pictures



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# 2018 IEEE Thesaurus

	UF:	Cinema Films (Motion pictures) Movies			Brushless motors Commutation DC motors
	BT:	Broadcasting			Electric motors
	RT:	Cameras Cinematography Entertainment industry Imaging Optical projectors			Hysteresis motors Induction motors Micromotors Permanent magnet motors Servomotors Traction motors Universal motors
<b>Motion planning</b>					
	BT:	Motion control			
	RT:	Navigation Robot control	<i>Moulding equipment</i>	USE:	Molding equipment
<b>Motion segmentation</b>			<i>Mouse</i>		
	BT:	Motion analysis		USE:	Mice
<i>Motor control</i>			<b>Mouth</b>		
	USE:	Motor drives		BT:	Digestive system Head
<b>Motor coordination</b>				RT:	Stomatognathic system
	BT:	Kinematics		NT:	Teeth
	RT:	Motion control	<i>Movies</i>		
<b>Motor drives</b>				USE:	Motion pictures
	UF:	Motor control	<i>Moving object databases</i>		
	BT:	Drives		USE:	Visual databases
	RT:	Industrial control Mechanical variables	<i>Moving picture experts group</i>		
control				USE:	MPEG standards
		Motors Sensorless control Servosystems Torque control Variable speed drives Velocity control Voltage control	<b>Moving Pictures Experts Group</b>		
				BT:	IEC ISO
<i>Motorbikes</i>			<i>MP3</i>		
	USE:	Motorcycles		USE:	Digital audio players AND Portable media players
<b>Motorcycles</b>			<i>MPEG</i>		
	UF:	Mopeds Motorbikes Scooters		USE:	Transform coding
	BT:	Road vehicles	<b>MPEG 1 Standard</b>	BT:	MPEG standards
<b>Motors</b>			<b>MPEG 2 Standard</b>		
	BT:	Energy conversion Machinery		BT:	MPEG standards
	RT:	Coils Motor drives Sensorless control	<b>MPEG 4 Standard</b>		
	NT:	AC motors		UF:	MPEG4
			broadcasting	BT:	MPEG standards
				RT:	Digital multimedia



# 2018 IEEE Thesaurus

	High efficiency video coding		USE:	Materials requirements
	Streaming media	planning		
	Vector quantization			
	Video codecs	<i>Mud</i>		
	Video coding	USE:		Sediments
	Video signal processing			
<b>MPEG 7 Standard</b>		<i>Mufflers</i>	USE:	Exhaust systems
UF:	MPEG7			
BT:	MPEG standards	<i>Multi modal integration</i>	USE:	Multisensory integration
RT:	Audio coding			
	Content management	<i>Multi sensory integration</i>	USE:	Multisensory integration
	Digital multimedia			
broadcasting		<i>Multi stage noise shaping</i>	USE:	Multi-stage noise shaping
	Multimedia communication			
	Multimedia systems	<i>Multi-agent models</i>	USE:	Multi-agent systems
<b>MPEG standards</b>				
UF:	Moving picture experts	<b>Multi-agent systems</b>	UF:	Multi-agent models
group				Multiagent models
BT:	IEC Standards		BT:	Adaptive systems
	ISO Standards		RT:	Agent-based modeling
RT:	Digital multimedia			Autonomous vehicles
broadcasting				System analysis and design
	Image coding			Vehicular automation
	Streaming media		NT:	Collaborative intelligence
	Transform coding			
	Video codecs			
	Video coding			
	Video signal processing			
NT:	MPEG 1 Standard	<i>Multi-carrier code division multiple access</i>	USE:	Multicarrier code division
	MPEG 2 Standard			multiple access
	MPEG 4 Standard			
	MPEG 7 Standard	<i>Multi-casting</i>	USE:	Multicast communication
<b>MPEG4</b>				
USE:	MPEG 4 Standard	<i>Multi-core processing</i>	USE:	Multicore processing
<b>MPEG7</b>				
USE:	MPEG 7 Standard	<i>Multi-core processors</i>	USE:	Multicore processing
<b>MPLS</b>				
USE:	Multiprotocol label	<b>Multi-factor authentication</b>	BT:	Access control
switching			RT:	Authentication
<b>MPPT</b>				
USE:	Maximum power point	<i>Multi-hop</i>	USE:	Spread spectrum
trackers				communication
<b>MRI</b>				
USE:	Magnetic resonance	<b>Multi-layer neural network</b>	UF:	MNN
imaging				
<b>MRP</b>				





# 2018 IEEE Thesaurus

Wavelength division

multiplexing

NT: Multicast VPN

## Multicast protocols

BT: Protocols

RT: Internet

Multicast communication

Routing protocols

## Multicast VPN

BT: Multicast communication

*Multicasting*

USE: Multicast communication

## Multichip modules

BT: Integrated circuit packaging

Packaging

## Multiconductor transmission lines

BT: Transmission lines

RT: Coupled mode analysis

*Multicore*

USE: Multicore processing

## Multicore processing

UF: Multi-core processing

Multi-core processors

Multicore

BT: Parallel architectures

NT: Embedded multicore

processing

## Multidimensional signal processing

BT: Signal processing

RT: Image processing

NT: Video signal processing

## Multidimensional systems

BT: Systems engineering and

theory

## Multifilamentary superconductors

BT: Superconducting materials

## Multifrequency antennas

BT: Antennas

## Multigrid methods

BT: Numerical analysis

*Multihop*

USE: Spread spectrum  
communication

## Multilayer perceptrons

BT: Feedforward neural  
networks

*Multilayers*

USE: Nonhomogeneous media

*Multileaf collimators*

USE: Collimators

*Multilevel fast multipole algorithm*

USE: MLFMA

## Multilevel systems

BT: Hierarchical systems

*Multilinear systems*

USE: Nonlinear systems

## Multimedia communication

BT: Communication systems

Multimedia systems

RT: B-ISDN

Broadband communication

Diffserv networks

Digital multimedia

broadcasting

Huffman coding

IEEE 802.16 Standard

ISDN

Intserv networks

MPEG 7 Standard

Multimedia computing

Streaming media

Transcoding

## Multimedia computing

BT: Multimedia systems

RT: Audio user interfaces

Collaborative work

Computer graphics

Computers and information

processing

Content management

Information systems

Multimedia communication

Multimedia databases

Video sequences

## Multimedia databases

BT: Database systems

Databases



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# 2018 IEEE Thesaurus

RT:	Multimedia systems Audio databases Huffman coding Multimedia computing	<i>Multiple input multiple output systems</i> USE: MIMO communication
<i>Multimedia products</i> USE:	Videos	<i>multiple input single-output</i> USE: MISO communication
<b>Multimedia systems</b>		<b>Multiple sclerosis</b> BT: Diseases
BT:	Consumer electronics	<b>Multiple signal classification</b> UF: MUSIC BT: Noise measurement
RT:	Authoring systems Electronic publishing Huffman coding MPEG 7 Standard	<i>Multiple-input multiple-output</i> USE: MIMO communication
NT:	Multimedia communication Multimedia computing Multimedia databases	<i>Multiple-input multiple-output systems</i> USE: MIMO communication
<i>Multimodal integraion</i> USE:	Multisensory integration	<i>multiple-input single output</i> USE: MISO communication
<i>Multimodal sensing</i> USE:	Multimodal sensors	<i>multiple-input single-output</i> USE: MISO communication
<b>Multimodal sensors</b>		<i>Multiple-input-multiple-output</i> USE: MIMO communication
UF:	Multi-modal sensors Multimodal sensing	<i>Multiplexed</i> USE: Multiplexing
BT:	Sensors	<b>Multiplexing</b> UF: Multiplexed BT: Communications technology RT: Arrayed waveguide gratings Multiaccess communication NT: Code division multiplexing Demultiplexing Frequency division multiplexing Multiplexing equipment OFDM Time division multiplexing Wavelength division multiplexing
RT:	Sensor fusion	<b>Multiplexing equipment</b> BT: Multiplexing RT: Communication equipment NT: Add-drop multiplexers
<i>Multiobjective programming</i> USE:	Pareto optimization	<b>Multiplying circuits</b> BT: Circuits RT: Digital integrated circuits
<i>multiobjective programming</i> USE:	Pareto optimization	
<b>Multipath channels</b>		
BT:	Communication channels	
RT:	Channel estimation Diversity methods Fading channels MIMO communication Meteorological factors Multiuser detection Radio propagation Terrain factors Ultra wideband	
communication		
<b>Multiple access interference</b> BT:	OFDM	
<i>Multiple input multiple output</i> USE:	MIMO communication	





# 2018 IEEE Thesaurus

Logic circuits

## Multiprocessing systems

BT: Parallel processing  
RT: Computer networks  
Computers and information

processing

Concurrency control  
Distributed computing  
Parallel languages  
Parallel programming  
Pipeline processing  
NT: Data flow computing  
Processor scheduling  
Systolic arrays

## Multiprocessor interconnection

UF: Interconnection networks  
Parallel processor

interconnection

BT: Computer architecture  
RT: Computer networks  
Data communication  
Local area networks  
Metropolitan area networks  
Wide area networks  
NT: Hypercubes

## Multiprocessor interconnection networks

BT: Computer networks

## Multiprocessor scheduling

USE: Processor scheduling

## Multiprotocol label switching

UF: Label swapping  
MPLS  
BT: Communication switching  
Packet switching  
Protocols  
RT: Asynchronous transfer

mode

Internet  
Routing protocols

## Multiresolution analysis

UF: Multi-resolution  
BT: Wavelet analysis

## Multirobot systems

USE: Multi-robot systems

## Multisensor systems

BT: Sensor fusion  
RT: Robot sensing systems

## Multisensory integration

UF: Multi modal integration  
Multi sensory integration  
Multimodal integraion  
BT: Sense organs

## Multiskilling

UF: Job rotation  
BT: Human resource  
management  
RT: Industrial training  
Job specification  
Vocational training

## Multispectral imaging

BT: Imaging

## Multistage noise shaping

USE: Multi-stage noise shaping

## Multistatic radar

BT: Radar  
NT: MIMO radar

## Multitasking

BT: Computers and information  
processing  
NT: Parametric study

## Multithreaded systems

USE: Program processors

## Multithreading

UF: Multi-threaded comput\*  
Multithreading comput\*  
BT: Parallel processing

## Multithreading comput\*

USE: Multithreading

## Multithreading systems

USE: Program processors

## Multiuser channels

BT: Communication channels

## Multiuser detection

UF: Multi-user detection  
BT: Signal detection  
RT: Land mobile radio  
Land mobile radio cellular

systems

Mobile communication  
Multipath channels





# 2018 IEEE Thesaurus

communication	Spread spectrum	<b>Music</b>	UF: Computer music Musical
<b>Multivalued logic</b>		BT: Acoustics	
UF: Many valued logic		RT: Audio systems	
BT: Logic		NT: Computer generated music	
RT: Logic functions		Electronic music	
<i>Multivariable systems</i>		Musical instrument digital	
USE: MIMO communication		interfaces	
<b>Multivariate regression</b>		Rhythm	
BT: Regression analysis		Timbre	
<b>Multivibrators</b>		<b>Music information retrieval</b>	
UF: Multi-vibrators		BT: Information retrieval	
BT: Electronic circuits		RT: Cepstral analysis	
<b>Multiwave mixing</b>		<i>Music recommendation</i>	
BT: Optical mixing		USE: Recommender systems	
<i>Munitions</i>		<i>Musical</i>	
USE: Weapons		USE: Music	
<b>Muon colliders</b>		<b>Musical instrument digital interfaces</b>	
UF: Muon sources		UF: MDDI	
BT: Colliding beam devices		BT: Computer interfaces	
RT: Luminescence		Music	
Luminescent devices		RT: Digital communication	
Storage rings		<i>Mutual conductance</i>	
<i>Muon sources</i>		USE: Transconductance	
USE: Muon colliders		<b>Mutual coupling</b>	
<i>Muons</i>		BT: Electromagnetic coupling	
USE: Mesons		<b>Mutual funds</b>	
<b>Muscles</b>		BT: Financial management	
BT: Musculoskeletal system		<b>Mutual information</b>	
NT: Myocardium		UF: Transinformation	
Neuromuscular		BT: Information theory	
<b>Musculoskeletal system</b>		<b>Myelin</b>	
BT: Anatomy		BT: Nerve fibers	
NT: Cartilage		RT: Axons	
Fascia		<i>Myocardial</i>	
Ligaments		USE: Myocardium	
Muscles		<b>Myocardium</b>	
Skeleton		UF: Myocardial	
Tendons		BT: Muscles	
<i>MUSIC</i>		<i>Myopia</i>	
USE: Multiple signal classification		USE: Vision defects	



# 2018 IEEE Thesaurus

<b>MySpace</b>	BT: Social network services Video sharing Web sites	RT: Enhanced magnetoresistance	Magnetoresistance Nanoelectronics Nanowires
<b>NACE International</b>	UF: National Association of Corrosion Engineers BT: Standards organizations	<i>Nanocrystal</i> USE: Nanocrystals	
<b>NACE Standards</b>	BT: Standards publications	<b>Nanocrystals</b> UF: Nanocrystal BT: Crystalline materials Nanoparticles RT: Quantum dots	
<b>Nails</b>	BT: Integumentary system	<i>Nanodevices</i> USE: Nanoscale devices	
<b>Nakagami distribution</b>	BT: Probability distribution	<b>Nanoelectromechanical systems</b> UF: NEMS BT: Nanotechnology RT: Microelectromechanical systems	
<i>NAND flash</i>	USE: Flash memories	<b>Nanoelectronics</b> UF: Nanoactuators BT: Nanotechnology RT: Graphene devices Molecular electronics Nanocontacts NT: Junctionless nanowire transistors	
<i>Nano devices</i>	USE: Nanoscale devices	<b>Nanofabrication</b> BT: Nanotechnology	
<i>Nano generators</i>	USE: Nanogenerators	<i>Nanofiltration</i> USE: Filtration	
<i>Nano ribbons</i>	USE: Nanoribbons	<b>Nanofluidics</b> UF: Nanofluids BT: Fluidics Nanotechnology RT: Nanobioscience	
<i>Nanoactuators</i>	USE: Actuators AND Nanoelectronics	<i>Nanofluids</i> USE: Nanofluidics	
<b>Nanobioscience</b>	BT: Biology Nanotechnology RT: Colloidal lithography Nanofluidics NT: DNA computing Nanobiotechnology	<b>Nanogenerators</b> UF: Nano generators BT: Energy harvesting RT: Electric generators Low-power electronics Micromechanical devices Nanowires	
<b>Nanobiotechnology</b>	BT: Nanobioscience RT: Nanomedicine		
<b>Nanocomposites</b>	BT: Nanostructured materials RT: Metamaterials		
<b>Nanocontacts</b>	BT: Nanoscale devices		



# 2018 IEEE Thesaurus

	Piezoelectric devices		BT:	Nanotechnology
	Triboelectricity			Position control
	Vibrations			
<i>Nanoimprint lithography</i>		<i>Nanopowders</i>		
USE:	Nanolithography	USE:		Nanoparticles
<b>Nanolithography</b>		<b>Nanoribbons</b>		
UF:	Nanoimprint lithography	UF:		Nano ribbons
BT:	Lithography	BT:		Nanostructures
	Nanotechnology			
RT:	Nanopatterning	<b>Nanoscale devices</b>		
	Soft lithography	UF:		Nano devices
				Nanodevices
<b>Nanomaterials</b>		BT:		Nanotechnology
BT:	Nanotechnology	RT:		Single electron devices
		NT:		Nanocontacts
<b>Nanomedicine</b>				Nanotube devices
BT:	Biomedical monitoring			Proteotronics
	Medical diagnosis	<b>Nanosensors</b>		
RT:	Cellular biophysics	BT:		Nanotechnology
	Nanobiotechnology			Sensors
	Nanoparticles	RT:		Biomedical equipment
<b>Nanometers</b>				Nanoparticles
UF:	Millimicron			Nanostructures
	Nanometres	<b>Nanostructured materials</b>		
BT:	Measurement units	UF:		Core-shelf nanostructures
<i>Nanometres</i>		BT:		Materials
USE:	Nanometers			Nanotechnology
		NT:		Nanocomposites
<b>Nanoparticles</b>				Nanoporous materials
UF:	Nanopowders	<b>Nanostructures</b>		
BT:	Nanostructures	BT:		Nanotechnology
RT:	Nanomedicine	RT:		Nanosensors
	Nanosensors	NT:		Nanoparticles
NT:	Magnetic nanoparticles			Nanoribbons
	Nanocrystals			Nanotubes
<b>Nanopatterning</b>				Nanowires
BT:	Nanotechnology			Semiconductor
RT:	Nanolithography	nanostructures		
	Nanotopography	<b>Nanotechnology</b>		
	Soft lithography	RT:		Atomic force microscopy
NT:	Colloidal lithography			Epitaxial growth
<b>Nanophotonics</b>				Fluidics
BT:	Nanotechnology			Lithography
	Photonics			Microfabrication
<b>Nanoporous materials</b>				Nanotube devices
BT:	Nanostructured materials			Power dissipation
				Quantum mechanics
<b>Nanopositioning</b>		manufacture		Semiconductor device
				Single electron devices







# 2018 IEEE Thesaurus

Nearest neighbor searches  
Nearest neighbour methods  
k neighbor methods  
k neighbour methods  
BT: Learning (artificial intelligence)

Nonparametric statistics  
Pattern recognition  
RT: Data mining  
Pattern classification  
Pattern clustering  
Regression analysis  
Search methods  
Statistical analysis

## *Nearest neighbor searches*

USE: Nearest neighbor methods

## *Nearest neighbour methods*

USE: Nearest neighbor methods

## **Neck**

BT: Body regions

## **Needles**

BT: Mechanical products  
RT: Biomedical equipment  
Textile machinery

## **Negative bias temperature instability**

UF: NBTI  
BT: MOS devices

## **Negative feedback**

BT: Feedback

## *Negative feedback amplifier*

USE: Feedback amplifiers

## **Negative feedback loops**

BT: Feedback loop

## *NEMS*

USE: Nanoelectromechanical systems

## **Neodymium**

UF: Nd  
BT: Metals  
NT: Neodymium alloys  
Neodymium compounds

## **Neodymium alloys**

BT: Neodymium  
RT: Alloying

## **Neodymium compounds**

BT: Neodymium

## **Neon**

BT: Chemical elements

## **Neonatology**

BT: Medical specialties  
RT: Pediatrics

## *Neoplasia*

USE: Neoplasms

## **Neoplasms**

UF: Neoplasia  
BT: Biological tissues  
NT: Breast neoplasms  
Liver neoplasms  
Lung neoplasms  
Skin neoplasms

## **Neptunium**

BT: Chemical elements

## *Nerve cells*

USE: Neurons

## **Nerve endings**

BT: Nervous system

## **Nerve fibers**

BT: Neurons  
NT: Axons  
Myelin

## **Nerve tissues**

BT: Nervous system

## **Nervous system**

BT: Anatomy  
RT: Bioelectric phenomena  
Computational

## neuroscience

Neural networks  
Neurological diseases  
Neurology  
Neuromuscular stimulation  
Neuropathology  
NT: Autonomic nervous system  
Brain  
Brain mapping  
Central nervous system  
Cranial  
Ganglia



# 2018 IEEE Thesaurus

Glial cells  
Nerve endings  
Nerve tissues  
Neural pathways  
Neuroanatomy  
Neurons  
Neuroradiology  
Neuroscience  
Peripheral nervous system  
Pituitary gland  
Spinal cord  
Spine  
Synapses

## *Net neutrality*

USE: Network neutrality

## **Network address translation**

BT: Computer network  
management

## **Network architecture**

BT: Network topology  
Telecommunication  
network management  
NT: Network function  
virtualization  
Network slicing

## **Network coding**

BT: Information theory  
RT: Network security

## *Network control systems*

USE: Networked control systems

## **Network function virtualization**

UF: NFV  
BT: Computer networks  
Network architecture  
RT: Application virtualization  
Cloud computing  
Intrusion detection  
Servers  
Software defined  
networking

## **Network interfaces**

BT: Interface phenomena  
RT: Interface management

## **Network location awareness**

BT: Location awareness

## **Network neutrality**

UF: Internet neutrality  
Net neutrality  
BT: Telecommunication  
network management

## **Network operating systems**

BT: Operating systems  
RT: Software defined  
networking  
NT: Autonomic systems

## **Network resource management**

UF: Dynamic service delivery  
BT: Resource management  
Telecommunication  
network management  
RT: Land mobile radio cellular  
systems  
Mobile communication

## **Network security**

BT: Computer networks  
Security  
RT: Communication networks  
Network coding

## **Network servers**

BT: Computer networks

## **Network slicing**

BT: Network architecture  
RT: Augmented reality

## **Network synthesis**

BT: Computer network  
management

## **Network theory (graphs)**

BT: Computer science  
Mathematics  
Physics

## *Network throughput*

USE: Throughput

## **Network topology**

BT: Communications  
technology  
RT: Overlay networks  
Telecommunication  
network topology  
NT: Complex networks  
Computer network reliability  
Network architecture







# 2018 IEEE Thesaurus

## *Neuro-feedback*

USE: Neurofeedback

## *Neuro-fuzzy networks*

USE: Fuzzy neural networks

## *Neuro-imaging*

USE: Neuroimaging

## *Neuro-transmitters*

USE: Neurotransmitters

## **Neuroanatomy**

BT: Anatomy  
Nervous system

## **Neurocontrollers**

BT: Intelligent control  
RT: Artificial intelligence  
Microcontrollers  
Neural network hardware

## **Neurodynamics**

BT: Brain  
RT: Neurophysiology

## *Neuroengineering*

USE: Neural engineering

## **Neurofeedback**

UF: Neuro-feedback  
BT: Feedback

## *Neuroglia*

USE: Glial cells

## **Neuroimaging**

UF: Neuro imaging  
Neuro-imaging  
BT: Biomedical image

## processing

Brain mapping  
RT: Neuroradiology  
NT: Functional neuroimaging

## **Neuroinformatics**

BT: Bioinformatics  
Informatics  
Neuroscience  
RT: Analytical models  
Big Data  
Computational modeling  
Data science  
Synapses

## **Neurological diseases**

UF: Neurological disorders  
BT: Diseases  
RT: Nervous system

## *Neurological disorders*

USE: Neurological diseases

## **Neurology**

BT: Medical specialties  
RT: Nervous system

## **Neuromodulation**

BT: Neurons  
Physiology  
RT: Control systems  
NT: Neurostimulation

## **Neuromorphic engineering**

BT: Neuromorphics  
RT: Artificial neural networks  
Synapses

## **Neuromorphics**

BT: Very large scale integration  
RT: Analog circuits  
NT: Neuromorphic engineering

## **Neuromuscular**

BT: Muscles

## **Neuromuscular stimulation**

UF: Functional electrical  
stimulation  
BT: Medical treatment  
RT: Nervous system

## *Neuronal networks*

USE: Biological neural networks

## *Neuronal process*

USE: Neurites

## *Neurone*

USE: Neurons

## **Neurons**

UF: Nerve cells  
Neurone  
BT: Nervous system  
RT: Action potentials  
Synapses  
NT: Dendrites (neurons)  
Nerve fibers  
Neurites



# 2018 IEEE Thesaurus

	Neuromodulation		Transcranial magnetic
	Photoreceptors	stimulation	
<b>Neuropathic pain</b>		<b>Neurosurgery</b>	
BT:	Pain	BT:	Surgery
<b>Neuropathology</b>		<b>Neurotechnology</b>	
BT:	Pathology	BT:	Brain
RT:	Nervous system		Technology
<b>Neurophysiology</b>		<i>Neurotransmission</i>	
BT:	Brain	USE:	Neurotransmitters
RT:	Biomedical signal processing	<b>Neurotransmitters</b>	
	Microelectrodes	UF:	Neuro transmitters
	Neural networks		Neuro-transmitters
	Neurodynamics		Neurotransmission
	Science - general		Synaptic transmission
NT:	Biological neural networks	BT:	Transmitters
	Neuroplasticity	RT:	Synapses
<b>Neuroplasticity</b>		<i>Neutrino</i>	
UF:	Brain plasticity	USE:	Neutrino sources
	Cortical plasticity	<b>Neutrino sources</b>	
BT:	Neurophysiology	UF:	Neutrino
<b>Neuropsychology</b>			Neutrinos
BT:	Brain	BT:	Elementary particles
	Psychology	RT:	Radioactive materials
<b>Neuroradiology</b>		<i>Neutrinos</i>	
BT:	Nervous system	USE:	Neutrino sources
	Radiology	<i>Neutron beams</i>	
RT:	Electromagnetics	USE:	Particle beams
	Neuroimaging	<b>Neutron capture therapy</b>	
<b>Neuroscience</b>		UF:	BNCT
BT:	Nervous system		Boron neutron capture
	Science - general	therapy	
NT:	Clinical neuroscience	BT:	Medical treatment
	Cognitive neuroscience	RT:	Biological effects of
	Computational	radiation	
neuroscience	Neuroinformatics		Dosimetry
	Systems neuroscience	<b>Neutron radiation effects</b>	
	Transcranial direct current	BT:	Radiation effects
stimulation	Transcranial magnetic	<i>Neutron scattering</i>	
stimulation		USE:	Neutron spin echo
<b>Neurostimulation</b>		<b>Neutron spin echo</b>	
BT:	Neuromodulation	UF:	Neutron scattering
RT:	Microelectrodes	BT:	Spectroscopy
NT:	Transcranial direct current		
stimulation			



# 2018 IEEE Thesaurus

## Neutrons

BT: Elementary particles  
RT: Cosmic rays

Pervasive computing  
Quality of service  
Telecommunications

## Newborns

USE: Pediatrics

## Next generation networks

USE: Next generation networking

## Newton Fourier method

USE: Newton method

## Next-generation networks

USE: Next generation networking

## Newton method

UF: Newton Fourier method  
Newton Raphson method  
Newton's method  
Newton-Fourier method  
Newton-Raphson method  
Newtons method  
BT: Numerical analysis  
RT: Optimization methods  
Poles and zeros

## NFB

USE: Feedback amplifiers

## NFC

USE: Near field communication

## NFPA

UF: National Fire Protection  
Agency  
National Fire Protection  
Association  
BT: Standards organizations

## Newton Raphson method

USE: Newton method

## NFV

USE: Network function  
virtualization

## Newton's method

USE: Newton method

## NGN

USE: Next generation networking

## Newton-Fourier method

USE: Newton method

## NGNA

USE: Next generation networking

## Newton-Raphson method

USE: Newton method

## Ni

USE: Nickel

## Newtons method

USE: Newton method

## Next generation network architecture

USE: Next generation networking

## Nickel

UF: Ni  
BT: Metals  
NT: Nickel alloys  
Nickel compounds

## Next generation networking

UF: 21CN  
21st century networks  
NGN  
NGNA  
Next generation network

## Nickel alloys

BT: Nickel  
RT: Alloying

## architecture

Next generation networks  
Next-generation networks  
BT: Computer networks  
RT: 3G mobile communication  
4G mobile communication  
5G mobile communication  
IP networks  
Internet  
Packet switching

## Nickel cadmium batteries

BT: Batteries

## Nickel compounds

BT: Nickel

## Night vision

BT: Infrared imaging  
RT: Image sensors



# 2018 IEEE Thesaurus

	Military equipment	USE:	Nuclear magnetic resonance
<b>Niobium</b>			
UF:	Nb		<i>NMR imaging</i>
BT:	Metals	USE:	Magnetic resonance
RT:	Type II superconductors		imaging
NT:	Niobium alloys		
	Niobium compounds	<b>Noise</b>	
<b>Niobium alloys</b>		BT:	Signal processing
BT:	Niobium	RT:	Autoregressive processes
RT:	Alloying		Cyclic redundancy check
NT:	Niobium-tin		Distortion
			Electromagnetic
<b>Niobium compounds</b>		interference	
BT:	Niobium		Interference
<b>Niobium-tin</b>			Noise generators
UF:	Nb3Sn		Noise measurement
BT:	Niobium alloys	NT:	Roundoff errors
	Superconducting materials		1/f noise
	Tin alloys		Additive noise
			Colored noise
<b>NISO Standards</b>			Gaussian noise
BT:	Standards publications		Laser noise
<b>NIST</b>			Low-frequency noise
UF:	NBS		Noise cancellation
	National Bureau of		Phase noise
Standards	National Institute of		Signal to noise ratio
	Standards & Technology		Superconducting device
	National Institute of	noise	
	Standards and Technology		White noise
BT:	Standards organizations	<i>Noise abatement</i>	
	US Department of	USE:	Noise reduction
Commerce		<b>Noise cancellation</b>	
<b>NIST Standards</b>		UF:	Noise cancellers
BT:	Standards publications	BT:	Acoustic noise
			Noise
<b>Nitrogen</b>		RT:	Filtering
BT:	Chemical elements	<i>Noise cancellers</i>	
	Gases	USE:	Noise cancellation
NT:	Silicon nitride	<b>Noise figure</b>	
		BT:	Noise measurement
<b>NLP</b>		RT:	Signal to noise ratio
USE:	Natural language	<b>Noise generators</b>	
processing		BT:	Signal generators
<b>nMOSFETs</b>		RT:	Noise
USE:	MOSFET	<b>Noise level</b>	
<b>NMR</b>		BT:	Acoustic noise
		<b>Noise measurement</b>	



# 2018 IEEE Thesaurus

UF:	Noisy		
BT:	Measurement		<i>Non-parametric statistics</i>
RT:	Distortion measurement	USE:	Nonparametric statistics
	Electric variables		
measurement			<i>Non-united-states activities</i>
	Noise	USE:	IEEE Professional activities
	Packet loss		
NT:	Multiple signal classification		<i>Non-volatile memory</i>
	Noise figure	USE:	Nonvolatile memory
	Noise shaping		
<b>Noise reduction</b>			<i>Non-volatile single electron memory</i>
UF:	Audio enhancement	USE:	Nonvolatile single electron memory
	De-noising		
	Denoising		<i>Non-volatile single-electron memory</i>
	Noise abatement	USE:	Nonvolatile single electron memory
BT:	Acoustic noise		
NT:	Active noise reduction		
	Noise robustness		<b>Nonconductive adhesives</b>
	Wiener filters	BT:	Adhesives
<i>Noise robust</i>			
USE:	Noise robustness		<b>Nondestructive testing</b>
<b>Noise robustness</b>			
UF:	Noise robust	BT:	Materials testing
BT:	Noise reduction	RT:	Acoustic emission
			Ultrasonic transducers
		NT:	Magnetic flux leakage
<b>Noise shaping</b>			<i>Nondeterministic polynomial-time hard</i>
UF:	Noise-shaping	USE:	NP-hard problem
BT:	Noise measurement		
NT:	Multi-stage noise shaping		<i>Nongyroscopes</i>
		USE:	Gyroscopes
<i>Noise-shaping</i>			
USE:	Noise shaping		<b>Nonhomogeneous media</b>
<i>Noisy</i>			
USE:	Noise measurement	UF:	Composite media
			Inhomogeneous media
			Layered media
			Multilayers
			Periodic media
			Stratified media
<b>NOMA</b>		BT:	Media
UF:	non-orthogonal multiple	RT:	Random media
access			
	Communication systems		<i>Noninvasive diagnosis</i>
BT:	MIMO communication	USE:	Noninvasive treatment
RT:	OFDM		
	Radio communication		<i>Noninvasive measurement</i>
		USE:	Noninvasive treatment
<i>Non relational databases</i>			
USE:	NoSQL databases		<i>Noninvasive surgery</i>
		USE:	Noninvasive treatment
<i>Non-gyroscopes</i>			
USE:	Gyroscopes		<i>Noninvasive technique</i>
		USE:	Noninvasive treatment
<i>non-orthogonal multiple access</i>			
USE:	NOMA		



# 2018 IEEE Thesaurus

## Noninvasive treatment

UF: Noninvasive diagnosis  
Noninvasive measurement  
Noninvasive surgery  
Noninvasive technique  
BT: Medical treatment  
NT: Embolization

Mathematics  
RT: Algebra  
Linear approximation  
Nonlinear systems  
Numerical analysis  
NT: Bifurcation

## Nonlinear acoustics

BT: Acoustics  
RT: Acoustic distortion  
Nonlinear wave

propagation

## Nonlinear circuits

BT: Circuits  
RT: Chaos  
Mixers  
Power conversion  
Rail to rail inputs  
Rail to rail outputs  
NT: Nonlinear network analysis

## Nonlinear control systems

BT: Control systems  
RT: Control nonlinearities  
Piecewise linear techniques

## Nonlinear distortion

BT: Distortion  
RT: Limiting  
Predistortion  
NT: Harmonic distortion  
Intermodulation distortion

## Nonlinear dynamical systems

UF: Nonlinear dynamics  
BT: Nonlinear systems  
RT: Chaos  
Econophysics  
Fuzzy sets  
Kalman filters  
Neural networks  
Pattern formation  
Possibility theory  
Predator prey systems  
Spatiotemporal phenomena  
Uncertainty

*Nonlinear dynamics*

USE: Nonlinear dynamical  
systems

## Nonlinear equations

BT: Equations

## Nonlinear filters

BT: Filters  
RT: Detectors  
Phase locked loops

## Nonlinear magnetics

BT: Magnetics  
RT: Ferroresonance

## Nonlinear network analysis

BT: Circuit analysis  
Nonlinear circuits

## Nonlinear optical devices

BT: Nonlinear optics  
RT: Optical detectors

## Nonlinear optics

BT: Optics  
RT: Electrooptic effects  
Pattern formation  
Photonic crystals  
Thermal lensing  
NT: Fiber nonlinear optics  
Nonlinear optical devices  
Optical mixing  
Optical saturation  
Photorefractive effect  
Raman scattering  
Supercontinuum generation

## Nonlinear systems

UF: Bilinear systems  
Multilinear systems  
BT: Mathematics  
RT: Control systems  
Linear approximation  
Manipulators  
Mobile robots  
Nonlinear equations  
Robots  
NT: Chaos  
Nonlinear dynamical

systems

## Nonlinear wave propagation

BT: Propagation  
RT: Nonlinear acoustics



# 2018 IEEE Thesaurus

## Nonparametric statistics

UF: Non-parametric statistics  
BT: Statistics  
NT: Nearest neighbor methods

## Nonrelational databases

USE: NoSQL databases

## Nonuniform electric fields

BT: Electric fields

## Nonuniform sampling

BT: Sampling methods

## Nonuniform transmission lines

USE: Distributed parameter circuits

## Nonvolatile memories

USE: Nonvolatile memory

## Nonvolatile memory

UF: Non-volatile memory  
Nonvolatile memories  
BT: Memory  
NT: Nonvolatile single electron memory

## Nonvolatile single electron memory

UF: Non-volatile single electron memory  
Non-volatile single-electron memory  
Nonvolatile single-electron memory  
BT: Nonvolatile memory

## Nonvolatile single-electron memory

USE: Nonvolatile single electron memory

## Normal distribution

USE: Gaussian distribution

## North America

BT: Continents

## North Pole

BT: Arctic

## Nose

BT: Head  
Sense organs  
NT: Olfactory

## NoSQL databases

UF: Non relational databases  
Nonrelational databases  
BT: Database systems  
RT: Big Data  
Data structures  
Data warehouses  
Distributed databases  
Linked data  
Query processing

## Notch filters

UF: Band-stop filters  
BT: Filters

## Notice of Violation

BT: IEEE publications  
RT: Intellectual property  
Plagiarism

## NP hard problem

USE: NP-hard problem

## NP-C

USE: NP-complete problem

## NP-complete problem

UF: NP-C  
BT: Complexity theory

## NP-hard problem

UF: NP hard problem  
Nondeterministic polynomial-time hard  
BT: Complexity theory  
NT: Traveling salesman problems

## Nuclear and plasma sciences

NT: Biomedical applications of radiation  
Colliding beam devices  
Electron emission  
Elementary particles  
Fusion power generation  
Fusion reactors  
Gamma-rays  
Gas discharge devices  
High energy physics  
instrumentation computing  
Ion beam applications  
Ion emission  
Nuclear electronics  
Nuclear imaging



# 2018 IEEE Thesaurus

	Nuclear medicine		
	Nuclear physics		
	Particle accelerators		
	Particle beam handling		
	Particle beam injection		
	Plasmas		
	Radiation effects		
	Radiation hardening		
(electronics)			
	Radiation monitoring		
	Radiation safety		
	Reactor instrumentation		
	Scintillation counters		
	Thermionic emission		
<i>Nuclear batteries</i>			
USE:	Atomic batteries		
<i>Nuclear bombs</i>			
USE:	Nuclear weapons		
<b>Nuclear electronics</b>			
BT:	Nuclear and plasma		
sciences			
RT:	FET circuits		
	High energy physics		
instrumentation computing			
<i>Nuclear facility licensing</i>			
USE:	Nuclear facility regulation		
<b>Nuclear facility regulation</b>			
UF:	Licensing (nuclear facilities)		
	Nuclear facility licensing		
BT:	Power industry		
RT:	Radioactive waste		
<i>Nuclear fission</i>			
USE:	Fission reactors		
<b>Nuclear fuels</b>			
BT:	Energy resources		
	Fuels		
	Radioactive materials		
RT:	Nuclear power generation		
	Radioactive waste		
<b>Nuclear imaging</b>			
UF:	Gamma-ray imaging		
BT:	Imaging		
	Nuclear and plasma		
sciences			
RT:	Nuclear medicine		
	Radiography		
NT:	Energy resolution		
		<b>Nuclear magnetic resonance</b>	
		UF:	NMR
		BT:	Magnetic resonance
		<i>Nuclear magnetic resonance imaging</i>	
		USE:	Magnetic resonance
		imaging	
		<b>Nuclear measurements</b>	
		BT:	Measurement
		RT:	Atomic measurements
			CAMAC
			Fastbus
			Position sensitive particle
		detectors	
			Radiation detectors
			Spectroscopy
		NT:	Particle tracking
		<b>Nuclear medicine</b>	
		BT:	Engineering in medicine
		and biology	
			Nuclear and plasma
		sciences	
		RT:	Energy resolution
			Gamma-rays
			Nuclear imaging
			Positron emission
		tomography	
		<b>Nuclear phase transformations</b>	
		UF:	Nuclear phase transitions
			Phase transformations,
		nuclear	
			Phase transitions, nuclear
		BT:	Nuclear physics
		RT:	Nuclear thermodynamics
		<i>Nuclear phase transitions</i>	
		USE:	Nuclear phase
		transformations	
		<b>Nuclear physics</b>	
		BT:	Nuclear and plasma
		sciences	
		RT:	Hafnium
		NT:	Alpha particles
			Beta rays
			Ignition
			Ion sources
			Isotopes
			Nuclear phase
		transformations	
			Nuclear thermodynamics





# 2018 IEEE Thesaurus

Relativistic effects		Matlab
<i>Nuclear Power Generating Stations</i>		Nonlinear equations
USE: Nuclear power generation		Numerical models
<b>Nuclear power generation</b>		Transforms
UF: Nuclear Power Generating	NT:	Adaptive mesh refinement
Stations	methods	Approximation methods
BT: Power generation		Convergence of numerical
RT: Nuclear fuels		Finite difference methods
NT: Atomic batteries		Finite element analysis
Fission reactors		Finite volume methods
Fusion power generation	analysis	Gradient methods
<i>Nuclear reactors (fission)</i>		Independent component
USE: Fission reactors	approximation	Iterative methods
<i>Nuclear reactors (fusion)</i>		Least squares
USE: Fusion reactors		Method of moments
<b>Nuclear thermodynamics</b>		Mode matching methods
BT: Nuclear physics		Multigrid methods
RT: Elementary particles		Newton method
Entropy		Numerical simulation
Nuclear phase		Numerical stability
transformations		Relaxation methods
Phase change materials		Sparse matrices
<i>Nuclear wastes</i>		Splines (mathematics)
USE: Radioactive pollution	methods	Surface fitting
<b>Nuclear weapons</b>		Symmetric matrices
UF: Nuclear bombs	<b>Numerical models</b>	Transmission line matrix
BT: Weapons	BT: Modeling	
<b>Null space</b>	RT: Numerical analysis	
BT: Kernel	<b>Numerical simulation</b>	
<b>Null value</b>	BT: Numerical analysis	
UF: Nullvalue	RT: Modeling	
BT: Data structures	Plasma simulation	
RT: Programming	Simulation	
<i>Nullvalue</i>	<b>Numerical stability</b>	
USE: Null value	BT: Numerical analysis	
<b>Numerical analysis</b>	RT: Algorithms	
BT: Mathematics	<i>Nursing</i>	
RT: Convolution	USE: Medical services	
Deconvolution	<i>Nuts (fasteners)</i>	
Difference equations	USE: Fasteners	
Differential equations	<i>NVQ</i>	
Error analysis	USE: Vocational training	
Integral equations	<i>Nylon fiber</i>	
Inverse problems		



# 2018 IEEE Thesaurus

	USE:	Synthetic fibers	BT:	Machine vision
<i>O-rings</i>			RT:	Image matching
	USE:	Structural rings		Image recognition
<i>OATS</i>				Object tracking
	USE:	Open area test sites	NT:	Robot vision systems
				Target recognition
<b>Obesity</b>			<b>Object segmentation</b>	
	BT:	Medical conditions	BT:	Machine vision
			NT:	Subspace constraints
<b>Obituaries</b>			<b>Object tracking</b>	
	BT:	IEEE indexing	BT:	Tracking
<b>Object detection</b>			RT:	Cinematography
	UF:	Image object detection		Image motion analysis
		Target detection		Image segmentation
	BT:	Image analysis		Motion estimation
	RT:	Image matching		Object recognition
		Internet of Things		Trajectory
		Magnetic anomaly		Video signal processing
detection			<i>Object-oriented programming</i>	
		Magnetic anomaly	USE:	Object oriented
detectors			programming	
		Robot vision systems	<b>Observability</b>	
	NT:	Buried object detection	BT:	Control theory
		Time difference of arrival		
<b>Object oriented databases</b>			<b>Observatories</b>	
	BT:	Database systems	BT:	Astronomy
		Databases	RT:	Telescopes
	RT:	Object oriented methods	<b>Observers</b>	
<b>Object oriented methods</b>			BT:	State estimation
	BT:	Programming	RT:	Machine vision
	RT:	Object oriented databases	NT:	Disturbance observers
		Object oriented		Earth Observing System
programming			<i>Obstacle avoidance</i>	
<b>Object oriented modeling</b>			USE:	Collision avoidance
	BT:	Modeling	<b>Occipital Lobe</b>	
<b>Object oriented programming</b>			BT:	Brain
	UF:	Object-oriented	<b>Occupational health</b>	
programming			UF:	Health (occupational)
	BT:	Programming	BT:	Health and safety
	RT:	C languages	RT:	Accidents
		C# languages		Biological effects of
		Object oriented methods	radiation	
		Software libraries		Domestic safety
		Software reusability		Electric shock
	NT:	Dispatching		Employee welfare
<b>Object recognition</b>				Environmental factors
	UF:	Image object recognition		Ergonomics



# 2018 IEEE Thesaurus

	Eye protection		
	Occupational medicine		<i>Ocean technology</i>
	Occupational safety	USE:	Marine technology
	Pollution		
	Protective clothing		<b>Ocean temperature</b>
	Radioactive materials	UF:	Sea surface temperature
	Risk analysis	BT:	Oceanic engineering and
	Safety	marine technology	Oceans
	Toxicology		Global warming
	Working environment noise	RT:	Land surface temperature
NT:	Occupational stress		
			<i>Ocean vegetation</i>
<b>Occupational medicine</b>		USE:	Marine vegetation
BT:	Medical services		
RT:	Medical diagnosis		
	Medical treatment		
	Occupational health		
			<b>Ocean waves</b>
		BT:	Hydrology
		NT:	Sea state
			Wave power
<i>Occupational pensions</i>			
USE:	Pensions		
			<b>Oceanic engineering and marine technology</b>
<b>Occupational safety</b>		NT:	Marine navigation
UF:	OSHA		Marine technology
BT:	Health and safety		Ocean temperature
RT:	Accidents		Oceanographic techniques
	Domestic safety		Water pollution
	Electric shock		
	Employee welfare		<b>Oceanographic techniques</b>
	Eye protection	BT:	Oceanic engineering and
	Industrial accidents	marine technology	
	Occupational health	RT:	Acoustic imaging
	Protection		Hydrologic measurements
	Protective clothing		Radar applications
	Radioactive materials		Remote sensing
	Risk analysis		
	Working environment noise		<b>Oceanography</b>
		UF:	Marine science
<b>Occupational stress</b>			Oceanology
BT:	Occupational health	BT:	Geoscience
RT:	Employee welfare	RT:	Oceans
	Hazards		
			<i>Oceanology</i>
<i>OCDM</i>		USE:	Oceanography
USE:	Code division multiplexing		
			<b>Oceans</b>
<i>Ocean animals</i>		UF:	Ocean composition
USE:	Marine animals		Planetary oceans
		BT:	Geoscience
<i>Ocean composition</i>		RT:	Geophysics
USE:	Oceans		Marine technology
			Oceanography
<b>Ocean salinity</b>			Sea ice
BT:	Oceans		Sea measurements
RT:	Salinity (geophysical)		Water
NT:	SMOS mission	NT:	Ocean salinity



# 2018 IEEE Thesaurus

		Ocean temperature			Electronic mail
		Sea coast			Information systems
		Sea floor			Local area networks
		Sea level			Microcomputers
		Sea surface			Teleconferencing
		Tides			Text processing
<b>OCR</b>					Unsolicited electronic mail
	USE:	Optical character		NT:	Voice mail
recognition software				software	Workflow management
<b>Octrees</b>					
	BT:	Data structures		<i>Offshore distribution systems</i>	
				USE:	Offshore installations
<b>OFDM</b>				<b>Offshore installations</b>	
	UF:	Orthogonal frequency		UF:	Gas platforms
division multiple access					Offshore distribution
		Orthogonal frequency		systems	
division multiplexing					Offshore power plants
	BT:	Multiplexing			Oil platforms
	RT:	3G mobile communication		BT:	Structural engineering
		Acoustic communication		RT:	Oil drilling
(telecommunication)					Petroleum industry
		Communication channels			Power industry
		Digital signal processing		<i>Offshore power plants</i>	
		MIMO communication		USE:	Offshore installations
		Modulation			
		Multiaccess communication		<b>OGC</b>	
		Multicarrier code division		USE:	Open Geospatial
multiple access				Consortium	
		NOMA			
	NT:	Multiple access interference		<b>Ohmic contacts</b>	
		OFDM modulation		BT:	Contacts
		Partial transmit sequences		RT:	Linear circuits
		Peak to average power			
ratio				<i>Ohmmeters</i>	
<b>OFDM modulation</b>				USE:	Electrical resistance
	BT:	OFDM		measurement	
<b>OFETs</b>				<b>Oil drilling</b>	
	UF:	Organic FETS		UF:	Drilling oil
		Organic field effect		BT:	Petroleum industry
transistors				RT:	Drilling
		Organic field-effect			Fuel processing industries
transistors					Offshore installations
	BT:	Field effect transistors			Technology
					Well logging
<b>Office automation</b>				<b>Oil filled cables</b>	
	BT:	Automation		BT:	Oil insulation
	RT:	Bring your own device		RT:	Cable insulation
		Communication systems			
		Data communication		<i>Oil filters</i>	
		Desktop publishing		USE:	Lubricating oils
		Document handling			



# 2018 IEEE Thesaurus

<i>Oil industry</i>	USE: Petroleum industry	NT: Lubricating oils Vegetable oils
<b>Oil insulation</b>	UF: Transformer oil BT: Insulation RT: Oils NT: Oil filled cables	<i>OLED</i> diodes USE: Organic light emitting
<i>Oil platforms</i>	USE: Offshore installations	<b>Olfactory</b> BT: Nose
<b>Oil pollution</b>	BT: Pollution RT: Accidents Land pollution Marine pollution Oils Petroleum Petroleum industry	<b>Olfactory bulb</b> BT: Forebrain Sense organs
<b>Oil refineries</b>	BT: Petroleum industry	<b>Oligopoly</b> BT: Economics RT: Game theory Microeconomics
<i>Oil sands</i>	USE: Hydrocarbons	<b>Omnidirectional antennas</b> BT: Antennas
<i>Oil shale</i>	USE: Hydrocarbons	<i>On demand software</i> USE: Software as a service
<i>Oil tanks</i>	USE: Fuel storage	<b>On load tap changers</b> UF: Load tap changers On-load tap changers Onload tap changers BT: Power transformers RT: Voltage control
<i>Oiling (lubrication)</i>	USE: Lubricating oils	<b>On the job training</b> UF: On-the-job training BT: Training RT: Industrial training
<b>Oils</b>	BT: Materials RT: Engines Fats Fluids Fractionation Fuel processing industries Insulation Marine pollution Mechanical factors Mechanical power	<i>On-chip</i> USE: System-on-chip
transmission	Oil insulation Oil pollution Petroleum Petroleum industry Pipelines Water pollution	<i>On-demand software</i> USE: Software AND Software as a service
		<i>On-line services</i> USE: Online services
		<i>On-load tap changers</i> USE: On load tap changers
		<i>On-the-job training</i> USE: On the job training
		<b>Oncological surgery</b> UF: Otologic surgery



# 2018 IEEE Thesaurus

	BT: Surgery oncology	USE: Ontologies
	RT: Surgery	
	RT: Cancer	<i>ONU</i>
	RT: Oncology	USE: Optical network units
<b>Oncology</b>		<i>OOO</i>
	BT: Medical specialties	USE: Out of order
	RT: Cancer	
	RT: Chemotherapy	<i>Op amp</i>
	RT: Oncological surgery	USE: Operational amplifiers
	RT: Tumors	
<b>Online banking</b>		<b>Open Access</b>
	UF: E-banking	BT: Open systems
	UF: E-currency	BT: Publishing
	UF: Electronic banking	NT: Public domain software
	UF: Electronic currency	
	UF: Internet banking	<b>Open area test sites</b>
	UF: Virtual currency	UF: OATS
	BT: Banking	BT: Test facilities
	BT: Online services	RT: Electromagnetic
	RT: Bitcoin	compatibility and interference
	RT: Cryptocurrency	Electromagnetic
	RT: Electronic commerce	interference
		Immunity testing
		Military equipment
<i>Online indexing</i>		<b>Open Educational Resources</b>
USE: Indexing		BT: Education courses
		BT: Open systems
<b>Online services</b>		<b>Open Geospatial Consortium</b>
	UF: Inverted classroom	UF: OGC
	UF: On-line services	BT: Standards Organizations
	UF: Reverse teaching	
	BT: Information retrieval	<i>Open loop control</i>
	RT: Cloud gaming	USE: Open loop systems
	RT: Google	
	RT: Internet	<b>Open loop systems</b>
	NT: Online banking	UF: Open loop control
<i>Online voting</i>		BT: Control systems
USE: Electronic voting		RT: Feedforward systems
		RT: Operational amplifiers
<i>Onload tap changers</i>		<b>Open source hardware</b>
USE: On load tap changers		UF: Opensource hardware
		BT: Hardware
<b>Ontologies</b>		<b>Open source software</b>
	UF: Ontology	UF: Open-source
	BT: Knowledge representation	BT: Software
	RT: Linked data	RT: Public domain software
	RT: Ranking (statistics)	
	RT: Semantic Web	<b>Open systems</b>
	RT: Semantic search	UF: OSI
	RT: Thesauri	
	NT: Description logic	

*Ontology*



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# 2018 IEEE Thesaurus

BT: Computers and information processing

RT: System analysis and design  
(electricity) Common Information Model

Computer networks  
Internetworking  
Interoperability  
Local area networks  
Metropolitan area networks  
Standards  
Wide area networks

NT: Open Access  
Resources Open Educational  
Physical layer

## Open wireless architecture

UF: OWA  
BT: Wireless communication

*Open-source*  
USE: Open source software

*Opensource hardware*  
USE: Open source hardware

*Operating cost reduction*  
USE: Costing

## Operating systems

UF: Computer operating systems  
Executive programs  
Robot operating systems  
Supervisory programs  
BT: System software  
RT: Computer security  
Cyber-physical systems  
Program processors  
Software defined

networking  
NT: System recovery  
Bootling  
Embedded systems  
Input-output programs  
Kernel  
Microsoft Windows  
Network operating systems  
System kernels

## Operational amplifiers

UF: Op amp  
BT: Active circuits  
Amplifiers

RT: FET circuits  
Linearization techniques  
MOSFET circuits  
Open loop systems  
NT: Feedback amplifiers

## Operations research

BT: Business  
RT: Linear programming  
Management  
Optimization methods  
Principal component

analysis  
Resource management  
Statistics  
TOPSIS  
NT: Inventory control  
Virtual enterprises

## Opportunistic software systems development

BT: Programming

*OPT*  
USE: Optimized production technology

*Optic flow*  
USE: Optical flow

## Optical add-drop multiplexers

UF: ROADMS  
BT: Add-drop multiplexers

*Optical amplification*  
USE: Stimulated emission

## Optical amplifiers

BT: Optics  
RT: Erbium  
NT: Doped fiber amplifiers  
Erbium-doped fiber

amplifiers  
Semiconductor optical amplifiers

## Optical arrays

BT: Optical devices  
RT: Micromirrors  
Phased arrays

## Optical attenuators

UF: Variable optical attenuators  
BT: Attenuators  
Optical devices



# 2018 IEEE Thesaurus

RT: Optical communication equipment  
Optical losses

## Optical beam splitting

BT: Optical beams

## Optical beams

BT: Beams  
RT: Bragg gratings  
Laser beams  
Laser theory  
NT: Optical beam splitting

## Optical bistability

UF: Bistability (optical)  
BT: Electrooptic effects  
RT: Electrooptic devices  
Optical switches

## Optical buffering

BT: Optical fiber communication

## Optical burst switching

BT: Burst switching

## Optical character recognition software

UF: OCR  
BT: Software

## Optical cloaking

UF: Metamaterial cloaking  
BT: Metamaterials  
Optical materials

## Optical code division multiplexing

USE: Code division multiplexing

## Optical coherence tomography

BT: Tomography  
RT: Eyes

## Optical collimators

BT: Optical devices

## Optical communication

USE: Optical fiber communication

## Optical communication equipment

BT: Communication equipment  
RT: Biomedical optical imaging  
Optical attenuators  
Optical switches  
NT: Optical transmitters

## Optical components

USE: Optical devices

## Optical computing

BT: Computers and information processing

## Optical control

BT: Control systems  
RT: Optical switches  
NT: Lighting control  
Optical variables control

## Optical coupling

BT: Electromagnetic coupling  
RT: Optical fiber couplers

## Optical crosstalk

BT: Optics  
RT: Optical fiber communication

## Optical design

BT: Optics  
RT: Laser theory  
NT: Optical design techniques

## Optical design techniques

BT: Optical design  
RT: Design methodology  
NT: High-speed optical

techniques

## Optical detectors

BT: Optical sensors  
RT: Nonlinear optical devices  
NT: Bar codes

## Optical device fabrication

BT: Fabrication  
Optical devices  
RT: Electronic equipment

manufacture

## Optical devices

UF: Optical components  
BT: Optics  
RT: Biomedical optical imaging  
Gratings  
Optical materials  
NT: Bragg gratings  
Collimators  
Displays  
Holographic optical

components

Lenses





# 2018 IEEE Thesaurus

Light deflectors  
Lighting  
Luminescent devices  
Mirrors  
Optical arrays  
Optical attenuators  
Optical collimators  
Optical device fabrication  
Optical filters  
Optical resonators  
Optical sensors  
Thermo-optical devices

## Optical diffraction

BT: Electromagnetic diffraction  
RT: Photonic band gap  
NT: Diffraction gratings

## Optical distortion

BT: Optics  
RT: Lasers  
Optical noise  
Thermal lensing

## Optical distortion measurement

USE: Distortion measurement

## Optical engineering

BT: Engineering - general  
Optics  
RT: Optical materials

## Optical feedback

BT: Image processing  
RT: Distributed feedback

devices

## Optical fiber amplifiers

UF: Optical fibre amplifiers  
BT: Optical fibers  
RT: Amplifiers

## Optical fiber applications

UF: Optical fibre applications  
BT: Optics  
RT: Channel spacing  
Code division multiplexing  
Optical fiber cables  
Optical fiber communication  
Optical fibers  
NT: Optical fiber devices

## Optical fiber cables

UF: Communication cables

(optical)

Optical fibre cables  
BT: Cables  
RT: Optical fiber applications  
Splicing

## Optical fiber communication

UF: Infrared communication  
Optical communication  
Optical fibre communication  
Optical links  
BT: Communication systems  
RT: Avalanche photodiodes  
Broadband communication  
Indoor communication  
Optical crosstalk  
Optical fiber applications  
Optical transmitters  
Silicon photonics  
Synchronous digital

hierarchy

NT: FDDI  
Free-space optical

communication

loops

conversion

Optical buffering  
Optical fiber networks  
Optical fiber subscriber

Optical interconnections  
Optical packet switching  
Optical wavelength

SONET  
Scheduling algorithms  
Visible light communication

## Optical fiber couplers

UF: Optical fibre couplers  
BT: Optical fibers  
RT: Optical coupling

## Optical fiber devices

UF: Optical fibre devices  
BT: Optical fiber applications  
RT: Optical fibers  
NT: Optical fiber sensors

## Optical fiber dispersion

UF: Optical fibre dispersion  
BT: Dispersion

## Optical fiber filters

BT: Optical filters

## Optical fiber LAN



# 2018 IEEE Thesaurus

network UF: Optical fiber local area

Optical fibre LAN  
Optical fibre local area

network BT: Optical fiber networks

*Optical fiber local area network*

USE: Optical fiber LAN

*Optical fiber loss*

USE: Optical fiber losses

## Optical fiber losses

UF: Optical fiber loss  
Optical fibre losses

BT: Optical fibers

## Optical fiber networks

UF: Elastic optical networks  
Optical fibre networks  
Optical networks  
Optical-fiber networks  
Optical-fibre networks  
BT: Optical fiber communication  
RT: Light fidelity  
NT: All-optical networks  
LAN emulation  
Optical fiber LAN  
Optical network units  
Passive optical networks  
Protection switching  
Wavelength assignment

## Optical fiber polarization

UF: Optical fibre polarisation  
Polarization-maintaining

optical fibers

BT: Optical fibers  
RT: Optical fiber sensors  
Optical interferometry  
NT: Polarization mode

dispersion

## Optical fiber sensors

UF: Fiber optic sensors  
Fibre optic sensors  
Optical fibre sensors  
BT: Optical fiber devices  
Optical sensors  
RT: Optical fiber polarization  
Partial discharge

measurement

## Optical fiber subscriber loops

UF: FTTH  
Fiber-in-the-loop  
Optical fibre subscriber

loops

BT: Optical fiber communication

## Optical fiber testing

UF: Optical fibre testing  
BT: Testing  
RT: Optical fibers

## Optical fiber theory

UF: Optical fibre theory  
BT: Optical fibers  
RT: Electromagnetic field theory

## Optical fibers

UF: Optical fibres  
BT: Fiber optics  
Optical waveguides  
RT: Electromagnetic

waveguides

Optical fiber applications  
Optical fiber devices  
Optical fiber testing  
Optical materials  
Optical propagation  
Optical waveguide theory  
Optical wavelength

conversion

Supercontinuum generation  
Temperature sensors  
NT: Optical fiber amplifiers  
Optical fiber couplers  
Optical fiber losses  
Optical fiber polarization  
Optical fiber theory  
Plastic optical fiber  
Wavelength conversion

## Optical fibre amplifiers

USE: Optical fiber amplifiers

## Optical fibre applications

USE: Optical fiber applications

## Optical fibre cables

USE: Optical fiber cables

## Optical fibre communication

USE: Optical fiber communication

## Optical fibre couplers

USE: Optical fiber couplers



# 2018 IEEE Thesaurus

## *Optical fibre devices*

USE: Optical fiber devices

## *Optical fibre dispersion*

USE: Optical fiber dispersion

## *Optical fibre LAN*

USE: Optical fiber LAN

## *Optical fibre local area network*

USE: Optical fiber LAN

## *Optical fibre losses*

USE: Optical fiber losses

## *Optical fibre networks*

USE: Optical fiber networks

## *Optical fibre polarisation*

USE: Optical fiber polarization

## *Optical fibre sensors*

USE: Optical fiber sensors

## *Optical fibre subscriber loops*

USE: Optical fiber subscriber loops

## *Optical fibre testing*

USE: Optical fiber testing

## *Optical fibre theory*

USE: Optical fiber theory

## *Optical fibres*

USE: Optical fibers

## **Optical films**

BT: Films

RT: Integrated optics

Optical materials

## **Optical filters**

BT: Optical devices

RT: Photography

NT: Optical fiber filters

## **Optical flow**

UF: Optic flow

BT: Optical imaging

Relativistic effects

## *Optical frequency combs*

USE: Optical harmonic generation

## **Optical frequency conversion**

BT: Frequency conversion

## *Optical gratings*

USE: Gratings

## **Optical harmonic generation**

UF: Optical frequency combs

BT: Optics

## *Optical heterodyning*

USE: Optical mixing

## **Optical imaging**

BT: Imaging

RT: Infrared imaging

Microscopy

Remote sensing

NT: Optical flow

Optical projectors

Talbot effect

Thermoreflectance imaging

## **Optical interconnections**

UF: Optical interconnects

BT: Optical fiber communication

## *Optical interconnects*

USE: Optical interconnections

## **Optical interferometry**

UF: Light interferometry

BT: Interferometry

RT: Optical fiber polarization

Speckle

Talbot effect

## *Optical lattices*

USE: Lattices

## *Optical links*

USE: Optical fiber communication

## **Optical losses**

BT: Optics

RT: Loss measurement

Optical attenuators

Optical scattering

## **Optical materials**

BT: Materials

RT: Glass

Indium tin oxide

Lenses



# 2018 IEEE Thesaurus

	Magnesium oxide	BT:	Optical fiber networks
	Metamaterials		
	Mirrors	<i>Optical networks</i>	
	Optical devices	USE:	Optical fiber networks
	Optical engineering		
	Optical fibers	<b>Optical noise</b>	
	Optical films	BT:	Integrated circuit noise
	Optics	RT:	Optical distortion
	Organic inorganic hybrid	NT:	Speckle
materials			
	Phase change materials	<b>Optical packet switching</b>	
	Photonic crystals	BT:	Optical fiber communication
	SIMO communication		
NT:	Optical cloaking	<b>Optical planar waveguides</b>	
	Optical polymers	BT:	Optical waveguides
	Optical retarders		
	Optical superlattices	<i>Optical polarisation</i>	
	Photorefractive materials	USE:	Optical polarization
<i>Optical measurements</i>			
USE:	Optical variables	<b>Optical polarization</b>	
measurement		UF:	Light polarisation
			Light polarization
			Optical polarisation
<b>Optical metamaterials</b>		BT:	Optics
UF:	Photonic metamaterials	RT:	Photoelasticity
BT:	Metamaterials	NT:	Polarization shift keying
RT:	Electromagnetic		Stokes parameters
metamaterials			
<b>Optical metrology</b>		<b>Optical polymers</b>	
BT:	Metrology	BT:	Optical materials
			Polymers
<b>Optical microscopy</b>			
BT:	Optics	<b>Optical projectors</b>	
		UF:	projectors (optical)
<b>Optical mixing</b>		BT:	Optical imaging
UF:	Optical heterodyning		Video equipment
BT:	Nonlinear optics	RT:	Image processing
	Optics		Micromirrors
RT:	Photorefractive materials		Motion pictures
NT:	Multiwave mixing		
<b>Optical modulation</b>		<b>Optical propagation</b>	
BT:	Modulation	UF:	Infrared propagation
RT:	Indoor communication	BT:	Electromagnetic
	Microwave photonics	propagation	
	Optical transmitters	RT:	Optical fibers
NT:	Electrooptic modulators		Thermooptic effects
	Intensity modulation	NT:	Optical surface waves
			Optical waveguides
<i>Optical multilayers</i>		<b>Optical pulse compression</b>	
USE:	Optical superlattices	BT:	Pulse compression
		methods	
<b>Optical network units</b>		<b>Optical pulse generation</b>	
UF:	ONU	BT:	Pulse generation



# 2018 IEEE Thesaurus

RT: Optical pulse shaping

## Optical pulse shaping

BT: Pulse shaping methods  
RT: Optical pulse generation

## Optical pulses

BT: Optics

## Optical pumping

BT: Laser excitation

## Optical radar

USE: Laser radar

## Optical receivers

BT: Receivers

## Optical recording

BT: Recording  
RT: Laser applications  
NT: CD recording

## Optical reflection

BT: Electromagnetic reflection  
RT: Mirrors  
Optical scattering  
Reflectivity  
Reflectometry  
Thermo optic effects

## Optical refraction

BT: Physical optics  
RT: Photorefractive effect  
Photorefractive materials  
Refractive index  
Thermo optic effects

## Optical regenerators

USE: Repeaters

## Optical resonators

BT: Optical devices  
RT: Digital filters  
Laser cavity resonators  
Resonance  
NT: Microcavities  
Optical ring resonators

## Optical retarders

UF: Half-wave plates  
Quarter-wave plates  
BT: Optical materials  
Optics  
RT: Polarimetry

## Optical ring resonators

UF: Ring resonators  
BT: Optical resonators

## Optical saturation

BT: Nonlinear optics  
Optics

## Optical scan voting systems

BT: Electronic voting systems

## Optical scattering

BT: Electromagnetic scattering  
RT: Laser radar  
Light scattering  
Optical losses  
Optical reflection  
Speckle

## Optical sensors

BT: Optical devices  
Sensors  
RT: Image sensors  
NT: Optical detectors  
Optical fiber sensors

## Optical signal detection

BT: Signal detection  
RT: Photodetectors

## Optical signal processing

BT: Signal processing  
NT: Laser noise

## Optical solitons

BT: Optics  
Solitons  
RT: Optical vortices

## Optical superlattices

UF: Optical multilayers  
BT: Optical materials  
Superlattices

## Optical surface waves

BT: Optical propagation

## Optical switch

USE: Optical switches

## Optical switches

UF: Optical switch  
BT: Switches  
RT: Optical bistability



# 2018 IEEE Thesaurus

equipment	Optical communication	<b>Optical waveguide theory</b>	BT: Optical waveguides RT: Optical fibers
	Optical control	<b>Optical waveguides</b>	BT: Optical propagation Waveguide components RT: Electrooptic modulators Integrated optics Photonic crystals NT: Arrayed waveguide gratings Electrooptical waveguides Optical fibers Optical planar waveguides Optical waveguide
	Photothyristors	components	Optical waveguide theory
	Smart pixels		
	Thermooptical devices		
<b>Optical transmitters</b>			
BT: Optical communication			
equipment	Transmitters		
	Bragg gratings		
	Diodes		
	Optical fiber communication		
	Optical modulation		
	Photodiodes		
	Semiconductor lasers		
	Semiconductor optical		
amplifiers			
<b>Optical tuning</b>			
BT: Optics			
	Tuning		
	Laser tuning		
		<b>Optical wavelength conversion</b>	BT: Optical fiber communication Signal processing RT: Multicast communication Optical fibers Telecommunications
<b>Optical variables control</b>			
BT: Optical control			
RT: Frequency control			
	Phase control		
<b>Optical variables measurement</b>		<i>Optical-fiber networks</i>	USE: Optical fiber networks
UF: Optical measurements		<i>Optical-fibre networks</i>	USE: Optical fiber networks
BT: Measurement			
RT: Frequency measurement			
	Phase measurement		
	Reflectometry		
	Wavelength measurement		
NT: Ellipsometry		<b>Optics</b>	BT: Lasers and electrooptics RT: Erbium Fourier transforms Laser theory Magneto optic effects Optical materials NT: Adaptive optics Birefringence Brightness Color Electron optics Extinction coefficients Fiber optics Fluorescence Four-wave mixing Geometrical optics Integrated optics Light sources Luminescence Microoptics Nonlinear optics Optical amplifiers Optical crosstalk
	Photometry		
	Reflection coefficient		
	Refractive index		
<i>Optical vortex</i>			
USE: Optical vortices			
<b>Optical vortices</b>			
UF: Optical vortex			
	Vortices, optical		
BT: Physical optics			
RT: Laser beams			
	Optical solitons		
<b>Optical waveguide components</b>			
BT: Optical waveguides			



# 2018 IEEE Thesaurus

generation	Optical design	RT:	Doping profiles
	Optical devices		Least squares
	Optical distortion	approximation	
	Optical engineering		Minimization
	Optical fiber applications		Parametric study
	Optical harmonic		Performance analysis
			TOPSIS
	Optical losses	NT:	Cost function
	Optical microscopy		Optimal scheduling
	Optical mixing		Optimization methods
	Optical polarization		Trajectory optimization
	Optical pulses		
	Optical retarders	<b>Optimization methods</b>	
	Optical saturation	UF:	Optimisation methods
	Optical solitons	BT:	Optimization
	Optical tuning	RT:	Infinite horizon
	Particle beam optics		Linear programming
	Photoluminescence		MIMO communication
	Physical optics		Newton method
	Ray tracing		Operations research
	Stray light		Processor scheduling
	Ultrafast optics		Response surface
	Whispering gallery modes	methodology	
<b>Optimal control</b>			Search methods
BT:	Control systems		Single machine scheduling
RT:	Game theory	NT:	Circuit optimization
	H infinity control		Design optimization
NT:	Bang-bang control		Fireworks algorithm
	Infinite horizon		Gradient methods
			H infinity control
			Mathematical programming
<b>Optimal matching</b>			Optimized production
BT:	Graph theory	technology	
<b>Optimal scheduling</b>			Pareto optimization
BT:	Optimization		Quadratic programming
			Simulated annealing
<i>Optimisation</i>		<b>Optimized production technology</b>	
USE:	Optimization	UF:	OPT
			Optimised production
<i>Optimisation methods</i>		technology	
USE:	Optimization methods	BT:	Optimization methods
			Production control
<i>Optimised production technology</i>		RT:	Production planning
USE:	Optimized production		Production systems
technology			
<i>Optimising compilers</i>		<b>Optimizing compilers</b>	
USE:	Optimizing compilers	UF:	Optimising compilers
		BT:	Program processors
<b>Optimization</b>		<i>Opto-electronic devices</i>	
UF:	Optimisation	USE:	Optoelectronic devices
	Performance optimisation		
	Performance optimization	<i>Optoacoustic effects</i>	
BT:	Mathematics	USE:	Photoacoustic effects





# 2018 IEEE Thesaurus

## Optoelectronic and photonic sensors

BT: Sensors

## Optoelectronic devices

UF: Opto-electronic devices  
BT: Lasers and electrooptics  
RT: Electrooptic devices  
Phototransistors  
NT: Charge-coupled image

sensors

Integrated optoelectronics  
Light emitting diodes  
Photoconducting devices  
Photodetectors  
Superluminescent diodes

## Optothermal effects

USE: Photothermal effects

## Optothyristors

USE: Photothyristors

## Oral communication

UF: Speech communication  
BT: Professional  
communication  
NT: Public speaking  
Speech

## Orange technology

USE: Social implications of  
technology

## Orbital calculations

BT: Energy states

## Orbital debris

USE: Space debris

## Orbital robotics

BT: Robots

## Orbits

BT: Astrophysics  
NT: Orbits (stellar)  
Planetary orbits

## Orbits (stellar)

BT: Orbits  
RT: Stellar motion

## Ordinance

USE: Weapons

## Ordinary magnetoresistance

BT: Magnetoresistance

## Ores

BT: Minerals

## Organic chemicals

BT: Chemistry  
NT: Hydrocarbons

## Organic compounds

BT: Compounds  
RT: Carbon  
NT: Carbon compounds  
Organic semiconductors  
Volatile organic compounds

## Organic electronics

UF: Paper electronics  
BT: Electronic equipment  
RT: Synapses

## Organic FETS

USE: OFETs

## Organic field effect transistors

USE: OFETs

## Organic field-effect transistors

USE: OFETs

## Organic inorganic hybrid materials

UF: Inorganic organic hybrid  
materials  
Inorganic-organic hybrid  
materials  
Organic-inorganic hybrid  
materials  
Organically modified  
silicates  
Ormosils  
BT: Materials  
RT: Inorganic compounds  
Optical materials

## Organic light emitting diodes

UF: OLED  
Organic light-emitting  
diodes  
Polymer led  
BT: Light emitting diodes  
RT: Electroluminescence  
Molecular electronics  
NT: Active matrix organic light  
emitting diodes





# 2018 IEEE Thesaurus

<i>Organic light-emitting diodes</i>			Organisational structure
USE: Organic light emitting diodes			Organizational culture
		BT: Management	Organizational structure
		RT: Business process re-	
<b>Organic materials</b>		engineering	
BT: Materials			Industrial communication
		NT: Business communication	
<b>Organic semiconductors</b>			Corporate acquisitions
BT: Organic compounds			Facilities management
Semiconductor materials			Role transfer
NT: Pentacene			Scheduling
			Stakeholders
			Team working
<b>Organic thin film transistors</b>			
UF: OTFT			
Organic thin-film transistors			
BT: Thin film transistors			
		<i>Organizational communication</i>	
		USE: Industrial communication	
<i>Organic thin-film transistors</i>			
USE: Organic thin film transistors			
		<i>Organizational culture</i>	
		USE: Organizational aspects	
<i>Organic-inorganic hybrid materials</i>			
USE: Organic inorganic hybrid materials			
		<i>Organizational structure</i>	
		USE: Organizational aspects	
		<b>Organizations</b>	
		BT: Business	
		NT: BNSC	
		Companies	
		Government	
		Sociotechnical systems	
<i>Organically modified silicates</i>			
USE: Organic inorganic hybrid materials			
		<i>Organobromine compounds</i>	
		USE: Bromine compounds	
<i>Organisational aspects</i>			
USE: Organizational aspects			
<i>Organisational culture</i>			
USE: Organizational aspects			
<i>Organisational structure</i>			
USE: Organizational aspects			
<b>Organisms</b>			
BT: Biological systems			
NT: Algae			
Animals			
Archaea			
Fish			
Fungi			
Mesomycetozoea			
Microorganisms			
Plants (biology)			
Viruses (medical)			
<b>Organizational aspects</b>			
UF: Business organisation			
Business organization			
Organisational aspects			
Organisational culture			
		<i>Orientation control</i>	
		USE: Position control	
		<i>Orientation determination</i>	
		USE: Position measurement	
		<i>Orientation measurement</i>	
		USE: Position measurement	
		<b>Orifices</b>	
		BT: Mechanical products	
		<i>Ormosils</i>	
		USE: Organic inorganic hybrid materials	
		<i>Orthogonal frequency division multiple access</i>	
		USE: OFDM	



# 2018 IEEE Thesaurus

*Orthogonal frequency division multiplexing*

USE: OFDM

## **Orthopedic procedures**

BT: Medical treatment

## **Orthopedic surgery**

BT: Surgery

## **Orthotics**

BT: Medical treatment  
RT: Assistive technology  
Biomedical engineering  
Biomedical equipment  
Medical control systems  
Prosthetics  
Sensory aids

## *Oscillations*

USE: Oscillators

## **Oscillators**

UF: Oscillations  
BT: Circuits and systems  
RT: Circuits  
Damping  
Klystrons  
Lasers  
Resonant frequency  
Vibrations  
NT: Digital-controlled oscillators  
Injection-locked oscillators  
Local oscillators  
Microwave oscillators  
Phase noise  
Ring oscillators  
Voltage-controlled

oscillators

## **Oscilloscopes**

UF: Cathode-ray oscilloscopes  
BT: Instruments  
RT: Electric variables

measurement

Test equipment

## *OSHA*

USE: Occupational safety

## *OSI*

USE: Open systems

## **Osmium**

BT: Chemical elements

## **Osmosis**

BT: Chemical processes  
NT: Electro-osmosis

## **Osteoarthritis**

BT: Bone diseases

## **Osteoporosis**

BT: Bone diseases  
RT: Cancellous bone

## *OTFT*

USE: Organic thin film transistors

## *Otologic surgery*

USE: Oncological surgery

## **Out of order**

UF: OOO  
BT: Instruction sets

## *Outlier detection*

USE: Anomaly detection

## **Output feedback**

BT: Feedback circuits

## *Output power*

USE: Power generation

## **Outsourcing**

BT: Management  
RT: Crowdsourcing

## **Ovens**

BT: Home appliances  
NT: Microwave ovens

## *Overflow oscillations*

USE: Finite wordlength effects

## *Overhead distribution lines*

USE: Power distribution lines

## *Overhead transmission lines*

USE: Power transmission lines

## **Overlay networks**

BT: Computer networks  
RT: Network topology  
Transport protocols

## *OWA*

USE: Open wireless architecture



# 2018 IEEE Thesaurus

<b>OWL</b>	UF:	Web ontology language	<b>PAAS</b>	USE:	IEEE 802.11 Standard
	BT:	Markup languages		USE:	Platform as a service
	RT:	Semantic Web			
	RT:	Knowledge representation	<b>Pacemakers</b>	BT:	Biomedical equipment
<b>Oxidation</b>			RT:	Cardiology	
	BT:	Chemical processes	<b>Packaging</b>	BT:	Industry applications
	RT:	Materials		RT:	Filling
	NT:	Combustion			Leak detection
<b>Oxygen</b>					Packaging machines
	BT:	Chemical elements			Seals
		Gases		NT:	Bagging
<b>Ozonation</b>					Bottling
	UF:	Ozone treatment			Canning
	BT:	Wastewater treatment			Encapsulation
	RT:	Environmental factors			Food packaging
		Pollution control			Labeling
<i>Ozone generators</i>					Multichip modules
	USE:	Discharges (electric)			Plastic packaging
<i>Ozone treatment</i>					Wrapping
	USE:	Ozonation	<b>Packaging machines</b>	BT:	Production equipment
<i>Ozonizers</i>			RT:	Bagging	
	USE:	Discharges (electric)		Bottling	
<i>P-I-N</i>				Labeling	
	USE:	PIN photodiodes		Packaging	
<b>P-i-n diodes</b>				Wrapping	
	BT:	Semiconductor devices	<b>Packet loss</b>	BT:	Loss measurement
		Semiconductor diodes			Packet switching
	RT:	CMOSFET logic devices	RT:	Data communication	
		Electrooptic modulators		Noise measurement	
		Vertical cavity surface	<i>Packet radio</i>	USE:	Packet radio networks
emitting lasers					
<b>P-n junctions</b>			<b>Packet radio networks</b>	UF:	Packet radio
	BT:	Junctions		BT:	Radio communication
	RT:	Light emitting diodes			
		Photodiodes			
		Semiconductor diodes	<b>Packet switching</b>	BT:	Communication switching
<i>P1394</i>			RT:	ARPANET	
	USE:	IEEE 1394 Standard		Data transfer	
<i>P2P</i>				IEEE 802.3 Standard	
	USE:	Peer-to-peer computing		Next generation networking	
<i>P802.11</i>			NT:	Burst switching	
				Frame relay	



# 2018 IEEE Thesaurus

switching Multiprotocol label  
Packet loss

*Pacs*  
USE: Picture archiving and  
communication systems

*Paediatrics*  
USE: Pediatrics

**Page description languages**  
UF: Postscript  
BT: Markup languages  
RT: Desktop publishing  
High level languages

**Paging strategies**  
BT: Land mobile radio cellular  
systems  
RT: Wireless communication

**Pain**  
BT: Injuries  
NT: Ischemic pain  
Neuropathic pain

**Painting**  
BT: Surface finishing  
Surface treatment  
RT: Coatings  
Paints

**Paints**  
BT: Chemical products  
Coatings  
Materials  
RT: Ink  
Lacquers  
Painting

*Pair-wise error probability*  
USE: Pairwise error probability

*Pairwise correlations*  
USE: Pairwise error probability

**Pairwise error probability**  
UF: Pair-wise error probability  
Pairwise correlations  
BT: Probability

**Palladium**  
BT: Metals

*Palletising*  
USE: Pallets

*Palletizing*  
USE: Pallets

**Pallets**  
UF: Palletising  
Palletizing  
BT: Materials handling  
RT: Containers  
Load management

*Palm print recognition*  
USE: Palmprint recognition

**Palmprint recognition**  
UF: Palm print recognition  
BT: Biometrics (access control)  
RT: Identification of persons

*Palmtop computers*  
USE: Personal digital assistants

**Pancreas**  
BT: Digestive system

*Paper electronics*  
USE: Organic electronics

*Paper industry*  
USE: Pulp and paper industry

**Paper making**  
BT: Pulp and paper industry  
RT: Bleaching  
Paper making machines  
Paper products  
Paper pulp  
Paper technology  
Pulp manufacturing  
Spinning machines

**Paper making machines**  
BT: Production equipment  
Pulp and paper industry  
RT: Paper making  
Paper products  
Paper pulp  
Paper technology  
Pulp manufacturing  
Spinning machines

**Paper mills**  
BT: Production facilities



# 2018 IEEE Thesaurus

RT: Pulp and paper industry  
Industrial plants  
Paper products  
Paper pulp  
Pulp manufacturing  
Spinning machines

## Paper products

BT: Manufactured products  
RT: Paper making  
Paper making machines  
Paper mills  
Paper pulp  
Paper technology  
Pulp and paper industry

## Paper pulp

BT: Manufactured products  
Materials  
RT: Paper making  
Paper making machines  
Paper mills  
Paper products  
Pulp and paper industry  
Pulp manufacturing

## Paper technology

BT: Industry applications  
RT: Paper making  
Paper making machines  
Paper products  
Pulp and paper industry

## PAPR

USE: Peak to average power ratio

## Paraelectric materials

USE: Dielectric materials

## Parallel algorithms

BT: Algorithms  
Parallel processing

## Parallel architectures

BT: Computer architecture  
RT: Parallel machines  
Parallel processing  
NT: Multicore processing

## Parallel computing

USE: Parallel processing

## Parallel languages

BT: High level languages

RT: Multiprocessing systems  
Parallel processing  
Parallel programming

## Parallel machines

BT: Computers  
RT: Parallel architectures  
Parallel processing

## Parallel processing

UF: Array processing  
Parallel computing  
Parallelism  
BT: Computers and information processing  
RT: Concurrency control  
Parallel architectures  
Parallel languages  
Parallel machines  
Parallel programming  
Multiprocessing systems  
Multithreading  
Parallel algorithms  
Pipeline processing

## Parallel processor interconnection

USE: Multiprocessor interconnection

## Parallel programming

BT: Programming  
RT: Multiprocessing systems  
Parallel languages  
Parallel processing

## Parallel robots

BT: Robots

## Parallelism

USE: Parallel processing

## Paramagnetic materials

BT: Magnetic materials  
RT: Paramagnetic resonance

## Paramagnetic resonance

BT: Magnetic resonance  
RT: Paramagnetic materials

## Parameter estimation

UF: Parameter identification  
BT: Signal analysis  
Statistical analysis  
RT: Control systems



# 2018 IEEE Thesaurus

computing	Power system analysis	Multiattribute optimization
	Spectral analysis	Multiobjective programming
NT:	Amplitude estimation	Pareto optimisation
	Direction-of-arrival	Vector optimization
estimation		multiobjective programming
	Frequency estimation	BT: Optimization methods
	Motion estimation	RT: Pareto analysis
	Phase estimation	Genetic algorithms
	Time of arrival estimation	
<b>Parameter extraction</b>		<b>Parietal lobe</b>
BT:	Electromagnetic	BT: Brain
measurements		<i>Parity check</i>
RT:	Bipolar transistor circuits	USE: Codes
	Very large scale integration	
<i>Parameter identification</i>		<b>Parity check codes</b>
USE:	Parameter estimation	UF: LDPC
		Ldpc codes
<i>Parameter uncertainty</i>		Low density parity check
USE:	Uncertain systems	codes
		Parity-check codes
<i>Parametric model</i>		BT: Codes
USE:	Parametric statistics	RT: Decoding
		NT: Iterative decoding
<b>Parametric statistics</b>		<i>Parity-check codes</i>
UF:	Parametric model	USE: Parity check codes
BT:	Statistics	
<b>Parametric study</b>		<b>Parkinson's disease</b>
BT:	Multitasking	BT: Diseases
RT:	Optimization	
<b>Parasitic capacitance</b>		<i>Parotid</i>
BT:	Capacitance	USE: Salivary glands
<b>Parasitic diseases</b>		
BT:	Diseases	<b>Partial differential equations</b>
<b>Parasympathetic nervous system</b>		BT: Differential equations
BT:	Autonomic nervous system	RT: Boundary value problems
<b>Pareto analysis</b>		Fourier transforms
BT:	Statistical analysis	NT: Boundary element methods
RT:	Cause effect analysis	Poisson equations
	Quality management	
NT:	Pareto optimization	<b>Partial discharge measurement</b>
<i>Pareto optimisation</i>		BT: Electric variables
USE:	Pareto optimization	measurement
		RT: Electrical safety
<b>Pareto optimization</b>		Insulation life
UF:	Multi-objective	Insulation testing
programming		Optical fiber sensors
		<b>Partial discharges</b>
		BT: Dielectric breakdown
		RT: Corona
		<b>Partial response channels</b>
		BT: Communication channels



# 2018 IEEE Thesaurus

## Partial response signaling

BT: Digital modulation

## Partial transmit sequences

BT: OFDM

## Particle accelerator

USE: Linear particle accelerator

## Particle accelerators

BT: Nuclear and plasma sciences  
RT: Colliding beam devices  
Large Hadron Collider  
Particle beams  
Voltage multipliers  
NT: Accelerator magnets  
Colliding beam accelerators  
Cyclotrons  
Electron accelerators  
Ion accelerators  
Linear accelerators  
Photon collider  
Plasma accelerators  
Proton accelerators  
Storage rings  
Synchrocyclotrons  
Synchrotrons

## Particle beam handling

BT: Nuclear and plasma sciences  
RT: Particle beams

## Particle beam injection

UF: Injected beams  
BT: Nuclear and plasma sciences  
RT: Particle beams

## Particle beam measurements

BT: Measurement  
RT: Particle beams

## Particle beam optics

UF: Ion optics  
BT: Optics  
RT: Electrodynamics  
Particle beams  
NT: Atom optics  
Electron optics  
Stimulated emission

## Particle beams

UF: Accelerator beams  
Neutron beams  
Proton beams  
BT: Beams  
Elementary particles  
RT: Colliding beam accelerators  
Laser theory  
Particle accelerators  
Particle beam handling  
Particle beam injection  
Particle beam

measurements  
Particle beam optics  
Storage rings  
Synchrotrons  
NT: Atomic beams  
Electron beams  
Ion beams

## Particle charging

BT: Electrostatic processes  
RT: Semiconductor detectors

## Particle collisions

BT: Elementary particles

## Particle detectors

USE: Radiation detectors

## Particle filters

BT: Filters

## Particle measurements

UF: Particulate measurements  
BT: Measurement  
RT: Current density  
High energy physics  
instrumentation computing  
Position sensitive particle detectors

## Particle physics

USE: High energy physics

## Particle production

BT: Electrostatic processes  
RT: Aerosols  
Spraying

## Particle scattering

BT: Scattering  
RT: Scanning electron microscopy

## Particle separators



# 2018 IEEE Thesaurus

UF: Separators  
BT: Separation processes  
RT: Magnetic separation

## *Particle swarm*

USE: Particle swarm optimization

## **Particle swarm optimization**

UF: Particle swarm  
Particle-swarm optimization  
Swarm intelligence  
Swarm optimization  
BT: Evolutionary computation  
RT: Fireworks algorithm  
Stochastic processes

## **Particle tracking**

BT: Nuclear measurements  
RT: High energy physics  
instrumentation computing  
Tracking

## *Particle-swarm optimization*

USE: Particle swarm optimization

## *Particles (elementary)*

USE: Elementary particles

## *Particulate measurements*

USE: Particle measurements

## **Partitioning algorithms**

BT: Algorithms

## **Passband**

BT: Digital communication  
Radio communication  
RT: Baseband

## **Passivation**

BT: Surface treatment  
RT: Corrosion

## **Passive circuits**

BT: Circuits

## **Passive filters**

BT: Passive networks  
RT: Filters

## **Passive microwave remote sensing**

BT: Remote sensing

## **Passive networks**

BT: Telecommunication  
network topology  
NT: Passive filters

## **Passive optical networks**

UF: PON  
Passive-optical-network  
BT: Optical fiber networks

## **Passive radar**

BT: Radar  
RT: Radar detection  
Radar imaging

## **Passive RFID tags**

BT: RFID tags

## *Passive-optical-network*

USE: Passive optical networks

## **Password**

BT: Access control  
Computer security  
RT: Authentication

## **Patch antennas**

BT: Antennas  
RT: Microstrip antennas

## **Patent law**

BT: Law

## **Patents**

BT: Legal factors  
RT: Intellectual property  
US Government agencies

## **Path planning**

UF: piano mover's problem  
BT: Motion control  
RT: Course correction  
Indoor navigation  
Vehicle routing  
NT: Trajectory  
Trajectory tracking

## **Pathogens**

UF: Germs  
BT: Diseases

## *Pathological*

USE: Pathology

## **Pathological processes**

BT: Pathology





# 2018 IEEE Thesaurus

NT:	Cadaver Death		Nonlinear optics Spatiotemporal phenomena	
<b>Pathology</b>		<b>Pattern matching</b>		
UF:	Pathological	BT:	Pattern recognition	
BT:	Medical specialties	RT:	Pattern clustering Spatiotemporal phenomena	
RT:	Autopsy			
NT:	Neuropathology Pathological processes	NT:	Image matching	
<i>Patient diagnosis</i>		<b>Pattern recognition</b>		
USE:	Medical diagnosis	UF:	Image pattern recognition	
<i>Patient identification</i>		BT:	Computers and information processing	
USE:	Medical treatment	RT:	Automatic optical inspection Computer vision Feature extraction Feedforward neural networks	
<b>Patient monitoring</b>			Hidden Markov models Learning systems Machine vision Pattern classification Principal component analysis	
BT:	Monitoring			
RT:	Chemotherapy Electronic medical records			
<b>Patient rehabilitation</b>				
BT:	Medical treatment			
RT:	Rehabilitation robotics			
<i>Patient treatment</i>			Publish subscribe systems Robot vision systems Shape Spatiotemporal phenomena Statistical learning Symbols	
<b>Pattern analysis</b>			Active shape model Activity recognition Character recognition Clustering methods Data mining Face recognition Fingerprint recognition Gesture recognition Handwriting recognition Nearest neighbor methods Pattern matching Speech recognition Text recognition	
BT:	Machine intelligence	NT:		
RT:	Surface reconstruction			
<b>Pattern classification</b>				
UF:	Signal classification			
BT:	Decision making			
RT:	Feature extraction Nearest neighbor methods Neural networks Pattern recognition Support vector machines			
<b>Pattern clustering</b>		<b>Payloads</b>		
BT:	Clustering methods	BT:	Military aircraft Space technology	
RT:	Image reconstruction Nearest neighbor methods Pattern matching Signal analysis Signal detection Signal processing	NT:	MODIS	
<b>Pattern formation</b>		<i>Pb</i>	USE:	Lead
BT:	Process design	<i>PCA</i>	USE:	Principal component analysis
RT:	Chaos Nonlinear dynamical systems			



# 2018 IEEE Thesaurus

<i>PCG</i>	USE:	Phonocardiography	<i>Peak-to-average ratio</i>	USE:	Peak to average power ratio
<i>PCM</i>	USE:	Phase change materials	<b>Pediatrics</b>	UF:	Babies Baby Child Children Infant Infants Newborns Paediatrics Toddler
<i>PCRAM</i>	USE:	Phase change random access memory	BT:	Medical specialties	
<b>PD control</b>	UF:	PID control	RT:	Neonatology	
control		Proportional + derivative			
control		Proportional derivative			
control		Proportional plus derivative			
control		Proportional-derivative			
control		Proportional-integral-			
derivative	BT:	Control systems	<i>Peer to peer communications</i>	USE:	Peer-to-peer computing
<i>PDA</i>	USE:	Personal digital assistants	<i>Peer to peer computing</i>	USE:	Peer-to-peer computing
<i>PDA's</i>	USE:	Personal digital assistants	<i>Peer to peer exchange</i>	USE:	Peer-to-peer computing
<i>PDF</i>	USE:	Portable document format	<i>Peer to peer network</i>	USE:	Peer-to-peer computing
<b>Peace technology</b>	BT:	Social implications of technology	<i>Peer-to-peer communications</i>	USE:	Peer-to-peer computing
<i>Peak signal to noise ratio</i>	USE:	PSNR	<b>Peer-to-peer computing</b>	UF:	File sharing P2P Peer to peer
<i>Peak signal-to-noise ratio</i>	USE:	PSNR	communications		Peer to peer computing Peer to peer exchange Peer to peer network Peer-to-peer
<b>Peak to average power ratio</b>	UF:	PAPR	communications		Peer-to-peer exchange Peer-to-peer network Computer networks Distributed computing Workstations
ratio		Peak-to-average power	BT:		
		Peak-to-average ratio	RT:		
	BT:	OFDM	<i>Peer-to-peer exchange</i>	USE:	Peer-to-peer computing
<i>Peak-to-average power ratio</i>	USE:	Peak to average power ratio	<i>Peer-to-peer network</i>	USE:	Peer-to-peer computing

*Peltier effect*



# 2018 IEEE Thesaurus

USE:	Thermoelectricity		
<b>Pelvic bones</b>		<i>Performance measurement</i>	
BT:	Bones	USE:	Measurement
<b>Pelvis</b>		<i>Performance metrics</i>	
BT:	Body regions	USE:	Measurement
<i>Pen test</i>		<i>Performance optimisation</i>	
USE:	Penetration testing	USE:	Optimization
<b>Penetration testing</b>		<i>Performance optimization</i>	
UF:	Pen test	USE:	Optimization
BT:	Computer security	<i>Performance related pay</i>	
<b>Pensions</b>		USE:	Incentive schemes
UF:	Occupational pensions Personal pensions Stakeholder pensions State pensions	<b>Perineum</b>	
BT:	Remuneration	BT:	Body regions
RT:	Employee welfare Termination of employment	<i>Periodic media</i>	
<b>Pentacene</b>		USE:	Nonhomogeneous media
BT:	Organic semiconductors	<b>Periodic structures</b>	
<b>Peptides</b>		BT:	Materials science and technology
BT:	Biochemistry	NT:	Gratings Photonic crystals
<b>Perfectly matched layers</b>		<i>Peripheral equipment</i>	
BT:	Propagation	USE:	Computer peripherals
RT:	Finite difference methods Finite element analysis Maxwell equations	<b>Peripheral nervous system</b>	
<b>Performance analysis</b>		BT:	Nervous system
UF:	Dynamic program analysis Performance index	<b>Permanent magnet generators</b>	
BT:	Programming	BT:	Permanent magnet machines
RT:	Optimization	<b>Permanent magnet machines</b>	
NT:	Performance gain	UF:	Permanent magnet synchronous machines
<b>Performance evaluation</b>		BT:	Electric machines Rotating machines
BT:	Measurement	RT:	Permanent magnet motors Permanent magnets
RT:	Benchmark testing	NT:	Permanent magnet generators
<b>Performance gain</b>		<b>Permanent magnet motors</b>	
BT:	Performance analysis	UF:	Permanent magnet synchronous motors
<i>Performance index</i>			Permanent-magnet generators
USE:	Performance analysis		Permanent-magnet motors Motors
<b>Performance loss</b>		BT:	
BT:	Computer performance		



# 2018 IEEE Thesaurus

RT: Permanent magnet machines

*Permanent magnet synchronous machines*

USE: Permanent magnet machines

*Permanent magnet synchronous motors*

USE: Permanent magnet motors

## Permanent magnets

BT: Magnets

RT: Magnetic gears

Permanent magnet machines

Remanence

*Permanent-magnet generators*

USE: Permanent magnet motors

*Permanent-magnet motors*

USE: Permanent magnet motors

## Permeability

UF: Magnetic permeability

BT: Electromagnetic analysis

RT: Magnetic materials

Permeability measurement

## Permeability measurement

BT: Magnetic variables

measurement

RT: Permeability

## Permission

UF: Access rights

File system permissions

BT: Computer security

## Permittivity

BT: Electric variables

RT: Dielectric constant

Dielectric materials

Permittivity measurement

## Permittivity measurement

BT: Dielectric measurement

RT: Permittivity

## Perpendicular magnetic anisotropy

BT: Magnetic anisotropy

## Perpendicular magnetic recording

UF: Vertical recording

BT: Magnetic recording

RT: Disk drives

## Perpendicular recording

USE: Magnetic recording

## Persistent currents

BT: Current

RT: High-temperature superconductors

Superconducting magnets

## Persistent identifiers

BT: Data structures

RT: Digital systems

Information retrieval

## Personal area networks

UF: Piconets

Scatternets

BT: Radio communication

RT: Computer networks

Data communication

Land mobile radio

Personal communication

networks

Wireless LAN

ZigBee

NT: Bluetooth

Body area networks

Body sensor networks

Wireless personal area

networks

## Personal communication networks

BT: Communication systems

RT: Digital systems

IEEE 802.15 Standard

Land mobile radio cellular

systems

Location awareness

Mobile handsets

Personal area networks

ZigBee

## Personal computers

USE: Microcomputers

## Personal digital assistants

UF: PDA

PDA's

Palmtop computers

BT: Handheld computers

## Personal pensions

USE: Pensions



# 2018 IEEE Thesaurus

## Personnel

BT: Human resource management  
 RT: Appraisal  
 Bring your own device  
 Education  
 Employment  
 Equal opportunities  
 Management  
 Productivity  
 Training  
 NT: Labor resources

## Personnel monitoring

USE: Radiation monitoring

## Persuasive systems

BT: Decision making  
 Social computing  
 RT: Behavioral sciences  
 Human factors  
 Man-machine systems  
 Psychology

## Perturbation methods

UF: Perturbation techniques  
 BT: Approximation methods  
 NT: Cavity perturbation methods

## Perturbation techniques

USE: Perturbation methods

## Pervasive computing

UF: Everywhere  
 Ubicomp  
 BT: Computers and information processing  
 Systems, man, and cybernetics  
 RT: Artificial intelligence  
 Context awareness  
 Next generation networking  
 NT: Ubiquitous computing  
 Wearable computers

## Pest control

UF: Insect control  
 Vermin control  
 BT: Environmental management  
 RT: Agriculture  
 Hazards

## PET

USE: Positron emission tomography

## Petascale computing

BT: Computers and information processing  
 RT: Supercomputers

## Petri nets

BT: System analysis and design  
 RT: Discrete-event systems Modeling

## Petrochemicals

BT: Chemical products  
 Materials  
 RT: Chemical industry  
 Chemistry  
 Fuels  
 Petroleum  
 Petroleum industry  
 Plastic products  
 Plastics

## Petrol

USE: Petroleum

## Petroleum

UF: Gasoline  
 Petrol  
 BT: Chemical products  
 Fuels  
 RT: Fuel processing industries  
 Oil pollution  
 Oils  
 Petrochemicals  
 Petroleum industry  
 NT: Hydrocarbons

## Petroleum industry

UF: Oil industry  
 BT: Industries  
 RT: Chemical industry  
 Fractionation  
 Fuel processing industries  
 Gas industry  
 Natural gas industry  
 Offshore installations  
 Oil pollution  
 Oils  
 Petrochemicals  
 Petroleum  
 Pipelines  
 NT: Oil drilling



# 2018 IEEE Thesaurus

	Oil refineries		NT:	Phase change random
	Well logging		access memory	
<i>PFD</i>			<i>Phase change RAM</i>	
	USE:	Phase frequency detector	USE:	Phase change random
			access memory	
<i>PGA</i>			<b>Phase change random access memory</b>	
	USE:	Electronics packaging	UF:	PCRAM
				Phase change RAM
<b>pH measurement</b>				Phase-change RAM
	BT:	Chemical analysis		Phase-change random
		Measurement		
			access memory	
<b>Phantoms</b>			BT:	Phase change memory
	BT:	Biomedical imaging		Random access memory
	RT:	Dosimetry		
		Positron emission		
tomography			<b>Phase control</b>	
		Single photon emission	UF:	Phase-control
computed tomography			BT:	Power electronics
		X-ray applications	RT:	Electric variables control
		X-ray detection		Optical variables control
		X-ray imaging		Phase transformers
			<b>Phase detection</b>	
<b>Pharmaceutical technology</b>			BT:	Signal detection
	BT:	Chemical technology	NT:	Phase frequency detector
	RT:	Biochemistry		
		Chemistry		
		Pharmaceuticals		
<b>Pharmaceuticals</b>			<b>Phase distortion</b>	
	BT:	Chemical products	BT:	Distortion
		Medical treatment	RT:	Delay effects
	RT:	Biochemistry		
		Chemistry		
		Pharmaceutical technology		
	NT:	Drugs	<b>Phase estimation</b>	
			BT:	Parameter estimation
<b>Pharynx</b>			<b>Phase frequency detector</b>	
	BT:	Digestive system	UF:	PFD
	RT:	Stomatognathic system	BT:	Phase detection
			RT:	Frequency measurement
				Measurement
				Voltage
				Voltage control
<b>Phase change materials</b>			<b>Phase locked loops</b>	
	UF:	PCM	UF:	PLL
	BT:	Materials		Phase locked-loops
	RT:	Memory		Phase-locked loops
		Nuclear thermodynamics		Phase-locked-loops
		Optical materials	BT:	Linear feedback control
		Phase change memory		
		Solar heating	systems	
				Signal processing
<b>Phase change memory</b>			RT:	Frequency locked loops
	BT:	Memory		Modulation
	RT:	Phase change materials		Nonlinear filters
		Resistive RAM		
			<i>Phase locked-loops</i>	



# 2018 IEEE Thesaurus

USE: Phase locked loops

## Phase measurement

BT: Measurement  
RT: Acoustic measurements  
Electric variables

measurement

Optical variables

measurement

## Phase modulation

BT: Modulation  
RT: Demodulation  
Electrooptic modulators  
NT: Continuous phase

modulation

Differential phase shift

keying

Phase shift keying

## Phase noise

BT: Noise  
Oscillators  
RT: Time-domain analysis

## Phase shift keying

UF: PSK  
Phase-shift keying  
Phase-shift-keying  
QPSK  
BT: Phase modulation  
NT: Binary phase shift keying  
Quadrature phase shift

keying

## Phase shifters

BT: Circuits  
RT: Butler matrices  
NT: Phase transformers

## Phase shifting interferometry

BT: Interferometry

*Phase transformations, nuclear*

USE: Nuclear phase  
transformations

## Phase transformers

BT: Phase shifters  
Transformers  
RT: Circuits  
Phase control

*Phase transitions, nuclear*

USE: Nuclear phase  
transformations

*Phase-change RAM*

USE: Phase change random  
access memory

*Phase-change random access memory*

USE: Phase change random  
access memory

*Phase-control*

USE: Phase control

*Phase-locked loops*

USE: Phase locked loops

*Phase-locked-loops*

USE: Phase locked loops

*Phase-shift keying*

USE: Phase shift keying

*Phase-shift-keying*

USE: Phase shift keying

## Phased arrays

UF: Antenna phased arrays  
BT: Antenna arrays  
RT: Optical arrays

## Phasor measurement units

UF: PMU  
PMUs  
BT: Electric variables  
measurement

## PHEMTs

UF: Pseudomorphic HEMTs  
BT: HEMTs

## Philosophical considerations

BT: Social implications of  
technology  
RT: Econophysics  
Ethical aspects  
Quantum mechanics  
Social factors  
Technology  
Technology social factors

## Phishing

BT: Computer security  
Information security



# 2018 IEEE Thesaurus

## *PHM*

USE: Prognostics and health management

## *Phonocardiogram*

USE: Phonocardiography

## **Phonocardiography**

UF: PCG  
Phonocardiogram  
BT: Cardiography  
RT: Biomedical monitoring  
Cardiology  
Heart rate measurement

## *Phonographs*

USE: Audio systems

## **Phonons**

BT: Elementary particles  
RT: Acoustics  
Crystals  
Electrons  
Indium phosphide

## **Phosphorescence**

BT: Luminescence  
RT: Phosphors

## **Phosphors**

BT: Light sources  
RT: Phosphorescence

## **Phosphorus**

BT: Chemical elements

## **Photoacoustic effects**

UF: Optoacoustic effects  
BT: Spectroscopy  
RT: Acoustic testing  
Laser applications  
Photothermal effects  
NT: Photoacoustic imaging

## **Photoacoustic imaging**

BT: Biomedical imaging  
Photoacoustic effects

## **Photobleaching**

BT: Photochemistry

## *Photocathodes*

USE: Cathodes

## **Photochemistry**

BT: Chemistry  
NT: Photobleaching

## **Photochromism**

UF: Photodarkening  
BT: Photonics  
RT: Color

## *Photocomposition*

USE: Text processing

## **Photoconducting devices**

BT: Optoelectronic devices  
RT: Photoconducting materials  
Photoconductivity  
Photodetectors  
Semiconductor devices  
NT: Electrophotography

## **Photoconducting materials**

UF: Photoconductors  
BT: Materials  
RT: Photoconducting devices  
Photoconductivity  
Photodetectors  
Semiconductor materials

## **Photoconductivity**

UF: Photocurrent  
BT: Conductivity  
RT: Photoconducting devices  
Photoconducting materials

## *Photoconductors*

USE: Photoconducting materials

## *Photocurrent*

USE: Photoconductivity

## *Photodarkening*

USE: Photochromism

## *Photodetector*

USE: Photodetectors

## **Photodetectors**

UF: Photodetector  
BT: Optoelectronic devices  
Radiation detectors  
RT: Image sensors  
Infrared detectors  
Optical signal detection  
Photoconducting devices  
Photoconducting materials  
Photoelectricity





# 2018 IEEE Thesaurus

NT:	Photodiodes Phototransistors Superconducting	<i>Photoionisation</i> USE: Ionization
photodetectors		<i>Photoionization</i> USE: Ionization
<b>Photodiodes</b>		<i>Photolithography</i> USE: Lithography
BT:	Photodetectors	
RT:	Optical transmitters P-n junctions	
NT:	Avalanche photodiodes PIN photodiodes	<b>Photoluminescence</b> UF: Electrophotoluminescence BT: Luminescence Optics RT: Judd-Ofelt theory Microcavities
<b>Photoelasticity</b>		
BT:	Mechanical factors	
RT:	Optical polarization Piezoelectric effects Stress	<i>Photomagnetic devices</i> USE: Magneto optic devices
<b>Photoelectricity</b>		<i>Photomagnetic effects</i> USE: Magneto optic effects
UF:	Photoemission Phototubes	
BT:	Electricity Electron devices	<b>Photometry</b> BT: Geoscience and remote sensing Optical variables measurement RT: Light sources Lighting Radiometry
RT:	Electron emission Photodetectors Photomultipliers Photovoltaic cells	
NT:	Photovoltaic effects	
<b>Photoelectron microscopy</b>		<b>Photomicrography</b> BT: Photography
UF:	Photoemission electron microscopy	
BT:	Electron microscopy	<b>Photomultipliers</b> BT: Vacuum technology RT: Avalanche photodiodes Electron multipliers Photoelectricity
<i>Photoemission</i> USE: Photoelectricity		
<i>Photoemission electron microscopy</i> USE: Photoelectron microscopy		
<i>Photogalvanic effects</i> USE: Photovoltaic effects		<b>Photon collider</b> BT: Particle accelerators
<b>Photography</b>		<i>Photon crystal fibers</i> USE: Photonic crystal fibers
BT:	Imaging	
RT:	Cameras Electrophotography Image capture Image storage Optical filters	<i>Photon crystal fibres</i> USE: Photonic crystal fibers
NT:	Cinematography Digital photography Image forensics Photomicrography	<b>Photonic band gap</b> UF: Band gap Band-gap Bandgap Photonic bandgap BT: Photonic crystals



# 2018 IEEE Thesaurus

RT: Electromagnetic wave  
polarization

Optical diffraction

*Photonic bandgap*

USE: Photonic band gap

## Photonic bandgap fibers

UF: Photonic bandgap fibres

BT: Photonic crystal fibers

*Photonic bandgap fibres*

USE: Photonic bandgap fibers

## Photonic crystal fibers

UF: Microstructured fibers

Microstructured fibres

Photon crystal fibers

Photon crystal fibres

Photonic crystal fibres

Photonic-crystal fibers

Photonic-crystal fibres

BT: Photonic crystals

NT: Holey fibers

Photonic bandgap fibers

*Photonic crystal fibres*

USE: Photonic crystal fibers

## Photonic crystals

UF: 2-D photonic crystals

2D photonic crystals

Photonic crystal fibers

Two dimensional photonic

crystals

Two-dimensional photonic

crystals

BT: Periodic structures

RT: Microwave devices

Nonlinear optics

Optical materials

Optical waveguides

Spontaneous emission

NT: Photonic band gap

Photonic crystal fibers

*Photonic crystal fibers*

USE: Photonic crystals

## Photonic integrated circuits

BT: Integrated circuits

*Photonic metamaterials*

USE: Optical metamaterials

*Photonic-crystal fibers*

USE: Photonic crystal fibers

*Photonic-crystal fibres*

USE: Photonic crystal fibers

## Photonics

BT: Lasers and electrooptics

RT: Electromagnetic

metamaterials

Epitaxial growth

Silicon devices

Synapses

NT: Biophotonics

Microwave photonics

Nanophotonics

Photochromism

Photothermal effects

Silicon photonics

Spontaneous emission

## Photoplethysmography

BT: Biomedical measurement

## Photoreceptors

BT: Neurons

## Photorefractive effect

BT: Nonlinear optics

RT: Birefringence

Optical refraction

Photorefractive materials

Refractive index

## Photorefractive materials

BT: Optical materials

RT: Birefringence

Holography

Optical mixing

Optical refraction

Photorefractive effect

*Photoresists*

USE: Resists

## Photothermal effects

UF: Optothermal effects

Thermal wave imaging

BT: Photonics

RT: Photoacoustic effects

## Photothyristors

UF: Optothyristors

BT: Thyristors

RT: Optical switches



# 2018 IEEE Thesaurus

## Phototransistors

BT: Photodetectors  
Transistors  
RT: Optoelectronic devices  
Radiation detectors

## Phototubes

USE: Photoelectricity

## Photovoltaic cells

UF: Solar cells  
BT: Electron devices  
Energy conversion  
RT: Photoelectricity  
Photovoltaic effects  
Photovoltaic systems  
NT: Light trapping

## Photovoltaic effects

UF: Photogalvanic effects  
BT: Photoelectricity  
RT: Photovoltaic cells  
Photovoltaic systems  
NT: Shunts (electrical)

## Photovoltaic power systems

USE: Photovoltaic systems

## Photovoltaic systems

UF: Photovoltaic power systems  
BT: Solar power generation  
RT: Hybrid power systems  
Photovoltaic cells  
Photovoltaic effects  
NT: Building integrated  
photovoltaics  
Fill factor (solar cell)  
Solar panels

## Phylogenetic tree

USE: Phylogeny

## Phylogenetics

USE: Phylogeny

## Phylogeny

UF: Cladistics  
Phylogenetic tree  
Phylogenetics  
BT: Evolution (biology)

## Physical design

BT: System analysis and design

theory

Systems engineering and  
RT: Integrated circuit layout

## Physical distribution management

USE: Logistics

## Physical layer

BT: Open systems  
NT: Physical layer security

## Physical layer security

BT: Physical layer

## Physical optics

BT: Optics  
NT: Optical refraction  
Optical vortices

## Physical theory of diffraction

BT: Electromagnetic diffraction

## Physician

USE: Medical services

## Physics

BT: Science - general  
RT: Buoyancy  
NT: Acoustics  
Astrophysics  
Beams  
Biophysics  
Dark energy  
Entropy  
Fluid flow  
Geophysics  
High energy physics  
Kinetic theory  
Levitation  
Lorentz covariance  
Mechanical factors  
Network theory (graphs)  
Physics education  
Quantum mechanics  
Solid-state physics  
String theory  
Thermal factors  
Waves

## Physics computing

BT: Computer applications

## Physics education

BT: Engineering education  
Physics



# 2018 IEEE Thesaurus

## Physiology

BT: Biology  
NT: Action potentials  
External stimuli  
Neuromodulation

## PhysiStimuli

USE: External stimuli

## PI control

UF: Proportional + integral  
control  
Proportional-integral control  
Proportional-integral  
controller  
Proportional-integral-  
derivative control  
Proportional-integral-  
derivative controller  
BT: Control systems

## piano mover's problem

USE: Path planning

## Pickling

BT: Surface treatment  
RT: Chemistry

## Pico-hydro

USE: Picohydro power

## Picohydro power

UF: Pico-hydro  
BT: Hydroelectric power  
generation  
RT: Appropriate technology

## Piconets

USE: Personal area networks

## Picture archiving and communication systems

UF: Pacs  
BT: Image communication  
RT: Biomedical communication  
Biomedical computing  
Biomedical imaging

## Picture phones

USE: Videophone systems

## Picture processing

USE: Image processing

## Picturephones

USE: Videophone systems

## PID control

USE: PD control

## Piecewise linear approximation

BT: Piecewise linear techniques

## Piecewise linear techniques

BT: Mathematics  
RT: Control system analysis  
Control system synthesis  
Difference equations  
Nonlinear control systems  
Piecewise linear  
NT: Piecewise linear  
approximation

## Piezoceramics

USE: Piezoelectric materials

## Piezoelectric actuators

BT: Actuators

## Piezoelectric devices

BT: Dielectric devices  
RT: Acoustic devices  
Acoustoelectric devices  
Nanogenerators  
Piezoelectric films  
Piezoelectric materials  
Piezoelectricity  
Piezoresistive devices  
Surface acoustic wave  
devices

## Piezoelectric effect

BT: Piezoelectricity

## Piezoelectric effects

USE: Piezoelectricity

## Piezoelectric films

BT: Dielectric films  
Films  
Piezoelectric materials  
RT: Piezoelectric devices  
Piezoelectricity

## Piezoelectric materials

UF: Piezoceramics  
BT: Dielectric materials  
RT: Acoustic materials  
Crystals  
Piezoelectric devices



# 2018 IEEE Thesaurus

	Piezoelectricity		
NT:	Piezoelectric films	<b>Pigmentation</b>	
		BT:	Color
<b>Piezoelectric polarization</b>			Materials science and
BT:	Piezoelectricity	technology	
		NT:	Pigments
<b>Piezoelectric transducers</b>		<b>Pigments</b>	
BT:	Transducers	BT:	Pigmentation
<b>Piezoelectricity</b>		<i>PIN diodes</i>	
UF:	Piezoelectric effects	USE:	PIN photodiodes
BT:	Electricity		
	Ultrasonics, ferroelectrics,	<i>Pin grid arrays</i>	
and frequency control		USE:	Electronics packaging
RT:	Electrostriction		
	Piezoelectric devices	<b>PIN photodiodes</b>	
	Piezoelectric films	UF:	P-I-N
	Piezoelectric materials		PIN diodes
	Piezoresistance	BT:	Photodiodes
	Pyroelectricity		
	Stress	<i>Pink noise</i>	
	Ultrasonic transducers	USE:	1/f noise
NT:	Piezoelectric effect		
	Piezoelectric polarization	<b>Pins</b>	
<i>Piezomagnetic effects</i>		BT:	Plugs
USE:	Magnetomechanical effects	<i>Pions</i>	
		USE:	Mesons
<b>Piezooptic effects</b>		<b>Pipeline processing</b>	
BT:	Acoustooptic effects	UF:	Computer pipeline
RT:	Photoelasticity	processing	
	Pressure effects		Pipelining
	Stress	BT:	Parallel processing
<b>Piezoresistance</b>		RT:	Multiprocessing systems
UF:	Piezoresistive		Systolic arrays
BT:	Electric variables		
	Resistance	<b>Pipelines</b>	
RT:	Piezoelectricity	BT:	Fluid flow
	Piezoresistive devices	RT:	Chemical industry
	Pressure effects		Magnetic flux leakage
	Stress		Materials handling
<i>Piezoresistive</i>			Natural gas industry
USE:	Piezoresistance		Oils
			Petroleum industry
<b>Piezoresistive devices</b>		<i>Pipelining</i>	
UF:	Piezoresistors	USE:	Pipeline processing
BT:	Semiconductor devices		
RT:	Piezoelectric devices	<i>Piracy (software)</i>	
	Piezoresistance	USE:	Computer crime
	Pressure measurement		
<i>Piezoresistors</i>		<b>Pistons</b>	
USE:	Piezoresistive devices	BT:	Machine components



# 2018 IEEE Thesaurus

	RT:	Mechanical products		
		Bellows	<b>Planar waveguides</b>	
		Engine cylinders	BT:	Electromagnetic
		Engines	waveguides	
		Gaskets	RT:	Rectangular waveguides
		Shafts		
		Structural rings	<i>Planarisation</i>	
			USE:	Planarization
<b>Pitch control (audio)</b>			<b>Planarization</b>	
BT:		Audio systems	UF:	Chemical mechanical
		Variable speed drives	planarisation	
<b>Pitch control (position)</b>				Chemical mechanical
BT:		Mechanical variables	planarization	
control				Planarisation
<b>Pituitary gland</b>			BT:	Surface treatment
BT:		Glands	RT:	Dielectric films
		Nervous system		Integrated circuits
<b>Pixel</b>			<i>Planetary chemistry</i>	
BT:		Digital images	USE:	Astrochemistry
<i>PLA</i>			<i>Planetary composition</i>	
USE:		Programmable logic arrays	USE:	Extraterrestrial
			measurements AND	
				Planets
<b>Plagiarism</b>			<i>Planetary landers</i>	
BT:		Professional	USE:	Land transportation AND
communication				Space vehicles
RT:		Copyright protection	<i>Planetary oceans</i>	
		Notice of Violation	USE:	Oceans AND
		Publishing		Planets
<i>Planar antennas</i>			<b>Planetary orbits</b>	
USE:		Planar arrays	BT:	Orbits
<i>Planar array</i>			<i>Planetary volcanic activity</i>	
USE:		Planar arrays	USE:	Planetary volcanoes
<b>Planar arrays</b>			<i>Planetary volcano</i>	
UF:		Planar antennas	USE:	Planetary volcanoes
		Planar array		
BT:		Antenna arrays	<b>Planetary volcanoes</b>	
<b>Planar motors</b>			UF:	Planetary volcanic activity
BT:		Electric motors		Planetary volcano
<b>Planar transmission lines</b>			BT:	Volcanoes
BT:		Transmission lines	<b>Planets</b>	
RT:		Spurline	UF:	Planetary composition
NT:		Coplanar transmission lines		Planetary oceans
		Finline	BT:	Solar system
		Microstrip	RT:	Extraterrestrial phenomena
		Slot lines	NT:	Earth
		Stripline		



# 2018 IEEE Thesaurus

Jupiter  
Mars  
Mercury (planets)  
Pluto  
Saturn  
Venus

BT: Plasma properties

## Planing

BT:	Machining
RT:	Finishing
	Surface roughness
	Surface treatment

## Planning

UF:	System planning
BT:	Engineering management
RT:	Decision making
	Economics
NT:	Meeting planning
	Schedules
	Strategic planning
	Technical planning
	Technology planning

## Plants (biology)

BT: Organisms  
RT: Life sciences

### Plants (industrial)

USE: Industrial plants

## Plasma accelerators

BT: Particle accelerators  
Plasma devices

## Plasma applications

BT: Plasmas  
RT: Plasma displays  
Plasma materials

processing

NT: Plasma devices  
Plasma immersion ion

implantation

## Plasma welding Tokamaks

## Plasma chemistry

BT: Plasma properties

## Plasma confinement

BT:	Plasmas
NT:	Inertial confinement
	Magnetic confinement

## Plasma density

## Plasma devices

BT:	Plasma applications
RT:	Gas discharge devices
	Plasmas
NT:	Plasma accelerators
	Plasma jets
	Tokamaks

## Plasma diagnostics

BT: Plasmas  
RT: Plasma measurements

### Plasma display panels

USE: Plasma displays

## Plasma displays

UF:	Plasma display panels
BT:	Image generation
RT:	Plasma applications
	TV

## Plasma immersion ion implantation

BT:	Ion implantation
	Plasma applications
RT:	Semiconductor impurities

## Plasma jets

BT: Plasma devices  
RT: Propulsion

## Plasma materials processing

BT: Materials processing  
RT: Plasma applications  
NT: Chemical vapor deposition  
Ignition

## Plasma measurements

BT:	Measurement
RT:	Plasma diagnostics
	Plasmas

## Plasma properties

BT:	Plasmas
RT:	Electron mobility
	Stability analysis
NT:	Dusty plasmas
	Plasma chemistry
	Plasma density
	Plasma sheaths
	Plasma stability
	Plasma temperature
	Plasmons



# 2018 IEEE Thesaurus

## Plasma sheaths

BT: Plasma properties

## Plasma simulation

BT: Plasmas  
RT: Modeling  
Numerical simulation  
Tokamaks

## Plasma sources

BT: Plasmas  
RT: Ion implantation  
Ion sources

## Plasma stability

BT: Plasma properties

## Plasma temperature

BT: Plasma properties

## Plasma transport processes

BT: Plasmas

## Plasma waves

BT: Waves  
RT: Plasmas

## Plasma welding

BT: Plasma applications  
RT: Joining processes  
Materials processing  
Plasmas

## Plasma x-ray sources

BT: X-ray imaging  
RT: X-ray lasers

## Plasma-assisted combustion

BT: Combustion  
Plasmas

## Plasmas

BT: Nuclear and plasma  
sciences  
RT: Arc discharges  
Discharges (electric)  
Ionization  
Ionosphere  
Plasma devices  
Plasma measurements  
Plasma waves  
Plasma welding  
Relativistic effects  
NT: Atmospheric-pressure  
plasmas

Plasma applications  
Plasma confinement  
Plasma diagnostics  
Plasma properties  
Plasma simulation  
Plasma sources  
Plasma transport processes  
Plasma-assisted

combustion

## Plasmon

USE: Plasmons

## Plasmonic solar cells

USE: Light trapping

## Plasmonics

USE: Plasmons

## Plasmons

UF: Plasmon  
Plasmonics  
BT: Plasma properties

## Plastic bottles

USE: Plastic products

## Plastic containers

USE: Plastic products

## Plastic films

BT: Films  
Plastics  
RT: Plastic insulation  
Plastic insulators

## Plastic IC packaging

USE: Plastic integrated circuit  
packaging

## Plastic insulation

BT: Insulation  
RT: Dielectric materials  
Plastic films  
Plastic insulators

## Plastic insulators

BT: Insulators  
RT: Fiber reinforced plastics  
Plastic films  
Plastic insulation  
Plastic packaging

## Plastic integrated circuit packaging

UF: Plastic IC packaging





# 2018 IEEE Thesaurus

BT:	Integrated circuit packaging	RT:	Virtual machine monitors
<b>Plastic optical fiber</b>		<b>Plating</b>	
BT:	Optical fibers	BT:	Materials processing
	Plastics	NT:	Chrome plating
<b>Plastic packaging</b>		<b>Platinum</b>	
BT:	Packaging	BT:	Metals
RT:	Bagging	NT:	Platinum alloys
	Electronics packaging	<b>Platinum alloys</b>	
	Encapsulation	BT:	Platinum
	Integrated circuit packaging	RT:	Alloying
	Plastic insulators	<b>Plethysmography</b>	
	Plastics	BT:	Measurement
<b>Plastic products</b>			Medical diagnosis
UF:	Plastic bottles	<b>PLL</b>	
	Plastic containers	USE:	Phase locked loops
BT:	Manufactured products	<b>Plug-in hybrid electric vehicles</b>	
RT:	Bottling	BT:	Hybrid electric vehicles
	Chemical industry	RT:	Charging stations
	Chemical products	<b>Plugboard</b>	
	Chemistry	USE:	Breadboard circuit
	Consumer products	<b>Plugs</b>	
	Petrochemicals	BT:	Connectors
	Plastics	NT:	Keyways
	Plastics industry		Pins
<b>Plastics</b>		<b>Plumbago</b>	
BT:	Chemical products	USE:	Graphite
	Materials	<b>Pluto</b>	
RT:	Petrochemicals	BT:	Planets
	Plastic packaging	<b>Plutonium</b>	
	Plastic products	BT:	Chemical elements
	Plastics industry	<b>pMOSFETs</b>	
	Polymers	USE:	MOSFET
	Resins	<b>PMU</b>	
NT:	Epoxy resins	USE:	Phasor measurement units
	Fiber reinforced plastics	<b>PMUs</b>	
	Plastic films	USE:	Phasor measurement units
	Plastic optical fiber	<b>PNA</b> s	
<b>Plastics industry</b>		USE:	Presence network agents
BT:	Manufacturing industries	<b>Pneumatic actuators</b>	
RT:	Chemical industry		
	Plastic products		
	Plastics		
<b>Platform as a service</b>			
UF:	PAAS		
BT:	Cloud computing		
<b>Platform virtualization</b>			
BT:	Computers and information processing		



# 2018 IEEE Thesaurus

BT: Actuators

## Pneumatic systems

BT: Control systems  
RT: Bellows  
Fluidics  
Mechanical systems

## Pnictide superconductors

USE: Superconducting materials

## Pockels readout optical modulator

USE: Electrooptic modulators

## Podcast

USE: Digital audio broadcasting

## Poincare group

USE: Poincare invariance

## Poincare invariance

UF: Poincare group  
BT: Transforms

## Poisons

USE: Toxicology

## Poisson equation

USE: Poisson equations

## Poisson equations

UF: Poisson equation  
BT: Partial differential equations  
RT: Electrostatics

## Polar cyclones

USE: Cyclones

## Polarimetric synthetic aperture radar

BT: Synthetic aperture radar

## Polarimetry

UF: Solar polarimetry  
BT: Electromagnetic  
measurements  
RT: Ellipsometry  
Optical retarders

## Polarisation

USE: Polarization

## Polarization

UF: Circular polarisation  
Circular polarization  
Polarisation

BT: Electromagnetic scattering

## Polarization mode dispersion

UF: Polarization-mode  
dispersion  
BT: Optical fiber polarization

## Polarization shift keying

BT: Optical polarization

## Polarization-maintaining optical fibers

USE: Optical fiber polarization

## Polarization-mode dispersion

USE: Polarization mode  
dispersion

## Poles & zeros

USE: Poles and zeros

## Poles and towers

UF: Pylons  
Towers  
Wood poles  
BT: Transmission lines  
RT: Power distribution lines  
Power transmission lines  
NT: Telephone poles

## Poles and zeros

UF: Poles & zeros  
Roots  
Zeros  
BT: Transfer functions  
RT: Circuits  
Control systems  
Newton method  
Polynomials

## Police

USE: Law enforcement

## Polishing machines

BT: Production equipment  
RT: Deburring  
Rough surfaces  
Surface finishing  
Surface roughness

## Pollution

BT: Environmental factors  
RT: Contamination  
Design for disassembly  
Environmental economics  
Green products



# 2018 IEEE Thesaurus

	Occupational health	RT:	Dielectric thin films
	Pollution control		
	Pollution measurement	<b>Polymer foams</b>	
	Sewage treatment	BT:	Materials
	Toxicology	RT:	Insulation
	Waste disposal		Insulators
NT:	Air pollution		Metal foam
	Industrial pollution		Resins
	Land pollution		
	Oil pollution	<b>Polymer gels</b>	
	Radioactive pollution	BT:	Materials
	Thermal pollution		
	Urban pollution	<i>Polymer led</i>	
	Water pollution	USE:	Organic light emitting diodes
<b>Pollution control</b>			
BT:	Environmental management	<b>Polymers</b>	
RT:	Carbon emissions	UF:	Electroactive polymers
	Decontamination	BT:	Materials
	Electrostatic precipitators	RT:	Colloidal lithography
	Environmental monitoring		Plastics
	Greenhouse effect	NT:	Azobenzene
	Ozonation		Liquid crystal polymers
	Pollution		Optical polymers
	Pollution measurement		Polycaprolactone
	Sewage treatment		Polyethylene
	Sludge treatment		Polyimides
<b>Pollution measurement</b>		<b>Polynomials</b>	
BT:	Measurement	BT:	Equations
RT:	Environmental monitoring	RT:	Poles and zeros
	Pollution		
	Pollution control	<i>PON</i>	
		USE:	Passive optical networks
<b>Polonium</b>		<b>Porcelain</b>	
BT:	Chemical elements	BT:	Ceramics
		RT:	Ceramic products
<b>Polycaprolactone</b>			Ceramics industry
BT:	Polymers	<b>Porous silicon</b>	
RT:	Smart materials	BT:	Silicon
<b>Polyethylene</b>		<b>Portable computers</b>	
BT:	Polymers	UF:	Laptops
NT:	Thermoplastic polyethylene		Portable PCs
<b>Polyimides</b>		BT:	Microcomputers
BT:	Polymers	NT:	Handheld computers
<i>Polymer coatings</i>		<b>Portable document format</b>	
USE:	Polymer films	UF:	PDF
		BT:	Document handling
<b>Polymer films</b>		RT:	Document image processing
UF:	Polymer coatings		
BT:	Films		



# 2018 IEEE Thesaurus

## Portable media players

UF: MP3  
Portable Multimedia players  
Portable video players  
iPOD  
BT: Audio systems  
Digital communication  
Home automation  
RT: Digital audio broadcasting  
Tablet computers

## Portable Multimedia players

USE: Portable media players

## Portable PCs

USE: Portable computers

## Portable video players

USE: Portable media players

## Portals

BT: Management information  
systems  
RT: Information retrieval  
Web sites

## Portfolios

UF: Electronic portfolios  
BT: Professional  
communication

## Ports (Computers)

BT: Computer interfaces  
RT: Computer networks  
Hardware  
Information exchange

## Pose estimation

BT: Estimation  
RT: Computer vision

## Position control

UF: Orientation control  
BT: Mechanical variables  
control  
RT: Attitude control  
Capacitive transducers  
Manipulators  
Mechanical guides  
Servosystems  
NT: Nanopositioning

## Position measurement

UF: Attitude determination  
Orientation determination

Orientation measurement  
Source location  
BT: Mechanical variables  
measurement  
RT: Direction-of-arrival  
Distance measurement  
Gaze tracking  
Geodesy  
Location awareness  
Navigation  
Tracking

## Position sensitive particle detectors

BT: Ionizing radiation sensors  
RT: High energy physics  
instrumentation computing  
Nuclear measurements  
Particle measurements  
Semiconductor counters

## Positive train control

BT: Control systems  
Rail transportation  
RT: Feedback

## Positron emission tomography

UF: PET  
BT: Tomography  
RT: Biomedical applications of  
radiation  
Medical diagnostic imaging  
Nuclear medicine  
Phantoms  
Tumors  
NT: Whole-body PET

## Positrons

BT: Elementary particles

## Possibility theory

BT: Probability  
RT: Fuzzy logic  
Nonlinear dynamical  
systems

## Post human

USE: Posthuman

## Post-filtering algorithm

USE: Filtering algorithms

## Post-human

USE: Posthuman



# 2018 IEEE Thesaurus

## *Post-wall waveguides*

USE: Substrate integrated waveguides

## **Postal services**

UF: Mail  
BT: Message systems  
RT: Electronic mail

## **Posthuman**

UF: Post human  
Post-human  
BT: Systems, man, and cybernetics  
RT: Artificial intelligence  
Transhuman

## *Postscript*

USE: Page description languages

## **Potassium**

BT: Chemical elements

## **Potential energy**

BT: Energy conservation  
RT: Kinetic energy  
Mechanical energy

## *Potential transformers*

USE: Voltage transformers

## **Potential well**

UF: Potential wells  
Quantum confinement  
BT: Energy conversion

## *Potential wells*

USE: Potential well

## **Potentiometers**

BT: Meters  
RT: Resistors  
Voltage measurement

## **Powders**

BT: Coatings  
RT: Ceramics

## **Power amplifiers**

UF: Radio frequency power amplifiers  
Radiofrequency power amplifiers  
BT: Amplifiers  
NT: High power amplifiers

## Predistortion

## **Power and energy standards**

BT: Standards categories

## **Power cable insulation**

BT: Cable insulation  
RT: Power cables

## **Power cables**

BT: Cables  
Power transmission lines  
RT: Conductors  
Power cable insulation  
Power distribution lines  
NT: Underground power cables

## **Power capacitors**

BT: Capacitors  
NT: Supercapacitors

## **Power combiners**

BT: Waveguide components  
RT: Microstrip components  
Power dividers  
Stripline components

## **Power conditioning**

BT: Power electronics  
RT: Power conversion  
Pulse width modulation

## converters

NT: Power smoothing

## *Power consumption*

USE: Power demand

## **Power control**

BT: Electric variables control  
RT: Electric current control  
Power factor correction  
Pulse width modulation

## converters

## **Power conversion**

BT: Converters  
RT: Choppers (circuits)  
Maximum power point

## trackers

Nonlinear circuits  
Power conditioning  
Power electronics  
Power semiconductor

## devices

Power supplies



# 2018 IEEE Thesaurus

converters	Pulse width modulation	RT:	Conductors Poles and towers Power cables
	Regulators		
	Switched systems		
NT:	AC-AC converters	<i>Power distribution transformers</i>	
	AC-DC power converters	USE:	Power transformers
	DC-AC power converters		
	DC-DC power converters	<b>Power dividers</b>	
	Matrix converters	BT:	Waveguide components
	Power conversion	RT:	Microstrip components Power combiners Stripline components
harmonics	Voltage-source converters		
<b>Power conversion harmonics</b>		<b>Power electronics</b>	
BT:	Power conversion	UF:	Electric power
RT:	Harmonic distortion	RT:	High-voltage techniques Matrix converters Power conversion Power filters Pulse width modulation
<b>Power demand</b>		converters	
UF:	Power consumption		Rectifiers Resonant inverters Switching converters Voltage-source converters
BT:	Power supplies		
	Power system planning		
RT:	Electricity supply industry	NT:	Adiabatic Converters Current limiters Gate drivers Inverters Phase control Power conditioning Power semiconductor
	Energy conservation		
	Energy resources		
	Load management		
	Load modeling		
	Power distribution		
NT:	Demand response		
	Load forecasting		
<b>Power dissipation</b>		devices	
BT:	Circuits	switches	
RT:	CMOS logic circuits MOSFET circuits Nanotechnology Power transmission System-on-chip		Power semiconductor Snubbers Three-phase electric power
<b>Power distribution</b>		<b>Power engineering</b>	
UF:	Distribution of electric	BT:	Power engineering and
power		energy	
BT:	Power systems	RT:	Power engineering
RT:	Electricity supply industry Industrial power systems Power demand Transactive energy	education	
NT:	Power distribution faults Power distribution lines	NT:	Ferroresonance High-voltage techniques Power engineering
<b>Power distribution faults</b>		computing	Power system simulation
BT:	Power distribution	<b>Power engineering and energy</b>	
<b>Power distribution lines</b>		RT:	Electrochemical devices
UF:	Overhead distribution lines	NT:	Electric variables control Energy Power engineering
BT:	Power distribution		



# 2018 IEEE Thesaurus

	Power generation		Power supplies
	Power systems		Pulse power systems
			Space power stations
<b>Power engineering computing</b>		NT:	Automatic generation
BT:	Computer applications	control	
	Power engineering		Cogeneration
RT:	Power system analysis		Distributed power
computing		generation	Geothermal power
		generation	Hydroelectric power
<b>Power engineering education</b>		generation	Magnetohydrodynamic
BT:	Engineering education	power generation	Nuclear power generation
RT:	Power engineering		Power generation control
<i>Power exchange</i>			Power generation dispatch
USE:	Power markets		Power generation planning
<i>Power factor</i>			Solar power generation
USE:	Reactive power		Trigeneration
<b>Power factor correction</b>			Turbomachinery
BT:	Electric current control		Wind energy generation
	Load flow control		Wind power generation
RT:	Power control		
	Power transmission		
	Voltage control		
<b>Power filters</b>		<b>Power generation control</b>	
UF:	Power line filters	BT:	Automatic control
BT:	Filters		Power generation
RT:	Power electronics		
NT:	Spurline	<b>Power generation dispatch</b>	
<i>Power flow</i>		BT:	Power generation
USE:	Load flow		
<i>Power flow analysis</i>		<b>Power generation economics</b>	
USE:	Load flow analysis	BT:	Economics
<i>Power flow control</i>		RT:	Power generation
USE:	Load flow control	NT:	Electricity supply industry
<b>Power generation</b>		deregulation	
UF:	Generation of electric	<b>Power generation planning</b>	
power		BT:	Power generation
	Output power		
	Power plants	<b>Power grids</b>	
	Power stations	UF:	Electricity grids
BT:	Power engineering and	BT:	Power systems
energy		RT:	Wind energy integration
	Batteries	NT:	Microgrids
	Fuel cells		Smart grids
	Generators	<b>Power harmonic filters</b>	
	Microgrids	BT:	Power system harmonics
	Power generation		
economics		<i>Power harvesting</i>	
		USE:	Energy harvesting
		<b>Power industry</b>	
		UF:	Electric utilities



# 2018 IEEE Thesaurus

BT: Industries  
RT: Offshore installations  
Power system faults  
Telecontrol equipment  
NT: Electrical equipment

industry  
Electricity supply industry  
Nuclear facility regulation  
Power system

interconnection

*Power injection molding*  
USE: Injection molding

*Power injection moulding*  
USE: Injection molding

**Power integrated circuits**  
BT: Circuits  
Integrated circuits  
RT: Power semiconductor  
devices

**Power lasers**  
BT: Lasers  
RT: Power semiconductor  
devices

**Power line communications**  
BT: Transmission lines

*Power line filters*  
USE: Power filters

*Power management*  
USE: Power system management

**Power markets**  
UF: Electricity markets  
Electricity trading  
Power exchange  
Power pools  
Power trading  
Power wheeling  
BT: Electricity supply industry  
deregulation  
RT: Power transmission  
Transactive energy

**Power measurement**  
BT: Electric variables  
measurement  
RT: Wattmeters  
NT: Dynamometers

**Power MOSFET**  
BT: MOSFET circuits  
RT: Power semiconductor  
devices

*Power outages*  
USE: Power system reliability

**Power overhead lines**  
BT: Power transmission lines  
RT: Railway electrification

*Power plants*  
USE: Power generation

*Power pools*  
USE: Power markets

**Power quality**  
UF: Power supply quality  
Voltage sags  
BT: Power supplies  
RT: Electricity supply industry  
Power system harmonics  
Power system transients

**Power semiconductor devices**  
BT: Power electronics  
Semiconductor devices  
RT: Power MOSFET  
Power conversion  
Power integrated circuits  
Power lasers  
NT: Power transistors

**Power semiconductor switches**  
BT: Power electronics  
Semiconductor devices  
NT: Bipolar transistors  
Thyristors

**Power smoothing**  
BT: Power conditioning

*Power spectra*  
USE: Spectral analysis

*Power stations*  
USE: Power generation

*Power stations (space)*  
USE: Space power stations

*Power stations (substations)*  
USE: Substations





# 2018 IEEE Thesaurus

## Power steering

BT: Automotive engineering

## Power supplies

BT: Power systems  
RT: Power conversion  
Power generation  
Pulse power systems  
Uninterruptible power

systems

NT: Battery chargers  
Charging stations  
Current supplies  
Emergency power supplies  
Inductive charging  
Islanding  
Power demand  
Power quality  
Power system restoration  
Switched mode power

supplies

Traction power supplies  
Umbilical cable

## Power supplies to apparatus

USE: Umbilical cable

## Power supply industry

USE: Electricity supply industry

## Power supply quality

USE: Power quality

## Power system analysis computing

BT: Computer applications  
Power systems  
RT: Digital simulation  
Modeling  
Parameter estimation  
Power engineering

computing

Software packages

## Power system control

BT: Electric variables control  
RT: Power systems  
NT: Bidirectional power flow  
Load flow control  
SCADA systems

## Power system dynamics

BT: Power systems

## Power system economics

BT: Power systems  
RT: Electricity supply industry  
deregulation  
Transactive energy

## Power system faults

BT: Power systems  
RT: Electricity supply industry  
Error correction  
Fuzzy set theory  
Power industry  
Power system protection  
Signal analysis

## Power system harmonics

BT: Power systems  
RT: Power quality  
NT: Power harmonic filters

## Power system interconnection

BT: Power industry  
RT: Power systems  
Power transmission

## Power system management

UF: Power management  
Telecommunication power  
management  
BT: Power systems  
RT: Microgrids  
Monitoring  
Preventive maintenance  
NT: Load flow

## Power system measurements

BT: Power systems  
NT: Meter reading

## Power system modeling

BT: Modeling  
RT: Power systems  
NT: Load modeling

## Power system planning

BT: Power systems  
RT: Demand-side management  
Electricity supply industry  
NT: Power demand

## Power system protection

BT: Power systems  
Product safety engineering  
RT: Arresters  
Circuit breakers  
Fuses



# 2018 IEEE Thesaurus

	Grounding			Power system
	Power system faults	interconnection		
	Power system transients			Power system modeling
	Protective relaying			Power system relaying
NT:	Electrical safety			Power system restoration
	Substation protection			Power system security
	Surge protection			Power system simulation
				Skin effect
<b>Power system relaying</b>				Telecontrol equipment
BT:	Relays			Time-frequency analysis
RT:	Power systems			Voltage fluctuations
	Protective relaying	NT:		Hybrid power systems
				Industrial power systems
<b>Power system reliability</b>				PSCAD
UF:	Power outages			Power distribution
BT:	Power systems			Power grids
RT:	Microgrids			Power supplies
	Power system stability			Power system analysis
	Reliability	computing		
<b>Power system restoration</b>				Power system dynamics
BT:	Power supplies			Power system economics
RT:	Electricity supply industry			Power system faults
	Power systems			Power system harmonics
				Power system management
<b>Power system security</b>				Power system
BT:	Security	measurements		
RT:	Load flow analysis			Power system planning
	Power systems			Power system protection
	Reactive power control			Power system reliability
<b>Power system simulation</b>				Power system stability
BT:	Power engineering			Power transmission
RT:	Power systems			Pulse power systems
				Reactive power
<b>Power system stability</b>				Substations
BT:	Power systems			Transformers
RT:	Power system reliability	systems		Uninterruptible power
				Wind energy integration
<b>Power system transients</b>				
BT:	Electromagnetic transients	<i>Power Systems Computer Aided Design</i>		
RT:	Arresters	USE:	PSCAD	
	Power quality			
	Power system protection	<i>Power trading</i>		
NT:	Transient analysis	USE:	Power markets	
<b>Power systems</b>		<b>Power transformer insulation</b>		
UF:	Electric power	BT:	Power transformers	
BT:	Power engineering and	RT:	Insulation	
energy		<b>Power transformers</b>		
RT:	Civil engineering	UF:	Power distribution	
	Mechanical power	transformers		
transmission		BT:	Transformers	
	Power system control	RT:	Transformer cores	
			Windings	



# 2018 IEEE Thesaurus

NT: On load tap changers  
Power transformer

insulation

**Power transistors**

BT: Power semiconductor

devices

RT: Driver circuits

**Power transmission**

UF: Transmission of electric

power

BT: Power systems

RT: Electric current control  
Load flow analysis  
Magnetic gears  
Power dissipation  
Power factor correction  
Power markets  
Power system

interconnection

NT: Power transmission lines  
Common Information Model

(electricity)

systems

Flexible AC transmission

HVDC transmission

Inductive power

transmission

Static VAr compensators  
Transmission lines  
Wireless power

transmission

**Power transmission lines**

UF: Overhead transmission

lines

BT: Transmission lines

RT: Conductors  
Poles and towers  
Power transmission  
Superconducting

transmission lines

NT: Gas insulated transmission

lines

Power cables  
Power overhead lines

*Power wheeling*

USE: Power markets

*Powertrain*

USE: Mechanical power

transmission

*Praeseodymium*

USE: Praseodymium

**Pragmatics**

UF: Linguistics

BT: Semiotics

RT: Communication symbols  
Context  
Natural language

processing

Professional

communication

**Praseodymium**

UF: Praeseodymium

BT: Chemical elements

**Pre-college programs**

BT: Educational programs

**Preamplifiers**

BT: Amplifiers

**Precision engineering**

BT: Engineering - general

RT: Industrial engineering  
Mechanical engineering

**Precoding**

BT: Encoding

**Predator prey systems**

UF: Predator-prey models  
Predator-prey systems

BT: Biology  
Mathematics

RT: Chaos  
Differential equations  
Game theory  
Nonlinear dynamical

systems

Stability

*Predator-prey models*

USE: Predator prey systems

*Predator-prey systems*

USE: Predator prey systems

**Prediction algorithms**

BT: Algorithms

**Prediction methods**

BT: Artificial intelligence

RT: Estimation



# 2018 IEEE Thesaurus

	Forecasting		
	Gaussian processes		
	Kalman filters		
	Prediction theory		
	Signal processing		
	Spectral analysis		
	Speech processing		
NT:	Linear predictive coding		
	Predictive coding		
	Predictive encoding		
	Predictive models		
<b>Prediction theory</b>			
BT:	Statistics		
RT:	Artificial intelligence		
	Estimation		
	Prediction methods		
<b>Predictive coding</b>			
BT:	Prediction methods		
<b>Predictive control</b>			
UF:	Model predictive control		
	Model-predictive control		
BT:	Process control		
RT:	Control engineering		
<b>Predictive encoding</b>			
BT:	Prediction methods		
<b>Predictive maintenance</b>			
BT:	Maintenance engineering		
<b>Predictive models</b>			
BT:	Prediction methods		
<b>Predistortion</b>			
UF:	Inverse distortion		
BT:	Power amplifiers		
RT:	Nonlinear distortion		
<i>Prefabricated buildings</i>			
USE:	Prefabricated construction		
<b>Prefabricated construction</b>			
UF:	Prefabricated buildings		
BT:	Construction		
	Construction industry		
RT:	Building materials		
	Buildings		
	Modular construction		
<b>Prefetching</b>			
BT:	Instruction sets		
		<b>Preforms</b>	
		BT:	Assembly
		<b>Pregnancy</b>	
		UF:	Pregnant
		BT:	Medical conditions
		<b>Pregnancy test</b>	
		BT:	Medical tests
		<i>Pregnant</i>	
		USE:	Pregnancy
		<b>Presence network agents</b>	
		UF:	PNAs
		BT:	Communications
		technology	
		<b>Presses</b>	
		BT:	Machine tools
		RT:	Dies
			Pressing
		<b>Pressing</b>	
		BT:	Materials processing
		RT:	Presses
		<b>Pressure control</b>	
		BT:	Control systems
		<b>Pressure effects</b>	
		BT:	Mechanical factors
		RT:	Meteorology
			Piezooptic effects
			Piezoresistance
		<b>Pressure gauges</b>	
		BT:	Instruments
		RT:	Atmospheric
		measurements	
			Density measurement
			Fluid flow measurement
			Force measurement
			Geophysical measurements
			Pressure measurement
			Pressure sensors
			Torque measurement
		<b>Pressure measurement</b>	
		BT:	Measurement
		RT:	Piezoresistive devices
			Pressure gauges
			Pressure sensors
			Tactile sensors
		NT:	Altimetry



# 2018 IEEE Thesaurus

Tire pressure

## Pressure sensors

BT: Sensors  
RT: Pressure gauges  
Pressure measurement

## Pressure vessels

BT: Mechanical products  
RT: Concrete  
Fission reactors  
Mechanical engineering  
Steel

## Preventive maintenance

BT: Maintenance engineering  
RT: Accident prevention  
Power system management  
Reliability  
Safety  
NT: Condition monitoring

## Pricing

BT: Financial management

## Primary motor cortex

BT: Brain

## Principal component analysis

UF: PCA  
BT: Statistical analysis  
RT: Feature extraction  
Independent component

analysis

Linear systems  
Operations research  
Pattern recognition  
Transform coding

## Print readers

USE: Character recognition

## Printed circuit boards

USE: Printed circuits

## Printed circuits

UF: Circuit boards  
Printed circuit boards  
BT: Circuits  
RT: Electronics packaging  
Integrated circuit layout  
Substrates  
Wiring  
NT: Flexible printed circuits  
Memory modules

## Printers

BT: Computer peripherals  
RT: Printing

## Printing

BT: Information technology  
RT: Character generation  
Ink  
Lithography  
Printers  
Printing machinery  
Publishing  
Typesetting  
NT: Digital printing  
Ink jet printing  
Teleprinting  
Three-dimensional printing

## Printing machinery

UF: Printing presses  
BT: Machinery  
RT: Printing

## Printing presses

USE: Printing machinery

## Privacy

BT: Technology social factors  
RT: Authorization  
Communication system

## security

Computer security  
Cryptography  
Cyberethics  
Data privacy  
Data protection  
Data security  
Malware  
NT: Eavesdropping

## Privacy preserving data mining

USE: Data privacy

## Privatisation

USE: Privatization

## Privatization

UF: Privatisation  
BT: Macroeconomics  
RT: Industrial economics

## Prize Paper awards

BT: IEEE Awards activities



# 2018 IEEE Thesaurus

## Probabilistic computing

BT: Computers and information processing

## Probabilistic logic

BT: Logic  
RT: Mixture models

## Probability

BT: Mathematics  
RT: Distribution functions  
Fourier transforms  
Information geometry  
Maximum likelihood

detection

Monte Carlo methods  
Random processes  
Statistical analysis  
Statistics  
Stochastic processes  
Stochastic systems  
Viterbi algorithm  
Weibull distribution  
NT: Ant colony optimization  
Bayes methods  
Error probability  
Forecasting  
Memoryless systems  
Pairwise error probability  
Possibility theory  
Probability distribution  
Random variables  
Statistical distributions  
Uncertainty

## Probability computing

BT: Computers and information processing

## Probability density function

BT: Integral equations  
RT: Distribution functions

## Probability distribution

BT: Probability  
NT: Exponential distribution  
Log-normal distribution  
Maxwell-Boltzmann

distribution

Nakagami distribution

## Probes

BT: Instruments

## Problem-solving

BT: Cognitive science  
RT: Human factors

## Process control

BT: Industrial control  
RT: Bleaching  
Chemical reactors  
Continuous production  
Manufacturing automation  
Process design  
Process modeling  
Process planning  
Production control  
NT: Predictive control  
Three-term control  
Two-term control

## Process design

BT: Design methodology  
RT: Chemical engineering  
Design for disassembly  
Design for quality  
Process control  
Process planning  
Product design  
Service computing  
NT: Pattern formation  
Process modeling

## Process modeling

BT: Modeling  
Process design  
RT: Process control

## Process planning

BT: Management  
Production  
Production management  
Production planning  
RT: Process control  
Process design  
NT: Business process

integration

management

Business process

Cause effect analysis

## Processor scheduling

UF: Multiprocessor scheduling  
BT: Concurrency control  
Multiprocessing systems  
RT: Microprocessors  
Optimization methods  
NT: Scheduling algorithms



# 2018 IEEE Thesaurus

## *Processors (program)*

USE: Program processors

management

Product life cycle

Software product lines

Time to market

## **Procurement**

BT: Supply chain management

RT: Contracts

Logistics

Proposals

Supply chains

## **Product liability**

BT: Legal factors

RT: Consumer products

Product safety

Quality assurance

Quality management

Warranties

## **Product codes**

BT: Codes

RT: Decoding

Error correction

Radiofrequency

NT:

## **Product life cycle management**

UF: System life cycle

management

BT: Product development

NT: Prognostics and health

management

identification

NT: Bar codes

## *Product customisation*

USE: Product customization

## **Product safety**

BT: Safety

RT: Accidents

Consumer products

Product liability

## **Product customization**

UF: Product customisation

BT: Product development

RT: Customer satisfaction

Manufactured products

Product design

## **Product safety engineering**

RT: Software safety

NT: Consumer protection

Power system protection

Safety

Vehicle crash testing

## **Product design**

BT: Design methodology

RT: Concurrent engineering

Design for disassembly

Design for quality

Design tools

Group technology

Manufactured products

Process design

Product customization

Product development

Prototypes

Requirements engineering

## *Product warranties*

USE: Warranties

## *Product warranty*

USE: Warranties

## **Production**

BT: Industry applications

RT: Containers

Wheels

Wire drawing

NT:

Ball milling

Compression molding

Embossing

Food products

Group technology

Injection molding

Materials processing

Mechanical products

Process planning

Production control

Production engineering

## **Product development**

BT: Crowdsourcing

Engineering management

RT: Brand management

Manufactured products

Product design

Quality function deployment

Rapid prototyping

Reverse engineering

Virtual prototyping

NT: Graphical user interfaces

Product customization



# 2018 IEEE Thesaurus

	Production equipment		Mining equipment
	Production facilities		Molding equipment
	Production management		Packaging machines
	Production materials		Paper making machines
	Production systems		Polishing machines
	Productivity		Soldering equipment
	Shafts		
	Springs		
	Suspensions		
	Transfer molding		
<b>Production control</b>		<b>Production facilities</b>	
BT:	Industrial control	UF:	Factories
	Production		Manufacturing facilities
RT:	Adaptive scheduling	BT:	Production
	Cellular manufacturing	RT:	Manufacturing
	Group technology		Warehousing
	Inventory control	NT:	Foundries
	Manufacturing		Greenhouses
	Process control		Industrial plants
	Production systems		Machine shops
	Supply chain management		Paper mills
NT:	Continuous production		
	Lot sizing		
	Optimized production		
technology	Scheduling	<b>Production management</b>	
		UF:	Manufacturing
		management	
		BT:	Management
			Production
		RT:	Continuous improvement
			Continuous production
			Industrial engineering
			Inventory control
			Lean production
			Mass production
			Production engineering
			Productivity
			Research and development
<i>Production economics</i>		management	
USE:	Industrial economics		Technology management
			Waste management
<b>Production engineering</b>		NT:	Control charts
BT:	Engineering - general		Inventory management
	Production		Lead time reduction
RT:	Industrial engineering		Logistics
	Inventory management		Process planning
	Manufacturing		Production planning
	Manufacturing systems		
	Production equipment		
	Production management		
	Production materials		
NT:	Production planning		
<b>Production equipment</b>		<b>Production materials</b>	
BT:	Production	BT:	Materials
RT:	Gears		Production
	Machinery	RT:	Additives
	Materials handling		Cast iron
equipment			Chemical products
	Production engineering		Hydraulic fluids
NT:	Applicators		Production engineering
	Clamps	NT:	Abrasives
	Cutting tools		Aerospace materials
	Fixtures		Automotive materials
	Machine tools		Inhibitors





# 2018 IEEE Thesaurus

	Ink		Semantics
	Joining materials		Semiotics
	Lubricants		Syntactics
	Retardants	NT:	Collaboration
<b>Production planning</b>			Communication aids
BT:	Production engineering	effectiveness	Communication
	Production management		Communication symbols
RT:	Demand forecasting		Context
	Lead time reduction		Databases
technology	Optimized production		Global communication
NT:	Capacity planning		Grammar
	Materials requirements		Information analysis
planning	Process planning		Information resources
			Information retrieval
<b>Production systems</b>			Information science
BT:	Production		Information services
RT:	Discrete-event systems		Information systems
	Industrial plants		Information technology
	Manufacturing		Manuals
technology	Optimized production		Meetings
NT:	Production control		Oral communication
	Assembly systems		Plagiarism
	Exhaust systems		Portfolios
	Intelligent manufacturing		Professional societies
systems	Lean production		Public speaking
	Manufacturing systems	<b>Professional societies</b>	Rhetoric
	Steering systems	BT:	Writing
		communication	
<b>Productivity</b>		<i>Profit sharing schemes</i>	
UF:	Labor productivity	USE:	Incentive schemes
	Labour productivity		
BT:	Production	<b>Profitability</b>	
RT:	Business	BT:	Economics
	Human factors	RT:	Cost accounting
	Incentive schemes		Econometrics
	Industrial psychology		Financial management
	Management		Productivity
	Manufacturing	<b>Progenitor cells</b>	
	Personnel	BT:	Cells (biology)
	Production management	RT:	Stem cells
	Profitability		
<b>Professional aspects</b>		<b>Prognostics and health management</b>	
BT:	Engineering profession	UF:	PHM
<b>Professional communication</b>		BT:	Product life cycle
UF:	Technical communication	management	
RT:	Collaborative work	<i>Program generators</i>	
	Cooperative communication	USE:	Automatic programming
	Pragmatics		



# 2018 IEEE Thesaurus

## Program management

UF: Programme management  
BT: Management  
RT: Project management  
Technical management

Programmable logic arrays

*Programmable read only memory*

USE: PROM

*Programme management*

USE: Program management

*Programmed instruction*

USE: Educational technology

## Programming

UF: Program profiling  
BT: Computer science  
RT: Aerospace and electronic

systems

Flowcharts  
Null value  
Programming environments  
Runtime  
Self-assembly  
Software  
Software debugging  
Software tools  
Structured Query Language  
Syntactics  
NT: Augmented reality  
Automatic programming  
Concatenated codes  
Functional programming  
Granular computing  
Integer linear programming  
Logic programming  
Microprogramming  
Object oriented methods  
Object oriented

NT:

programming

Opportunistic software

systems development

Parallel programming  
Performance analysis  
Programming profession  
Robot programming

## Programming environments

BT: Software engineering  
RT: Computer aided software

engineering

Programming  
Software debugging  
Software tools

*Programming languages*

USE: Computer languages

## Program processors

UF: Assemblers (program)  
Compilers (program)  
Interpreters (program)  
Multi-threaded systems  
Multi-threading systems  
Multithreaded systems  
Multithreading systems  
Processors (program)  
BT: System software  
RT: Input-output programs  
Operating systems  
NT: Application specific  
processors  
Graphics processing units  
Instruction sets  
Optimizing compilers

*Program profiling*

USE: Programming

## Programmable circuits

BT: Circuits  
NT: Field programmable analog  
arrays  
Programmable logic arrays  
Programmable logic  
devices

## Programmable control

BT: Digital control  
RT: Industrial control  
Manufacturing automation  
NT: Flow graphs

## Programmable logic arrays

UF: PLA  
BT: Circuits  
Logic arrays  
Logic circuits  
Programmable circuits  
RT: Programmable logic  
devices

## Programmable logic devices

BT: Circuits  
Logic devices  
Programmable circuits  
RT: High level synthesis



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# 2018 IEEE Thesaurus

## Programming profession

profession  
 UF: Computer programming  
 BT: Programming  
 RT: Employment  
 Engineering profession

## Project engineering

BT: Engineering management  
 NT: Scheduling

## Project management

management  
 development)  
 BT: Management  
 RT: Concurrent engineering  
 Lead time reduction  
 Program management  
 Requirements engineering  
 Requirements management  
 Research and development  
 Scrum (Software  
 System integration  
 Technology management  
 NT: Proposals

## Projectiles

BT: Weapons

## Projection algorithms

BT: Algorithms

## Projective geometry

BT: Geometry

## Projective shadowing

USE: Shadow mapping

## projectors (optical)

USE: Optical projectors

## PROM

memory  
 UF: Programmable read only  
 BT: Read only memory  
 NT: EPROM

## Promethium

BT: Chemical elements

## Promotion - marketing

UF: Sales promotion  
 BT: Marketing management  
 RT: Public relations

## Propagation

UF: Wave equations  
 Wave propagation  
 BT: Waves  
 RT: Damping  
 Electromagnetic  
 waveguides  
 NT: Attenuation  
 Electromagnetic  
 propagation  
 Insertion loss  
 Nonlinear wave  
 propagation  
 Perfectly matched layers  
 Reflection  
 Scattering  
 Transient response

## Propagation constant

BT: Electromagnetic  
 propagation

## Propagation delay

BT: Delay effects

## Propagation loss

USE: Propagation losses

## Propagation losses

UF: Propagation loss  
 BT: Electromagnetic  
 propagation

## Propellants

BT: Chemical products

## Propellers

BT: Aircraft propulsion  
 RT: Aircraft  
 Blades  
 Engines  
 Impellers  
 Marine vehicles  
 Shafts

## Proportional + derivative control

USE: PD control

## Proportional + integral control

USE: PI control

## Proportional control

BT: Control systems

## Proportional derivative control



# 2018 IEEE Thesaurus

USE: PD control

*Proportional plus derivative control*

USE: PD control

*Proportional-derivative control*

USE: PD control

*Proportional-integral control*

USE: PI control

*Proportional-integral controller*

USE: PI control

*Proportional-integral-derivative*

USE: PD control

*Proportional-integral-derivative control*

USE: PI control

*Proportional-integral-derivative controller*

USE: PI control

## Proposals

UF: Technical proposals

BT: Project management

RT: Contracts  
Procurement  
Technical requirements  
Writing

## Propulsion

BT: Vehicular and wireless technologies

RT: Engines  
Plasma jets  
Traction motors  
Vehicle-to-grid  
NT: Aerospace propulsion  
Aircraft propulsion  
Electromagnetic launching  
Electrothermal launching  
Rockets

*Prosencephalon*

USE: Forebrain

## Prostate cancer

BT: Cancer

*Prosthesis*

USE: Prosthetics

## Prosthetic hand

BT: Prosthetics

## Prosthetic limbs

BT: Prosthetics

## Prosthetics

UF: Hip joint replacements  
Knee joint replacements  
Neural prostheses  
Prosthesis  
BT: Medical services  
RT: Assistive technology  
Bioceramics  
Biological control systems  
Biomedical equipment  
Medical control systems  
Orthotics  
Sensory aids  
NT: Artificial biological organs  
Artificial limbs  
Prosthetic hand  
Prosthetic limbs  
Visual prosthesis

## Protactinium

BT: Chemical elements

## Protection

BT: Safety  
RT: Circuit breakers  
Fuses  
Galvanizing  
Grounding  
Hazardous areas  
Occupational safety  
Security  
Uninterruptible power

systems

NT: Explosion protection  
Lightning protection  
Radiation protection

## Protection switching

UF: Automatic protection  
switching  
BT: Optical fiber networks

## Protective clothing

BT: Clothing  
Safety devices  
RT: Clothing industry  
Eye protection  
Occupational health  
Occupational safety  
Safety



# 2018 IEEE Thesaurus

## Protective relaying

UF: Distance relays  
Protective relays  
BT: Relays  
RT: Instrument transformers  
Power system protection  
Power system relaying

switching

Multicast protocols  
Multiprotocol label  
Routing protocols  
Transport protocols  
Wireless application

protocol

## Protective relays

USE: Protective relaying

## Protein engineering

BT: Biomedical engineering

## Protein sequence

BT: Proteins

## Proteins

BT: Biochemistry  
RT: Proteotronics  
NT: Protein sequence

## Proteomics

BT: Molecular biomarkers

## Proteotronics

BT: Nanoscale devices  
RT: Proteins

## Protocols

UF: Communication protocols  
BT: Communication systems  
RT: Ad hoc networks  
Bluetooth  
Concurrency control  
Frame relay  
IEEE 802.11 Standard  
IEEE 802.11e Standard  
IEEE 802.11g Standard  
IEEE 802.11n Standard  
IPTV  
Internet of Things  
Local area networks  
Metropolitan area networks  
Multicarrier code division

multiple access

networking

Software defined  
TCP/IP  
Wide area networks  
NT: Access protocols  
Asynchronous transfer

mode

Cryptographic protocols  
Master-slave

## Proton accelerators

BT: Particle accelerators  
RT: Ion accelerators  
Protons

## Proton beam effects

USE: Proton effects

## Proton beams

USE: Particle beams

## Proton effects

UF: Biological effects of protons  
Proton beam effects  
BT: Electrothermal effects  
Quantum mechanics  
RT: Elementary particle

exchange interactions

Elementary particles  
High energy physics

instrumentation computing

Protons  
Radiation effects  
Space vehicles  
Thermal factors  
NT: Proton radiation effects  
Single event latchup

## Proton radiation effects

BT: Proton effects  
RT: Bipolar transistors  
Ion radiation effects  
Protons  
Radiation effects  
Semiconductor devices  
Silicon-on-insulator

## Proton therapy

BT: Medical treatment  
RT: Biological effects of

radiation

## Protons

BT: Elementary particles  
RT: Cosmic rays  
Ions  
Proton accelerators



# 2018 IEEE Thesaurus

Proton effects  
Proton radiation effects

BT: Behavioral sciences  
RT: Medical treatment  
NT: Mental disorders

## Prototypes

BT: Design methodology  
RT: Laser sintering  
Product design  
Stereolithography  
Virtual prototyping  
NT: Rapid prototyping

## Psychoacoustic models

BT: Auditory system  
NT: Masking threshold

## Psychoacoustics

BT: Acoustics  
RT: Auditory system

## Proximity effects

UF: Current crowding  
BT: Electromagnetics  
RT: Conductors  
Lithography

## Psychology

UF: Emotional responses  
BT: Behavioral sciences  
RT: Affective computing  
Cognition  
Cognitive science  
Emotion recognition  
Employee welfare  
Persuasive systems  
Social engineering

## *Pry and Bean model*

USE: Bean model

## PSCAD

UF: Power Systems Computer  
Aided Design  
BT: Design automation  
Power systems  
Software packages

(security)

NT: Industrial psychology  
Mood  
Neuropsychology  
Psychometric testing

## *Pseudobinary semiconductors*

USE: Semiconductor materials

## *Pseudomorphic HEMTs*

USE: PHEMTs

## Psychometric testing

BT: Psychology  
RT: Industrial psychology

## *Pseudonoise coded communication*

USE: Spread spectrum  
communication

## Public domain software

BT: Open Access  
Software  
RT: Copyright protection  
Open source software

## *Pseudonoise coded radar*

USE: Spread spectrum radar

## Public finance

UF: Government borrowing  
Government expenditure  
BT: Governmental factors  
RT: Financial management  
Government  
Macroeconomics

## *Pseudorandom sequences*

USE: Random sequences

## PSK

USE: Phase shift keying

## *Public health*

USE: Public healthcare

## PSNR

UF: Peak signal to noise ratio  
Peak signal-to-noise ratio  
BT: Signal to noise ratio

## Public healthcare

UF: Public health  
BT: Medical services

## *pSPICE*

USE: SPICE

## Public infrastructure

BT: Asset management

## Psychiatry



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# 2018 IEEE Thesaurus

RT: Electricity supply industry  
Environmental  
management

Government policies  
Public policy  
Rural areas  
Urban areas  
Urban planning  
NT: Critical infrastructure

## Public key

BT: Cryptography  
NT: Public key cryptography

## Public key cryptography

UF: Public key cryptosystems  
BT: Public key  
NT: Elliptic curve cryptography  
Identity-based encryption

## Public key cryptosystems

USE: Public key cryptography

## Public policy

BT: Government policies  
RT: Public infrastructure

## Public relations

BT: Management  
RT: Customer relationship  
management  
Marketing management  
Promotion - marketing

## Public speaking

UF: Speechmaking  
BT: Oral communication  
Professional  
communication  
RT: Meetings

## Public transportation

UF: Subways  
Taxi  
Trolley cars  
Uber  
BT: Transportation  
RT: Light rail systems  
Rail transportation  
Urban areas

## Publish subscribe systems

UF: Publish-subscribe systems  
Publish/subscribe systems  
BT: Message systems

RT: Content management  
Middleware  
Pattern recognition  
Queueing analysis

## Publish-subscribe

BT: Distributed information  
systems

## Publish-subscribe systems

USE: Publish subscribe systems

## Publish/subscribe systems

USE: Publish subscribe systems

## Publishing

BT: Computer applications  
RT: Bibliographies  
Copyright protection  
Digital printing  
Document handling  
Guidelines  
Plagiarism  
Printing  
Text processing  
NT: Bibliometrics  
Company reports  
Desktop publishing  
Electronic publishing  
Open Access  
Scientific publishing

## Pulleys

BT: Materials handling  
equipment  
RT: Freight handling  
Lifting equipment  
Loading

## Pulp and paper industry

UF: Paper industry  
BT: Manufacturing industries  
RT: Forestry  
Paper products  
Paper pulp  
Paper technology  
Pulp manufacturing  
Spinning machines  
Wood industry  
NT: Paper making  
Paper making machines  
Paper mills

## Pulp manufacturing

BT: Manufacturing systems



# 2018 IEEE Thesaurus

RT: Paper making  
Paper making machines  
Paper mills  
Paper pulp  
Pulp and paper industry  
Wood industry

## Pulse amplifiers

BT: Amplifiers

## Pulse circuits

UF: Bistable multivibrator  
BT: Circuits  
RT: Digital circuits  
NT: Flip-flops

## Pulse compression methods

BT: Signal processing  
NT: Optical pulse compression

## Pulse generation

UF: Impulse generation  
Pulse generators  
BT: Signal generators  
NT: Optical pulse generation

## Pulse generators

USE: Pulse generation

## Pulse inverters

UF: Logic inverters  
BT: Inverters  
RT: Logic circuits

## Pulse measurements

UF: Impulse measurements  
BT: Measurement  
RT: Electric variables  
measurement

## Pulse modulation

BT: Modulation  
RT: Demodulation

## Pulse power systems

BT: Power systems  
RT: Energy storage  
High-voltage techniques  
Power generation  
Power supplies  
NT: Pulsed power supplies

## Pulse shaping

USE: Pulse shaping methods

## Pulse shaping methods

UF: Pulse shaping  
BT: Signal processing  
NT: Optical pulse shaping

## Pulse transformers

BT: Transformers

## Pulse width modulated power converters

USE: Pulse width modulation  
converters

## Pulse width modulation

UF: PWM  
Pulsewidth modulation  
Pulsewidth-modulation  
BT: Modulation  
RT: AC generators  
AC machines  
AC motors  
Converters  
DC generators  
DC machines  
DC motors  
Pulse width modulation

converters

NT: Pulse width modulation

inverters

modulation

Space vector pulse width

## Pulse width modulation converters

UF: PWM converters  
PWM converters  
Pulse width modulated

power converters

Pulse width modulation

converters

Pulsewidth modulation

converters

Pulsewidth modulation

converters

BT: Converters  
RT: Power conditioning  
Power control  
Power conversion  
Power electronics  
Pulse width modulation  
Voltage-source converters

## Pulse width modulation converters

USE: Pulse width modulation  
converters

## Pulse width modulation inverters





# 2018 IEEE Thesaurus

UF: PWM invertors  
Pulse width modulation

invertors

BT: Pulse width modulation  
RT: AC motors  
AC-DC power converters  
Converters  
DC motors  
DC-DC power converters

## *Pulse width modulation invertors*

USE: Pulse width modulation

invertors

## **Pulsed electroacoustic methods**

BT: Acoustoelectric effects  
RT: Acoustoelectric devices  
Charge measurement  
Insulation testing  
Space charge

## **Pulsed laser deposition**

BT: Chemical vapor deposition

## **Pulsed power supplies**

BT: Pulse power systems

## *Pulsewidth modulation*

USE: Pulse width modulation

## *Pulsewidth modulation converters*

USE: Pulse width modulation

converters

## *Pulsewidth modulation convertors*

USE: Pulse width modulation

converters

## *Pulsewidth-modulation*

USE: Pulse width modulation

## **Pump lasers**

BT: Lasers

## *Pumping of lasers*

USE: Laser excitation

## **Pumps**

BT: Machinery  
RT: Bellows  
Compressors  
Impellers  
Turbomachinery

NT: Fuel pumps  
Heat pumps

Insulin pumps  
Micropumps

## **Punching**

BT: Materials processing  
RT: Sheet metal processing

## **Purification**

BT: Cleaning  
RT: Air cleaners  
Decontamination  
Refining  
Sugar refining

## **Pursuit algorithms**

BT: Algorithms

## *PWM*

USE: Pulse width modulation

## *PWM converters*

USE: Pulse width modulation

converters

## *PWM convertors*

USE: Pulse width modulation

converters

## *PWM invertors*

USE: Pulse width modulation

invertors

## *Pylons*

USE: Poles and towers

## **Pyroelectric devices**

BT: Dielectric devices  
RT: Pyroelectricity

## **Pyroelectricity**

BT: Electricity  
Ultrasonics, ferroelectrics,  
and frequency control  
RT: Ferroelectric materials  
Piezoelectricity  
Pyroelectric devices  
Thermal factors

## *Q factor*

USE: Q-factor

## **Q measurement**

BT: Electric variables  
measurement  
RT: Q-factor



# 2018 IEEE Thesaurus

## Q-factor

UF: Q factor  
Quality factor  
BT: Electric variables  
RT: Capacitors  
Q measurement

## QAM

USE: Quadrature amplitude modulation

## QCD vacuum

USE: Elementary particle vacuum

## QFD

USE: Quality function deployment

## QFP

USE: Electronics packaging

## QoE

USE: Quality of experience

## QoS

USE: Quality of service

## Qox

USE: Quality of experience

## QPSK

USE: Phase shift keying

## QR codes

USE: Bar codes

## Quad flat packs

USE: Electronics packaging

## Quadratic programming

BT: Optimization methods

## Quadrature amplitude modulation

UF: QAM  
BT: Amplitude modulation

## Quadrature phase shift keying

BT: Phase shift keying  
NT: Differential quadrature phase shift keying

## Qualifications

BT: Training  
RT: Continuing professional development

## Standards

## Quality assessment

BT: Quality management

## Quality assurance

BT: Quality management  
RT: Consumer protection  
Data integrity  
Design for quality  
IEEE 802.11e Standard  
Product liability  
Quality awards  
Quality control  
Quality function deployment  
Six sigma  
Total quality management  
Best practices  
NT:

## Quality awards

BT: Quality management  
RT: Continuous improvement  
Quality assurance  
Quality function deployment  
Total quality management

## Quality control

BT: Quality management  
RT: Contamination  
Coordinate measuring

## machines

Data integrity  
Design for quality  
Failure analysis  
IEEE 802.11e Standard  
Quality assurance  
Quality function deployment  
Reliability  
Six sigma  
Total quality management

## Quality factor

USE: Q-factor

## Quality function deployment

UF: QFD  
BT: Quality management  
RT: Concurrent engineering  
Product development  
Quality assurance  
Quality awards  
Quality control

## Quality management

UF: ISO 9000



# 2018 IEEE Thesaurus

management	BT:	Management		Finite wordlength effects
	RT:	Control charts		Signal sampling
		Customer relationship	NT:	Vector quantization
		Customer satisfaction		<i>Quantization effects</i>
		Design for quality	USE:	Quantization (signal)
		ISO Standards		<i>Quantization errors</i>
		Pareto analysis	USE:	Quantization (signal)
		Product liability		<b>Quantum capacitance</b>
		Reliability	BT:	Capacitance
		System improvement		Quantum mechanics
	NT:	Quality assessment	RT:	CNTFETs
		Quality assurance		<b>Quantum cascade lasers</b>
		Quality awards	UF:	Cascade lasers
		Quality control	BT:	Quantum well lasers
		Quality function deployment	RT:	Quantum mechanics
		Total quality management		<b>Quantum cellular automata</b>
			BT:	Quantum computing
<b>Quality of experience</b>				<i>Quantum communication</i>
UF:		QoE	USE:	Communication systems
		Qox		<b>Quantum computing</b>
BT:		Communication systems	BT:	Computers and information processing
		Customer satisfaction		Electron devices
RT:		Quality of service	NT:	Quantum cellular automata
				<i>Quantum confinement</i>
<b>Quality of service</b>			USE:	Potential well
UF:		QoS		<b>Quantum cryptography</b>
		Quality-of-service	BT:	Cryptography
BT:		Communication systems		Quantum mechanics
		Customer satisfaction		<i>Quantum dash</i>
RT:		IEEE 802.11e Standard	USE:	Quantum dots
		IP networks		<b>Quantum dot lasers</b>
		Next generation networking	UF:	Quantum-dot lasers
		Quality of experience	BT:	Semiconductor lasers
		Spatial diversity	RT:	Quantum dots
		Telecommunication		Quantum mechanics
computing				Quantum well lasers
	NT:	Admission control		<b>Quantum dots</b>
			UF:	Quantum dash
<i>Quality-of-service</i>				Quantum-dot
USE:		Quality of service		Quantum-dots
			BT:	Semiconductor devices
<i>Quantisation</i>			RT:	Nanocrystals
USE:		Quantization (signal)		
<b>Quantization (signal)</b>				
UF:		Quantisation		
		Quantization effects		
		Quantization errors		
		Signal quantisation		
		Signal quantization		
BT:		Signal processing		
RT:		Analog-digital conversion		
		Data compression		
		Encoding		



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Quantum dot lasers		Two dimensional hole gas	
Quantum mechanics			
<b>Quantum entanglement</b>		<b>Quantum well lasers</b>	
UF:	Entangled states	UF:	Quantum-well lasers
BT:	Quantum mechanics	BT:	Lasers
RT:	Teleportation		Quantum well devices
			Semiconductor devices
			Semiconductor lasers
			Solid lasers
<b>Quantum mechanics</b>		RT:	Quantum dot lasers
UF:	Quantum theory		Quantum mechanics
BT:	Physics		Quantum wells
RT:	Laser theory		Semiconductor optical
	Nanotechnology		
	Philosophical	amplifiers	Surface emitting lasers
considerations			Two dimensional hole gas
	Quantum cascade lasers	NT:	Quantum cascade lasers
	Quantum dot lasers		
	Quantum dots	<b>Quantum wells</b>	
	Quantum well devices	UF:	Semiconductor quantum
	Quantum well lasers		
	Resonant frequency	BT:	Electrons
	Solid-state physics		Quantum well devices
	String theory	RT:	Quantum well lasers
NT:	Density functional theory		Surface emitting lasers
	Lagrangian functions		Two dimensional hole gas
	Proton effects		
	Quantum capacitance	<i>Quantum-dot</i>	
	Quantum cryptography	USE:	Quantum dots
	Quantum entanglement	<i>Quantum-dot lasers</i>	
	Relativistic quantum	USE:	Quantum dot lasers
mechanics		<i>Quantum-dots</i>	
	Schrodinger equation	USE:	Quantum dots
	Stationary state	<i>Quantum-well devices</i>	
	Teleportation	USE:	Quantum well devices
	Tunneling	<i>Quantum-well lasers</i>	
<i>Quantum teleportation</i>		USE:	Quantum well lasers
USE:	Teleportation	<i>Quantumwell devices</i>	
<i>Quantum theory</i>		USE:	Quantum well devices
USE:	Quantum mechanics	<i>Quarter-wave plates</i>	
<i>Quantum vacuum</i>		USE:	Optical retarders
USE:	Elementary particle vacuum	<b>Quasi-doping</b>	
<b>Quantum well devices</b>		BT:	Semiconductor device
UF:	Quantum-well devices	manufacture	
	Quantumwell devices	RT:	Semiconductor device
BT:	Electron devices	doping	
RT:	Electrooptic modulators	<i>Quasi-resonant inverters</i>	
	Quantum mechanics		
	Resonant tunneling devices		
	Tunneling		
NT:	Quantum well lasers		
	Quantum wells		



# 2018 IEEE Thesaurus

USE:	Resonant inverters	USE:	Radiation hardening (electronics)
<i>Quasi-resonant invertors</i>		<i>Rad-hard</i>	
USE:	Resonant inverters	USE:	Radiation hardening (electronics)
<b>Quaternions</b>		<b>Radar</b>	
BT:	Mathematics	UF:	Microwave radar
<i>Query evaluation</i>		BT:	Aerospace and electronic systems
USE:	Query processing		Geoscience and remote sensing
<i>Query languages</i>		RT:	Microwave technology Radar detection Radar scattering
USE:	Database languages	NT:	Airborne radar Bistatic radar Cognitive radar Doppler radar Ground penetrating radar Laser radar Meteorological radar Millimeter wave radar Multistatic radar Passive radar Radar applications Radar clutter Radar cross-sections Radar equipment Radar theory Spaceborne radar Spread spectrum radar Synthetic aperture radar Ultra wideband radar
<i>Query optimisation</i>			
USE:	Query processing		
<i>Query optimization</i>			
USE:	Query processing		
<i>Query pipeline</i>			
USE:	Query processing		
<i>Query process</i>			
USE:	Query processing		
<b>Query processing</b>			
UF:	Query evaluation Query optimisation Query optimization Query pipeline Query process Query routing		
BT:	Database systems		
RT:	Linked data NoSQL databases Semantic search		
<i>Query routing</i>		<b>Radar antennas</b>	
USE:	Query processing	BT:	Antennas
<b>Queueing analysis</b>		<b>Radar applications</b>	
UF:	Queueing theory	BT:	Radar
BT:	Traffic control	RT:	Oceanographic techniques
RT:	Publish subscribe systems Scheduling	NT:	Radar countermeasures Radar detection Radar imaging Radar measurements Radar polarimetry Radar remote sensing Radar tracking
<i>Queueing theory</i>			
USE:	Queueing analysis		
<b>Rabbits</b>		<b>Radar clutter</b>	
BT:	Animals	BT:	Radar
<i>Rad hardened</i>		RT:	Jamming

## Radar countermeasures



# 2018 IEEE Thesaurus

BT: Electronic warfare  
Radar applications  
RT: Adaptive arrays  
Electronic countermeasures  
Jamming  
Spread spectrum radar

## *Radar cross section*

USE: Radar cross-sections

## *Radar cross sections*

USE: Radar cross-sections

## *Radar cross-section*

USE: Radar cross-sections

## **Radar cross-sections**

UF: Radar cross section  
Radar cross sections  
Radar cross-section  
BT: Radar  
Radar measurements  
Reflection

## **Radar detection**

BT: Radar applications  
Signal detection  
RT: Ground penetrating radar  
Passive radar  
Radar  
Ultra wideband radar

## **Radar equipment**

BT: Radar

## **Radar imaging**

BT: Radar applications  
RT: Ground penetrating radar  
Landmine detection  
Meteorological radar  
Passive radar  
Remote sensing  
Synthetic aperture radar  
Ultra wideband radar

## **Radar interferometry**

BT: Interferometry  
NT: Synthetic aperture radar

interferometry

## **Radar measurements**

BT: Radar applications  
RT: Remote sensing  
NT: Radar cross-sections

## **Radar polarimetry**

UF: SAR imaging  
Synthetic aperture radar

imaging

BT: Radar applications

## **Radar remote sensing**

BT: Radar applications  
RT: Spaceborne radar

## **Radar scattering**

BT: Electromagnetic scattering  
RT: Radar

## **Radar signal processing**

BT: Signal processing

## **Radar theory**

BT: Radar

## **Radar tracking**

BT: Radar applications  
RT: Target tracking

## **Radial basis function networks**

UF: RBF networks  
Radial basis function neural

networks

BT: Neural networks  
RT: Artificial intelligence  
Computer networks  
Cybernetics  
Interpolation

## *Radial basis function neural networks*

USE: Radial basis function

networks

## *Radiation counters*

USE: Radiation detectors

## *Radiation detection*

USE: Radiation detectors

## **Radiation detector circuits**

BT: Circuits  
RT: Counting circuits  
Radiation detectors

## **Radiation detectors**

UF: Counters  
Particle detectors  
Radiation counters  
Radiation detection  
Ratemeters



# 2018 IEEE Thesaurus

BT:	Ionizing radiation sensors	RT:	Ionizing radiation
RT:	Atomic measurements		Satellite communication
	Dosimetry		Total ionizing dose
	Nuclear measurements		
	Phototransistors	<b>Radiation imaging</b>	
	Radiation detector circuits	BT:	Imaging
	Radiation monitoring	RT:	Biomedical imaging
	Spectroscopy	<b>Radiation monitoring</b>	
	X-ray detectors	UF:	Health physics
NT:	Bolometers		Personnel monitoring
	Gamma-ray detectors	BT:	Monitoring
	Infrared detectors		Nuclear and plasma
	Photodetectors	sciences	
	Semiconductor radiation	RT:	Dosimetry
detectors			Radiation detectors
	Silicon radiation detectors		Radiation effects
			Radiation protection
<b>Radiation dosage</b>			Radioactive pollution
BT:	Radiation monitoring		Reactor instrumentation
<i>Radiation dosimetry</i>		NT:	Radiation dosage
USE:	Dosimetry		
<b>Radiation effects</b>		<i>Radiation pattern</i>	
UF:	Irradiation	USE:	Antenna radiation patterns
BT:	Nuclear and plasma	<b>Radiation protection</b>	
sciences		UF:	Radiation shielding
RT:	Biomedical applications of		Radiological protection
radiation		BT:	Protection
	Brachytherapy		Radiation safety
	High energy physics	RT:	Biological effects of
instrumentation computing		radiation	
	Proton effects		Contamination
	Proton radiation effects		Dosimetry
	Radiation monitoring		Fission reactors
	Radiation protection		Radiation effects
	Safety		Radiation monitoring
NT:	Biological effects of		Radioactive pollution
radiation		<b>Radiation safety</b>	
	Gamma-ray effects	BT:	Nuclear and plasma
	Ion radiation effects	sciences	
	Neutron radiation effects		Safety
	Scintillators	NT:	Radiation protection
	Single event latchup		
	Space radiation	<i>Radiation shielding</i>	
	Terahertz radiation	USE:	Radiation protection
	Total ionizing dose	<i>Radiation therapy</i>	
<b>Radiation hardening (electronics)</b>		USE:	Biomedical applications of
UF:	Rad hardened	radiation	
	Rad-hard	<b>Radiative recombination</b>	
BT:	Electronic equipment	BT:	Spontaneous emission
manufacture		RT:	Semiconductor materials
	Nuclear and plasma		
sciences			





# 2018 IEEE Thesaurus

## *Radiators (automotive)*

USE: Automotive components

## **Radio access networks**

UF: RAN  
BT: Telecommunications  
RT: 3G mobile communication  
4G mobile communication  
Land mobile radio  
Radio communication  
Telecommunication

services

## **Radio astronomy**

UF: Radio telescopes  
BT: Antennas and propagation  
Astronomy  
RT: Reflector antennas  
Telescopes

## **Radio broadcasting**

BT: Broadcasting  
Radio communication  
RT: Digital multimedia

broadcasting

NT: Frequency modulation  
Radio networks

## **Radio communication**

BT: Communication systems  
RT: Bandwidth  
Convolutional codes  
Cross layer design  
Diversity methods  
Film bulk acoustic

resonators

IEEE 802.11 Standard  
IEEE 802.11g Standard  
IEEE 802.11n Standard  
IEEE 802.15 Standard  
MIMO communication  
Mobile communication  
NOMA  
Radio access networks  
Radio communication

equipment

Radio propagation  
SIMO communication  
SISO communication  
Wireless LAN  
NT: Baseband  
Bluetooth  
Indoor radio communication  
Land mobile radio

communication

Millimeter wave

Near field communication  
Packet radio networks  
Passband  
Personal area networks  
Radio broadcasting  
Radio communication

countermeasures

Radio frequency  
Radio link  
Radio spectrum

management

Satellite communication  
Satellite ground stations  
Software radio  
ZigBee

## **Radio communication countermeasures**

BT: Communication system  
security

RT: Radio communication  
Adaptive arrays  
Electronic countermeasures  
Electronic warfare  
Jamming  
Spread spectrum

communication

## **Radio communication equipment**

BT: Communication equipment  
RT: Antennas  
Radio communication  
Telephone equipment  
NT: Base stations  
Ham radios  
Land mobile radio

equipment

Radio transceivers  
Transponders

## **Radio control**

BT: Control systems

## **Radio frequency**

UF: RF  
Radio-frequency  
Radiofrequency  
BT: Radio communication  
RT: Light fidelity  
Wireless fidelity

## *Radio frequency identification*

USE: Radiofrequency  
identification





# 2018 IEEE Thesaurus

## *Radio frequency integrated circuits*

USE: Radiofrequency integrated circuits

## *Radio frequency interference*

USE: Radiofrequency interference

## *Radio frequency power amplifiers*

USE: Power amplifiers

## *Radio interference*

USE: Electromagnetic interference

## **Radio interferometry**

UF: Radiowave interferometry

BT: Interferometry

## *Radio LAN*

USE: Wireless LAN

## **Radio link**

BT: Radio communication

RT: Transport protocols

## **Radio navigation**

UF: Loran

BT: Navigation

RT: Air traffic control  
Indoor navigation  
Satellite navigation systems  
Transponders

## **Radio networks**

BT: Radio broadcasting

## **Radio propagation**

BT: Electromagnetic propagation

RT: Fading channels  
Multipath channels  
Radio communication  
Radiowave propagation  
Rayleigh channels

## *Radio receivers*

USE: Receivers

## *Radio resource management*

USE: Resource management

## **Radio spectrum management**

UF: Frequency allocation

Spectrum management

BT: Radio communication

RT: Communication standards

NT: Direct sequence spread

spectrum communication

White spaces

## *Radio telescopes*

USE: Radio astronomy

## **Radio transceivers**

BT: Radio communication equipment

Transceivers

NT: Dynamic spectrum access

## **Radio transmitters**

BT: Transmitters

## *Radio-frequency*

USE: Radio frequency

## *Radio-frequency identification*

USE: Radiofrequency identification

## **Radioactive decay**

BT: Radioactive materials

## **Radioactive materials**

UF: Alphavoltaic power sources  
Betavoltaic power sources  
Radioisotopes

BT: Materials

RT: Isotopes

Neutrino sources

Occupational health

Occupational safety

Radioactive pollution

Safety

NT: Nuclear fuels

Radioactive decay

Radioactive waste

## **Radioactive pollution**

UF: Nuclear wastes

BT: Pollution

RT: Hazardous areas

Incineration

Industrial pollution

Land pollution

Radiation monitoring

Radiation protection

Radioactive materials

Radioactive waste



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# 2018 IEEE Thesaurus

Radioactive waste disposal	MMICs
Safety	Radiofrequency
Waste materials	identification
<b>Radioactive waste</b>	<b>Radiofrequency interference</b>
BT: Radioactive materials	UF: Radio frequency
Waste materials	interference
RT: Hazardous areas	BT: Electromagnetic
Hazardous materials	interference
Incineration	RT: Superconducting filters
Materials handling	<i>Radiofrequency micro-electro-mechanical systems</i>
Nuclear facility regulation	USE: Radiofrequency
Nuclear fuels	microelectromechanical systems
Radioactive pollution	<i>Radiofrequency micro-electromechanical systems</i>
Waste disposal	USE: Radiofrequency
Waste management	microelectromechanical systems
NT: Radioactive waste disposal	<b>Radiofrequency microelectromechanical systems</b>
<b>Radioactive waste disposal</b>	UF: RF micro-electro-mechanical systems
BT: Radioactive waste	RF microelectromechanical systems
Waste disposal	Radiofrequency micro-electro-mechanical systems
RT: Incineration	Radiofrequency micro-electromechanical systems
Materials handling	BT: Microelectromechanical systems
Radioactive pollution	<i>Radiofrequency power amplifiers</i>
Vitrification	USE: Power amplifiers AND
Waste handling	Radiofrequency amplifiers
<i>Radiofrequency</i>	<b>Radiographic image enhancement</b>
USE: Radio frequency	BT: Biomedical image processing
<b>Radiofrequency amplifiers</b>	<b>Radiography</b>
UF: Radiofrequency power amplifiers	BT: Imaging
BT: Amplifiers	RT: Biomedical applications of radiation
<b>Radiofrequency identification</b>	Medical diagnosis
UF: RFID	Nuclear imaging
Radio frequency	X-ray detection
identification	X-ray imaging
identification	NT: Diagnostic radiography
BT: Sensor systems and applications	<b>Radioisotope thermoelectric generators</b>
RT: Internet of Things	BT: Atomic batteries
Product codes	
Radiofrequency integrated circuits	
NT: RFID tags	
<b>Radiofrequency integrated circuits</b>	
UF: RFIC	
Radio frequency integrated circuits	
BT: Integrated circuits	
RT: MIMICs	



# 2018 IEEE Thesaurus

## *Radioisotopes*

USE: Radioactive materials

MOSFET circuits

Rail to rail inputs

Rail to rail outputs

## *Radiological protection*

USE: Radiation protection

## **Rail to rail inputs**

UF: RRI

BT: Rail to rail operation

RT: Nonlinear circuits

Rail to rail amplifiers

## **Radiology**

BT: Biomedical image

processing

NT: Neuroradiology

## **Rail to rail operation**

BT: Circuits

RT: Amplifiers

CMOSFET circuits

MODFET circuits

MOSFET circuits

NT: Rail to rail amplifiers

Rail to rail inputs

Rail to rail outputs

## **Radiometers**

BT: Meters

Radiometry

NT: Spectroradiometers

## **Radiometry**

BT: Electromagnetic

measurements

Geoscience and remote

sensing

RT: Imaging

Photometry

Remote sensing

Temperature measurement

NT: Microwave radiometry

Radiometers

## **Rail to rail outputs**

UF: RRO

BT: Rail to rail operation

RT: Nonlinear circuits

Rail to rail amplifiers

## *Radiowave interferometry*

USE: Radio interferometry

## *Rail traffic*

USE: Rail transportation

## **Radiowave propagation**

BT: Electromagnetic

propagation

RT: Radio propagation

## **Rail transportation**

UF: High speed rail

transportation

High-speed rail

transportation

Highspeed rail

transportation

Rail line

Rail lines

Rail traffic

Rail ways

Railways

BT: Land transportation

RT: Land vehicles

Magnetic levitation

Public transportation

NT:

Light rail systems

Positive train control

Railway communication

Railway electrification

## **Radium**

BT: Chemical elements

## **Radomes**

BT: Antenna accessories

## **Radon**

BT: Chemical elements

## *Rail line*

USE: Rail transportation

## *Rail lines*

USE: Rail transportation

## **Rail to rail amplifiers**

BT: Rail to rail operation

RT: Amplifiers

MODFET circuits

## *Rail ways*

USE: Rail transportation

## **Railguns**

BT: Electromagnetic launching



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# 2018 IEEE Thesaurus

	RT:	Rails		<i>Raleigh fading channels</i>	
<b>Rails</b>				USE:	Rayleigh channels
	BT:	Structural shapes		<i>RAM</i>	
	RT:	Flanges		USE:	Random access memory
		Railguns		<i>Raman effect</i>	
<b>Railway accidents</b>				USE:	Raman scattering
	UF:	Derailments		<b>Raman scattering</b>	
	BT:	Accidents		UF:	Raman effect
	RT:	Railway engineering			Raman spectroscopy
		Railway safety		BT:	Electromagnetic scattering
<i>Railway bridges</i>					Nonlinear optics
USE:		Structural panels		<i>Raman spectroscopy</i>	
<b>Railway communication</b>				USE:	Raman scattering
	BT:	Rail transportation		<i>RAN</i>	
		Telecommunications		USE:	Radio access networks
<b>Railway electrification</b>				AND	Regional area networks
	BT:	Rail transportation		<i>Random access communication</i>	
	RT:	Power overhead lines		USE:	Multiaccess communication
<b>Railway engineering</b>				<b>Random access memory</b>	
	BT:	Civil engineering		UF:	RAM
	RT:	Railway accidents			Random access storage
	NT:	Railway safety		BT:	Memory
<b>Railway safety</b>				NT:	DRAM chips
	BT:	Railway engineering			Phase change random
	RT:	Railway accidents		access memory	
		Safety devices			Resistive RAM
<i>Railways</i>					SDRAM
USE:		Rail transportation			SRAM cells
<b>Rain</b>					SRAM chips
	BT:	Meteorology		<i>Random access storage</i>	
	RT:	Floods		USE:	Random access memory
		Monsoons		<b>Random media</b>	
<i>Rain fades</i>				UF:	Turbulent media
USE:		Rain fading		BT:	Media
<b>Rain fading</b>				RT:	Chaos
	UF:	Rain fades			Nonhomogeneous media
	BT:	Interference		<b>Random number generation</b>	
<b>RAKE receivers</b>				BT:	Cryptography
	BT:	Receivers		RT:	Random sequences
	RT:	Signal to noise ratio			Stochastic processes
<i>Raleigh fading</i>					White noise
USE:		Rayleigh channels		<b>Random processes</b>	



# 2018 IEEE Thesaurus

BT: Mathematics  
 RT: Algorithms  
 Probability  
 Signal processing  
 Statistical analysis  
 Time series analysis  
 NT: Brownian motion

## Random sequences

UF: Pseudorandom sequences  
 BT: Sequences  
 RT: Cryptography  
 Random number

generation

## Random variables

BT: Probability  
 RT: Stochastic processes  
 Stochastic systems

*Ranging*

USE: Distance measurement

## Ranking (statistics)

BT: Statistics  
 RT: Information retrieval  
 Ontologies  
 Search methods  
 Semantic Web  
 Vocabulary

*Ransomware*

USE: Malware

## Rapid prototyping

BT: Prototypes  
 RT: CAD/CAM  
 Design methodology  
 Manufacturing processes  
 Product development  
 Software engineering  
 Three-dimensional printing  
 Virtual prototyping

## Rapid thermal annealing

BT: Annealing  
 RT: Semiconductor devices

## Rapid thermal processing

BT: High-temperature  
 techniques  
 RT: Heating systems

## Rare earth metals

BT: Metals

*Rate distortion*

USE: Rate-distortion

## Rate distortion theory

BT: Information theory  
 RT: Audio coding  
 Channel coding  
 Channel spacing  
 Distortion  
 Image coding  
 Signal analysis  
 Signal processing  
 Source coding  
 Speech coding  
 Video coding  
 NT: Channel rate control

## Rate-distortion

UF: Rate distortion  
 BT: Information theory  
 RT: Data compression

*Ratemeters*

USE: Radiation detectors

## Rats

BT: Animals

## Raw materials

BT: Materials  
 RT: Mining industry

## Ray tracing

UF: Ray-tracing  
 BT: Geometrical optics  
 Optics  
 RT: Computer graphics  
 Stray light

*Ray-tracing*

USE: Ray tracing

## Rayleigh channels

UF: Raleigh fading  
 Raleigh fading channels  
 Rayleigh-fading  
 BT: Fading channels  
 RT: Radio propagation

## Rayleigh scattering

BT: Electromagnetic scattering

*Rayleigh-Benard convection*

USE: Convection



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# 2018 IEEE Thesaurus

## *Rayleigh-fading*

USE: Rayleigh channels

## *RBF networks*

USE: Radial basis function networks

## *RDF*

USE: Resource description framework

## *Re-configurable devices*

USE: Reconfigurable devices

## **Reachability analysis**

BT: Graph theory

## **Reactive power**

UF: Power factor  
VAR  
BT: Power systems  
RT: Reactive power control  
Static VAR compensators

## **Reactive power control**

BT: Electric variables control  
RT: Power system security  
Reactive power  
Voltage control

## **Reactor instrumentation**

BT: Nuclear and plasma sciences  
RT: Radiation monitoring

## *Reactors*

USE: Inductors

## **Read only memory**

UF: ROM  
BT: Memory  
RT: Read-write memory  
NT: PROM

## **Read-write memory**

BT: Memory  
RT: Read only memory

## *Readability formulas*

USE: Readability metrics

## **Readability metrics**

UF: Readability formulas  
Readability tests

BT: Writing

## *Readability tests*

USE: Readability metrics

## **Readout electronics**

BT: Displays  
RT: Detectors  
SQUIDs

## *Real time*

USE: Real-time systems

## *Real time control*

USE: Real-time systems

## *Real time monitoring*

USE: Real-time systems

## *Real time processing*

USE: Real-time systems

## *Real time systems*

USE: Real-time systems

## *Real-time control*

USE: Real-time systems

## *Real-time monitoring*

USE: Real-time systems

## *Real-time processing*

USE: Real-time systems

## **Real-time systems**

UF: Real time  
Real time control  
Real time monitoring  
Real time processing  
Real time systems  
Real-time control  
Real-time monitoring  
Real-time processing  
Computers and information processing

BT: Control systems  
Hardware-in-the loop

## simulation

High energy physics  
instrumentation computing  
Networked control systems  
NT: Telexistence  
WebRTC

## *Reasoning*



# 2018 IEEE Thesaurus

USE: Cognition AND  
Cognitive systems

## Reasoning about programs

UF: Type interference  
BT: Software engineering

## Rebreathers

USE: Rebreathing equipment

## Rebreathing equipment

UF: Rebreathers  
BT: Underwater equipment

## Receive antennas

USE: Receiving antennas

## Received signal strength indicator

UF: RSSI  
BT: Communication system

## signaling

Signal processing

## Receivers

UF: Radio receivers  
BT: Communication equipment  
RT: Demodulation  
Signal detection  
NT: Optical receivers  
RAKE receivers  
Receiving antennas

## Receiving antennas

UF: Receive antennas  
BT: Antennas  
Receivers  
RT: Spatial diversity  
Transmitting antennas

## Receptor (biochemistry)

BT: Biochemistry

## Recommender systems

UF: Music recommendation  
BT: Information filtering

## Reconfigurable architectures

BT: Computer architecture

## Reconfigurable devices

UF: Re-configurable devices  
BT: Hardware  
RT: Field programmable gate

## arrays

## Reconfigurable logic

BT: Logic design

## Reconfigurable radio

USE: Software radio

## Reconnaissance

BT: Military communication  
Security  
RT: Remote sensing  
Surveillance

## Reconstruction algorithm

USE: Reconstruction algorithms

## Reconstruction algorithms

UF: Reconstruction algorithm  
Reconstruction methods  
BT: Tomography

## Reconstruction methods

USE: Reconstruction algorithms

## Recording

BT: Signal processing  
RT: Memory  
NT: Audio recording  
Digital recording  
Disk recording  
Magnetic recording  
Optical recording  
Video recording

## Recruitment

BT: Human resource  
management  
RT: Equal opportunities  
Job specification  
Labor resources

## Rectangular waveguides

BT: Electromagnetic  
waveguides  
RT: Planar waveguides

## Rectennas

BT: Antennas  
Microwave communication

## Rectifiers

BT: Circuits  
RT: Bridge circuits  
Power electronics  
Voltage multipliers



# 2018 IEEE Thesaurus

## Rectifying circuits

BT: AC-DC power converters

## Recurrent neural nets

USE: Recurrent neural networks

## Recurrent neural networks

UF: RNN  
Recurrent neural nets  
BT: Neural networks  
NT: Hopfield neural networks

## Recursive estimation

BT: Bayes methods  
RT: Least squares

approximation

## Recycle

USE: Recycling

## Recycling

UF: Recycle  
BT: Environmental

management

## Red blood cells

BT: Blood

## Reduced instruction set computing

UF: RISC  
BT: Instruction sets

## Reduced order model

USE: Reduced order systems

## Reduced order systems

UF: Model reduction  
Reduced order model  
Reduced-order model  
Reduced-order systems  
BT: Systems engineering and  
theory  
RT: Estimation  
Simulation

## Reduced-order model

USE: Reduced order systems

## Reduced-order systems

USE: Reduced order systems

## Redundancy

BT: Fault tolerance  
RT: Codes  
Reliability

## Redundancy (employment)

USE: Termination of employment

## Reed Solomon codes

USE: Reed-Solomon codes

## Reed-Solomon codes

UF: Reed Solomon codes  
BT: Error correction codes

## Refining

BT: Materials processing  
RT: Chemical technology  
Cleaning  
Purification  
Smelting  
Sugar refining

## Reflectance

USE: Reflectivity

## Reflection

BT: Propagation  
RT: Mirrors  
Scattering  
NT: Acoustic reflection  
Backscatter  
Electromagnetic reflection  
Fresnel reflection  
Radar cross-sections

## Reflection coefficient

BT: Optical variables  
measurement  
Waveguide discontinuities  
RT: Amplitude estimation

## Reflective binary codes

UF: Gray codes  
Grey codes  
BT: Binary codes

## Reflectivity

UF: Reflectance  
BT: Waves  
RT: Geometrical optics  
Light trapping  
Optical reflection  
Sonar detection  
Telecommunications

## Reflectometry

BT: Measurement





# 2018 IEEE Thesaurus

RT: measurements	Electromagnetic	BT: Tissue engineering	
	Electromagnetic reflection	<b>Regional area networks</b>	
	Optical reflection	UF: RAN	
measurement	Optical variables	BT: Communication systems	
<b>Reflector antennas</b>		RT: IEEE 802.22 Standard	
BT: Antennas		Local area networks	
RT: Aperture antennas		Metropolitan area networks	
Radio astronomy		Wireless communication	
<b>Reflow soldering</b>		NT: WRAN	
BT: Soldering		<b>Registers</b>	
<b>Refractive index</b>		BT: Memory	
UF: Refractivity		NT: Shift registers	
BT: Optical variables		<b>Regression analysis</b>	
measurement		BT: Statistical analysis	
RT: Birefringence		RT: Correlation coefficient	
Dispersion		Econometrics	
Gain measurement		Nearest neighbor methods	
Laser beams		NT: Linear regression	
Metamaterials		Multivariate regression	
Optical refraction		<b>Regression tree analysis</b>	
Photorefractive effect		BT: Decision trees	
Semiconductor device		<b>Regulators</b>	
measurement	Semiconductor lasers	BT: Control equipment	
<i>Refractivity</i>		RT: Current control	
USE: Refractive index		Electric variables control	
<i>Refracting</i>		Power conversion	
USE: Code refracting		Voltage control	
<b>Refrigerants</b>		<b>Rehabilitation robotics</b>	
BT: Coolants		UF: Assistive robotics	
RT: Heat pumps		BT: Medical robotics	
Space cooling		RT: Patient rehabilitation	
<b>Refrigeration</b>		<i>Reinforcement learning</i>	
BT: Cooling		USE: Learning (artificial intelligence)	
<b>Refrigerators</b>		<b>Relational databases</b>	
BT: Home appliances		BT: Databases	
Home automation		RT: Structured Query Language	
<i>Refuse</i>		Triples (Data structure)	
USE: Waste materials		<b>Relativistic effects</b>	
<i>Refuse incineration</i>		BT: Nuclear physics	
USE: Incineration		RT: Electron beams	
<b>Regeneration engineering</b>		Free electron lasers	
		Klystrons	
		Magnetrons	
		Masers	
		Plasmas	



# 2018 IEEE Thesaurus

NT:	Optical flow		Semiconductor device
<b>Relativistic quantum mechanics</b>		reliability	Software reliability
BT:	Quantum mechanics		Stability
<b>Relaxation methods</b>			Telecommunication
BT:	Numerical analysis	network reliability	
RT:	Simulated annealing	<b>Reliability engineering</b>	
<b>Relaxor ferroelectrics</b>		BT:	Reliability
BT:	Ferroelectric materials	RT:	Weibull distribution
<b>Relay networks (telecommunications)</b>		<i>Reliability management</i>	
BT:	Communication networks	USE:	Management AND
	Relays		Reliability
<b>Relays</b>		<b>Reliability theory</b>	
BT:	Switchgear	BT:	Reliability
RT:	Switching circuits	<b>Reluctance generators</b>	
NT:	Digital relays	BT:	Synchronous generators
	Microrelays	<b>Reluctance machines</b>	
	Power system relaying	BT:	Rotating machines
	Protective relaying		Synchronous machines
	Relay networks	NT:	Reluctance motors
(telecommunications)		<b>Reluctance motors</b>	
<b>Reliability</b>		BT:	Reluctance machines
UF:	Reliability management		Synchronous motors
	System reliability	NT:	Switched reluctance motors
RT:	Aging	<b>Remaining life assessment</b>	
	Dependability management	BT:	Testing
	Electron traps	RT:	Failure analysis
	Failure analysis		Maintenance engineering
	Life testing	<b>Remanence</b>	
	Power system reliability	BT:	Magnetics
	Preventive maintenance	RT:	Magnetic fields
	Quality control		Magnetic flux
	Quality management		Magnetic hysteresis
	Redundancy		Permanent magnets
	Risk analysis	<b>Remote handling</b>	
	System improvement	UF:	Manipulators (nonrobotic)
	System recovery	BT:	Materials handling
	Thermal management	RT:	Remote handling
NT:	Availability	equipment	Telecontrol equipment
	Fault diagnosis	<b>Remote handling equipment</b>	
	Fault tolerance	BT:	Materials handling
	Fluctuations	equipment	
	Integrated circuit reliability	RT:	Remote handling
	Maintenance		Telerobotics
	Maldistribution		
	Materials reliability		
	Reliability engineering		
	Reliability theory		
	Robustness		



# 2018 IEEE Thesaurus

Waste handling equipment

USE: Unmanned vehicles

## Remote laboratories

BT: Laboratories

## Remote monitoring

BT: Monitoring  
Remote sensing  
RT: Machine-to-machine

communications

## Remote sensing

BT: Geoscience and remote  
sensing

RT: Atmospheric  
measurements

techniques

Earth  
Geologic measurements  
Geophysical measurement

Geophysical measurements  
Imaging  
Infrared imaging  
Land surface temperature  
Landmine detection  
Meteorology  
Microwave imaging  
Oceanographic techniques  
Optical imaging  
Radar imaging  
Radar measurements  
Radiometry  
Reconnaissance  
Sea measurements  
Soil measurements  
Sonar measurements  
Surveillance  
Terrain mapping  
Vegetation mapping  
Water resources  
NT: Hyperspectral sensors  
Passive microwave remote

sensing

Remote monitoring

## Remotely guided vehicles

USE: Unmanned vehicles

## Remotely operated automobiles

USE: Unmanned vehicles

## Remotely operated cars

USE: Unmanned vehicles

## Remotely operated vehicles

## Remuneration

BT: Human resource  
management  
RT: Employee welfare  
NT: Incentive schemes  
Pensions

## Renal calculi

USE: Kidney stones

## Rendering (computer graphics)

BT: Computer graphics

## Renewable energy

USE: Renewable energy sources

## Renewable energy resources

USE: Renewable energy sources

## Renewable energy sources

UF: Renewable energy  
Renewable energy

resources

BT: Renewable-energy  
Energy conservation  
Environmental

management

RT: Wave power  
NT: Biomass

## Renewable-energy

USE: Renewable energy sources

## Repair

USE: Maintenance engineering

## Repeaters

UF: Optical regenerators  
BT: Communication equipment

## Replica molding

USE: Soft lithography

## Replica moulding

USE: Soft lithography

## Report writing

USE: Writing

## Representational state transfer

BT: Software architecture

## Reproducibility of results



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# 2018 IEEE Thesaurus

UF:	Reproducible research	Engineering profession
BT:	Biomedical measurement	Production management
	Measurement	Project management
		Research and development
<i>Reproducible research</i>		Technology management
USE:	Reproducibility of results	Venture capital
		NT: Innovation management
<i>Reproductive cloning</i>		
USE:	Cloning	
<b>Requirements engineering</b>		<b>Research initiatives</b>
BT:	Systems engineering and	BT: Engineering management
theory		<b>Reservoirs</b>
RT:	Product design	BT: Water resources
	Project management	Water storage
	Requirements management	RT: Lakes
	Software engineering	Land use planning
	Stakeholders	Water
NT:	Technical requirements	
<b>Requirements management</b>		<i>Residual stress</i>
BT:	Management	USE: Residual stresses
	Systems engineering and	
theory		<b>Residual stresses</b>
RT:	Project management	UF: Residual stress
	Requirements engineering	BT: Stress
<i>ReRAM</i>		<b>Resilience</b>
USE:	Resistive RAM	UF: Resiliency
		Resilient systems
		BT: Material properties
<b>Rescue robots</b>		<i>Resiliency</i>
BT:	Robots	USE: Resilience
RT:	Emergency services	
	Hazards	<i>Resilient systems</i>
		USE: Resilience
<b>Research and development</b>		<i>Resin transfer molding</i>
BT:	Engineering - general	USE: Transfer molding
RT:	Electrical engineering	
	Engineering profession	<i>Resin transfer moulding</i>
	Industrial engineering	USE: Transfer molding
	International collaboration	
	Laboratories	<b>Resins</b>
	Research and development	BT: Materials
management		RT: Plastics
	Reverse engineering	
	Science - general	NT: Polymer foams
	Technology	Epoxy resins
	Virtual enterprises	
	Virtual manufacturing	<b>Resistance</b>
	Virtual prototyping	BT: Electric variables
		RT: Electrical resistance
<b>Research and development management</b>		measurement
BT:	Engineering management	Resistance heating
	Management	Skin effect
RT:	Concurrent engineering	NT: Electric resistance



# 2018 IEEE Thesaurus

Piezoresistance	Stochastic resonance
Surface resistance	
Thermal resistance	<i>Resonance frequency</i>
Viscosity	USE: Resonant frequency
<b>Resistance heating</b>	<b>Resonance light scattering</b>
UF: Electric heating	BT: Resonance
BT: Heating systems	Spectroscopy
RT: Resistance	RT: Light scattering
<b>Resistive RAM</b>	<i>Resonant circuits</i>
UF: RRAM	USE: RLC circuits
ReRAM	
BT: Random access memory	<b>Resonant converters</b>
RT: Memristors	BT: Converters
Phase change memory	
<b>Resistive transducers</b>	<b>Resonant frequency</b>
BT: Transducers	UF: Resonance frequency
	BT: Frequency
<i>Resistivity</i>	RT: Oscillators
USE: Conductivity	Quantum mechanics
	NT: Magnetic resonance
<i>Resistivity measurement</i>	<b>Resonant inverters</b>
USE: Conductivity measurement	UF: Quasi-resonant inverters
<b>Resistors</b>	Quasi-resonant invertors
BT: Electronic components	Resonant invertors
RT: Electrical ballasts	BT: Inverters
Potentiometers	RT: Power electronics
NT: Memristors	Resonance
Switched capacitor	<i>Resonant invertors</i>
networks	USE: Resonant inverters
Varistors	
<b>Resists</b>	<b>Resonant tunneling devices</b>
UF: Photoresists	UF: Resonant tunnelling
BT: Materials	devices
	Resonant-tunneling devices
<b>Resonance</b>	Resonant-tunnelling
RT: Cavity resonators	devices
Dielectric resonator	BT: Tunneling
antennas	RT: Quantum well devices
	Resonance
Film bulk acoustic	Single electron devices
resonators	
Microstrip resonators	<i>Resonant tunnelling devices</i>
Optical resonators	USE: Resonant tunneling devices
Resonant inverters	
Resonant tunneling devices	<i>Resonant-tunneling devices</i>
Resonator filters	USE: Resonant tunneling devices
Resonators	
Vibrations	<i>Resonant-tunnelling devices</i>
NT: Ferroresonance	USE: Resonant tunneling devices
Magnetic resonance	
Resonance light scattering	<b>Resonator filters</b>



# 2018 IEEE Thesaurus

BT: Filters  
RT: Resonance

## Resonators

BT: Amplifiers  
RT: Acoustics  
Resonance  
Tuners  
NT: Cavity resonators

## Resource allocation

USE: Resource management

## Resource description framework

UF: RDF  
BT: Semantic Web

## Resource distribution

USE: Resource management

## Resource management

UF: Allocation  
Radio resource  
management  
Resource allocation  
Resource distribution  
Resource sharing  
Resource utilisation  
Resource utilization  
Resources management  
BT: Management  
RT: Business process  
integration  
Business process  
management  
Environmental engineering  
Forestry  
Operations research  
System integration  
NT: Elastic computing  
Network resource  
management  
Resource virtualization

## Resource sharing

USE: Resource management

## Resource utilisation

USE: Resource management

## Resource utilization

USE: Resource management

## Resource virtualization

BT: Resource management

## Resources management

USE: Resource management

## Respiratory system

UF: Asthma  
Bronchi  
BT: Anatomy  
NT: Larynx  
Lung

## Response surface methodology

BT: Surface fitting  
RT: Optimization methods

## Resumes

BT: Writing

## Retail price index

USE: Economic indicators

## Retardants

BT: Production materials  
RT: Inhibitors  
NT: Flame retardants

## Retina

UF: Retinal  
BT: Eyes  
NT: Retinal vessels

## Retinal

USE: Retina

## Retinal vessels

BT: Retina

## Retinopathy

BT: Diseases

## Retirement

BT: Human resource  
management

## Reverberation

BT: Acoustics

## Reverberation chambers

BT: Electromagnetic  
compatibility

## Reverse engineering

BT: Engineering - general  
RT: Product development  
Research and development



# 2018 IEEE Thesaurus

## Reverse logistics

BT: Logistics

## Reverse osmosis

BT: Chemical processes

RT: Desalination

## Reverse teaching

USE: Education AND  
Online services

## Reviews

BT: Writing

## RF

USE: Radio frequency

## RF interference

USE: Electromagnetic  
interference

## RF micro-electro-mechanical systems

USE: Radiofrequency  
microelectromechanical systems

## RF microelectromechanical systems

USE: Radiofrequency  
microelectromechanical systems

## RF signals

BT: Signal processing

## RFIC

USE: Radiofrequency integrated  
circuits

## RFID

USE: Radiofrequency  
identification

## RFID tags

BT: Radiofrequency  
identification

NT: Active RFID tags  
Passive RFID tags

## Rhenium

BT: Chemical elements

## Rheology

BT: Fluid dynamics  
RT: Viscosity

## Rhetoric

BT: Professional  
communication

## Rhodium

BT: Chemical elements

## Rhombencephalon

USE: Hindbrain

## Rhythm

BT: Music

## Ribonucleic acid

USE: RNA

## Ribs

BT: Thorax

## Riccati equations

BT: Equations

## Rician channels

UF: Rician fading  
Rician fading channels  
BT: MIMO communication

## Rician fading

USE: Rician channels

## Rician fading channels

USE: Rician channels

## Ring generators

BT: Automatic testing  
Testing

## Ring lasers

BT: Lasers  
RT: Gyroscopes  
NT: Fiber lasers

## Ring oscillators

BT: Oscillators

## Ring resonators

USE: Optical ring resonators

## RISC

USE: Reduced instruction set  
computing

## Risk analysis

BT: Management  
RT: Accident prevention  
Accidents



# 2018 IEEE Thesaurus

	Decision making	USE:	Recurrent neural networks
	Occupational health		
	Occupational safety	<b>Road accidents</b>	
	Reliability	BT:	Accidents
	Safety	RT:	Road safety
	Technology social factors		Road vehicles
	Venture capital		
NT:	Fault trees	<i>Road bridges</i>	
	Risk management	USE:	Structural panels
<i>Risk assessment</i>		<b>Road safety</b>	
USE:	Risk management	BT:	Roads
		RT:	Automated highways
<i>Risk handling</i>			Automotive engineering
USE:	Risk management		Road accidents
<b>Risk management</b>		<b>Road transportation</b>	
UF:	Risk mitigation	UF:	Highways
	Risk assessment	BT:	Land transportation
	Risk handling	RT:	Civil engineering
	Risk minimization		Global Positioning System
	Risk reduction	NT:	Roads
BT:	Risk analysis		Traffic congestion
RT:	Contract management		
<i>Risk minimization</i>		<b>Road vehicles</b>	
USE:	Risk management	BT:	Land vehicles
		RT:	Road accidents
<i>Risk mitigation</i>			Roads
USE:	Risk management	NT:	Automobiles
			Motorcycles
<i>Risk reduction</i>		<b>ROADMS</b>	
USE:	Risk management	USE:	Optical add-drop
			multiplexers
<b>Rivers</b>		<b>Roads</b>	
BT:	Geoscience	BT:	Road transportation
RT:	Floods	RT:	Civil engineering
	Lakes		Road vehicles
	Sediments	NT:	Road safety
	Water		
	Water pollution	<b>Roaming</b>	
	Water resources	BT:	Wireless communication
	Wetlands	RT:	Dual band
			GSM
<b>RLC circuits</b>		<i>Robot automobiles</i>	
UF:	Resonant circuits	USE:	Autonomous automobiles
BT:	Circuits		
	Tunable circuits and	<i>Robot cars</i>	
devices		USE:	Autonomous automobiles
<b>RNA</b>			
UF:	Ribonucleic acid	<b>Robot control</b>	
BT:	Biological cells	UF:	Robotic control
		BT:	Control systems
<i>RNN</i>			





# 2018 IEEE Thesaurus

	Robots		Imaging
RT:	Force control		Intelligent robots
	Motion planning		Object detection
	Trajectory tracking		Object recognition
NT:	Robot motion		Pattern recognition
			Stereo vision
<b>Robot kinematics</b>		NT:	Visual servoing
BT:	Robots		
NT:	Motion analysis	<i>Robot-assisted surgery</i>	
		USE:	Surgery
<b>Robot learning</b>		<b>Robotic assembly</b>	
BT:	Machine learning	UF:	Assembly robots
	Robots	BT:	Assembly systems
RT:	Artificial intelligence	RT:	Robotics and automation
<b>Robot localization</b>		<i>Robotic control</i>	
BT:	Motion analysis	USE:	Robot control
RT:	Robot sensing systems		
<b>Robot motion</b>		<i>Robotic motion</i>	
UF:	Robotic motion	USE:	Robot motion
BT:	Robot control		
<i>Robot operating systems</i>		<i>Robotic programming</i>	
USE:	Operating systems	USE:	Robot programming
<b>Robot programming</b>		<b>Robotics and automation</b>	
UF:	Robotic programming	RT:	Image motion analysis
BT:	Programming		Robotic assembly
	Robots	NT:	Animatronics
			Automation
			Autonomous systems
			Multi-robot systems
			Robots
<b>Robot sensing systems</b>		<b>Robots</b>	
UF:	Manipulator sensing	BT:	Robotics and automation
systems		RT:	Assembly systems
	Mobile robot sensing		Botnet
systems			Control equipment
	Robot sensor networks		Control systems
BT:	Robots		Cybernetics
	Sensor systems and		Industrial control
applications			Manufacturing automation
RT:	Multisensor systems		Materials handling
	Robot localization		Mechanical variables
NT:	Robot vision systems		
	Simultaneous localization		
and mapping		control	
	Tactile sensors		
<i>Robot sensor networks</i>			Mechatronics
USE:	Robot sensing systems		Nonlinear systems
			Servosystems
<b>Robot vision systems</b>		NT:	Androids
UF:	Manipulator vision systems		Aquatic robots
	Mobile robot vision systems		Automata
BT:	Robot sensing systems		Autonomous robots
RT:	Image sensors		Cognitive robotics
			Computer vision



# 2018 IEEE Thesaurus

Educational robots  
Evolutionary robotics  
Humanoid robots  
Intelligent robots  
Manipulators  
Medical robotics  
Mobile robots  
Orbital robotics  
Parallel robots  
Rescue robots  
Robot control  
Robot kinematics  
Robot learning  
Robot programming  
Robot sensing systems  
Service robots  
Soft robotics  
Telerobotics  
Visual odometry

## Robust control

UF: Active disturbance rejection  
control  
BT: System analysis and design  
RT: Disturbance observers

## Robust stability

BT: Stability

## Robustness

BT: Reliability  
RT: Control systems  
Sensitivity  
Stability  
Uncertain systems

## Rockets

BT: Propulsion  
RT: Engines  
Ground support

## Rocks

BT: Geology

## Rodents

BT: Animals

## Roentgenium

BT: Chemical elements

## Role transfer

BT: Organizational aspects

## Roller bearings

USE: Rolling bearings

## Rolling bearings

UF: Roller bearings  
Rolling contact bearings  
Rolling element bearings  
BT: Mechanical bearings  
RT: Ball bearings

## Rolling contact bearings

USE: Rolling bearings

## Rolling element bearings

USE: Rolling bearings

## ROM

USE: Read only memory

## Roof mounted photovoltaics

USE: Building integrated photovoltaics

## Roof mounted solar cell arrays

USE: Building integrated photovoltaics

## Root mean square

UF: Root mean square error  
Root mean square value  
BT: Mathematics  
Statistics

## Root mean square error

USE: Root mean square

## Root mean square value

USE: Root mean square

## Roots

USE: Poles and zeros

## Rotating machines

BT: Electric machines  
RT: Brushes  
Coils  
DC generators  
Synchronous motors  
Windings  
NT: Generators  
Hysteresis motors  
Induction machines  
Induction motors  
Micromotors  
Permanent magnet

## machines

Reluctance machines



# 2018 IEEE Thesaurus

	Servomotors		Wireless access points
	Standby generators		
<b>Rotation measurement</b>		<i>RPI</i>	USE: Economic indicators
UF: Rotation representation			
BT: Mechanical variables		<i>RRAM</i>	USE: Resistive RAM
measurement			
<i>Rotation representation</i>		<i>RRI</i>	USE: Rail to rail inputs
USE: Rotation measurement			
<i>Rotational measurement</i>		<i>RRO</i>	USE: Rail to rail outputs
USE: Velocity control			
<i>Rotational speed</i>		<i>RSSI</i>	USE: Received signal strength
USE: Velocity control		indicator	
<b>Rotors</b>		<b>Rubber</b>	
BT: Electric machines		BT: Insulators	
Machine components		RT: Rubber industry	
		Rubber products	
<b>Rough sets</b>			
BT: Set theory		<b>Rubber industry</b>	
		BT: Manufacturing industries	
<b>Rough surfaces</b>		RT: Chemical industry	
BT: Surfaces		Rubber	
RT: Polishing machines		Rubber products	
Surface roughness			
Terrain factors		<b>Rubber products</b>	
NT: Corrugated surfaces		BT: Manufactured products	
		RT: Hoses	
<b>Round robin</b>		Rubber	
BT: Scheduling algorithms		Rubber industry	
		Wastewater treatment	
<b>Roundoff errors</b>		NT: Tires	
BT: Finite wordlength effects			
RT: Error analysis		<b>Rubidium</b>	
Noise		BT: Chemical elements	
<b>Routing</b>			
BT: Communication systems		<i>Rule based systems</i>	
RT: Multicast communication		USE: Knowledge based systems	
Routing protocols			
Soft switching		<b>Runtime</b>	
NT: Wavelength routing		BT: Software engineering	
		RT: Programming	
<b>Routing protocols</b>		NT: Dynamic compiler	
BT: Protocols		Runtime environment	
RT: Internet			
Land mobile radio		<b>Runtime environment</b>	
Mobile communication		BT: Runtime	
Multicast protocols			
Multiprotocol label		<b>Runtime library</b>	
switching		BT: Formal languages	
	Routing		



# 2018 IEEE Thesaurus

## Rural areas

BT: Geography  
RT: Macrocell networks  
Public infrastructure

Railway safety  
Smoke detectors  
NT: Eye protection  
Protective clothing

## Ruthenium

BT: Chemical elements

## Safety in the home

USE: Domestic safety

## S parameters

USE: Scattering parameters

## Safety management

BT: Management  
Safety  
RT: Dependability management

## S-parameters

USE: Scattering parameters

## Sagnac interferometers

BT: Interferometry

## S/N

USE: Signal to noise ratio

## Sales promotion

USE: Promotion - marketing

## SaaS

USE: Software as a service

## Saliency detection

BT: Image processing  
RT: Feature extraction  
Visual systems

## Safety

BT: Industry applications  
Product safety engineering  
RT: Alarm systems  
Electric shock  
Environmental factors  
Explosions  
Eye protection  
Fires  
Hazardous areas  
Occupational health  
Preventive maintenance  
Protective clothing  
Radiation effects  
Radioactive materials  
Radioactive pollution  
Risk analysis  
NT: Aerospace safety  
Domestic safety  
Emergency services  
Explosion protection  
Hazards  
Health and safety  
Marine safety  
Product safety  
Protection  
Radiation safety  
Safety devices  
Safety management  
Vehicle safety

## Salinity (geophysical)

BT: Soil measurements  
RT: Geochemistry  
Ocean salinity  
Sea measurements  
Sea surface salinity

## Salivary glands

UF: Parotid  
BT: Glands  
Stomatognathic system

## Samarium

BT: Metals  
NT: Samarium alloys

## Samarium alloys

BT: Samarium

## Sampled data circuits

BT: Circuits

## Sampled data systems

BT: Discrete-time systems

## Sampling methods

BT: Statistics  
RT: Signal sampling  
NT: Compressed sensing  
Nonuniform sampling

## Safety devices

BT: Safety  
RT: Accident prevention  
Alarm systems



# 2018 IEEE Thesaurus

## **SAN**

USE: Storage area networks

## **Sandblasting**

BT: Surface treatment  
RT: Surface roughness

## **Sandwich structures**

BT: Structural shapes  
RT: Honeycomb structures  
Lightweight structures  
Sheet materials  
Structural panels  
Thin wall structures

## **Sanitary engineering**

BT: Engineering - general  
RT: Environmental  
management

Sewage treatment  
Waste disposal  
Waste management  
Waste materials  
Wastewater  
Wastewater treatment  
Water pollution

## **SAR**

USE: Specific absorption rate

## **AND**

Synthetic aperture radar

## **SAR imaging**

USE: Radar polarimetry

## **SAS**

USE: Synthetic aperture sonar

## **Satellite antennas**

BT: Antennas

## **Satellite born radar**

USE: Spaceborne radar

## **Satellite borne radar**

USE: Spaceborne radar

## **Satellite broadcasting**

UF: DBS  
Direct broadcast satellites  
Satellite broadcasts  
BT: Broadcasting  
Satellite communication  
RT: Global Positioning System

## **Satellite broadcasts**

USE: Satellite broadcasting

## **Satellite communication**

UF: Communication satellites  
BT: Communication systems  
Radio communication  
RT: Artificial satellites  
Convolutional codes  
Global Positioning System  
Handover  
Radiation hardening

(electronics)

Transponders  
NT: Downlink  
Satellite broadcasting  
Satellite ground stations  
Uplink

## **Satellite constellations**

BT: Satellite navigation systems

## **Satellite ground stations**

BT: Communication systems  
Radio communication  
Satellite communication  
RT: Communication equipment

## **Satellite navigation systems**

BT: Navigation  
RT: Radio navigation  
Time dissemination  
NT: Global Positioning System  
Global navigation satellite

system

Satellite constellations

## **Satellites**

BT: Solar system  
RT: Artificial satellites  
NT: Moon

## **Saturation detection**

USE: Feedback

## **Saturation magnetisation**

USE: Saturation magnetization

## **Saturation magnetization**

UF: Saturation magnetisation  
BT: Magnetization processes

## **Saturn**

BT: Planets



# 2018 IEEE Thesaurus

## SAW filters

BT: Electromechanical devices

RT: Reflection

Scattering parameters

NT: Acoustic scattering

## Sawing

BT: Machining

RT: Sawing machines

Brillouin scattering

Electromagnetic scattering

Light scattering

Particle scattering

## Sawing machines

BT: Machine tools

RT: Sawing

## Scattering parameters

UF: S parameters

S-parameters

BT: System analysis and design

RT: Circuits

Scattering

## SCADA systems

UF: Supervisory control and data acquisition systems

Supervisory control and data-acquisition systems

BT: Control systems

Power system control

Supervisory control

RT: Substation automation

## Scatternets

USE: Personal area networks

## Scene analysis

USE: Image analysis

## Scalability

BT: System analysis and design

## Scene classification

USE: Image analysis

## Scalp

BT: Head

## Schedules

BT: Planning

RT: Scheduling

## Scandium

BT: Chemical elements

## Scheduling

BT: Organizational aspects

Production control

Project engineering

RT: Materials requirements

## Scanning electron microscopy

UF: SEM

BT: Electron microscopy

RT: Electron beam applications

Particle scattering

planning

Queueing analysis

Schedules

Statistics

Synchronization

NT: Adaptive scheduling

Dynamic scheduling

Job shop scheduling

Single machine scheduling

## Scanning microwave microscopy

BT: Microscopy

RT: Atomic force microscopy

## Scanning probe data storage

BT: Memory

## Scanning probe microscopy

BT: Microscopy

NT: Scanning thermal

microscopy

## Scheduling algorithms

BT: Optical fiber communication

Processor scheduling

NT: Round robin

## Scanning thermal microscopy

BT: Scanning probe microscopy

## Scholarships

BT: Educational programs

## Scattering

UF: Backscattering

Wave scattering

BT: Propagation

## Schools

USE: Educational institutions

## Schottky barriers



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# 2018 IEEE Thesaurus

UF: Schottky contacts  
BT: Semiconductor-metal  
interfaces  
RT: MESFETs  
Schottky diodes

## *Schottky contacts*

USE: Schottky barriers

## *Schottky diode*

USE: Schottky diodes

## **Schottky diodes**

UF: Schottky diode  
BT: Semiconductor devices  
Semiconductor diodes  
RT: Schottky barriers  
Semiconductor-metal

interfaces

## *Schottky FETs*

USE: MESFETs

## *Schottky gate FET*

USE: Schottky gate field effect  
transistors

## **Schottky gate field effect transistors**

UF: Schottky gate FET  
BT: Field effect transistors

## **Schrodinger equation**

BT: Quantum mechanics  
RT: Electrons

## **Science - general**

RT: Econophysics  
Neurophysiology  
Research and development  
STEM  
NT: Astronomy  
Biology  
Chemistry  
Electricity  
Geoscience  
History  
Life sciences  
Metrology  
Neuroscience  
Physics  
Sociology  
Thermodynamics

*science technology engineering and math*

USE: STEM

*Science technology engineering mathematics*

USE: STEM

*science, technology, engineering, and math*

USE: STEM

## **Scientific computing**

UF: Computational science  
BT: Computer applications

## **Scientific publishing**

BT: Publishing

## **Scintillation counters**

BT: Measurement  
Nuclear and plasma

sciences

NT: Solid scintillation detectors

## **Scintillators**

BT: Radiation effects  
RT: Luminescence

## *SCM supply chains*

USE: Supply chain management

## *Scooters*

USE: Motorcycles

## *SCR*

USE: Thyristors

## *Screws*

USE: Fasteners

## *Scrubbers*

USE: Materials handling

## **Scrum (Software development)**

BT: Agile software development  
RT: Feedback  
Project management  
Software development

management

## *SDH*

USE: Synchronous digital

hierarchy

## *SDHTs*

USE: MODFETs

## *SDN*



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# 2018 IEEE Thesaurus

USE: Software defined  
networking

## SDRAM

UF: Synchronous DRAM  
Synchronous dynamic  
random access memory  
BT: Random access memory

## Sea animals

USE: Marine animals

## Sea coast

BT: Oceans

## Sea floor

BT: Oceans  
RT: Sediments  
NT: Sea floor roughness

## Sea floor roughness

BT: Sea floor

## Sea ice

BT: Ice  
RT: Oceans

## Sea level

BT: Oceans

## Sea measurements

UF: Current measurement  
(water)  
BT: Geophysical measurements  
RT: Oceans  
Remote sensing  
Salinity (geophysical)  
Sonar measurements  
NT: Geoacoustic inversion

## Sea state

BT: Measurement  
Ocean waves  
RT: Marine navigation  
Sea surface roughness

## Sea surface

BT: Oceans  
RT: Surface waves  
Wind  
NT: Sea surface roughness  
Sea surface salinity

## Sea surface roughness

BT: Sea surface

RT: Sea state

## Sea surface salinity

BT: Sea surface  
RT: Salinity (geophysical)

## Sea surface temperature

USE: Ocean temperature

## Sea vegetation

USE: Marine vegetation

## Sealants

USE: Sealing materials

## Sealing materials

UF: Sealants  
BT: Joining materials  
RT: Seals

## Seals

BT: Mechanical products  
RT: Packaging  
Sealing materials  
Structural rings  
NT: Gaskets  
Hermetic seals

## Search engines

BT: Information retrieval

## Search methods

BT: Information retrieval  
RT: Genetic algorithms  
Gradient methods  
Nearest neighbor methods  
Optimization methods  
Ranking (statistics)  
NT: Keyword search  
Metasearch  
Search problems  
Semantic search  
Web search

## Search problems

BT: Search methods

## Seat belts

USE: Belts

## Sebaceous glands

USE: Sebaceous glands

## Sebaceous glands

UF: Sebaceous glands





# 2018 IEEE Thesaurus

BT: Glands  
Skin

## Second Life

BT: Social network services

## Secondary cells

USE: Batteries

## Secondary electron emission

USE: Electron emission

## Secondary generated hot electron injection

UF: Secondary generated hot-electron injection

BT: Hot carrier injection

## Secondary generated hot-electron injection

USE: Secondary generated hot electron injection

## Secondary ion emission

USE: Ion emission

## Secure storage

BT: Material storage

RT: Security

## Security

BT: Industry applications  
Anti-virus software  
Biometrics (access control)  
Bring your own device  
Business continuity  
Identification of persons  
Malware  
Protection  
Secure storage  
Surveillance  
NT: Access control  
Alarm systems  
Capability-based security  
Computer security  
Cryptography  
Data security  
Digital signatures  
Information security  
Network security  
Power system security  
Reconnaissance  
Security management  
Terrorism  
Watermarking

## Security management

BT: Management  
Security

## Security of data

USE: Data security

## Sediments

UF: Mud  
BT: Geoscience  
RT: Lakes  
Rivers  
Sea floor  
Soil

## Seebeck effect

USE: Thermoelectricity

## Seismic measurements

UF: Seismic visualization  
BT: Geophysical measurements  
RT: Acoustic measurements  
Seismology

## Seismic retrofitting

USE: Earthquake engineering

## Seismic visualization

USE: Seismic measurements

## Seismic waves

BT: Waves  
RT: Acoustic waves  
Earthquakes  
Elastodynamics  
Explosions  
Seismology  
Shock waves

## Seismology

BT: Geophysics  
RT: Earthquake engineering  
Earthquakes  
Seismic measurements  
Seismic waves  
Well logging

## Selective laser sintering

USE: Laser sintering

## Selectively doped heterojunction transistors

USE: MODFETs

## Selenium

BT: Chemical elements



# 2018 IEEE Thesaurus

## *Self organising feature maps*

USE: Self-organizing feature maps

## *Self organizing feature maps*

USE: Self-organizing feature maps

## *Self organizing maps*

USE: Self-organizing feature maps

## *Self organizing networks*

USE: Self-organizing networks

## *Self replicating machines*

USE: Self-replicating machines

## *Self testing*

USE: Automatic testing

## **Self-assembly**

BT: Nanotechnology  
RT: Biological cells  
Programming  
Semiconductor device  
Thin films  
NT: Electrostatic self-assembly

## *Self-driving automobiles*

USE: Autonomous automobiles

## *Self-driving car*

USE: Autonomous automobiles

## *Self-dynamic voltage scaling*

USE: Dynamic voltage scaling

## **Self-organizing feature maps**

UF: Kohonen maps  
SOM  
Self organising feature

maps

maps

Self organizing maps  
Self-organizing maps  
BT: Artificial neural networks  
RT: Feedforward neural

networks

Knowledge acquisition

## *Self-organizing maps*

USE: Self-organizing feature maps

## **Self-organizing networks**

UF: Self organizing networks  
BT: Wireless networks

## **Self-replicating machines**

UF: Self replicating machines  
BT: Nanotechnology

## **Self-study courses**

BT: Educational programs

## *Self-testing*

USE: Built-in self-test

## *Self-tuning regulators*

USE: Adaptive control

## *SEM*

USE: Scanning electron microscopy

## **Semantic search**

BT: Search methods  
Semantics  
RT: Context awareness  
Natural language  
processing  
Ontologies  
Query processing  
Semantic Web

## **Semantic technology**

BT: Information technology  
Semantics  
RT: Data models  
Encoding  
Natural language  
processing  
Semantic Web

## *Semantic triple*

USE: Triples (Data structure)

## **Semantic Web**

BT: Internet  
RT: Artificial intelligence  
Content management  
Data models  
Distributed computing  
Document handling  
Knowledge management  
Linked data



# 2018 IEEE Thesaurus

	Markup languages		Semiconductor device
	Ontologies	testing	
	Ranking (statistics)		Tolerance analysis
	Semantic search		
	Semantic technology	<b>Semiconductor device doping</b>	
NT:	OWL	UF:	Semiconductor doping
	Resource description	BT:	Semiconductor device
framework		manufacture	
		RT:	Doping
<b>Semantics</b>			Quasi-doping
BT:	Semiotics		Semiconductor materials
RT:	Natural language		
processing		<b>Semiconductor device manufacture</b>	
	Professional	BT:	Electronic equipment
communication		manufacture	
	Sign language	RT:	Fiducial markers
NT:	Semantic search		Gettering
	Semantic technology		Ion implantation
			Microassembly
<i>Semi-insulating materials</i>			Micromachining
USE:	Semiconductor materials		Nanotechnology
			Self-assembly
<i>Semi-supervised learning</i>			Semiconductor devices
USE:	Semisupervised learning		Surface cleaning
			Surface contamination
<b>Semiconductivity</b>		NT:	Diffusion processes
BT:	Conductivity		Flip-chip devices
	Electron devices		High-k gate dielectrics
RT:	Charge carriers		Quasi-doping
			Semiconductor device
<i>Semiconductor alloys</i>		doping	
USE:	Semiconductor materials		Semiconductor epitaxial
		layers	
<i>Semiconductor charge carriers</i>			Semiconductor growth
USE:	Charge carrier processes		Silicidation
			Wafer bonding
<i>Semiconductor controlled rectifiers</i>		<b>Semiconductor device measurement</b>	
USE:	Thyristors	BT:	Measurement
		RT:	Refractive index
<b>Semiconductor counters</b>			Semiconductor device
UF:	Junction detectors	noise	
BT:	Semiconductor devices		Semiconductor device
RT:	Position sensitive particle	reliability	
detectors			Semiconductor device
		testing	
<b>Semiconductor detectors</b>			
BT:	Detectors	<b>Semiconductor device modeling</b>	
	Semiconductor devices	UF:	Semiconductor device
RT:	Absorption	models	
	Particle charging	BT:	Modeling
			Semiconductor devices
<b>Semiconductor device breakdown</b>		RT:	Semiconductor device
BT:	Failure analysis	noise	
RT:	Semiconductor device		
reliability			



# 2018 IEEE Thesaurus

## *Semiconductor device models*

USE: Semiconductor device modeling

## **Semiconductor device noise**

BT: Semiconductor devices

RT: Integrated circuit noise  
Semiconductor device

measurement

Semiconductor device

modeling

devices

## **Semiconductor device packaging**

BT: Components, packaging, and manufacturing technology

RT: Integrated circuit packaging  
Semiconductor devices

switches

## **Semiconductor device reliability**

BT: Reliability

RT: Semiconductor device

breakdown

Semiconductor device

modeling

measurement

noise

## **Semiconductor device testing**

BT: Testing

RT: Semiconductor device

breakdown

Semiconductor device

interfaces

measurement

## **Semiconductor devices**

UF: SIS devices

(semiconductor)

Semiconductor-insulator-

semiconductor devices

BT: Electron devices

RT: Contacts

Epitaxial growth

Field effect transistors

Heterojunction bipolar

transistors

Hot carriers

Integrated circuits

Molecular beam

applications

Photoconducting devices

Proton radiation effects

Rapid thermal annealing

Semiconductor device

manufacture

Semiconductor device

packaging

Silicon-on-insulator

Varistors

NT: Flip-chip devices

Gunn devices

Hall effect devices

Junctions

MIS devices

MONOS devices

P-i-n diodes

Piezoresistive devices

Power semiconductor

Power semiconductor

Quantum dots

Quantum well lasers

SONOS devices

Schottky diodes

Semiconductor counters

Semiconductor detectors

Semiconductor device

Semiconductor device

Semiconductor diodes

Semiconductor lasers

Semiconductor waveguides

Semiconductor-insulator

Silicon devices

Superluminescent diodes

Surface emitting lasers

Thermistors

Transistors

## **Semiconductor diodes**

BT: Semiconductor devices

RT: Diodes

Magnetic field induced

strain

NT:

P-n junctions

P-i-n diodes

Schottky diodes

Semiconductor-metal

interfaces

Superluminescent diodes

Varactors

## *Semiconductor doping*

USE: Semiconductor device

doping

## *Semiconductor electronics industry*

USE: Electronics industry

## **Semiconductor epitaxial layers**



# 2018 IEEE Thesaurus

	UF:	Silicon epitaxial layers		Surface emitting lasers
	BT:	Semiconductor device		
manufacture			<b>Semiconductor materials</b>	
	RT:	Bipolar transistors	UF:	Pseudobinary
			semiconductors	
<b>Semiconductor films</b>				Semi-insulating materials
	BT:	Films		Semiconductor alloys
	RT:	Buffer layers	BT:	Materials
		Dielectric thin films	RT:	Acoustoelectric effects
		Magnetic field induced		Charge carriers
strain				Conducting materials
		Semiconductor growth		Crystals
		Semiconductor materials		Excitons
		Thick films		High-k dielectric materials
		Thin films		Photoconducting materials
				Radiative recombination
<b>Semiconductor growth</b>				Semiconductor device
	BT:	Semiconductor device	doping	
manufacture				Semiconductor films
	RT:	Buffer layers		Semiconductor growth
		Crystal growth		Semiconductor impurities
		Epitaxial layers		Semiconductor thin films
		Semiconductor films		Silicon compounds
		Semiconductor materials		Tunneling
			NT:	Amorphous semiconductors
<b>Semiconductor impurities</b>				Elemental semiconductors
	BT:	Impurities		Gallium
	RT:	Charge carrier processes		Gallium arsenide
		Plasma immersion ion		Germanium
implantation				II-VI semiconductor
		Semiconductor materials	materials	
<i>Semiconductor industry</i>			materials	III-V semiconductor
	USE:	Electronics industry		Indium gallium arsenide
<b>Semiconductor laser arrays</b>				Indium phosphide
	BT:	Semiconductor lasers		Magnetic semiconductors
				Organic semiconductors
<b>Semiconductor lasers</b>				Semiconductor
			superlattices	
	UF:	Injection lasers		Silicon
		Junction lasers		Silicon germanium
		Laser diodes		Substrates
	BT:	Lasers		Wide band gap
		Semiconductor devices	semiconductors	
		Solid lasers		
	RT:	Molecular beam	<b>Semiconductor memory</b>	
applications			BT:	Memory
		Optical transmitters	RT:	Integrated circuits
		Refractive index		
	NT:	Laser tuning	<b>Semiconductor nanostructures</b>	
		Quantum dot lasers	BT:	Nanostructures
		Quantum well lasers		
		Semiconductor laser arrays	<b>Semiconductor nanotubes</b>	
		Semiconductor optical	BT:	Nanotubes
amplifiers				



# 2018 IEEE Thesaurus

## Semiconductor optical amplifiers

UF: SOA  
BT: Optical amplifiers  
Semiconductor lasers  
RT: Optical transmitters  
Quantum well lasers

## Semiconductor process modeling

BT: Modeling  
RT: Circuit simulation

## Semiconductor quantum wells

USE: Quantum wells

## Semiconductor radiation detectors

BT: Radiation detectors

## Semiconductor superlattices

BT: Semiconductor materials  
Superlattices

## Semiconductor thin films

BT: Thin films  
RT: Epitaxial growth  
Gallium  
Germanium  
Semiconductor materials  
Silicon

## Semiconductor waveguides

BT: Semiconductor devices

## Semiconductor-insulator interfaces

BT: Semiconductor devices  
RT: CMOSFETs  
MIM devices  
MIS devices  
MOS devices  
Silicon-on-insulator

## Semiconductor-insulator-semiconductor devices

USE: Semiconductor devices

## Semiconductor-metal interfaces

UF: Metal-semiconductor

## interfaces

BT: Semiconductor diodes  
RT: Magnetic field induced

## strain

NT: Schottky diodes  
Schottky barriers

## Semicustom integrated circuits

USE: Application specific

## integrated circuits

## Seminars

BT: Educational programs  
NT: Webinars

## Semiology

USE: Semiotics

## Semiosis

USE: Semiotics

## Semiotic studies

USE: Semiotics

## Semiotics

UF: Semiology  
Semiosis  
Semiotic studies  
BT: Communication symbols  
RT: Communication symbols  
Natural language

## processing

Professional

## communication

NT: Pragmatics  
Semantics  
Syntactics

## Semisupervised learning

UF: Semi-supervised learning  
BT: Learning systems  
RT: Supervised learning  
Unsupervised learning

## Senior citizens

UF: Elderly  
BT: Social groups  
RT: Aging  
Assisted living  
Geriatrics  
Gerontology

## Sense and avoid

USE: Collision avoidance

## Sense organs

BT: Anatomy  
NT: Ear  
Eyes  
Multisensory integration  
Nose  
Olfactory bulb  
Taste buds  
Visual systems



# 2018 IEEE Thesaurus

<b>Sensitivity</b>			Induction motors
BT:	Measurement		Inductive power
RT:	Circuit analysis	transmission	
	Control systems		Motor drives
	Robustness		Motors
	Tolerance analysis		
NT:	Sensitivity analysis	<b>Sensors</b>	
<b>Sensitivity analysis</b>		UF:	Sun sensors
BT:	Sensitivity	RT:	Capacitive transducers
			Magnetostrictive devices
			Wireless sensor networks
<b>Sensitivity and specificity</b>		NT:	Acoustic sensors
BT:	Biomedical measurement		Chemical and biological
	Medical diagnosis	sensors	
<b>Sensor arrays</b>			Electromechanical sensors
BT:	Arrays		Force sensors
	Sensor systems and		Infrared sensors
applications			Intelligent sensors
NT:	Sensor fusion	sensors	Intracranial pressure
<b>Sensor fusion</b>			Ionizing radiation sensors
BT:	Sensor arrays		Magnetic sensors
RT:	Kalman filters		Mechanical sensors
	Multimodal sensors		Multimodal sensors
NT:	Multisensor systems		Nanosensors
			Optical sensors
<b>Sensor phenomena and characterization</b>			Optoelectronic and
BT:	Sensors	photonic sensors	
			Pressure sensors
<b>Sensor systems</b>		characterization	Sensor phenomena and
BT:	Aerospace and electronic	applications	Sensor systems and
systems			Thermal sensors
	Sensor systems and		Thick film sensors
applications			Thin film sensors
RT:	Navigation		Vision sensors
NT:	Activity recognition		Wearable sensors
	Gunshot detection systems		
<b>Sensor systems and applications</b>		<i>Sensors (image)</i>	
BT:	Sensors	USE:	Image sensors
NT:	Detectors	<b>Sensory aids</b>	
	Electric sensing devices	BT:	Medical services
	Leak detection	RT:	Assistive technology
	Radiofrequency		Biomedical equipment
identification			Orthotics
	Robot sensing systems		Prosthetics
	Sensor arrays	NT:	Hearing aids
	Sensor systems		
<b>Sensorless control</b>		<b>Sentiment analysis</b>	
BT:	Control systems	BT:	Computational linguistics
RT:	AC machines		Natural language
	DC machines	processing	
	Drives	RT:	Emotion recognition





# 2018 IEEE Thesaurus

Information analysis	BT:	IEEE Awards activities
<b>Separation processes</b>		<i>Service composability</i>
BT: Materials science and technology	USE:	Interoperability
NT: Fractionation Particle separators		<b>Service computing</b>
<i>Separators</i>		BT: Information technology
USE: Particle separators		RT: Business Cloud computing Process design Service-oriented
<i>September 11</i>		architecture
USE: Terrorism		Service-oriented systems
<i>Sequence analysis</i>		engineering
USE: Sequences		Web services
<b>Sequences</b>		<i>Service oriented architecture</i>
UF: Digital sequences Sequence analysis	USE:	Service-oriented
BT: Mathematics		architecture
RT: Codes		<b>Service robots</b>
NT: Binary sequences Random sequences	BT:	Robots
	RT:	Home automation Manipulators Mobile robots
<i>Sequencing</i>		<b>Service-oriented architecture</b>
USE: Sequential analysis	UF:	SOA Service oriented
<b>Sequential analysis</b>		architecture
UF: Sequencing		Service-oriented
BT: System analysis and design		architectures
<b>Sequential circuits</b>	BT:	Web services
UF: Sequential logic circuits	RT:	Service computing Service-oriented systems
BT: Circuits		engineering
<b>Sequential diagnosis</b>		<i>Service-oriented architectures</i>
BT: System analysis and design	USE:	Service-oriented
<i>Sequential logic circuits</i>		architecture
USE: Sequential circuits		<b>Service-oriented systems engineering</b>
<i>Sequential production</i>	UF:	SOSE
USE: Flow production systems	BT:	Systems engineering and theory
<i>Serious games</i>	RT:	Formal specifications Service computing Service-oriented
USE: Games		architecture
<b>Servers</b>		Software engineering
BT: Client-server systems		<i>Servo control</i>
RT: Network function	USE:	Servosystems
virtualization		<i>Servo-control</i>
NT: Web servers		
<b>Service awards</b>		





# 2018 IEEE Thesaurus

USE:	Servosystems	UF:	Standard Generalized Markup Language
<b>Servomechanisms</b>		BT:	Markup languages
BT:	Servomotors	<b>Shadow mapping</b>	
RT:	Actuators	UF:	Projective shadowing
	Manipulators		Shadowing
<b>Servomotors</b>		BT:	Computer graphics
UF:	Servos	RT:	Three-dimensional displays
BT:	Motors		
	Rotating machines	<i>Shadowing</i>	
	Servosystems	USE:	Shadow mapping
NT:	Servomechanisms		
<i>Servos</i>		<b>Shafts</b>	
USE:	Servomotors	BT:	Machine components
			Production
<b>Servosystems</b>		RT:	Couplings
UF:	Servo control		Gears
	Servo-control		Machine tool spindles
BT:	Control equipment		Mechanical power
RT:	Actuators	transmission	
	Manipulators		Mechanical splines
	Motion control		Pistons
	Motor drives		Propellers
	Position control		Torque converters
	Robots	NT:	Camshafts
	Velocity control		
NT:	Servomotors	<b>Shape</b>	
		BT:	Graphics
<b>Set theory</b>		RT:	Geometry
BT:	Algebra		Pattern recognition
	Mathematics		Shape control
RT:	Boolean algebra		Shape measurement
	Maximum likelihood	<b>Shape control</b>	
estimation		BT:	Mechanical variables
NT:	Fuzzy set theory	control	
	Fuzzy sets	RT:	Shape
	Rough sets		
<i>SEU</i>		<b>Shape measurement</b>	
USE:	Single event upsets	BT:	Measurement
		RT:	Shape
<b>Sewage treatment</b>		<b>Shape memory alloys</b>	
BT:	Waste handling	BT:	Alloying
RT:	Pollution	RT:	Actuators
	Pollution control		
	Sanitary engineering	<i>Shape memory material</i>	
	Sludge treatment	USE:	Smart materials
	Water pollution	<i>Shape memory technology</i>	
<i>SF6</i>		USE:	Smart materials
USE:	Sulfur hexafluoride	<b>Share prices</b>	
		BT:	Economic indicators
<b>SGML</b>			



# 2018 IEEE Thesaurus

<b>Shearing</b>	BT: Materials processing RT: Sheet metal processing	Seismic waves	
<b>Sheet materials</b>	BT: Materials Structural shapes RT: Sandwich structures Sheet metal processing Structural panels Thin wall structures	<i>Shoe manufacture</i> USE: Footwear industry	
<b>Sheet metal processing</b>	BT: Manufacturing systems RT: Blanking Embossing Punching Shearing Sheet materials	<i>Shoes</i> USE: Footwear	
<i>Shewhart charts</i> USE: Control charts		<i>Short circuit currents</i> USE: Short-circuit currents	
<b>Shift registers</b> BT: Registers RT: Logic circuits NT: Linear feedback shift registers		<b>Short-circuit currents</b> UF: Short circuit currents BT: Current	
<b>Shipbuilding industry</b> UF: Boat building industry BT: Manufacturing industries RT: Construction industry		<b>Shortest path problem</b> UF: Shortest-path-problem BT: Graph theory	
<i>Ships</i> USE: Marine vehicles		<i>Shortest-path-problem</i> USE: Shortest path problem	
<i>Shock</i> USE: Electric shock		<b>Shoulder</b> BT: Extremities NT: Axilla	
<b>Shock (mechanics)</b> BT: Mechanical factors		<b>Shunts (electrical)</b> BT: Electric current control Photovoltaic effects	
<b>Shock absorbers</b> UF: Dampers BT: Suspensions RT: Automotive components Damping Springs Vibration control		<i>Si</i> USE: Silicon	
<b>Shock waves</b> BT: Waves RT: Aerodynamics		<i>SiC</i> USE: Silicon carbide	
		<i>Sick pay</i> USE: Employee welfare	
		<i>Side channel attacks</i> USE: Side-channel attacks	
		<b>Side-channel attacks</b> UF: Side channel attacks BT: Cryptography	
		<i>SiGe</i> USE: Silicon germanium	
		<i>Sigma delta</i> USE: Sigma-delta modulation	
		<b>Sigma-delta modulation</b> UF: Delta sigma Sigma delta	



# 2018 IEEE Thesaurus

BT:	Delta modulation	Correlators
<b>Sign language</b>		Decision making
BT:	Gesture recognition	Demodulation
RT:	Assistive technology	Pattern clustering
	Deafness	Receivers
	Semantics	Signal resolution
<b>Signal analysis</b>		Source separation
UF:	Waveform analysis	Time of arrival estimation
BT:	Signal processing	NT: Acoustic signal detection
RT:	Autocorrelation	Motion detection
	Blind source separation	Multiuser detection
	Frequency-domain analysis	Optical signal detection
	Pattern clustering	Phase detection
	Power system faults	Radar detection
	Rate distortion theory	<i>Signal estimation</i>
	Signal resolution	USE: Estimation
	Speech analysis	<i>Signal flow graphs</i>
	Total harmonic distortion	USE: Flow graphs
	Transient analysis	<b>Signal generators</b>
	Wavelet transforms	UF: Function generators
NT:	Discrete-event systems	Waveform generators
	Harmonic analysis	BT: Signal processing
	Parameter estimation	NT: Noise generators
	Signal mapping	Pulse generation
	Spectral analysis	
<i>Signal classification</i>		<b>Signal integrity</b>
USE: Pattern classification		BT: Signal processing
<i>Signal constellation</i>		<b>Signal mapping</b>
USE: Constellation diagram		BT: Signal analysis
<i>Signal de-noising</i>		<b>Signal processing</b>
USE: Signal denoising		UF: Vibrational signal
<i>Signal decomposition</i>		processing
USE: Signal resolution		RT: Analog processing circuits
<b>Signal denoising</b>		Antennas and propagation
UF: Signal de-noising		Band-pass filters
BT: Signal reconstruction		Bandwidth
RT: Signal resolution		Biomedical computing
	Signal restoration	Bit rate
	Signal to noise ratio	Correlators
<b>Signal design</b>		Data processing
BT: Signal processing		Decoding
<b>Signal detection</b>		Deconvolution
UF: Detection (signal)		Digital signal processors
BT: Signal processing		Discrete Fourier transforms
RT: Blind source separation		Empirical mode
	Channel estimation	decomposition
		Encoding
		Estimation
		Estimation theory
		Feature extraction



# 2018 IEEE Thesaurus

analysis	Fourier series	Signal generators
	Gaussian noise	Signal integrity
	Independent component	Signal reconstruction
		Signal resolution
	Matrix decomposition	Signal restoration
	Pattern clustering	Signal sampling
	Prediction methods	Signal synthesis
	Random processes	Source separation
	Rate distortion theory	Spectrogram
	Stability analysis	Tracking loops
	Structure from motion	
	Synapses	
	System-on-chip	<b>Signal processing algorithms</b>
	Transforms	BT: Algorithms
	Transversal filters	<i>Signal quantisation</i>
	Vectors	USE: Quantization (signal)
NT:	Wavelet transforms	<i>Signal quantization</i>
	Acoustic signal processing	USE: Quantization (signal)
	Adaptive signal processing	
	Amplifiers	<b>Signal reconstruction</b>
	Array signal processing	BT: Signal processing
	Attenuators	RT: Inverse problems
	Chirp	Signal sampling
	Convolution	Signal to noise ratio
	Decorrelation	NT: Signal denoising
	Digital signal processing	
	Dispersion	<b>Signal representation</b>
	Distortion	BT: Modeling
	Error correction	RT: Approximation methods
	Fading channels	Wavelet transforms
	Filters	
	Frequency locked loops	<b>Signal resolution</b>
processing	Geophysical signal	UF: Signal decomposition
		BT: Signal processing
	Limiting	RT: Array signal processing
	Modulation	Signal analysis
processing	Multidimensional signal	Signal denoising
		Signal detection
	Noise	Spectral analysis
	Optical signal processing	NT: Diversity reception
conversion	Optical wavelength	
		<b>Signal restoration</b>
	Phase locked loops	BT: Signal processing
	Pulse compression	RT: Deconvolution
methods		Distortion
	Pulse shaping methods	Signal denoising
	Quantization (signal)	
	RF signals	<b>Signal sampling</b>
	Radar signal processing	BT: Signal processing
	Received signal strength	RT: Quantization (signal)
indicator		Sampling methods
	Recording	Signal reconstruction
	Signal analysis	
	Signal design	
	Signal detection	<i>Signal separation</i>



# 2018 IEEE Thesaurus

USE:	Source separation		Silicon devices
			Silicon germanium
			Silicon-on-insulator
<b>Signal synthesis</b>			
BT:	Signal processing	NT:	Amorphous silicon
RT:	Speech synthesis		Porous silicon
			Silicon alloys
			Silicon photonics
<b>Signal to noise ratio</b>			
UF:	S/N		
	SNR		
	Signal-to-noise ratio		
	Signal-to-noise-ratio		
BT:	Noise		
RT:	Filters		
	Noise figure		
	RAKE receivers		
	Signal denoising		
	Signal reconstruction		
NT:	PSNR		
<i>Signal-to-noise ratio</i>			
USE:	Signal to noise ratio		
<i>Signal-to-noise-ratio</i>			
USE:	Signal to noise ratio		
<i>Signaling systems</i>			
USE:	Communication system		
signaling			
<i>Signature detection</i>			
USE:	Handwriting recognition		
<i>Signature verification</i>			
USE:	Handwriting recognition		
<i>Silica</i>			
USE:	Silicon compounds		
<b>Silicidation</b>			
BT:	Semiconductor device		
manufacture			
<b>Silicides</b>			
BT:	Silicon compounds		
<b>Silicon</b>			
UF:	Si		
	Silicon materials		
	Siliconization		
BT:	Semiconductor materials		
RT:	Amorphous semiconductors		
	Elemental semiconductors		
	Epitaxial growth		
	Semiconductor thin films		
	Silicon compounds		
		<b>Silicon alloys</b>	
		BT:	Silicon
		RT:	Alloying
		NT:	Germanium silicon alloys
		<b>Silicon carbide</b>	
		UF:	SiC
		BT:	Silicon compounds
		<b>Silicon compiler</b>	
		BT:	Computer aided
		manufacturing	
		RT:	Integrated circuit
		manufacture	
		<b>Silicon compounds</b>	
		UF:	Silica
			Silicon dioxide
		BT:	Compounds
		RT:	Critical current density
			Semiconductor materials
			Silicon
			Wide band gap
		semiconductors	
		NT:	Silicides
			Silicon carbide
			Silicon nitride
		<i>Silicon controlled rectifiers</i>	
		USE:	Thyristors
		<b>Silicon devices</b>	
		BT:	Semiconductor devices
		RT:	Doping
			Photonics
			Silicon
		<i>Silicon dioxide</i>	
		USE:	Silicon compounds
		<i>Silicon epitaxial layers</i>	
		USE:	Semiconductor epitaxial
		layers	
		<b>Silicon germanium</b>	
		UF:	SiGe
		BT:	Semiconductor materials



# 2018 IEEE Thesaurus

RT:	Germanium	NT:	Silicon on sapphire
	Silicon		<i>Silicon-on-insulator technology</i>
	Silicon-on-insulator	USE:	Silicon-on-insulator
	Substrates		<i>Silicon-on-sapphire</i>
	Transistors	USE:	Silicon on sapphire
<i>Silicon materials</i>			<i>Silicon-oxide-nitride-oxide-silicon</i>
USE:	Silicon	USE:	SONOS devices
<b>Silicon nitride</b>		<i>Siliconization</i>	
BT:	Nitrogen	USE:	Silicon
	Silicon compounds		<b>Silver</b>
<i>Silicon on insulator</i>		UF:	Ag
USE:	Silicon-on-insulator	BT:	Metals
<i>Silicon on insulator technology</i>			<b>SIMO communication</b>
USE:	Silicon-on-insulator	UF:	Single input multiple output systems
<b>Silicon on sapphire</b>		BT:	Communication systems
UF:	Silicon-on-sapphire	RT:	Antenna arrays
BT:	CMOS technology		Diversity reception
	Silicon-on-insulator		Feedback
RT:	Substrates		MIMO communication
<b>Silicon photonics</b>			MISO communication
BT:	Photonics		Optical materials
	Silicon		Radio communication
RT:	Optical fiber communication		SISO communication
<b>Silicon radiation detectors</b>			<b>Simple object access protocol</b>
BT:	Radiation detectors	UF:	SOAP
RT:	Ionizing radiation	BT:	Web services
<b>Silicon-on-insulator</b>			<b>Simulated annealing</b>
UF:	SOI	BT:	Mathematics
	SOS (silicon on sapphire)		Optimization methods
	Silicon on insulator	RT:	Annealing
	Silicon on insulator		Monte Carlo methods
technology			Relaxation methods
	Silicon-on-insulator		<b>Simulation</b>
technology		UF:	Simulation results
BT:	Circuits	BT:	Modeling
RT:	Double-gate FETs	RT:	Application virtualization
	Integrated circuits		Computer aided analysis
	Interface states		Computer graphics
	Junctionless nanowire		Emulation
transistors			Matlab
	Proton radiation effects		Monte Carlo methods
	Semiconductor devices		Numerical simulation
	Semiconductor-insulator		Reduced order systems
interfaces		NT:	Computer simulation
	Silicon		Digital simulation
	Silicon germanium		
	Thin film circuits		



# 2018 IEEE Thesaurus

simulation	Hardware-in-the loop	RT:	Optimization methods
	Medical simulation		
	Systems simulation		
<i>Simulation Program with Integrated Circuit Emphasis</i>		<b>Single photon emission computed tomography</b>	
USE:	SPICE	UF:	SPECT
		BT:	Computed tomography
		RT:	Cancer
			Collimators
			Phantoms
			Tumors
<i>Simulation results</i>			
USE:	Simulation		
<b>Simultaneous localization and mapping</b>		<i>Single-electron transistors</i>	
UF:	SLAM	USE:	Single electron transistors
BT:	Robot sensing systems		
<i>Single atom lasers</i>		<i>Single-wall carbon nanotubes</i>	
USE:	Atom lasers	USE:	Carbon nanotubes
<b>Single electron devices</b>		<b>Singular value decomposition</b>	
BT:	Circuits and systems	BT:	Matrices
	Electron devices		
RT:	Nanoscale devices	<i>SIS devices (semiconductor)</i>	
	Nanotechnology	USE:	Semiconductor devices
	Resonant tunneling devices	<i>SIS devices (superconductor)</i>	
NT:	Single electron memory	USE:	Superconducting devices
	Single electron transistors		
<b>Single electron memory</b>		<b>SISO communication</b>	
BT:	Single electron devices	UF:	Single input single output systems
NT:	Hetero-nanocrystal memory	BT:	Communication systems
		RT:	Antenna arrays
<b>Single electron transistors</b>			Diversity reception
UF:	Single-electron transistors		MIMO communication
BT:	Single electron devices		MISO communication
			Radio communication
			SIMO communication
<b>Single event latchup</b>			Transmitters
BT:	Proton effects	<b>Six sigma</b>	
	Radiation effects	BT:	Total quality management
<b>Single event transients</b>		RT:	Quality assurance
BT:	Ionization		Quality control
<b>Single event upsets</b>		<b>Size control</b>	
UF:	SEU	BT:	Mechanical variables
BT:	Ionization	control	
<i>Single input multiple output systems</i>		RT:	Thickness control
USE:	SIMO communication		
<i>Single input single output systems</i>		<b>Size measurement</b>	
USE:	SISO communication	BT:	Measurement
		RT:	Area measurement
			Length measurement
			Thickness measurement
			Volume measurement
<b>Single machine scheduling</b>		NT:	Functional point analysis
BT:	Scheduling		



# 2018 IEEE Thesaurus

<b>Skeleton</b>	BT: Musculoskeletal system NT: Bones Joints Spine Thorax	BT: Snore signals Snoring Medical conditions Sleep
		<i>Sleep apnoea</i> USE: Sleep apnea
<b>Skin</b>	BT: Integumentary system NT: Dermis Epidermis Sebaceous glands Sweat glands	<i>Slideways (mechanical)</i> USE: Mechanical guides
<b>Skin cancer</b>	BT: Cancer	<b>Sliding mode control</b> UF: Sliding-mode control BT: Control systems
<b>Skin effect</b>	BT: Current density RT: Conductors Power systems Resistance System analysis and design	<i>Sliding-mode control</i> USE: Sliding mode control
<b>Skin neoplasms</b>	BT: Neoplasms	<b>Slot antennas</b> BT: Antennas
<b>Skull</b>	BT: Head RT: Bones	<b>Slot line components</b> UF: Slotline components BT: Slot lines
<b>Slabs</b>	BT: Structural shapes	<b>Slot lines</b> UF: Slotline BT: Planar transmission lines NT: Slot line components
<b>Slag</b>	BT: Industrial waste RT: Fly ash Waste disposal Waste management	<i>Slotline</i> USE: Slot lines
<b>SLAM</b> and mapping	USE: Simultaneous localization	<i>Slotline components</i> USE: Slot line components
<b>SLD</b>	USE: Superluminescent diodes	<b>Slow light</b> BT: Light sources RT: Velocity measurement
<b>Sleep</b>	BT: Brain NT: Sleep apnea	<b>Sludge treatment</b> UF: Activated sludge process BT: Waste handling RT: Pollution control Sewage treatment Wastewater Wastewater treatment
<b>Sleep apnea</b>	UF: Sleep apnoea Snore activity	<b>Slurries</b> BT: Waste materials RT: Industrial waste
		<b>Small business technology transfer</b> BT: Technology transfer





# 2018 IEEE Thesaurus

## *Small cell networks*

USE: Microcell networks

## **SMAP mission**

UF: Soil Moisture Active

## Passive mission

BT: Soil moisture

## *Smart actuators*

USE: Intelligent actuators

## **Smart buildings**

BT: Buildings

## **Smart cameras**

BT: Cameras

Computer vision

RT: Distributed vision networks

## **Smart cards**

BT: User interfaces

RT: Access control  
Data processing

## **Smart cities**

BT: Intelligent structures

Internet of Things

Urban areas

RT: Buildings  
Construction industry  
Cyber-physical systems

## **Smart devices**

BT: Electronic equipment

Wireless communication

RT: Smart glasses  
Smart manufacturing

## *Smart elastomers*

USE: Dielectric elastomers

## **Smart glasses**

UF: Smartglasses

BT: Wearable Computers

RT: Smart devices

## **Smart grids**

UF: Smart microgrids

Smart power grids

BT: Power grids

RT: Cyber-physical systems

Microgrids

Smart meters

Transactive energy

NT: Vehicle-to-grid

## **Smart homes**

BT: Buildings

Home automation

## **Smart manufacturing**

BT: Manufacturing

RT: Intelligent manufacturing

## systems

Smart devices

Smart materials

## **Smart materials**

UF: Shape memory material

Shape memory technology

BT: Materials

RT: Austenite

Azobenzene

Dielectric elastomers

Martensite

Metamaterials

Polycaprolactone

Smart manufacturing

Smart transportation

Biomimetic materials

NT:

## **Smart meters**

BT: Meter reading

RT: Automatic meter reading

Smart grids

## *Smart microgrids*

USE: Smart grids

## **Smart phones**

UF: Smartphones

BT: Mobile handsets

RT: Bring your own device

## **Smart pixels**

BT: Image processing

RT: Integrated optoelectronics

Optical switches

## *Smart power grids*

USE: Smart grids

## *Smart sensors*

USE: Intelligent sensors

## *Smart structures*

USE: Intelligent structures

## **Smart transportation**

BT: Transportation



# 2018 IEEE Thesaurus

RT: Automated highways  
Intelligent transportation  
systems  
Intelligent vehicles  
Smart materials

## Smart TV

BT: TV  
RT: Internet

## Smartglasses

USE: Smart glasses

## Smartphones

USE: Smart phones

## Smelting

BT: Materials processing  
RT: Blast furnaces  
Heat treatment  
Melt processing  
Metals industry  
Refining

## SMES

USE: Superconducting magnetic  
energy storage

## Smoke detectors

BT: Alarm systems  
RT: Domestic safety  
Fires  
Ionization chambers  
Safety devices  
ZigBee

## Smoothed particle hydrodynamics

USE: Fluid flow AND  
Hydrodynamics

## Smoothing methods

BT: Mathematics

## SMOS mission

UF: Soil moisture and ocean  
salinity  
Soil moisture and ocean  
salinity mission  
BT: Ocean salinity  
Soil moisture

## SMPS

USE: Switched mode power  
supplies

## SMPTE

UF: Society of Motion Picture  
and Television Engineers  
BT: Standards organizations

## SMPTE Standards

BT: Standards publications

## Sn

USE: Tin

## Snake bots

USE: Snake robots

## Snake robots

UF: Snake bots  
Snakebots  
BT: Information security

## Snakebots

USE: Snake robots

## Snore activity

USE: Sleep apnea

## Snore signals

USE: Sleep apnea

## Snoring

USE: Sleep apnea

## Snow

BT: Meteorology  
RT: Ice

## SNR

USE: Signal to noise ratio

## SNS devices

USE: Superconducting devices

## Snubbers

BT: Power electronics

## SOA

USE: Semiconductor optical  
amplifiers AND  
Service-oriented  
architecture

## SOAP

USE: Simple object access  
protocol

## SOC



# 2018 IEEE Thesaurus

USE:	System-on-chip		
<b>Social computing</b>		<b>Social intelligence</b>	
BT:	Collaborative work	BT:	Behavioral sciences
	Internet		Social computing
RT:	Behavioral sciences	RT:	Sociology
	Crowdsourcing		Cultural differences
	Social computing		Social factors
	Social network services	<b>Social media</b>	
NT:	Persuasive systems	USE:	Social network services
	Social intelligence		
<b>Social engineering (security)</b>		<b>Social network services</b>	
BT:	Information security	UF:	Social media
RT:	Human factors		Social networking
	Psychology		Social networks
	Social factors		Social-network
<b>Social factors</b>		BT:	Information retrieval
BT:	Social implications of	RT:	Blogs
technology			Crowdsourcing
RT:	Digital divide		Electronic mail
	Governmental factors		Internet
	International collaboration		Social computing
	International relations		Web sites
	Philosophical	NT:	Computer mediated
considerations		communication	
(security)	Social engineering		Facebook
	Social intelligence		Flickr
	Technology planning		LinkedIn
NT:	Demography		MySpace
	Technology social factors		Second Life
			Twitter
			YouTube
<b>Social groups</b>		<b>Social networking</b>	
BT:	Sociology	USE:	Social network services
NT:	Millennials	<b>Social networks</b>	
	Senior citizens	USE:	Social network services
<b>Social implications of technology</b>		<b>Social-network</b>	
UF:	Orange technology	USE:	Social network services
RT:	Cyberethics	<b>Society of Motion Picture and Television</b>	
	Digital divide	<b>Engineers</b>	
NT:	Cultural differences	USE:	SMPTE
	Environmental factors	<b>Socio-technical systems</b>	
	Ethical aspects	USE:	Sociotechnical systems
	Ethics	<b>Sociology</b>	
	Globalization	BT:	Science - general
	International relations	RT:	Collective intelligence
	Peace technology	NT:	Digital divide
	Philosophical		Social groups
considerations	Social factors		Social intelligence
	Sustainable development		
	Technology		



# 2018 IEEE Thesaurus

## Sociotechnical systems

UF: Socio-technical systems  
BT: Organizations

## Sockets

BT: Connectors

## Sodium

BT: Chemical elements

## Soft electronics

BT: Electronic equipment  
RT: Flexible electronics  
Inorganic materials  
Wearable computers

## Soft lithography

UF: Microcontact printing  
Replica molding  
Replica moulding  
BT: Lithography  
RT: Nanolithography  
Nanopatterning

## Soft magnetic materials

BT: Magnetic materials

## Soft robotics

UF: Soft robots  
BT: Robots

## Soft robots

USE: Soft robotics

## Soft switch

USE: Soft switching

## Soft switching

UF: Soft switch  
Softswitch  
BT: Telecommunication

## computing

RT: Routing

## Softening

UF: Softening (metallurgical)  
BT: Materials processing  
RT: Annealing

## Softening (metallurgical)

USE: Softening

## Softswitch

USE: Soft switching

## Software

UF: Computer software  
On-demand software  
BT: Computers and information

## processing

RT: Algorithms  
Collaborative work  
Computer languages  
Computer science  
Courseware  
Documentation  
Enterprise resource

## planning

Firewalls (computing)  
Geospatial analysis  
Microprogramming  
Programming  
Software engineering  
Software protection  
Software standards  
NT: Anti-virus software  
Application software  
Embedded software  
Invasive software  
Middleware  
Open source software  
Optical character

## recognition software

Public domain software  
Software agents  
Software as a service  
Software debugging  
Software maintenance  
Software packages  
Software performance  
Software quality  
Software reusability  
Software safety  
Software systems  
Software tools  
System software

## Software agents

BT: Software  
RT: Artificial intelligence  
Computer applications  
Distributed computing  
Intelligent systems  
Knowledge based systems  
Learning systems  
Mobile agents  
NT: Agent-based modeling  
Autonomous agents  
Botnet



# 2018 IEEE Thesaurus

Intelligent agents

## Software algorithms

BT: Algorithms

## Software architecture

BT: Software engineering  
RT: Distributed computing  
NT: Client-server systems  
Microarchitecture  
Representational state

transfer

## Software as a service

UF: On demand software  
On-demand software  
SaaS  
Software-as-a-service  
BT: Software  
RT: Cloud computing  
Information processing

## Software debugging

BT: Software  
RT: Programming  
Programming environments  
NT: Software design

## Software defined networking

UF: SDN  
BT: Computer networks  
RT: Application programming

interfaces

Cloud computing  
Computer network

management

Distributed processing  
Intelligent networks  
Mobile computing  
Network function

virtualization

Network operating systems  
Operating systems  
Protocols  
Virtual machining  
Virtualization

## Software defined radio

USE: Software radio

## Software design

BT: Software debugging  
RT: Web design  
NT: Model driven engineering  
Usability

## Software development management

BT: Engineering management  
RT: Scrum (Software development)

NT: Software product lines  
Agile software development  
Model-driven development

## Software documentation

USE: Documentation

## Software engineering

BT: Computers and information processing

RT: Code refractoring  
Functional point analysis  
Rapid prototyping  
Requirements engineering  
Service-oriented systems

engineering

Software  
Static analysis  
Systems Modeling

Language

NT: Visual BASIC  
Capability maturity model  
Computer aided software

engineering

Formal verification  
Programming environments  
Reasoning about programs  
Runtime  
Software architecture  
Software libraries  
Software product lines

## Software libraries

BT: Libraries  
Software engineering  
RT: Algorithms  
Matlab  
Object oriented

programming

Software reusability

## Software maintenance

BT: Software  
RT: Software product lines

## Software measurement

BT: Measurement  
NT: Software metrics

## Software metrics



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# 2018 IEEE Thesaurus

BT:	Software measurement	BT:	Reliability
<b>Software packages</b>		<b>Software reusability</b>	
BT:	Software	UF:	Software reuse
RT:	Computer applications	BT:	Software
	Power system analysis	RT:	Capability maturity model
computing			Object oriented
NT:	EMTDC	programming	Software libraries
	PSCAD		
	SPICE		
<b>Software performance</b>		<i>Software reuse</i>	
BT:	Software	USE:	Software reusability
RT:	Algorithmic efficiency		
	Capability maturity model	<b>Software reviews</b>	
<i>Software piracy</i>		BT:	IEEE indexing
USE:	Computer crime		
<b>Software product lines</b>		<b>Software safety</b>	
BT:	Product development	BT:	Software
	Software engineering	RT:	Product safety engineering
RT:	Software development		
management		<b>Software standards</b>	
	Software maintenance	BT:	Standards categories
		RT:	ISO
			ISO Standards
			Software
<b>Software protection</b>		<b>Software systems</b>	
BT:	Copyright protection	BT:	Software
	Legal factors		
RT:	Digital rights management	<b>Software testing</b>	
	Intellectual property	BT:	Testing
	Software	NT:	Fuzzing
<b>Software prototyping</b>		<b>Software tools</b>	
BT:	System analysis and design	BT:	Software
		RT:	Computer aided software
<b>Software quality</b>		engineering	
BT:	Software		Programming
RT:	Algorithmic efficiency		Programming environments
			Visual BASIC
<b>Software radio</b>		NT:	Authoring systems
UF:	Reconfigurable radio	<i>Software-as-a-service</i>	
	Software defined radio	USE:	Software as a service
	Software-defined radio		
BT:	Mobile communication	<i>Software-defined radio</i>	
	Radio communication	USE:	Software radio
RT:	Code division multiplexing		
	Land mobile radio	<i>SOI</i>	
	Land mobile radio cellular	USE:	Silicon-on-insulator
systems			
	Telecommunication	<b>Soil</b>	
computing		BT:	Geoscience
	Transceivers	RT:	Earth
			Sediments
<b>Software reliability</b>			



# 2018 IEEE Thesaurus

NT:	Soil measurements	RT:	Heating systems
	Soil pollution		Phase change materials
	Soil moisture		Solar energy
	Soil properties		Space heating
	Soil texture		
<b>Soil measurements</b>		<b>Solar panels</b>	
BT:	Measurement	BT:	Photovoltaic systems
RT:	Geophysical measurements		Solar power generation
	Moisture measurement	<i>Solar polarimetry</i>	
	Remote sensing	USE:	Polarimetry
	Soil	<b>Solar power generation</b>	
NT:	Salinity (geophysical)	BT:	Power generation
<b>Soil moisture</b>		RT:	Building integrated
BT:	Soil	photovoltaics	
NT:	SMAP mission		Solar energy
	SMOS mission		Solar powered vehicles
<i>Soil Moisture Active Passive mission</i>		NT:	Maximum power point
USE:	SMAP mission	trackers	
			Photovoltaic systems
			Solar panels
<i>Soil moisture and ocean salinity</i>		<b>Solar powered vehicles</b>	
USE:	SMOS mission	BT:	Electric vehicles
<i>Soil moisture and ocean salinity mission</i>		RT:	Battery powered vehicles
USE:	SMOS mission		Energy storage
			Solar power generation
			Traction motors
			Vehicle-to-grid
<b>Soil pollution</b>		<b>Solar radiation</b>	
BT:	Land pollution	BT:	Extraterrestrial phenomena
RT:	Agriculture	RT:	Solar energy
	Soil		Space radiation
<b>Soil properties</b>		<b>Solar system</b>	
BT:	Soil	BT:	Astronomy
<b>Soil texture</b>		NT:	Kuiper belt
BT:	Soil		Planets
<i>Solar cells</i>			Satellites
USE:	Photovoltaic cells		Sun
<b>Solar cooling</b>		<i>Solder joints</i>	
BT:	Cooling	USE:	Soldering
<b>Solar energy</b>		<b>Soldering</b>	
BT:	Energy resources	UF:	Solder joints
RT:	Maximum power point	BT:	Assembly
trackers			Fabrication
	Solar heating		Joining processes
	Solar power generation	RT:	Bonding processes
	Solar radiation		Manufacturing
<b>Solar heating</b>			Materials processing
BT:	Energy conversion		Soldering equipment



# 2018 IEEE Thesaurus

NT:        Brazing  
             Flip chip solder joints  
             Reflow soldering

## Soldering equipment

BT:        Production equipment  
RT:        Joining materials  
             Joining processes  
             Soldering

## Solderless breadboard

USE:       Breadboard circuit

## Solenoids

BT:        Magnetic devices  
RT:        Switches  
             Transducers

## Solid lasers

UF:        Color center lasers  
             Solid state lasers  
             Solid-state lasers  
BT:        Lasers  
RT:        Thermal lensing  
             Thermooptical devices  
NT:        Microchip lasers  
             Quantum well lasers  
             Semiconductor lasers  
             Surface emitting lasers

## Solid modeling

BT:        Modeling  
RT:        Solid-state physics  
             Virtual reality

## Solid oxide electrolyzer cells

USE:       Fuel cells

## Solid scintillation detectors

BT:        Scintillation counters  
RT:        Energy resolution  
             Medical diagnostic imaging  
             Spectroscopy

## Solid state batteries

UF:        Solid-state batteries  
BT:        Batteries

## Solid state circuit design

UF:        Solid-state circuit design  
BT:        Solid state circuits  
RT:        Circuit synthesis

## Solid state circuits

UF:        Solid-state circuits

RT:        Circuits and systems  
NT:        Circuit subsystems  
             Circuit theory  
             FET circuits  
             Gate leakage  
             Solid state circuit design  
             Transistors

## Solid state lasers

USE:       Solid lasers

## Solid state lighting

UF:        Solid-state lighting  
BT:        Lighting

## Solid-state batteries

USE:       Solid state batteries

## Solid-state circuit design

USE:       Solid state circuit design

## Solid-state circuits

USE:       Solid state circuits

## Solid-state lasers

USE:       Solid lasers

## Solid-state lighting

USE:       Solid state lighting

## Solid-state physics

BT:        Physics  
RT:        Materials science and  
technology  
             Quantum mechanics  
             Solid modeling

## Solids

BT:        Materials  
RT:        Crystals  
             Materials science and  
technology  
NT:        Young's modulus

## Solitons

BT:        Waves  
NT:        Optical solitons

## Solution design

BT:        Systems engineering and  
theory

## Solvents

BT:        Chemical processes  
RT:        Methanol





# 2018 IEEE Thesaurus

## SOM

USE: Self-organizing feature  
maps

## Sonar

BT: Aerospace and electronic  
systems  
RT: Acoustic arrays  
Chirp modulation  
Ultrasonic transducers  
NT: Sonar applications  
Sonar equipment  
Synthetic aperture sonar

## Sonar applications

BT: Sonar  
RT: Sonar navigation  
NT: Sonar detection  
Sonar measurements

## Sonar detection

BT: Acoustic signal detection  
Sonar applications  
RT: Reflectivity

## Sonar equipment

UF: Hydrophones  
BT: Sonar

## Sonar measurements

BT: Sonar applications  
RT: Remote sensing  
Sea measurements

## Sonar navigation

BT: Navigation  
RT: Sonar applications

## SONET

UF: Synchronous optical  
network  
BT: Communication standards  
Digital communication  
ETSI Standards  
Optical fiber communication  
RT: Asynchronous transfer  
mode  
Synchronous digital  
hierarchy  
Transport protocols

## Sonification

BT: Audio systems  
Information processing

## Sonogram

BT: Ultrasonography  
RT: Spectrogram

## SONOS devices

UF: Silicon-oxide-nitride-oxide-  
silicon  
BT: Semiconductor devices

## Sorting

BT: Data handling  
RT: Merging

## SOS (*silicon on sapphire*)

USE: Silicon-on-insulator

## SOSE

USE: Service-oriented systems  
engineering

## Sound systems

USE: Audio systems

## Source coding

BT: Data compression  
Encoding  
Information theory  
RT: Rate distortion theory

## Source location

USE: Position measurement

## Source separation

UF: Signal separation  
BT: Signal processing  
RT: Adaptive signal detection  
Array signal processing  
Signal detection  
NT: Blind source separation

## South America

BT: Continents

## South Pole

BT: Antarctica

## Space based radar

USE: Spaceborne radar

## Space born radar

USE: Spaceborne radar

## Space charge

BT: Charge carrier processes



# 2018 IEEE Thesaurus

Electrostatic processes  
RT: Pulsed electroacoustic  
methods Vacuum technology

## Space communications

BT: Telecommunications  
NT: Deep-space  
communications

## Space cooling

BT: Cooling  
RT: Buildings  
Coolants  
Refrigerants

## Space debris

UF: Orbital debris  
Space junk  
Space waste  
BT: Space technology

## Space diversity

USE: Spatial diversity

## Space exploration

UF: Space travel  
BT: Space technology  
RT: NASA  
NT: Interplanetary exploration  
Space missions

## Space habitats

USE: Buildings AND  
Space technology

## Space heating

BT: Heating systems  
RT: Building services  
Gas appliances  
Solar heating  
Temperature control  
Vents

## Space junk

USE: Space debris

## Space measurements

USE: Extraterrestrial  
measurements

## Space missions

BT: Space exploration  
RT: Interplanetary exploration  
NASA

## Space phenomena

USE: Extraterrestrial phenomena

## Space power stations

UF: Power stations (space)  
BT: Space stations  
RT: Power generation

## Space radiation

BT: Radiation effects  
RT: Ionization  
Solar radiation

## Space shuttles

BT: Space vehicles  
RT: Aerospace safety

## Space stations

BT: Artificial satellites  
NT: International Space Station  
Space power stations

## Space technology

UF: Space habitats  
BT: Aerospace engineering  
RT: Artificial satellites  
Extraterrestrial phenomena  
Field programmable analog

## arrays

NASA  
Space vehicles  
NT: Payloads  
Space debris  
Space exploration

## Space travel

USE: Space exploration

## Space vector pulse width modulation

UF: SVPWM  
BT: Pulse width modulation  
RT: AC motors  
Converters  
DC motors

## Space vehicle electronics

USE: Aerospace electronics

## Space vehicle instrumentation

USE: Aerospace electronics

## Space vehicle navigation

USE: Space vehicles



# 2018 IEEE Thesaurus

## Space vehicles

UF: Planetary landers  
Space vehicle navigation  
BT: Vehicles  
RT: Aerospace accidents  
Aerospace control  
Aerospace electronics  
Aerospace materials  
Aerospace safety  
Artificial satellites  
Ground support  
Proton effects  
Space technology  
NT: Space shuttles

## Space waste

USE: Space debris

## Space-time codes

BT: Codes  
RT: Channel coding  
Decoding

## Spaceborn radar

USE: Spaceborne radar

## Spaceborne radar

UF: Satellite born radar  
Satellite borne radar  
Space based radar  
Space born radar  
Spaceborn radar  
BT: Radar  
RT: Radar remote sensing  
Synthetic aperture radar

## Spacecraft materials

USE: Aerospace materials

## Spacial indices

USE: Spatial indexes

## Spam

USE: Unsolicited electronic mail

## Spamming

USE: Unsolicited electronic mail

## Spark gaps

BT: Electromagnetic analysis  
RT: Air gaps  
Electrodes  
Insulation  
Sparks  
Switches

## Sparks

BT: Electric breakdown  
RT: Spark gaps

## Sparse matrices

UF: Sparse matrix  
BT: Numerical analysis

## Sparse matrix

USE: Sparse matrices

## Spatial coherence

BT: Image processing

## Spatial databases

BT: Databases

## Spatial diversity

UF: Antenna diversity  
Space diversity  
BT: Communication systems  
Wireless communication  
RT: Antennas  
Quality of service  
Receiving antennas

## Spatial filters

BT: Filters

## Spatial indexes

UF: Spacial indices  
BT: Indexes

## Spatial resolution

BT: Image resolution  
RT: Image quality

## Spatio-temporal phenomena

USE: Spatiotemporal phenomena

## Spatiotemporal phenomena

UF: Spatio-temporal  
phenomena  
BT: Chaos  
RT: Nonlinear dynamical  
systems  
Pattern formation  
Pattern matching  
Pattern recognition

## Speaker recognition

BT: Identification of persons  
RT: Biometrics (access control)  
Speech recognition



# 2018 IEEE Thesaurus

	Viterbi algorithm	<i>Spectral domain</i>	USE: Spectral analysis
<i>Special issues</i>		<b>Spectral efficiency</b>	
USE:	Special issues and sections	UF:	Bandwidth efficiency
<b>Special issues and sections</b>		BT:	Channel allocation
UF:	Special issues		Measurement
	Special sections	RT:	Bandwidth
BT:	IEEE indexing		Information processing
<i>Special sections</i>		<b>Spectral shape</b>	
USE:	Special issues and sections	BT:	Acoustics
<b>Specific absorption rate</b>		<i>Spectral waterfall</i>	
UF:	SAR	USE:	Spectrogram
BT:	Electromagnetic	<i>Spectral-domain</i>	
interference		USE:	Spectral analysis
<b>Specification languages</b>		<b>Spectrogram</b>	
BT:	Computer languages	UF:	Spectral waterfall
NT:	Domain specific languages		Voice print
	Unified modeling language		Voicegram
<b>Speckle</b>			Voiceprint
BT:	Optical noise	BT:	Signal processing
RT:	Optical interferometry	RT:	Sonogram
	Optical scattering	<i>Spectrometry</i>	
<i>SPECT</i>		USE:	Spectroscopy
USE:	Single photon emission	<b>Spectroradiometers</b>	
computed tomography		BT:	Radiometers
<b>Spectral analysis</b>			Spectral analysis
UF:	Power spectra	NT:	MODIS
	Spectral domain	<b>Spectroscopy</b>	
	Spectral-domain	UF:	Spectrometry
	Spectrum analysis	BT:	Measurement
	Spectrum estimation	RT:	Atomic measurements
BT:	Signal analysis		Bandwidth
RT:	Direction-of-arrival		Fourier series
estimation			Infrared spectra
	Estimation		Nuclear measurements
	Frequency estimation		Radiation detectors
	Harmonic analysis		Solid scintillation detectors
	Parameter estimation		Spectral analysis
	Prediction methods		Thermorefectance imaging
	Signal resolution	NT:	Electrochemical impedance
	Spectroscopy	spectroscopy	
	Speech analysis		Electron paramagnetic
	Time series analysis	resonance	
	Transforms	spectroscopy	Fourier transform infrared
NT:	Infrared spectra		Kirchhoff's Law
	Judd-Ofelt theory		MERIS
	Spectroradiometers		



# 2018 IEEE Thesaurus

Mass spectroscopy  
Neutron spin echo  
Photoacoustic effects  
Resonance light scattering

BT: Speech processing  
RT: Hearing aids  
Speech recognition

## *Spectrum analysis*

USE: Spectral analysis

## *Spectrum estimation*

USE: Spectral analysis

## *Spectrum management*

USE: Radio spectrum  
management

## **Speech**

BT: Oral communication

## *Speech activity detection*

USE: Voice activity detection

## **Speech analysis**

BT: Speech recognition  
RT: Cepstral analysis  
Frequency estimation  
Signal analysis  
Spectral analysis  
Speech coding  
Speech synthesis

## **Speech codecs**

BT: Codecs  
Communication equipment  
RT: Decoding  
Speech coding  
Vocoders

## **Speech coding**

BT: Encoding  
Information theory  
RT: Audio coding  
Rate distortion theory  
Speech analysis  
Speech codecs  
Vector quantization  
Vocoders  
Voice activity detection

## *Speech communication*

USE: Oral communication

## *Speech detection*

USE: Voice activity detection

## **Speech enhancement**

## **Speech processing**

BT: Acoustic signal processing  
RT: Delay estimation  
Prediction methods  
NT: Human voice  
Speech enhancement  
Speech synthesis  
Voice activity detection

## **Speech recognition**

BT: Identification of persons  
Pattern recognition  
RT: Cepstral analysis  
Emotion recognition  
Feature extraction  
Speaker recognition  
Speech enhancement  
Voice activity detection  
Automatic speech  
recognition  
Speech analysis

## **Speech synthesis**

UF: Voice response systems  
BT: Speech processing  
RT: Biomedical equipment  
Signal synthesis  
Speech analysis  
Voice activity detection

## *Speechmaking*

USE: Public speaking

## *Speed control*

USE: Velocity control

## *Speed measurement*

USE: Velocity measurement

## **SPICE**

UF: Simulation Program with  
Integrated Circuit Emphasis  
pSPICE  
BT: Software packages  
RT: Circuit analysis  
Design automation  
Integrated circuits

## *Spin injection*

USE: Spin polarized transport



# 2018 IEEE Thesaurus

## *Spin polarised transport*

USE: Spin polarized transport

Pulp and paper industry

Spinning

Textile industry

Textiles

## **Spin polarized transport**

UF: Spin injection  
Spin polarised transport

BT: Magnetoelectronics

RT: Magnetic tunneling  
Magnetoresistance

## **Spintronics**

UF: Fluxtronics

Spinelectronics

BT: Magnetoelectric effects

## **Spin valves**

BT: Magnetic sensors

RT: Hysteresis

## **Spirals**

BT: Mathematics

## *Spin-dependent tunneling*

USE: Magnetic tunneling

## **Splicing**

UF: Cable splicing

Fusion splicing

BT: Joining processes

RT: Optical fiber cables

Transmission lines

## *Spin-dependent tunnelling*

USE: Magnetic tunneling

## **Spinal cord**

BT: Nervous system

NT: Cerebrospinal fluid

Spinal cord injury

## *Spline functions*

USE: Splines (mathematics)

## *Spinal cord injuries*

USE: Spinal cord injury

## **Splines (mathematics)**

UF: B-Spline

Spline functions

BT: Numerical analysis

RT: Curve fitting

## **Spinal cord injury**

UF: Spinal cord injuries

BT: Spinal cord

## **Split gate flash memory cells**

UF: Split-gate flash memory cells

BT: Flash memory cells

## *Spinal cord stimulation*

USE: Electrical stimulation

## *Split-gate flash memory cells*

USE: Split gate flash memory cells

## *Spindle bearings*

USE: Machine tool spindles

## **Spine**

BT: Nervous system

Skeleton

## *SPO*

USE: Triples (Data structure)

## *Spinelectronics*

USE: Spintronics

## **Spontaneous emission**

UF: Superradiance

BT: Photonics

RT: Microcavities

Photonic crystals

NT: Radiative recombination

## **Spinning**

BT: Textile technology

RT: Spinning machines

Textile fibers

## **Sports equipment**

BT: Manufactured products

RT: Bicycles

## **Spinning machines**

BT: Textile machinery

RT: Paper making

Paper making machines

Paper mills

## **Spot welding**

BT: Welding



# 2018 IEEE Thesaurus

## Spraying

BT: Surface finishing  
 RT: Aerosols  
 Coatings  
 Liquids  
 Particle production  
 Surface charging  
 NT: Thermal spraying

## Spread spectrum communication

UF: Frequency hop  
 communication  
 Frequency-hop  
 communication  
 Multi-hop  
 Multihop  
 Pseudonoise coded  
 communication  
 BT: Digital communication  
 RT: 3G mobile communication  
 4G mobile communication  
 Bluetooth  
 Channel estimation  
 Chirp modulation  
 Code division multiplexing  
 Electronic countermeasures  
 Electronic warfare  
 Multicarrier code division  
 multiple access  
 Multiuser detection  
 Radio communication  
 countermeasures  
 Time division synchronous  
 code division multiple access  
 Ultra wideband  
 communication

## Spread spectrum radar

UF: Frequency hop radar  
 Pseudonoise coded radar  
 BT: Radar  
 RT: Chirp modulation  
 Electronic countermeasures  
 Electronic warfare  
 Radar countermeasures

## Spreadsheet programs

UF: Microsoft Excel  
 BT: Data processing

## Springs

BT: Mechanical products  
 Production  
 RT: Shock absorbers  
 Suspensions

Wires

## Sprites (computer)

BT: Computer graphics  
 RT: Three-dimensional displays  
 Two dimensional displays

## Spur gears

USE: Gears

## Spurline

BT: Power filters  
 RT: Planar transmission lines  
 NT: Spurline components

## Spurline components

BT: Spurline

## Sputter deposition

USE: Sputtering

## Sputter etching

BT: Sputtering  
 RT: Radiography

## Sputtering

UF: Sputter deposition  
 Thin film deposition  
 BT: Materials preparation  
 RT: Coatings  
 Films  
 Magnetrons  
 NT: Sputter etching

## Spyware

BT: Malware

## SQL

USE: Structured Query Language

## SQL injection

BT: Computer crime  
 Information security

## SQUID magnetometers

BT: Magnetometers  
 RT: Magnetic fields

## SQUIDS

UF: Superconducting quantum  
 interference devices  
 BT: Superconducting devices  
 RT: Readout electronics

Sr



# 2018 IEEE Thesaurus

	USE:	Strontium		
<b>SRAM</b>			<i>Standard Generalized Markup Language</i>	
	USE:	SRAM chips	USE:	SGML
<b>SRAM cells</b>			<b>Standardization</b>	
	BT:	Random access memory	BT:	Engineering - general
<b>SRAM chips</b>			RT:	IEC
	UF:	SRAM		ISO
	BT:	Random access memory	NT:	ISO Standards
	RT:	CMOS memory circuits		Formal specifications
				Guidelines
				Standards
<b>Stability</b>			<b>Standards</b>	
	BT:	Reliability	BT:	Standardization
	RT:	Asymptotic stability	RT:	IEC
		Control systems		ISO
		Damping		International collaboration
		Lyapunov methods		Open systems
		Predator prey systems		Qualifications
		Robustness	NT:	Standards Organizations
	NT:	Circuit stability		Standards categories
		Robust stability		Standards organizations
		Stability analysis		Standards publications
		Thermal stability		
<b>Stability analysis</b>			<b>Standards categories</b>	
	BT:	Stability	BT:	Standards
	RT:	Algorithms	NT:	Communication standards
		Differential equations		International Atomic Time
		Laser stability		Measurement standards
		Plasma properties		Military standards
		Signal processing		Power and energy
		System analysis and design	standards	Software standards
	NT:	Stability criteria		
<b>Stability criteria</b>			<b>Standards Organizations</b>	
	BT:	Stability analysis	BT:	Standards
			NT:	Open Geospatial
<b>Stacking</b>			Consortium	
	BT:	Material storage	<b>Standards organizations</b>	
	RT:	Containers	BT:	Standards
		Materials handling	NT:	3GPP
		Warehousing		ANSI
				ASA
<i>Stakeholder pensions</i>				DMTF
	USE:	Pensions		ETSI
				IEC
<b>Stakeholders</b>				IEEE Standards
	BT:	Customer relationship	Association	
management				ISO
		Organizational aspects		ITU
	RT:	Decision making		NACE International
		Requirements engineering		NFPA
		Strategic planning		NIST





# 2018 IEEE Thesaurus

SMPTE W3C		<b>State-space methods</b>	
		UF:	State-space model
		BT:	Control system analysis
		RT:	Time-domain analysis
<b>Standards publications</b>		<i>State-space model</i>	
BT:	Standards	USE:	State-space methods
NT:	3GPP Standards	<b>Static analysis</b>	
	ANSI Standards	UF:	Static projection
	ASA Standards		Statis scoring
	DMTF Standards	BT:	Statistical analysis
	ETSI Standards		System analysis and design
	IEC Standards	RT:	Model checking
	IEEE Standards		Software engineering
	ISO Standards	<i>Static compensator</i>	
	ITU Standards	USE:	STATCOM
	NACE Standards	<i>Static converters</i>	
	NISO Standards	USE:	Static power converters
	NIST Standards	<b>Static induction transistors</b>	
	SMPTE Standards	BT:	Transistors
	W3C Standards	<b>Static power converters</b>	
<b>Standby generators</b>		UF:	Static converters
UF:	Emergency power	BT:	Converters
generators		<i>Static projection</i>	
BT:	Generators	USE:	Static analysis
	Rotating machines	<b>Static VAr compensators</b>	
RT:	Emergency power supplies	UF:	SVC
<i>Standby power supplies</i>		BT:	Power transmission
USE:	Emergency power supplies	RT:	Reactive power
<b>Stark effect</b>		NT:	STATCOM
BT:	Electrooptic effects	<b>Stationary state</b>	
<i>Starter motors (automotive)</i>		UF:	Ground state
USE:	Automotive components	BT:	Quantum mechanics
<b>STATCOM</b>		<i>Statis scoring</i>	
UF:	Static compensator	USE:	Static analysis
BT:	Static VAr compensators	<b>Statistical analysis</b>	
<b>State estimation</b>		UF:	Statistical testing
BT:	Estimation	BT:	Statistics
RT:	Control systems	RT:	Measurement errors
NT:	Observers		Nearest neighbor methods
<b>State feedback</b>			Probability
BT:	Linear feedback control		Random processes
systems			Time series analysis
<b>State of charge</b>		NT:	Analysis of variance
BT:	Battery chargers		Mode matching methods
<i>State pensions</i>			
USE:	Pensions		



# 2018 IEEE Thesaurus

	Monte Carlo methods		Root mean square
	Parameter estimation		Sampling methods
	Pareto analysis		Statistical analysis
	Principal component		Time series analysis
analysis			
	Regression analysis	<b>Stator bars</b>	
	Static analysis	BT:	Stators
<b>Statistical distributions</b>		<b>Stator cores</b>	
BT:	Probability	BT:	Stators
NT:	Distribution functions	<b>Stator windings</b>	
	Gaussian distribution	BT:	Stators
	Weibull distribution		
<b>Statistical learning</b>		<b>Stators</b>	
BT:	Machine learning	BT:	Electric machines
RT:	Pattern recognition	NT:	Stator bars
			Stator cores
			Stator windings
<i>Statistical testing</i>			
USE:	Statistical analysis	<i>Steady state</i>	
		USE:	Steady-state
<b>Statistics</b>		<b>Steady-state</b>	
BT:	Mathematics	UF:	Steady state
RT:	Econometrics	BT:	Dynamic equilibrium
	Estimation theory	RT:	Transient analysis
	Extrapolation		
	Fourier transforms	<b>Steam engines</b>	
	Information theory	BT:	Heat engines
	Interpolation	RT:	Boilers
	Matrix decomposition		Water
	Maximum likelihood		
detection		<b>Steel</b>	
	Operations research	BT:	Metals
	Probability	RT:	Pressure vessels
	Scheduling	NT:	Martensite
	Weibull distribution		
NT:	Adaptive estimation	<b>Steel industry</b>	
	Autoregressive processes	BT:	Industries
	Boltzmann distribution		
	Correlation	<b>Steering systems</b>	
	Correlation coefficient	BT:	Mechanical products
	Covariance matrices		Production systems
	Dimensionality reduction	RT:	Automotive components
	Gaussian mixture model		Wheels
	Higher order statistics		
	Histograms	<b>Steganography</b>	
	Linear discriminant analysis	BT:	Message authentication
	Maximum likelihood	RT:	Cryptography
estimation		<i>Steiner points</i>	
	Minimax techniques	USE:	Steiner trees
	Mixture models		
	Nonparametric statistics	<b>Steiner trees</b>	
	Parametric statistics		
	Prediction theory		
	Ranking (statistics)		



# 2018 IEEE Thesaurus

UF:	Steiner points	Layered manufacturing
	Steiner vertices	Manufacturing
BT:	Combinatorial mathematics	Prototypes
<i>Steiner vertices</i>		
USE:	Steiner trees	
<b>Stellar dynamics</b>		
BT:	Astrophysics	
NT:	Stellar motion	
<b>Stellar motion</b>		
BT:	Stellar dynamics	
RT:	Orbits (stellar)	
<b>STEM</b>		
UF:	Science technology	
engineering mathematics	science technology	
engineering and math	science, technology,	
engineering, and math		
BT:	Educational programs	
RT:	Curriculum development	
	Education courses	
	Engineering - general	
	Mathematics	
	Science - general	
	Technology	
<i>Stem cell research</i>		
USE:	Stem cells	
<b>Stem cells</b>		
UF:	Stem cell research	
BT:	Biological cells	
RT:	Progenitor cells	
<b>Stereo image processing</b>		
UF:	Stereoscopic	
BT:	Stereo vision	
<b>Stereo vision</b>		
UF:	Three-dimensional vision	
BT:	Imaging	
RT:	Image matching	
	Machine vision	
	Robot vision systems	
NT:	Stereo image processing	
<b>Stereolithography</b>		
BT:	Lithography	
RT:	Laser applications	
	Laser sintering	
	Lasers	
<i>Stereophonic systems</i>		
USE:	Audio systems	
<i>Stereoscopic</i>		
USE:	Stereo image processing	
<b>Sternum</b>		
BT:	Thorax	
<b>Stethoscope</b>		
BT:	Biomedical equipment	
<b>Stimulated emission</b>		
UF:	Optical amplification	
BT:	Particle beam optics	
RT:	Lasers	
	Masers	
<b>Stirling engines</b>		
BT:	Heat engines	
<i>Stochastic distribution</i>		
USE:	Stochastic processes	
<i>Stochastic prediction</i>		
USE:	Stochastic processes	
<b>Stochastic processes</b>		
UF:	Stochastic distribution	
	Stochastic prediction	
	Stochastic theory	
BT:	Mathematics	
RT:	Computational	
electromagnetics		
	Diffusion processes	
	Particle swarm optimization	
	Probability	
	Random number	
generation		
	Random variables	
	Viterbi algorithm	
NT:	Gaussian processes	
	Markov processes	
<b>Stochastic resonance</b>		
BT:	Resonance	
<b>Stochastic systems</b>		
BT:	Systems engineering and	
theory		
RT:	Control systems	



# 2018 IEEE Thesaurus

	Probability		RT:	Ions
	Random variables			Muon colliders
				Particle beams
<i>Stochastic theory</i>				
USE:	Stochastic processes	<i>Stored energy</i>		
		USE:		Energy storage
<i>Stock exchanges</i>		<i>Storm systems</i>		
USE:	Stock markets	USE:		Tropical cyclones
<b>Stock markets</b>		<b>Storms</b>		
UF:	Stock exchanges	BT:		Meteorology
BT:	Economics	RT:		Lightning
				Monsoons
<b>Stokes parameters</b>		<b>Strain</b>		
BT:	Optical polarization	UF:		Deformation
<b>Stomach</b>		BT:		Mechanical factors
BT:	Digestive system	RT:		Elasticity
				Strain control
<b>Stomatognathic system</b>				Strain measurement
BT:	Anatomy	NT:		Tensile strain
RT:	Face			Uniaxial strain
	Lips			
	Mouth			
	Pharynx			
	Tongue			
NT:	Masticatory muscles	<i>Strain based sensors</i>		
	Salivary glands	USE:		Capacitive sensors
<b>Storage area networks</b>		<b>Strain control</b>		
UF:	SAN	UF:		Friction stir processing
BT:	Computer networks	BT:		Mechanical variables
RT:	Data storage systems	control		
	Local area networks	RT:		Strain
<b>Storage automation</b>		<i>Strain gauges</i>		
UF:	Automated storage and	USE:		Strain measurement
retrieval systems				
BT:	Automation	<b>Strain measurement</b>		
	Material storage	UF:		Strain gauges
RT:	Warehousing	BT:		Mechanical variables
		measurement		
<i>Storage batteries</i>		RT:		Micrometers
USE:	Batteries			Strain
<i>Storage battery</i>		<i>Strain sensors</i>		
USE:	Batteries	USE:		Capacitive sensors
<b>Storage management</b>		<b>Strategic planning</b>		
BT:	Capacity planning	BT:		Planning
	Management	RT:		Analytic hierarchy process
RT:	Memory management			Business intelligence
				Decision making
				Information systems
				Stakeholders
<b>Storage rings</b>		<i>Stratified media</i>		
BT:	Particle accelerators			



# 2018 IEEE Thesaurus

USE:	Nonhomogeneous media	BT:	Mechanical variables measurement
<i>Stratosphere</i>		RT:	Stress
USE:	Terrestrial atmosphere		
<b>Stray light</b>		<b>String theory</b>	
BT:	Light sources	BT:	Physics
	Optics	RT:	Quantum mechanics
RT:	Ray tracing		
<b>Streaming media</b>		<i>String vacuum</i>	
UF:	Media streaming	USE:	Elementary particle vacuum
	Video streaming		
BT:	Communication system	<b>Stripboard circuit</b>	
software		UF:	Veroboard
RT:	Data compression	BT:	Electronic circuits
	IEEE 802.11e Standard		
	IPTV	<b>Stripline</b>	
	Internet	BT:	Planar transmission lines
	MPEG 4 Standard		Transmission lines
	MPEG standards	NT:	Stripline components
	Multimedia communication		
	Unicast	<b>Stripline components</b>	
	Video coding	BT:	Stripline
	Video signal processing	RT:	Power combiners
NT:	Video on demand		Power dividers
<i>Streetcars</i>		<b>Strips</b>	
USE:	Light rail systems	BT:	Structural shapes
<b>Stress</b>		<b>Strontium</b>	
UF:	Mechanical stress	UF:	Sr
BT:	Mechanical factors	BT:	Metals
RT:	Magnetomechanical effects	NT:	Strontium compounds
	Photoelasticity	<b>Strontium compounds</b>	
	Piezoelectricity	BT:	Strontium
	Piezoelectric effects	RT:	Alloying
	Piezoresistance		
	Stress control	<b>Structural beams</b>	
	Stress measurement	UF:	Cantilever beams
NT:	Compressive stress		Girders
	Internal stresses	BT:	Structural shapes
	Residual stresses	RT:	Building materials
	Tensile stress		
<i>Stress (psychological)</i>		<b>Structural discs</b>	
USE:	Human factors	UF:	Disks (structures)
		BT:	Structural shapes
<b>Stress control</b>		<b>Structural engineering</b>	
BT:	Mechanical variables	UF:	Structural parameter
control			Structural stability
RT:	Stress	BT:	Civil engineering
		RT:	Architecture
<b>Stress measurement</b>			Bridges
			Construction
			Flexible structures



# 2018 IEEE Thesaurus

	Floods	Structural rods
	Intelligent structures	Structural shells
	Mechanical factors	Thin wall structures
NT:	Offshore installations	Wires
<b>Structural panels</b>		<b>Structural shells</b>
UF:	Railway bridges	BT: Structural shapes
	Road bridges	RT: Thin wall structures
	Suspension bridges	
BT:	Structural shapes	<i>Structural stability</i>
RT:	Honeycomb structures	USE: Structural engineering
	Sandwich structures	
	Sheet materials	<b>Structure from motion</b>
	Structural plates	BT: Image processing
	Thin wall structures	RT: Motion control
		Signal processing
<i>Structural parameter</i>		Three-dimensional displays
USE:	Structural engineering	Two dimensional displays
<b>Structural plates</b>		<b>Structured Query Language</b>
BT:	Electronic components	UF: SQL
	Structural shapes	BT: Database languages
RT:	Flanges	RT: Programming
	Structural panels	Relational databases
	Wheels	
<b>Structural rings</b>		<b>Student awards</b>
UF:	O-rings	BT: IEEE Awards activities
BT:	Structural shapes	RT: IEEE Student Members
RT:	Engine cylinders	
	Mechanical products	<i>Student engineers</i>
	Pistons	USE: Engineering students
	Seals	
<b>Structural rods</b>		<b>Student experiments</b>
BT:	Structural shapes	BT: Engineering education
		RT: Laboratories
<b>Structural shapes</b>		<b>Style sheet languages</b>
BT:	Mechanical products	BT: Computer languages
NT:	Bars	NT: Cascading style sheets
	Bridges	
	Ducts	<i>Sub-mm wave filters</i>
	Flexible structures	USE: Submillimeter wave filters
	Honeycomb structures	
	Lightweight structures	<i>Sub-sea cables</i>
	Rails	USE: Underwater cables
	Sandwich structures	
	Sheet materials	<b>Subcontracting</b>
	Slabs	BT: Contracts
	Strips	
	Structural beams	<i>Subject predicate object</i>
	Structural discs	USE: Triples (Data structure)
	Structural panels	
	Structural plates	<i>Submarine cables</i>
	Structural rings	USE: Underwater cables



# 2018 IEEE Thesaurus

## *Submarine technology*

USE: Underwater technology

## *Submarines*

USE: Underwater vehicles

## *Submersibles*

USE: Underwater vehicles

## **Submillimeter wave circuits**

BT: Circuits  
Submillimeter wave

## technology

RT: Analog circuits  
Submillimeter wave devices  
Submillimeter wave filters

NT: Submillimeter wave

## integrated circuits

## **Submillimeter wave communication**

BT: Communication systems  
Submillimeter wave

## technology

## **Submillimeter wave devices**

UF: Submillimeter wave

## systems

BT: Submillimeter wave

## technology

RT: Submillimeter wave circuits  
Submillimeter wave

## integrated circuits

NT: Submillimeter wave filters

## **Submillimeter wave filters**

UF: Sub-mm wave filters  
Submillimetre wave filters  
BT: Submillimeter wave devices  
RT: Submillimeter wave circuits

## **Submillimeter wave integrated circuits**

BT: Integrated circuits  
Submillimeter wave circuits  
Submillimeter wave

## technology

RT: Analog integrated circuits  
Submillimeter wave devices

## **Submillimeter wave measurements**

BT: Electromagnetic

## measurements

RT: Hyperspectral sensors  
Submillimeter wave

## technology

## **Submillimeter wave propagation**

BT: Electromagnetic  
propagation

## *Submillimeter wave systems*

USE: Submillimeter wave devices

## **Submillimeter wave technology**

BT: Microwave theory and  
techniques

RT: Submillimeter wave

## measurements

NT: Submillimeter wave circuits  
Submillimeter wave

## communication

Submillimeter wave devices  
Submillimeter wave

## integrated circuits

## *Submillimetre wave filters*

USE: Submillimeter wave filters

## *Subroutines*

USE: Algorithms

## **Subscriber loops**

BT: Communication systems  
Multiaccess communication

## *Subscriber sets*

USE: Telephone sets

## *Subsea cables*

USE: Underwater cables

## **Subspace constraints**

BT: Object segmentation

## **Substation automation**

BT: Substations  
RT: Automation  
SCADA systems  
Substation protection

## **Substation protection**

BT: Power system protection  
Substations  
RT: Substation automation

## **Substations**

UF: Power stations  
(substations)

BT: Power systems  
NT: Substation automation  
Substation protection



# 2018 IEEE Thesaurus

<b>Substrate hot electron injection</b>		RT:	Food products
UF:	Substrate hot-electron injection		Sugar industry
BT:	Hot carrier injection		Sugar refining
<i>Substrate hot-electron injection</i>		<b>Sugar industry</b>	
USE:	Substrate hot electron injection	BT:	Industries
		RT:	Food industry
			Food products
			Sugar
		NT:	Sugar refining
<b>Substrate integrated waveguides</b>		<b>Sugar refining</b>	
UF:	Post-wall waveguides	BT:	Sugar industry
BT:	Waveguide lasers	RT:	Food industry
<b>Substrates</b>			Food products
BT:	Semiconductor materials		Food technology
RT:	Epitaxial growth		Purification
	Microprocessor chips		Refining
	Printed circuits		Sugar
	Silicon germanium		
	Silicon on sapphire		
<i>Subthreshold conduction</i>		<b>Sulfur</b>	
USE:	Subthreshold current	UF:	Sulphur
		BT:	Chemical elements
<b>Subthreshold current</b>		<b>Sulfur hexafluoride</b>	
UF:	Subthreshold conduction	UF:	SF <sub>6</sub>
	Subthreshold drain current	BT:	Gas insulation
	Subthreshold leakage	<i>Sulphur</i>	
BT:	Threshold voltage	USE:	Sulfur
<i>Subthreshold drain current</i>		<b>Sum product algorithm</b>	
USE:	Subthreshold current	UF:	Sum-product algorithm
		BT:	Iterative algorithms
<i>Subthreshold leakage</i>		<i>Sum-product algorithm</i>	
USE:	Subthreshold current	USE:	Sum product algorithm
<b>Subtraction techniques</b>		<b>Summing circuits</b>	
BT:	Image analysis	BT:	Circuits
RT:	Biomedical image processing	RT:	Analog computers
<i>Subways</i>		<b>Sun</b>	
USE:	Public transportation	BT:	Solar system
<i>Sucrose</i>		<i>Sun sensors</i>	
USE:	Sugar	USE:	Sensors
<b>Sufficient conditions</b>		<i>Super earths</i>	
BT:	Logic	USE:	Extrasolar planets
<b>Sugar</b>		<i>Super hi-vision</i>	
UF:	Glucose	USE:	UHDTV
	Sucrose		
BT:	Agricultural products	<b>Supercapacitors</b>	





# 2018 IEEE Thesaurus

UF: Electrical double layer  
capacitors  
BT: Ultracapacitors  
Electrochemical devices  
Energy storage  
Power capacitors  
RT: Capacitance  
Capacitance measurement  
Electrolytes

## Supercomputers

BT: Computers  
RT: Petascale computing

## Superconducting cables

BT: Superconducting  
transmission lines  
RT: Superconducting coils  
Superconducting magnets

## Superconducting coils

BT: Coils  
Superconducting devices  
RT: Superconducting cables  
Superconducting magnets

## Superconducting device noise

BT: Noise  
RT: Superconducting devices

## Superconducting devices

UF: Josephson devices  
SIS devices  
(superconductor)  
SNS devices  
Superconductor-insulator-  
superconductor devices  
Superconductor-normal-  
superconductor devices  
BT: Superconductivity  
RT: Cryogenic electronics  
High-temperature  
superconductors  
Superconducting device  
noise  
Superconducting films  
Thermal factors  
NT: Josephson junctions  
SQUIDs  
Superconducting coils  
Superconducting magnets  
Superconducting  
microwave devices  
Superconducting  
photodetectors

## Superconducting epitaxial layers

BT: Epitaxial layers  
RT: Superconducting materials

## Superconducting filaments

USE: Superconducting materials

## Superconducting filaments and wires

BT: Superconductivity

## Superconducting films

UF: Superconducting tapes  
BT: Superconductivity  
RT: High-temperature  
superconductors  
Superconducting devices  
Surface impedance  
Surface resistance  
Thick films  
Thin films  
NT: Superconducting thin films

## Superconducting filters

BT: Filters  
RT: Radiofrequency  
interference

## Superconducting infrared detectors

USE: Superconducting  
photodetectors

## Superconducting integrated circuits

BT: Integrated circuits  
Superconductivity

## Superconducting junction devices

USE: Josephson junctions

## Superconducting logic circuits

BT: Logic circuits

## Superconducting magnet energy storage

USE: Superconducting magnetic  
energy storage

## Superconducting magnetic energy storage

UF: SMES  
Superconducting magnet  
energy storage  
BT: Energy storage  
Superconductivity

## Superconducting magnets

BT: Electromagnets



# 2018 IEEE Thesaurus

RT:	Superconducting devices Persistent currents Superconducting cables Superconducting coils	NT:	Superconducting cables
<b>Superconducting materials</b>			<i>Superconducting ultraviolet detectors</i>
UF:	Pnictide superconductors Superconducting filaments Superconducting wires	USE:	Superconducting photodetectors
BT:	Materials		<i>Superconducting wires</i>
RT:	Superconductivity Critical current density Cryogenic electronics Superconducting epitaxial layers	USE:	Superconducting materials
NT:	Thermal factors Granular superconductors High-temperature superconductors	<b>Superconductivity</b>	
	Multifilamentary	NT:	Bean model Critical current density (superconductivity)
	Niobium-tin Type II superconductors		Flux pinning Superconducting devices Superconducting filaments
<b>Superconducting microwave devices</b>		and wires	Superconducting films Superconducting integrated circuits
BT:	Superconducting devices		Superconducting magnetic energy storage
RT:	Microwave devices		Superconducting materials Superconducting transition temperature
<b>Superconducting photodetectors</b>			<i>Superconductor-insulator-superconductor devices</i>
UF:	Superconducting infrared detectors	USE:	Superconducting devices
	Superconducting ultraviolet detectors		<i>Superconductor-normal-superconductor devices</i>
BT:	Photodetectors	USE:	Superconducting devices
RT:	Superconducting devices Infrared detectors		<i>Superconductors (high temperature)</i>
<i>Superconducting quantum interference devices</i>		USE:	High-temperature superconductors
USE:	SQUIDs	<b>Supercontinuum generation</b>	
<i>Superconducting tapes</i>		BT:	Nonlinear optics
USE:	Superconducting films	RT:	Laser beams Light sources Optical fibers
<b>Superconducting thin films</b>		<b>Superlattices</b>	
BT:	Superconducting films	BT:	Crystalline materials
RT:	Thin films	NT:	Magnetic superlattices Metallic superlattices Optical superlattices Semiconductor superlattices
<b>Superconducting transition temperature</b>			
BT:	Superconductivity		
RT:	High-temperature superconductors		
<b>Superconducting transmission lines</b>		<b>Superluminescent diodes</b>	
BT:	Transmission lines	UF:	SLD
RT:	Power transmission lines	BT:	Light emitting diodes Light sources



# 2018 IEEE Thesaurus

Optoelectronic devices  
Semiconductor devices  
Semiconductor diodes  
RT: Lasers

*Superradiance*  
USE: Spontaneous emission

*Superstring vacuum*  
USE: Elementary particle vacuum

**Supervised learning**  
BT: Learning systems  
RT: Semisupervised learning  
NT: Boosting

**Supervisory control**  
BT: Control systems  
NT: SCADA systems

*Supervisory control and data acquisition systems*  
USE: SCADA systems

*Supervisory control and data-acquisition systems*  
USE: SCADA systems

*Supervisory programs*  
USE: Operating systems

**Supply and demand**  
BT: Economics  
RT: Microeconomics  
Utility theory

**Supply chain management**  
UF: SCM supply chains  
BT: Management  
RT: Business process

integration  
Business process

management  
Capacity planning  
Customer relationship

management  
Electronic commerce  
Management information

systems  
Materials requirements

planning  
Production control  
Supply chains  
NT: Procurement

**Supply chains**  
BT: Logistics  
RT: Materials requirements

planning  
Procurement  
Supply chain management

**Support vector machine classification**  
BT: Support vector machines

**Support vector machines**  
UF: SVM  
Support vector regression  
BT: Computation theory  
RT: Artificial intelligence  
Feedforward neural

networks  
Pattern classification  
NT: Support vector machine

classification

*Support vector regression*  
USE: Support vector machines

**Surface acoustic wave devices**  
BT: Acoustic devices  
RT: Acoustoelectric devices  
Piezoelectric devices

**Surface acoustic waves**  
UF: Acoustic surface waves  
BT: Acoustic waves  
Surface waves  
Waves

**Surface charging**  
BT: Electrostatic processes  
RT: Spraying  
NT: Triboelectricity

**Surface cleaning**  
BT: Cleaning  
Surface treatment  
RT: Semiconductor device

manufacture  
Surface contamination

**Surface contamination**  
BT: Contamination  
RT: Semiconductor device

manufacture  
Surface cleaning  
Surface treatment

**Surface cracks**



# 2018 IEEE Thesaurus

BT:	Mechanical factors	<b>Surface resistance</b>	BT:	Resistance Surfaces
<b>Surface discharges</b>			RT:	High-temperature superconductors
BT:	Dielectric breakdown			Superconducting films
RT:	Insulator testing	<b>Surface roughness</b>	BT:	Surfaces
<b>Surface emitting lasers</b>			RT:	Planing Polishing machines Rough surfaces Sandblasting Surface morphology
BT:	Lasers Semiconductor devices Semiconductor lasers Solid lasers	<b>Surface soil</b>	BT:	Surfaces
RT:	Laser cavity resonators Quantum well lasers Quantum wells	<b>Surface states</b>	BT:	Energy states Surface structures Surfactants
NT:	Vertical cavity surface emitting lasers		NT:	
<b>Surface engineering</b>		<b>Surface structures</b>	BT:	Surfaces
BT:	Materials science and technology		NT:	Surface states
RT:	Surface treatment	<b>Surface tension</b>	BT:	Surfaces
<b>Surface finishing</b>			RT:	Surfactants
BT:	Finishing	<b>Surface texture</b>	BT:	Surfaces
RT:	Lapping Polishing machines	<b>Surface topography</b>	BT:	Geometry Surfaces
NT:	Burnishing Deburring Painting Spraying		NT:	Nanotopography
<b>Surface fitting</b>		<b>Surface treatment</b>	BT:	Surfaces
BT:	Numerical analysis		RT:	Colloidal lithography Planing Surface contamination Surface engineering
RT:	Computational geometry Computer graphics Curve fitting Interpolation		NT:	Etching Finishing Galvanizing Painting Passivation Pickling Planarization Sandblasting Surface cleaning Surfactants
NT:	Response surface methodology			
<b>Surface impedance</b>				
BT:	Surfaces			
RT:	High-temperature superconductors			
	Superconducting films			
<b>Surface morphology</b>				
BT:	Surfaces			
RT:	Surface roughness			
NT:	Adsorption			
<b>Surface reconstruction</b>				
BT:	Visualization			
RT:	Pattern analysis			



# 2018 IEEE Thesaurus

## Surface waves

BT: Geophysics  
RT: Sea surface  
NT: Surface acoustic waves

## Surface-mount technology

BT: Integrated circuit  
manufacture

## Surfaces

BT: Materials science and  
technology  
NT: Corrosion  
Corrugated surfaces  
Rough surfaces  
Surface impedance  
Surface morphology  
Surface resistance  
Surface roughness  
Surface soil  
Surface structures  
Surface tension  
Surface texture  
Surface topography  
Surface treatment

## Surfactants

BT: Materials  
Surface states  
Surface treatment  
RT: Adsorption  
Surface tension

## Surge protection

BT: Power system protection  
RT: Surges  
NT: Arresters

## Surgery

UF: Robot-assisted surgery  
BT: Medical treatment  
RT: Biomedical equipment  
Catheters  
Endoscopes  
NT: Ambulatory surgery  
Hepatectomy  
Laser surgery  
Microsurgery  
Minimally invasive surgery  
Neurosurgery  
Oncological surgery  
Orthopedic surgery

USE: Oncological surgery

## Surges

BT: Electromagnetic transients  
RT: Surge protection

## Surgical instruments

BT: Biomedical equipment  
NT: Laparoscopes

## Surgical robots

USE: Medical robotics

## Surveillance

BT: Monitoring  
RT: Hazardous areas  
Reconnaissance  
Remote sensing  
Security  
Terrorism  
NT: Infrared surveillance  
Video surveillance

## Suspension bridges

USE: Structural panels

## Suspensions

BT: Mechanical products  
Production  
RT: Automotive components  
Springs  
NT: Shock absorbers

## Sustainability

USE: Sustainable development

## Sustainable design

USE: Green design

## Sustainable development

UF: Sustainability  
BT: Environmental  
management  
Social implications of  
technology  
RT: Green computing

## SVC

USE: Static VAR compensators

## SVM

USE: Support vector machines

## SVPWM

## Surgery oncology



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# 2018 IEEE Thesaurus

USE: Space vector pulse width modulation

## Swaging

BT: Materials processing  
RT: Metal products

## Swarm intelligence

USE: Particle swarm optimization

## Swarm optimization

USE: Particle swarm optimization

## Sweat glands

BT: Glands  
Skin

## Swimming robots

USE: Aquatic robots

## Switched capacitor circuits

UF: Switched-capacitor circuit  
BT: Switched circuits

## Switched capacitor networks

UF: Switched-capacitor networks  
BT: Resistors  
RT: Analog circuits  
Capacitors

## Switched circuits

BT: Circuits  
RT: Telecommunications  
NT: Switched capacitor circuits

## Switched mode power

USE: Switched mode power supplies

## Switched mode power supplies

UF: SMPS  
Switched mode power  
BT: Power supplies

## Switched reluctance motors

BT: Reluctance motors

## Switched systems

BT: Time-varying systems  
RT: Control systems  
Power conversion

## Switched-capacitor circuit

USE: Switched capacitor circuits

## Switched-capacitor networks

USE: Switched capacitor networks

## Switches

BT: Control equipment  
Electronic components  
RT: Current control  
IEEE 802.3 Standard  
Solenoids  
Spark gaps  
Switchgear  
Switching circuits  
NT: Contactors  
Microswitches  
Optical switches

## Switchgear

BT: Control equipment  
RT: Current control  
Fuses  
Switches  
NT: Circuit breakers  
Interrupters  
Relays

## Switching circuits

BT: Circuits  
RT: Circuit breakers  
Digital circuits  
Relays  
Switches  
NT: Choppers (circuits)  
Logic circuits  
Switching converters  
Zero current switching  
Zero voltage switching

## Switching converters

BT: Switching circuits  
RT: Power electronics  
Zero current switching  
Zero voltage switching

## Switching convertors

USE: Converters

## Switching frequency

BT: Switching systems

## Switching loss

UF: Switching losses  
BT: Switching systems



# 2018 IEEE Thesaurus

## *Switching losses*

USE: Switching loss

## **Switching systems**

BT: Communication systems  
RT: Communication switching  
NT: Electronic switching

systems

Switching frequency  
Switching loss  
Telecommunication

switching

## **Symbiosis**

UF: Symbiotic relationships  
BT: Biological processes

## *Symbiotic relationships*

USE: Symbiosis

## **Symbols**

BT: Graphics  
RT: Huffman coding  
Information retrieval  
Pattern recognition  
NT: CAPTCHAs

## **Symmetric matrices**

UF: Symmetric matrix  
BT: Numerical analysis

## *Symmetric matrix*

USE: Symmetric matrices

## **Sympathetic nervous system**

UF: Sympathetic outflow  
BT: Autonomic nervous system

## *Sympathetic outflow*

USE: Sympathetic nervous

system

## *Symposia*

USE: Conferences

## **Synapses**

BT: Nervous system  
RT: Artificial intelligence  
Artificial neural networks  
Brain  
Communication channels  
Computational intelligence  
Electrochemical devices  
Integrated optics  
Neuroinformatics

## Neuromorphic engineering

Neurons  
Neurotransmitters  
Organic electronics  
Photonics  
Signal processing

## *Synaptic transmission*

USE: Neurotransmitters

## *Sync*

USE: Synchronization

## **Synchrocyclotrons**

BT: Particle accelerators

## *Synchronisation*

USE: Synchronization

## **Synchronization**

UF: Clock synchronization  
Sync  
Synchronisation  
BT: Timing  
RT: Chaotic communication  
Concurrency control  
Frequency locked loops  
Scheduling  
Synchronous digital

hierarchy

Time dissemination  
Tracking loops

## **Synchronous digital hierarchy**

UF: SDH  
BT: Communication standards  
Communication systems  
ETSI Standards  
RT: Digital communication  
Optical fiber communication  
SONET  
Synchronization  
Transport protocols

## *Synchronous DRAM*

USE: SDRAM

## *Synchronous dynamic random access memory*

USE: SDRAM

## **Synchronous generators**

BT: AC generators  
Synchronous machines  
RT: Alternators  
NT: Reluctance generators





# 2018 IEEE Thesaurus

## Synchronous machines

BT: AC machines  
NT: Hysteresis motors  
Reluctance machines  
Synchronous generators  
Synchronous motors

## Synchronous motors

BT: Synchronous machines  
RT: Rotating machines  
NT: Hysteresis motors  
Reluctance motors

## Synchronous optical network

USE: SONET

## Synchrotron radiation

BT: Synchrotrons  
RT: Biomedical applications of  
radiation  
Light sources  
X-rays

## Synchrotrons

BT: Particle accelerators  
RT: Colliding beam accelerators  
Electric fields  
High energy physics  
instrumentation computing  
Magnetic fields  
Particle beams  
NT: Synchrotron radiation  
Undulators

## Syngas

UF: Synthesis gas  
Synthetic gas  
BT: Gases

## Syntactics

UF: Syntax  
BT: Semiotics  
RT: Communication symbols  
Grammar  
Natural language  
processing  
Professional  
communication  
Programming

## Syntax

USE: Syntactics

## Synthesis gas

USE: Syngas

## Synthesisers

USE: Synthesizers

## Synthesizers

UF: Synthesisers  
BT: Electronic music

## Synthetic aperture radar

UF: SAR  
BT: Radar  
RT: Airborne radar  
Ground penetrating radar  
Radar imaging  
Spaceborne radar  
Synthetic aperture sonar  
Ultra wideband radar  
NT: Inverse synthetic aperture

radar  
Polarimetric synthetic  
aperture radar

## Synthetic aperture radar imaging

USE: Radar polarimetry

## Synthetic aperture radar interferometry

BT: Radar interferometry

## Synthetic aperture sonar

UF: SAS  
BT: Sonar  
RT: Synthetic aperture radar

## Synthetic biology

UF: Synthetic life research  
BT: Biology  
Engineering in medicine  
and biology  
RT: Biological system modeling  
Computational biology

## Synthetic fibers

UF: Artificial fibers  
Artificial fibres  
Nylon fiber  
Synthetic fibres  
BT: Textile fibers

## Synthetic fibres

USE: Synthetic fibers

## Synthetic gas

USE: Syngas





# 2018 IEEE Thesaurus

## *Synthetic life research*

USE: Synthetic biology

## *SYSML*

USE: Systems Modeling  
Language

## *System analysis*

USE: System analysis and design

## **System analysis and design**

UF: Logical decomposition  
System analysis  
System design  
System metrics  
BT: Systems engineering and  
theory  
RT: Configuration management  
Design methodology  
Flowcharts  
Multi-agent systems  
Skin effect  
Stability analysis  
System improvement  
System validation  
System verification  
Systems simulation  
NT: Asymptotic stability  
Control system analysis  
Diakoptics  
Distributed processing  
Distributed vision networks  
Fault detection  
Fault tolerant systems  
Interconnected systems  
Large-scale systems  
Lyapunov methods  
Open systems  
Petri nets  
Physical design  
Robust control  
Scalability  
Scattering parameters  
Sequential analysis  
Sequential diagnosis  
Software prototyping  
Static analysis  
System dynamics  
System performance  
System-level design  
Systems Modeling  
Language  
Systems modeling  
Task analysis  
Time factors

## *System availability*

USE: Availability

## **System buses**

BT: Computer interfaces

## *System design*

USE: System analysis and design

## **System dynamics**

BT: System analysis and design  
RT: Behavioral sciences  
Complex networks  
Feedback  
Flow production systems  
Timing

## **System identification**

BT: Modeling

## **System implementation**

BT: Systems engineering and  
theory

## **System improvement**

BT: Systems engineering and  
theory  
RT: Quality management  
Reliability  
System analysis and design  
System testing

## **System integration**

BT: Systems engineering and  
theory  
RT: Enterprise resource  
planning  
Integrated manufacturing  
systems  
Project management  
Resource management

## **System kernels**

BT: Kernel  
Operating systems

## *System level design*

USE: System-level design

## *System life cycle management*

USE: Product life cycle  
management AND  
Technical management



# 2018 IEEE Thesaurus

## *System metrics*

USE: System analysis and design

## *System modeling*

USE: Modeling

## **System of systems**

BT: Systems engineering and theory

RT: Complex networks

NT: Cyber-physical systems

## *System on chip*

USE: System-on-chip

## **System performance**

UF: Cooperative cache

BT: System analysis and design

NT: Cooperative caching

## *System planning*

USE: Planning

## *System privacy management*

USE: Data security

## **System realization**

BT: Systems engineering and theory

## **System recovery**

UF: Deadlocks (computers)

Error recovery (computers)

BT: Computers and information

processing

RT: Business continuity

Operating systems

Reliability

NT: Checkpointing

Core dumps

Debugging

## *System reliability*

USE: Reliability

## *System resilience*

USE: Fault tolerance

## **System software**

BT: Software

RT: Visual BASIC

NT: File systems

Operating systems

Program processors

Utility programs

## **System testing**

BT: System validation  
System verification

Testing

RT: System improvement

NT: Model checking

## **System validation**

BT: Systems engineering and theory

RT: System analysis and design

NT: System testing

## **System verification**

BT: Systems engineering and theory

RT: System analysis and design

NT: System testing

## **System-level design**

UF: System level design

BT: System analysis and design

## *System-on-a-chip*

USE: System-on-chip

## **System-on-chip**

UF: On-chip  
SOC

System on chip

System-on-a-chip

BT: Application specific

integrated circuits

RT: Microcontrollers

Microprocessors

Mixed analog digital

integrated circuits

Power dissipation

Signal processing

NT: Lab-on-a-chip

Network-on-chip

## **Systematics**

UF: Biological systematics

BT: Biology

## **Systems architecture**

BT: Systems engineering and theory

## **Systems biology**

BT: Biology

## *Systems engineering*



# 2018 IEEE Thesaurus

theory USE: Systems engineering and

## Systems engineering and theory

UF: Systems engineering  
RT: Aerospace and electronic

systems

Business process

integration

Business process

management

NT: Adaptive systems  
Capability engineering  
Complex systems  
Configuration management  
Hierarchical systems  
Integrated design  
Interface management  
Modeling  
Multidimensional systems  
Physical design  
Reduced order systems  
Requirements engineering  
Requirements management  
Service-oriented systems

engineering

Solution design  
Stochastic systems  
System analysis and design  
System implementation  
System improvement  
System integration  
System of systems  
System realization  
System validation  
System verification  
Systems architecture  
Systems engineering

education

Systems operation  
Systems simulation  
Systems support  
Systems thinking  
Task analysis  
Technical management

## Systems engineering education

BT: Engineering education  
Systems engineering and

theory

## Systems modeling

BT: Modeling  
System analysis and design

## Systems Modeling Language

UF: SYSML  
BT: Computer languages  
System analysis and design  
RT: Modeling  
Software engineering

## Systems neuroscience

BT: Neuroscience  
RT: Neural networks

## Systems operation

BT: Systems engineering and

theory

## Systems simulation

BT: Simulation  
Systems engineering and

theory

RT: System analysis and design  
Technical management

## Systems support

BT: Maintenance engineering  
Systems engineering and

theory

## Systems thinking

BT: Systems engineering and

theory

RT: Systems, man, and

cybernetics

## Systems, man, and cybernetics

RT: Systems thinking  
NT: Behavioral sciences  
Biological control systems  
Computational linguistics  
Cybernetics  
Ergonomics  
Human factors  
Identification of persons  
Man-machine systems  
Natural languages  
Pervasive computing  
Posthuman  
Teleworking  
Transhuman  
User interfaces

## Systolic arrays

BT: Multiprocessing systems  
RT: Pipeline processing

## Table lookup



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# 2018 IEEE Thesaurus

UF:	LUT		
	Look-up table		
	Lookup table		
BT:	Data structures		
	Image processing		
<b>Tablet computers</b>			
UF:	Tablet PC		
BT:	Computers		
RT:	Mobile handsets		
	Portable media players		
<i>Tablet PC</i>			
USE:	Tablet computers		
<b>Tachometers</b>			
BT:	Meters		
<i>Tactile feedback</i>			
USE:	Tactile sensors		
<b>Tactile sensors</b>			
UF:	Tactile feedback		
	Touch sensors		
BT:	Robot sensing systems		
RT:	Pressure measurement		
	Touch sensitive screens		
<b>Tag clouds</b>			
UF:	Word cloud		
BT:	Tagging		
<b>Tagging</b>			
UF:	Hashtag		
BT:	Information retrieval		
RT:	Indexing		
	Internet of Things		
NT:	Tag clouds		
<i>TAI</i>			
USE:	International Atomic Time		
<b>Tail</b>			
BT:	Animal structures		
<b>Takagi-Sugeno model</b>			
BT:	Fuzzy logic		
RT:	Fuzzy control		
	Fuzzy systems		
NT:	Takagi-Sugeno-Kang		
model			
<b>Takagi-Sugeno-Kang model</b>			
BT:	Takagi-Sugeno model		
<b>Talbot effect</b>			
BT:	Optical imaging		
RT:	Interferometry		
	Optical interferometry		
<b>Tantalum</b>			
BT:	Chemical elements		
<b>Tape casting</b>			
BT:	Casting		
RT:	Ceramics		
<i>Target detection</i>			
USE:	Object detection		
<b>Target recognition</b>			
BT:	Object recognition		
<b>Target tracking</b>			
BT:	Tracking		
RT:	Control systems		
	Radar tracking		
<b>Targeted drug delivery</b>			
BT:	Drug delivery		
<b>Task analysis</b>			
BT:	Business process		
management			
	System analysis and design		
	Systems engineering and		
theory			
<b>Taste buds</b>			
BT:	Sense organs		
<i>Taxes</i>			
USE:	Finance		
<i>Taxi</i>			
USE:	Public transportation		
<b>Taxonomy</b>			
BT:	Information retrieval		
<i>Taylor expansion</i>			
USE:	Taylor series		
<b>Taylor series</b>			
UF:	Taylor expansion		
BT:	Mathematics		
<i>TCP/IP</i>			
USE:	TCPIP		



# 2018 IEEE Thesaurus

## *TCP/IP protocol suite*

USE: TCPIP

## **TCPIP**

UF: TCP/IP  
TCP/IP protocol suite  
Transmission control

protocol-internet protocol  
Transmission control

protocol/internet protocol

BT: IP networks  
RT: Computer networks  
Data communication  
Digital communication  
Internet  
Protocols  
Transport protocols

## *TDM*

USE: Time division multiplexing

## *TDSCDMA*

USE: Time division synchronous  
code division multiple access

## *Teaching*

USE: Education

## *Teaching machines*

USE: Computer aided instruction

## **Team working**

BT: Organizational aspects

## **Teamwork**

BT: Collaboration

## **Technetium**

BT: Chemical elements

## *Technical assessment*

USE: Technical management

## *Technical communication*

USE: Professional  
communication

## *Technical data management*

USE: Database systems AND  
Technical management

## **Technical drawing**

BT: Design methodology  
RT: Engineering drawings  
Graphics

## **Technical Field awards**

BT: IEEE Awards activities

## **Technical management**

UF: System life cycle  
management

Technical assessment  
Technical data

management

BT: Technical risk management  
Management  
Systems engineering and

theory

RT: Program management  
Systems simulation  
NT: Maintenance management  
Technical planning

## *Technical manuals*

USE: Manuals

## *Technical meetings*

USE: Meetings

## **Technical planning**

BT: Planning  
Technical management

## *Technical proposals*

USE: Proposals

## *Technical reports*

USE: Writing

## **Technical requirements**

BT: Requirements engineering  
RT: Proposals

## *Technical risk management*

USE: Technical management

## *Technical textiles*

USE: Textile products

## *Technical writing*

USE: Writing

## *Technician training*

USE: Training

## *Technique for order of preference by similarity to ideal solution*

USE: TOPSIS



# 2018 IEEE Thesaurus

## *Technological forecasting*

USE: Technology forecasting

## **Technological innovation**

UF: Innovation  
Invention  
BT: Technology  
RT: Technology social factors

## **Technology**

BT: Social implications of  
technology

RT: Engineering - general  
Oil drilling  
Philosophical

## considerations

Research and development  
STEM  
Technology forecasting  
Technology planning  
NT: Appropriate technology  
Neurotechnology  
Technological innovation  
Technology social factors  
Technology transfer  
Telepresence  
Telexistence

## **Technology forecasting**

UF: Futurism  
Technological forecasting  
BT: Forecasting  
RT: Technology  
Technology social factors

## **Technology management**

BT: Management  
RT: Data processing  
Innovation management  
Production management  
Project management  
Research and development

## management

Technology transfer

## **Technology planning**

BT: Planning  
RT: Social factors  
Technology

## **Technology social factors**

BT: Social factors  
Technology  
RT: Philosophical

## considerations

Risk analysis  
Technological innovation  
Technology forecasting  
NT: Privacy

## **Technology transfer**

BT: Technology  
RT: Technology management  
NT: Small business technology  
transfer

## **Teeth**

UF: Tooth  
BT: Mouth

## *TEGFETs*

USE: MODFETs

## *Telecom*

USE: Telecommunications

## *Telecom buffers*

USE: Telecommunication buffers

## *Telecom channels*

USE: Communication channels

## *Telecom computing*

USE: Telecommunication  
computing

## *Telecom congestion control*

USE: Telecommunication  
congestion control

## *Telecom control*

USE: Telecommunication control

## *Telecom network management*

USE: Telecommunication  
network management

## *Telecom network reliability*

USE: Telecommunication  
network reliability

## *Telecom network topology*

USE: Telecommunication  
network topology

## *Telecom services*

USE: Telecommunication  
services

## *Telecom signaling*



# 2018 IEEE Thesaurus

USE: Communication system  
signaling

## *Telecom switching*

USE: Telecommunication  
switching

## *Telecom system signaling*

USE: Communication system  
signaling

## *Telecom traffic*

USE: Telecommunication traffic

## **Telecommunication buffers**

UF: Telecom buffers  
BT: Data communication  
RT: Buffer storage

## *Telecommunication channels*

USE: Communication channels

## **Telecommunication computing**

UF: Communications computing  
Telecom computing  
BT: Computer applications  
Telecommunications  
RT: 3G mobile communication  
4G mobile communication  
Mobile computing  
Quality of service  
Software radio  
TV  
Telecommunication control  
Telecommunication

network management

Telegraphy  
Telephony  
NT: Internetworking  
Soft switching

## **Telecommunication congestion control**

UF: Telecom congestion control  
BT: Telecommunication  
NT: Call admission control

## **Telecommunication control**

UF: Telecom control  
BT: Communication system  
RT: Telecommunication

control

computing

## **Telecommunication network management**

UF: Telecom network  
management  
BT: Telecommunication  
network topology  
RT: Management information  
base  
Telecommunication  
computing  
NT: Mobile nodes  
Network architecture  
Network neutrality  
Network resource  
management

## **Telecommunication network reliability**

UF: Communication network  
reliability  
Telecom network reliability  
BT: Reliability  
Telecommunication  
network topology  
NT: Diversity schemes

## **Telecommunication network topology**

UF: Telecom network topology  
BT: Telecommunications  
RT: Dynamic spectrum access  
Network topology  
NT: Intelligent networks  
Passive networks  
Telecommunication  
congestion control  
Telecommunication  
network management  
Telecommunication  
network reliability  
Telecommunication traffic

## *Telecommunication power management*

USE: Power system management

## *Telecommunication security*

USE: Communication system  
security

## **Telecommunication services**

UF: Telecom services  
BT: Telecommunications  
RT: Radio access networks  
NT: Acoustic communication  
(telecommunication)

## *Telecommunication signalling*

USE: Communication system  
signaling



# 2018 IEEE Thesaurus

<i>Telecommunication standards</i>	BT: Communication systems
USE: Communication standards	RT: Image communication
	Meetings
	Office automation
<b>Telecommunication switching</b>	
UF: Telecom switching	<b>Telecontrol equipment</b>
BT: Switching systems	BT: Control equipment
	RT: Communication systems
<b>Telecommunication traffic</b>	Data communication
UF: Network traffic	Power industry
Telecom traffic	Power systems
Traffic load	Remote handling
BT: Telecommunication	Telecommunications
network topology	
RT: Communication system	<b>Telegraphy</b>
traffic	BT: Communication systems
	RT: Telecommunication
<b>Telecommunications</b>	computing
UF: Telecom	<b>Telematics</b>
BT: Communication systems	BT: Information technology
RT: Convolutional codes	Telecommunications
Diversity reception	RT: Cyberspace
Film bulk acoustic	
resonators	<b>Telemedicine</b>
Global Positioning System	BT: Biomedical communication
Helical antennas	RT: Telepresence
Multiaccess communication	
Multicarrier code division	<b>Telemetry</b>
multiple access	BT: Aerospace and electronic
Multicast communication	systems
Next generation networking	Data communication
Optical wavelength	RT: Deep-space
conversion	communications
Reflectivity	Measurement
Switched circuits	NT: Biomedical telemetry
Telecontrol equipment	
NT: Ambient intelligence	<b>Teleoperators</b>
Feedback communications	BT: Telerobotics
IP networks	
Radio access networks	<b>Telephone equipment</b>
Railway communication	BT: Communication equipment
Space communications	RT: Land mobile radio
Telecommunication	equipment
Telecommunication	Radio communication
computing	Telephony
network topology	NT: Cellular phones
services	Telephone sets
Telematics	Vocoders
<i>Telecommuting</i>	
USE: Teleworking	<b>Telephone poles</b>
	BT: Poles and towers
<b>Teleconferencing</b>	
UF: Videoconferencing	<b>Telephone sets</b>





# 2018 IEEE Thesaurus

UF:	Handsets	USE:	TV
	Subscriber sets		
BT:	Telephone equipment	<b>Teleworking</b>	
RT:	Telephony	UF:	Mobile office
NT:	Mobile handsets		Telecommuting
			Virtual office
<b>Telephony</b>		BT:	Systems, man, and
BT:	Communication systems	cybernetics	
RT:	Telecommunication	<b>Telexistence</b>	
computing		BT:	Human computer
	Telephone equipment	interaction	
	Telephone sets		Real-time systems
	Videophone systems		Technology
<b>Teleportation</b>		<b>Tellurium</b>	
UF:	Quantum teleportation	BT:	Chemical elements
BT:	Quantum mechanics		
RT:	Information theory	<b>TEM cells</b>	
	Quantum entanglement	UF:	GHZ transverse
<b>Telepresence</b>		electromagnetic cells	
BT:	Human computer		GTEM cells
interaction			Transverse electromagnetic
	Technology	cells	
RT:	Telemedicine	BT:	Test facilities
		RT:	Anechoic chambers
<b>Teleprinting</b>			Electromagnetic
BT:	Communication systems	compatibility and interference	
	Data communication		Electromagnetic
	Printing	interference	
RT:	Digital communication		Electronic equipment
<b>Telerobotics</b>		testing	
BT:	Robots	<b>Temperature</b>	
RT:	Delay systems	BT:	Thermal factors
	Human factors	RT:	Temperature control
	Manipulators		Temperature measurement
	Mobile robots	NT:	Temperature distribution
	Remote handling		
equipment		<b>Temperature control</b>	
NT:	Teleoperators	BT:	Thermal variables control
<b>Telescopes</b>		RT:	Space heating
BT:	Instruments		Temperature
RT:	Astronomy		Thermal factors
	Observatories		Ventilation
	Radio astronomy	NT:	Cooling
			Heating systems
<b>Teletext</b>		<b>Temperature dependence</b>	
BT:	Communication systems	BT:	Thermal factors
	Information services		
RT:	Data communication	<b>Temperature distribution</b>	
	Videotex	BT:	Temperature
		RT:	Insulators

*Television*



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# 2018 IEEE Thesaurus

## Temperature measurement

BT:	Thermal variables measurement
RT:	Bolometers Radiometry Temperature Temperature sensors Thermistors Thermoresistivity
NT:	Cryobiology Cryogenics Cryotherapy Global warming Kelvin Thomson effect

## Temperature sensors

BT:	Thermal sensors
RT:	Bragg gratings Optical fibers Temperature measurement Transducers

## Temporal lobe

BT:	Brain
NT:	Hippocampus

## Tendons

BT:	Musculoskeletal system
-----	------------------------

## Tensile strain

BT:	Strain
RT:	Tensile stress

## Tensile stress

UF:	Sensors
BT:	Stress
RT:	Tensile strain

## Tensors

USE:	Tensile stress
------	----------------

## Terahertz materials

BT:	Materials
NT:	Terahertz metamaterials

## Terahertz metamaterials

BT:	Electromagnetic metamaterials
	Terahertz materials

## Terahertz radiation

BT:	Radiation effects
RT:	Electromagnetic radiation

## Terbium

BT:	Chemical elements
-----	-------------------

## Termination of employment

UF:	Dismissal (employment) Redundancy (employment)
BT:	Employment Human resource management
RT:	Pensions

## Terminology

UF:	Definitions Glossaries
BT:	Information retrieval
NT:	Dictionaries

## Ternary logic

USE:	Multivalued logic
------	-------------------

## Terrain factors

BT:	Interference
RT:	Earth Multipath channels Rough surfaces

## Terrain mapping

UF:	Topography (earth)
BT:	Geoscience and remote sensing
RT:	Earth Geologic measurements Geophysical measurements Global Positioning System Remote sensing Vegetation mapping
NT:	Digital elevation models

## Terrestrial atmosphere

UF:	Earth atmosphere Stratosphere Troposphere
BT:	Geoscience and remote sensing
RT:	Atmospheric measurements
NT:	Geophysics Meteorology Clouds Global warming Ionosphere Magnetosphere

## Terrorism

UF:	9/11
-----	------



# 2018 IEEE Thesaurus

	9/11 attack	Error analysis	
	911 attack	Error-free operations	
	September 11	Failure analysis	
	Terrorist	Frequency response	
BT:	Security	Impulse testing	
RT:	Biohazards	Insulator testing	
	Surveillance	Integrated circuit testing	
	Weapons	Life testing	
NT:	Bioterrorism	Materials testing	
	Cyber terrorism	Optical fiber testing	
	National security	Remaining life assessment	
<i>Terrorist</i>		Ring generators	
USE:	Terrorism	Semiconductor device	
		Software testing	
<b>Test data compression</b>		System testing	
BT:	Data compression	Test equipment	
		Test facilities	
<b>Test equipment</b>			
BT:	Testing	<b>Text analysis</b>	
RT:	Oscilloscopes	BT:	Data mining
NT:	Automatic test equipment	NT:	Text categorization
<b>Test facilities</b>		<b>Text categorization</b>	
BT:	Testing	UF:	Text classification
NT:	Anechoic chambers	BT:	Text analysis
	Laboratories	RT:	Data analysis
	Large Hadron Collider		
	Open area test sites	<i>Text classification</i>	
	TEM cells	USE:	Text categorization
	Wind tunnels		
<b>Test pattern generators</b>		<i>Text messaging</i>	
BT:	Automatic test pattern	USE:	Electronic messaging
generation			
<b>Testing</b>		<b>Text mining</b>	
BT:	Industrial electronics	BT:	Data mining
	Instrumentation and	RT:	Triples (Data structure)
measurement		<b>Text processing</b>	
RT:	Cause effect analysis	UF:	Photocomposition
	Fault diagnosis		Word processing
	Hardware-in-the loop	BT:	Data processing
simulation		RT:	Desktop publishing
			Document handling
	Inspection		Office automation
	Leak detection		Publishing
	Maintenance engineering		Text recognition
	Measurement	NT:	Typesetting
NT:	Aerospace testing	<b>Text recognition</b>	
	Automatic testing	BT:	Pattern recognition
	Benchmark testing	RT:	Character recognition
	Built-in self-test		Text processing
	Circuit testing		
	Electronic equipment		
testing		<b>Textile fibers</b>	



# 2018 IEEE Thesaurus

UF:	Fibers	<b>Textiles</b>	BT:	Materials
BT:	Textile fibres		RT:	Spinning machines
RT:	Cotton			Textile machinery
	Spinning			Textile products
	Textile products			Textile technology
	Textile technology			Weaving
	Weaving	NT:		Cotton
	Wool			Fabrics
NT:	Natural fibers			Textile fibers
	Synthetic fibers			Wool
	Yarn			
<i>Textile fibres</i>		<b>TFETs</b>	UF:	Tunnel field effect
USE:	Textile fibers	transistors	BT:	Field effect transistors
			RT:	MOSFET
<b>Textile industry</b>		<i>TFT</i>	USE:	Thin film transistors
BT:	Manufacturing industries			
RT:	Clothing industry	<b>Thalamus</b>	BT:	Brain
	Cotton			
	Spinning machines	<b>Thallium</b>	BT:	Chemical elements
	Textile machinery			
	Textile products	<b>Theodolites</b>	BT:	Instruments
	Textile technology		RT:	Geodesy
	Textiles			Geologic measurements
NT:	Spinning machines	techniques		Geophysical measurement
<b>Textile machinery</b>		<i>Theoretical neuroscience</i>	USE:	Computational
BT:	Machinery	neuroscience		
RT:	Needles	<i>Therapy</i>	USE:	Medical treatment
	Textile industry			
	Textile products	<b>Thermal analysis</b>	BT:	Thermal variables control
	Textile technology		NT:	Thermomechanical
	Textiles	processes		
NT:		<b>Thermal conductivity</b>	BT:	Thermal factors
<b>Textile products</b>			RT:	Grain boundaries
UF:	Technical textiles			Thermal resistance
BT:	Manufactured products		NT:	Heat transfer
RT:	Textile fibers	<b>Thermal decomposition</b>	BT:	Thermolysis
	Textile industry			
	Textile machinery			
	Textile technology			
	Textiles			
NT:	Spinning			
	Weaving			
<b>Textile technology</b>				
BT:	Industries			
RT:	Bleaching			
	Textile fibers			
	Textile industry			
	Textile machinery			
	Textile products			
	Textiles			
NT:	Spinning			
	Weaving			



# 2018 IEEE Thesaurus

## Thermal degradation

BT: Thermolysis

## Thermal energy

BT: Heating systems  
RT: Energy  
Kinetic energy  
Thermal engineering

## Thermal engineering

BT: Engineering - general  
RT: Cooling  
Heat recovery  
Heating systems  
Thermal energy  
Thermal factors  
Thermal variables control  
Thermal variables

measurement

## Thermal expansion

BT: Thermal factors  
NT: Thermal force

## Thermal factors

UF: High-temperature effects  
BT: Physics  
RT: Annealing  
Critical current density  
Heat treatment  
Proton effects  
Pyroelectricity  
Superconducting devices  
Superconducting materials  
Temperature control  
Thermal engineering  
Thermal stability  
Thermal variables control  
Thermal variables

measurement

NT: Temperature  
Temperature dependence  
Thermal conductivity  
Thermal expansion  
Thermal management  
Thermal stresses  
Thermoelasticity  
Thermoelectricity  
Thermolysis  
Thermooptic effects  
Thermoresistivity

## Thermal force

BT: Thermal expansion

## Thermal lensing

BT: Thermooptic effects  
RT: Laser beams  
Nonlinear optics  
Optical distortion  
Solid lasers

## Thermal loading

BT: Thermal stresses

## Thermal management

BT: Thermal factors  
RT: Enthalpy  
Reliability

## Thermal management of electronics

BT: Components, packaging,  
and manufacturing technology  
NT: Electronic packaging  
thermal management  
Electronics cooling

## Thermal noise

UF: Johnson Nyquist noise  
BT: Circuit noise  
RT: Conductors

## Thermal plumes

USE: Thermal pollution

## Thermal pollution

UF: Heat islands  
Thermal plumes  
Urban heat islands  
BT: Pollution  
RT: Air pollution  
Global warming  
Industrial pollution  
Marine pollution  
Waste heat  
Water pollution

## Thermal quenching

BT: Cooling

## Thermal resistance

BT: Resistance  
RT: Thermal conductivity

## Thermal sensors

BT: Sensors  
NT: Temperature sensors

## Thermal spraying

BT: Spraying



# 2018 IEEE Thesaurus

## Thermal stability

BT: Stability  
RT: Integrated circuit reliability  
Thermal factors

## Thermal stresses

BT: Thermal factors  
NT: Thermal loading

## Thermal variables control

BT: Control systems  
RT: Thermal engineering  
Thermal factors  
NT: Temperature control  
Thermal analysis

## Thermal variables measurement

BT: Measurement  
RT: Calorimetry  
Thermal engineering  
Thermal factors  
Transducers  
NT: Temperature measurement

## Thermal wave imaging

USE: Photothermal effects

## Thermionic emission

BT: Nuclear and plasma  
sciences  
RT: Electron emission  
Ion emission  
Transmission electron  
microscopy  
Vacuum arcs

## Thermionic valves

USE: Electron tubes

## Thermistors

BT: Semiconductor devices  
RT: Temperature measurement  
Thermoresistivity

## Thermo-mechanics

USE: Thermomechanical  
processes

## Thermo-optic effects

USE: Thermo-optic effects

## Thermo-optical devices

USE: Thermo-optical devices

## Thermochromism

BT: Thermo-optic effects

## Thermodynamics

BT: Science - general  
NT: Enthalpy  
Isobaric  
Isothermal processes

## Thermoelasticity

BT: Thermal factors

## Thermoelectric devices

BT: Thermoelectricity

## Thermoelectric effect

USE: Thermoelectricity

## Thermoelectric materials

BT: Materials  
Thermoelectricity

## Thermoelectricity

UF: Peltier effect  
Seebeck effect  
Thermoelectric effect  
BT: Electricity  
Energy conversion  
Thermal factors  
NT: Electrothermal effects  
Thermoelectric devices  
Thermoelectric materials

## Thermoforming

BT: Manufacturing systems

## Thermoluminescence

BT: Luminescence

## Thermolysis

BT: Chemical processes  
Thermal factors  
NT: Thermal decomposition  
Thermal degradation

## Thermomechanical processes

UF: Thermo-mechanics  
Thermomechanics  
BT: Thermal analysis

## Thermomechanics

USE: Thermomechanical  
processes

## Thermonuclear fusion



# 2018 IEEE Thesaurus

USE: Fusion reactors

Thick film inductors

## Thermooptic effects

UF: Thermo-optic effects  
BT: Thermal factors  
RT: Birefringence  
Optical propagation  
Optical reflection  
Optical refraction  
Thermooptical devices  
NT: Thermal lensing  
Thermochromism  
Thermoreflectance

## Thick film devices

BT: Electron devices  
RT: Thick film circuits  
Thick films  
NT: Thick film inductors

## Thick film inductors

BT: Inductors  
Thick film devices  
RT: Microstrip components  
Thick film circuits  
Thick films

## Thermooptical devices

UF: Thermo-optical devices  
BT: Optical devices  
RT: Integrated optics  
Optical switches  
Solid lasers  
Thermooptic effects

## Thick film sensors

BT: Sensors

## Thick films

BT: Films  
RT: Dielectric films  
Semiconductor films  
Superconducting films  
Thick film devices  
Thick film inductors

## Thermoplastic polyethylene

BT: Polyethylene  
NT: UHMWPE

## Thermoreflectance

BT: Thermooptic effects

## Thermoreflectance imaging

BT: Optical imaging  
RT: Spectroscopy

## Thermoresistivity

BT: Thermal factors  
RT: Temperature measurement  
Thermistors

## Thermostats

BT: Control equipment

## Thesauri

UF: Thesaurus  
BT: Knowledge representation  
Writing  
RT: Ontologies

## Thesaurus

USE: Thesauri

## Thick film circuits

BT: Circuits  
Integrated circuits  
RT: Hybrid integrated circuits  
Thick film devices

## Thickness control

BT: Mechanical variables  
control  
RT: Size control

## Thickness measurement

BT: Mechanical variables  
measurement  
RT: Micrometers  
Size measurement

## Thigh

BT: Extremities

## Thin film circuits

BT: Circuits  
Integrated circuits  
RT: Hybrid integrated circuits  
Silicon-on-insulator  
Thin film devices  
Thin film inductors

## Thin film deposition

USE: Sputtering

## Thin film devices

BT: Electron devices  
RT: Amorphous semiconductors  
Doping profiles



# 2018 IEEE Thesaurus

	Giant magnetoresistance	<i>Thin-film transistors</i>	
	Thin film circuits	USE:	Thin film transistors
	Thin films		
NT:	Film bulk acoustic resonators	<i>Third generation mobile communication</i>	
	Thin film inductors	USE:	3G mobile communication
	Thin film transistors		
<b>Thin film inductors</b>		<b>Thomson effect</b>	
BT:	Inductors	BT:	Temperature measurement
	Thin film devices	<b>Thorax</b>	
RT:	Thin film circuits	BT:	Body regions
	Thin films		Skeleton
		NT:	Ribs
			Sternum
<b>Thin film sensors</b>		<b>Thorium</b>	
BT:	Sensors	BT:	Chemical elements
<b>Thin film transistors</b>		<i>Three dimensional displays</i>	
UF:	TFT	USE:	Three-dimensional displays
	Thin-film transistors		
BT:	Active matrix technology	<b>Three-dimensional displays</b>	
	Field effect transistors	UF:	3-D displays
	Thin film devices		3-D modeling
RT:	Displays		3-D modelling
	Liquid crystal devices		3-D reconstruction
NT:	Organic thin film transistors		3D displays
			3D modeling
<b>Thin films</b>			3D modelling
BT:	Films		3D reconstruction
RT:	Diamond-like carbon		Three dimensional displays
	Dielectric films	BT:	Displays
	Epitaxial layers	RT:	Shadow mapping
	Magnetic films		Sprites (computer)
	Molecular beam epitaxial growth		Structure from motion
		NT:	Bundle adjustment
	Molecular beams		
	Self-assembly	<b>Three-dimensional integrated circuits</b>	
	Semiconductor films	BT:	Integrated circuits
	Superconducting films		
	Superconducting thin films	<b>Three-dimensional printing</b>	
	Thin film devices	UF:	3D printing
	Thin film inductors		Additive manufacturing
NT:	Buffer layers	BT:	Manufacturing systems
	Epitaxial growth		Printing
	Semiconductor thin films	RT:	Ink jet printing
			Rapid prototyping
<b>Thin wall structures</b>		<b>Three-dimensional television</b>	
BT:	Structural shapes	BT:	TV
RT:	Honeycomb structures		
	Lightweight structures	<i>Three-dimensional vision</i>	
	Sandwich structures	USE:	Stereo vision
	Sheet materials		
	Structural panels	<b>Three-phase electric power</b>	
	Structural shells		





# 2018 IEEE Thesaurus

BT: Power electronics			
RT: Conductors		rectifiers	Semiconductor controlled
Voltage control			Silicon controlled rectifiers
			Triacs
<b>Three-term control</b>		BT: Power semiconductor	
BT: Process control		switches	Thyristor circuits
			NT: Phototyristsors
<b>Threshold current</b>			
BT: Current		<i>Ti</i>	
RT: Electron devices		USE: Titanium	
Lasers			
<b>Threshold voltage</b>		<b>Tides</b>	
BT: Voltage		BT: Oceans	
RT: Integrated circuit noise			
MOSFET circuits		<b>Tiles</b>	
Transistors		BT: Building materials	
NT: Subthreshold current		RT: Ceramic products	
		Ceramics	
		Floors	
<b>Thresholding (Imaging)</b>			
BT: Image segmentaton		<b>Timbre</b>	
RT: Image edge detection		BT: Music	
<b>Thrombosis</b>			
BT: Medical conditions		<b>Time complexity</b>	
		BT: Computational complexity	
<b>Through-silicon vias</b>		RT: Computational modeling	
UF: TSV			
BT: Integrated circuits		<i>Time delay</i>	
		USE: Delay effects	
<b>Throughput</b>			
UF: Network throughput		<b>Time difference of arrival</b>	
BT: Communication channels		UF: Time-difference-of-arrival	
		BT: Object detection	
<i>Throughput (communication systems)</i>			
USE: Information rates		<b>Time dissemination</b>	
<b>Thulium</b>		BT: Time measurement	
BT: Chemical elements		RT: Satellite navigation systems	
		Synchronization	
<b>Thumb</b>			
BT: Fingers		<i>Time division multiaccess</i>	
		USE: Time division multiple	
<b>Thyratrons</b>		access	
BT: Electron tubes			
RT: Gas discharge devices		<b>Time division multiple access</b>	
		UF: Time division multiaccess	
		BT: Multiaccess communication	
<b>Thyristor circuits</b>			
BT: Circuits		<i>Time division multiplexed</i>	
RT: Thyristors		USE: Time division multiplexing	
<b>Thyristors</b>			
UF: Diacs		<b>Time division multiplexing</b>	
SCR		UF: TDM	
		Time division multiplexed	
		BT: Multiplexing	



# 2018 IEEE Thesaurus

## Time division synchronous code division multiple access

UF: TDSCDMA  
BT: Multiaccess communication  
RT: 3G mobile communication  
4G mobile communication  
Land mobile radio cellular

systems

Multicarrier code division

multiple access

Spread spectrum

communication

## Time domain analysis

USE: Time-domain analysis

## Time factors

BT: System analysis and design  
RT: Bang-bang control  
NT: Continuous time systems  
Discrete-time systems  
Time invariant systems  
Time-varying systems

## Time frequency analysis

USE: Time-frequency analysis

## Time invariant systems

BT: Time factors  
RT: Differential equations

## Time measurement

BT: Measurement  
RT: Time-frequency analysis  
Watches  
NT: Clocks  
Time dissemination  
Timing

## Time of arrival estimation

UF: TOA estimation  
Time-of-arrival estimation  
BT: Parameter estimation  
RT: Array signal processing  
Direction-of-arrival

estimation

Signal detection

## Time series analysis

BT: Statistics  
RT: Autocorrelation  
Autoregressive processes  
Chaotic communication  
Modeling

Random processes

Spectral analysis

Statistical analysis

## Time sharing computer systems

UF: Time-sharing computer systems

Time-sharing systems

BT: Computers and information

processing

## Time to market

BT: Design methodology

Product development

RT: Concurrent engineering

## Time varying circuits

BT: Circuits

## Time varying systems

USE: Time-varying systems

## Time warp simulation

BT: Discrete event simulation

## Time-difference-of-arrival

USE: Time difference of arrival

## Time-domain analysis

UF: FDTD  
Time domain analysis  
BT: Electromagnetic analysis  
RT: Phase noise  
State-space methods  
Waves

## Time-frequency analysis

UF: Time frequency analysis  
BT: Frequency-domain analysis  
RT: Biomedical signal

processing

Fourier transforms

Frequency measurement

Image processing

Power systems

Time measurement

Video signal processing

## Time-of-arrival estimation

USE: Time of arrival estimation

## Time-sharing computer systems

USE: Time sharing computer systems



# 2018 IEEE Thesaurus

## *Time-sharing systems*

USE: Time sharing computer systems

## **Time-varying channels**

BT: Communication channels  
RT: Mobile communication  
Wireless LAN

## **Time-varying systems**

UF: Time varying systems  
BT: Time factors  
RT: Control systems  
NT: Switched systems

## **Timing**

BT: Time measurement  
RT: Clocks  
Logic design  
System dynamics  
Timing jitter  
NT: Bit rate  
Delays  
Synchronization

## **Timing jitter**

BT: Jitter  
RT: Timing

## **Tin**

UF: Sn  
BT: Metals  
NT: Tin alloys  
Tin compounds

## **Tin alloys**

BT: Tin  
RT: Alloying  
NT: Niobium-tin

## **Tin compounds**

BT: Tin

## **Tire pressure**

BT: Pressure measurement  
Tires

## **Tires**

UF: Tyres  
BT: Mechanical products  
Rubber products  
RT: Automobile manufacture  
Automotive components  
Vehicles  
Wheels

NT: Tire pressure

## **Tissue damage**

BT: Lesions

## **Tissue engineering**

UF: Tissue scaffolds  
BT: Biomedical engineering  
RT: Biological materials  
Colloidal lithography  
Diamond-like carbon  
Genetic engineering  
NT: Regeneration engineering

## *Tissue scaffolds*

USE: Tissue engineering

## *Tissues*

USE: Biological tissues

## *Titanates*

USE: Titanium compounds

## **Titanium**

UF: Ti  
BT: Chemical elements  
Metals  
NT: Titanium alloys  
Titanium compounds  
Titanium nitride

## **Titanium alloys**

BT: Titanium  
RT: Alloying

## **Titanium compounds**

UF: Titanates  
BT: Titanium

## **Titanium nitride**

BT: Titanium

## *TMR*

USE: Tunneling magnetoresistance

## *TOA estimation*

USE: Time of arrival estimation

## *Toddler*

USE: Pediatrics

## **Tokamak devices**

BT: Tokamaks  
RT: Magnetic confinement



# 2018 IEEE Thesaurus

	Toroidal magnetic fields	RT:	Stomatognathic system
<b>Tokamaks</b>		<b>Tools</b>	
BT:	Fusion reactors Plasma applications Plasma devices	BT:	Manufactured products
RT:	Magnetic confinement Plasma simulation	NT:	Hand tools
NT:	Tokamak devices	<i>Tooth</i>	USE: Teeth
<b>Token networks</b>		<i>Topography (earth)</i>	USE: Terrain mapping
BT:	Communication systems Computer networks Digital systems	<b>Topological insulators</b>	BT: Insulators
RT:	Local area networks Metropolitan area networks Wide area networks	<b>Topology</b>	BT: Mathematics RT: Graph theory Morphological operations
<b>Tolerance analysis</b>		<b>TOPSIS</b>	UF: Technique for order of preference by similarity to ideal solution BT: Decision theory RT: Decision making Fuzzy set theory Operations research Optimization
UF:	Circuit tolerance analysis Tolerating problems	<i>Tornado</i>	USE: Tornadoes
BT:	Manufacturing	<b>Tornadoes</b>	UF: Tornado Tornados BT: Geoscience
RT:	Circuit analysis Circuit optimization Semiconductor device	<i>Tornados</i>	USE: Tornadoes
breakdown	Sensitivity	<b>Toroidal magnetic fields</b>	BT: Magnetic fields RT: Tokamak devices
<i>Tolerating problems</i>	USE: Tolerance analysis	<i>Torpedoes</i>	USE: Missiles
<i>Tomographic</i>	USE: Tomography	<b>Torque</b>	BT: Mechanical factors RT: Torque control Torque converters Torque measurement
<b>Tomography</b>		<b>Torque control</b>	
UF:	Tomographic		
BT:	Imaging		
RT:	Biomedical imaging Geophysical measurement		
techniques	Image reconstruction Computed tomography Electrical capacitance		
NT:			
tomography	Optical coherence		
tomography	Positron emission		
tomography	Reconstruction algorithms		
<i>Tomosynthesis</i>	USE: Biomedical imaging		
<b>Tongue</b>	BT: Digestive system		



# 2018 IEEE Thesaurus

control  
BT: Mechanical variables  
RT: Motor drives  
Torque

## Torque converters

UF: Torque convertors  
BT: Mechanical power  
transmission  
RT: Automotive components  
Drives  
Engines  
Gears  
Shafts  
Torque

## Torque convertors

USE: Torque converters

## Torque measurement

UF: Torque ripple  
BT: Mechanical variables  
measurement  
RT: Pressure gauges  
Torque  
NT: Dynamometers

## Torque ripple

USE: Torque measurement

## Torso

BT: Body regions

## Total harmonic distortion

BT: Distortion measurement  
Harmonic distortion  
RT: Signal analysis

## Total ionizing dose

BT: Radiation effects  
RT: Aerospace electronics  
Radiation hardening

(electronics)

## Total quality management

UF: TQM  
BT: Quality management  
RT: Business process re-  
engineering  
Design for quality  
Quality assurance  
Quality awards  
Quality control  
NT: Continuous improvement  
Six sigma

## Touch screens

USE: Touch sensitive screens

## Touch sensitive screens

UF: Touch screens  
BT: Computer displays  
RT: Haptic interfaces  
Tactile sensors

## Touch sensors

USE: Tactile sensors

## Towers

USE: Poles and towers

## Town gas

USE: Coal gas

## Toxic chemicals

BT: Chemical hazards  
Toxicology

## Toxicology

UF: Poisons  
BT: Hazards  
RT: Chemical hazards  
Hazardous materials  
Occupational health  
Pollution  
NT: Toxic chemicals

## Toy industry

BT: Industries

## Toy manufacturing industry

UF: Toys  
BT: Manufacturing industries  
RT: Electronics industry

## Toys

USE: Toy manufacturing industry

## TQM

USE: Total quality management

## Tracking

BT: Motion measurement  
RT: Iterative learning control  
Maximum likelihood

## estimation

Particle tracking  
Position measurement  
Tracking loops  
Velocity measurement



# 2018 IEEE Thesaurus

NT:	Object tracking Target tracking Trajectory tracking Underwater tracking Video tracking	RT:	Traffic control
<b>Tracking loops</b>		<b>Traffic control</b>	
UF:	Delay lock loops	UF:	Traffic pattern Traffic simulation
BT:	Linear feedback control	BT:	Control systems
systems		RT:	Communication systems Computer network
RT:	Signal processing Modulation Synchronization Tracking	management	Traffic congestion Queueing analysis Vehicle routing
<b>Traction motors</b>		<i>Traffic load</i>	
BT:	Motors	USE:	Telecommunication traffic
RT:	Battery powered vehicles Fuel cell vehicles Hybrid electric vehicles Propulsion Solar powered vehicles	<i>Traffic pattern</i>	
		USE:	Traffic control
<b>Traction power supplies</b>		<i>Traffic simulation</i>	
BT:	Power supplies	USE:	Traffic control
<i>Tractors</i>		<b>Training</b>	
USE:	Agricultural machinery	UF:	Technician training
<i>Trade</i>		BT:	Education
USE:	Business	RT:	Accreditation Continuing education Continuing professional
<i>Trade (international)</i>		development	Electronic learning Learning management
USE:	International trade	systems	Manuals Mentoring Personnel Certification Industrial training Management training On the job training Qualifications Vocational training
<b>Trade agreements</b>		NT:	
UF:	Free trade GATT General agreement on		
tariffs and trade			
BT:	Economics		
RT:	Globalization International collaboration International trade		
<i>Trade unions</i>		<b>Training data</b>	
USE:	Industrial relations	BT:	Data analysis
<b>Trademarks</b>		<b>Trajectory</b>	
BT:	Law Legal factors	BT:	Path planning
RT:	Copyright protection	RT:	Motion control Object tracking
<b>Traffic congestion</b>		NT:	Trajectory optimization
BT:	Road transportation	<b>Trajectory optimization</b>	
		BT:	Optimization Trajectory



# 2018 IEEE Thesaurus

## Trajectory tracking

BT: Path planning  
Tracking  
RT: Motion control  
Robot control

## Trans human

USE: Transhuman

## Trans-human

USE: Transhuman

## Transaction databases

BT: Databases  
NT: Itemsets

## Transactive energy

BT: Energy management  
RT: Power distribution  
Power markets  
Power system economics  
Smart grids

## Transceivers

BT: Communication equipment  
RT: Land mobile radio  
equipment  
Mobile communication  
Mobile handsets  
Software radio  
NT: Radio transceivers

## Transcoding

BT: Encoding  
RT: Data compression  
Image coding  
Multimedia communication  
Video coding

## Transconductance

UF: Mutual conductance  
BT: Conductivity  
RT: Transconductors

## Transconductors

BT: CMOS integrated circuits  
RT: Transconductance

## Transcranial direct current stimulation

BT: Neuroscience  
Neurostimulation

## Transcranial magnetic stimulation

BT: Neuroscience  
Neurostimulation

## Transducers

BT: Electronic components  
RT: Electric variables  
measurement

Measurement  
Mechanical variables

measurement

Solenoids  
Temperature sensors  
Thermal variables

measurement

NT: Acoustic transducers  
Biomedical transducers  
Capacitive transducers  
Chemical transducers  
Inductive transducers  
Piezoelectric transducers  
Resistive transducers  
Ultrasonic transducer

arrays

## Transfer function

USE: Transfer functions

## Transfer functions

UF: Transfer function  
BT: Differential equations  
RT: Control systems  
Damping  
Linear systems  
NT: Poles and zeros

## Transfer molding

UF: Resin transfer molding  
Resin transfer moulding  
Transfer moulding  
BT: Production

## Transfer moulding

USE: Transfer molding

## Transferred electron devices

USE: Gunn devices

## Transform coding

UF: JPEG  
JPEG2000  
MPEG  
BT: Data compression  
RT: Digital photography  
MPEG standards  
Principal component

analysis

Vector quantization



# 2018 IEEE Thesaurus

## Transformer cores

BT: Magnetic cores  
Magnetic devices  
RT: Power transformers  
Transformers

## Transformer oil

USE: Oil insulation

## Transformer windings

USE: Windings

## Transformers

BT: Power systems  
RT: Coils  
Core loss  
Inductive power

## transmission

Transformer cores  
Voltage multipliers  
Windings  
NT: Baluns  
Current transformers  
Flyback transformers  
Instrument transformers  
Phase transformers  
Power transformers  
Pulse transformers

## Transforms

BT: Mathematics  
RT: Numerical analysis  
Signal processing  
Spectral analysis  
NT: Discrete transforms  
Empirical mode

## decomposition

Fourier transforms  
Karhunen-Loeve transforms  
Poincare invariance  
Wavelet transforms

## Transhuman

UF: Trans human  
Trans-human  
Transhumanism  
BT: Systems, man, and

## cybernetics

RT: Posthuman

## Transhumanism

USE: Transhuman

## Transient analysis

UF: Transients  
BT: Power system transients  
RT: Electromagnetic transients  
Signal analysis  
Steady-state

## Transient gratings

USE: Gratings

## Transient response

UF: Natural response  
BT: Propagation  
RT: Damping

## Transients

USE: Transient analysis

## Transinformation

USE: Mutual information

## Transistors

BT: Semiconductor devices  
Solid state circuits  
RT: Aluminum gallium nitride  
Bipolar transistors  
CMOS technology  
Silicon germanium  
Threshold voltage  
NT: Field effect transistors  
Heterojunction bipolar  
transistors  
Millimeter wave transistors  
Phototransistors  
Static induction transistors

## Transmissible disease

USE: Infectious diseases

## Transmission control protocol-internet protocol

USE: TCP/IP

## Transmission control protocol/internet protocol

USE: TCP/IP

## Transmission electron microscopy

BT: Electron microscopy  
RT: Electron beams  
Thermionic emission

## Transmission line antennas

BT: Antennas  
RT: Transmission lines

## Transmission line circuits





# 2018 IEEE Thesaurus

USE: Distributed parameter  
circuits

## Transmission line discontinuities

BT: Transmission lines  
RT: Freight handling  
NT: Waveguide discontinuities

## Transmission line matrix methods

BT: Mathematics  
Numerical analysis

## Transmission line measurements

BT: Electric variables  
measurement  
RT: Impedance measurement  
Transmission lines

## Transmission line theory

BT: Transmission lines  
RT: Capacitance  
Conductivity  
Crosstalk  
Frequency  
Inductance

## Transmission lines

UF: Transmission-line  
BT: Power transmission  
RT: Baluns  
Circuit noise  
Civil engineering  
Coaxial cables  
Distributed parameter

circuits

Helical antennas  
Splicing  
Transmission line antennas  
Transmission line

measurements

NT: Cables  
Electromagnetic

waveguides

Multiconductor transmission

lines

Planar transmission lines  
Poles and towers  
Power line communications  
Power transmission lines  
Stripline  
Superconducting

transmission lines

Transmission line

discontinuities

Transmission line theory

## Transmission of electric power

USE: Power transmission

## Transmission-line

USE: Transmission lines

## Transmit antennas

USE: Transmitting antennas

## Transmitters

BT: Communication equipment  
RT: Linearization techniques  
Modulation  
SISO communication  
NT: Auxiliary transmitters  
Diversity methods  
Neurotransmitters  
Optical transmitters  
Radio transmitters  
Transmitting antennas

## Transmitting antennas

UF: Transmit antennas  
BT: Antennas  
Transmitters  
RT: Receiving antennas

## Transponders

BT: Communication equipment  
Radio communication  
equipment  
RT: Radio navigation  
Satellite communication

## Transport protocols

BT: Protocols  
RT: IP networks  
Overlay networks  
Radio link  
SONET  
Synchronous digital

hierarchy

TCPIP

## Transportation

BT: Intelligent transportation  
systems  
RT: Bridges  
Freight containers  
NT: Air transportation  
Land transportation  
Public transportation  
Smart transportation  
Vehicles



# 2018 IEEE Thesaurus

## Transportation industry

BT: Industries

## Transversal filters

BT: Filters

RT: Digital filters  
Filtering theory  
Signal processing

## Transverse electromagnetic cells

USE: TEM cells

## Traveling salesman

USE: Traveling salesman problems

## Traveling salesman problems

UF: Traveling salesman  
Travelling salesman problem

BT: NP-hard problem

## Travelling salesman problem

USE: Traveling salesman problems

## Tree data structures

BT: Data structures

NT: Binary trees

## Tree graphs

BT: Graph theory

RT: Circuit topology

## Tree searching

USE: Decision trees

## Trees (botanical)

USE: Vegetation

## Trees - insulation

UF: Water trees

BT: Insulators

RT: Humidity  
Insulation life  
Moisture

## Trellis codes

USE: Convolutional codes

## Triacs

USE: Thyristors

## Triboelectricity

BT: Electricity  
Electrostatic processes  
Surface charging  
RT: Nanogenerators

## Tribology

BT: Motion measurement

## Trigen

USE: Trigenation

## Trigenation

UF: CHCP  
Combined heat, cooling and power

Combined heat, cooling, and power

BT: Trigen  
Cooling  
Heating systems  
Power generation  
RT: Cogeneration

## Trigger circuits

BT: Circuits

## Trions

BT: Electrons

## Triples (Data structure)

UF: SPO  
Semantic triple  
Subject predicate object  
Triplestore  
BT: Data storage systems  
RT: Database systems  
Information retrieval  
Metasearch  
Relational databases  
Text mining

## Triplestore

USE: Triples (Data structure)

## Tritium batteries

USE: Atomic batteries

## Trojan horses

UF: Trojans  
BT: Malware  
RT: Cyber espionage

## Trojans

USE: Trojan horses



# 2018 IEEE Thesaurus

## *Trolley cars*

USE: Public transportation

## **Tropical cyclones**

UF: Cyclonic storms  
Storm systems  
Tropical depressions  
Tropical storms  
BT: Cyclones

## *Tropical depressions*

USE: Tropical cyclones

## *Tropical storms*

USE: Tropical cyclones

## *Troposphere*

USE: Terrestrial atmosphere

## *Truncation errors*

USE: Finite wordlength effects

## **Tsunami**

BT: Geoscience

## *TSV*

USE: Through-silicon vias

## *Tubes*

USE: Electron tubes

## *Tumor*

USE: Tumors

## *Tumor cells*

USE: Tumors

## *Tumor detection*

USE: Tumors

## **Tumors**

UF: Tumor  
Tumor cells  
Tumor detection  
Tumours  
BT: Medical conditions  
RT: Cancer  
Medical diagnostic imaging  
Oncology  
Positron emission

## tomography

Single photon emission

## computed tomography

NT: Benign tumors  
Breast tumors

## Colonic polyps

## Lesions

## Malignant tumors

## *Tumours*

USE: Tumors

## **Tunable circuits and devices**

BT: Circuits and systems  
Frequency control  
RT: Inductors  
Tuners  
Tuning  
NT: RLC circuits  
Tuned circuits

## **Tuned circuits**

BT: Tunable circuits and devices

## **Tuners**

BT: Instruments  
Tuning  
RT: Frequency control  
Frequency synthesizers  
Resonators  
Tunable circuits and

## devices

## **Tungsten**

UF: Wolfram  
BT: Metals

## **Tuning**

BT: Frequency control  
RT: Tunable circuits and devices  
NT: Laser tuning  
Optical tuning  
Tuners

## *Tuning forks*

USE: Vibrations

## *Tunnel effect*

USE: Tunneling

## *Tunnel field effect transistors*

USE: TFETs

## **Tunneling**

UF: Tunnel effect  
BT: Electron devices  
Quantum mechanics  
RT: Quantum well devices



# 2018 IEEE Thesaurus

	NT: Semiconductor materials Gate leakage Josephson effect Magnetic tunneling Resonant tunneling devices Tunneling		NT: Pumps Turbines Turbogenerators
magnetoresistance		<i>Turbulent media</i>	USE: Random media
<b>Tunneling magnetoresistance</b>		<b>Turing machines</b>	BT: Automata
UF: TMR Tunnelling		<b>Turning</b>	BT: Machining RT: Boring Machine tools
magnetoresistance			
BT: Magnetoresistance Tunneling		<b>Tutorials</b>	BT: Educational programs IEEE indexing
RT: Magnetoresistive devices			
<i>Tunnelling magnetoresistance</i>		<b>TV</b>	UF: Mobile television TV broadcasting Television BT: Communications technology RT: Electronic learning Entertainment industry HbbTV Standards Image communication Plasma displays TV equipment Telecommunication
USE: Tunneling			computing
magnetoresistance			UHDTV Visual communication
<b>Turbines</b>			NT: Cable TV Digital TV Mobile TV Smart TV Three-dimensional
BT: Turbomachinery			television
RT: Aircraft propulsion Boilers Compressors Turbogenerators Wind energy			Web TV
NT: Hydraulic turbines Wind turbines		<i>TV broadcasting</i>	USE: TV
<b>Turbo codes</b>		<b>TV equipment</b>	BT: Communication equipment RT: TV Video equipment NT: Large screen displays TV receivers
BT: Channel coding		<b>TV interference</b>	BT: Interference
RT: Error correction Viterbi algorithm			
<i>Turbo generators</i>			
USE: Turbogenerators			
<b>Turbogenerators</b>			
UF: Turbo generators			
BT: Turbomachinery			
RT: Turbines Wind power generation			
<i>Turbomachine blades</i>			
USE: Turbomachinery			
<b>Turbomachinery</b>			
UF: Turbomachine blades			
BT: Power generation			
RT: Blades Compressors Engines Machine components Mechanical systems			



# 2018 IEEE Thesaurus

RT:	Echo interference Gaussian noise	<i>Uber</i>	USE:	Public transportation
<b>TV receivers</b>		<i>Ubicomp</i>	USE:	Pervasive computing
BT:	TV equipment			
<b>Twitter</b>		<b>Ubiquitous computing</b>		
UF:	Hashtag	UF:	Ubiquitous wireless*	
BT:	Social network services	BT:	Pervasive computing	
		RT:	Ambient intelligence	
		NT:	Context-aware services	
<b>Two dimensional displays</b>		<i>Ubiquitous wireless*</i>	USE:	Ubiquitous computing
UF:	2-D displays 2D displays Two-dimensional displays			
BT:	Displays	<i>UHD</i>	USE:	UHDTV
RT:	Sprites (computer) Structure from motion			
<b>Two dimensional hole gas</b>		<b>UHDTV</b>		
UF:	2-d hole gas 2d hole gas	UF:	4K UHD 8K UHD Super hi-vision UHD Ultra HD Ultra HD TV Ultra-high definition TV Ultra-high definition	
BT:	Quantum well devices			
RT:	Quantum well lasers Quantum wells	television	BT:	HDTV
<i>Two dimensional photonic crystals</i>			RT:	ITU Standards TV
USE:	Photonic crystals			
<i>Two-dimensional displays</i>		<b>UHF antennas</b>		
USE:	Two dimensional displays	BT:	Antennas UHF technology UHF devices	
<i>Two-dimensional electron gas FETs</i>				
USE:	MODFETs	<b>UHF circuits</b>		
<i>Two-dimensional photonic crystals</i>		UF:	Ultra-high-frequency	
USE:	Photonic crystals	circuits	BT:	Circuits UHF technology
<b>Two-term control</b>			RT:	Analog circuits
BT:	Process control		NT:	UHF integrated circuits
<b>Type II superconductors</b>		<b>UHF communication</b>		
BT:	Superconducting materials	UF:	Ultra-high-frequency	
RT:	Flux pinning Niobium	communication	BT:	Communication systems UHF technology
<i>Type interference</i>			RT:	Mobile handsets
USE:	Reasoning about programs			
<b>Typesetting</b>		<b>UHF devices</b>		
BT:	Text processing	UF:	Ultra-high-frequency	
RT:	Printing	devices		
<i>Tyres</i>				
USE:	Tires			



# 2018 IEEE Thesaurus

BT: UHF technology  
RT: UHF antennas  
UHF integrated circuits

## UHF integrated circuits

UF: Ultra-high-frequency  
integrated circuits  
BT: Circuits  
Integrated circuits  
UHF circuits  
UHF technology  
RT: Analog integrated circuits  
UHF devices

## UHF measurements

UF: Ultra-high-frequency  
measurements  
BT: Measurement  
RT: UHF technology

## UHF propagation

UF: UHF radio propagation  
Ultra-high-frequency  
propagation  
BT: Electromagnetic  
propagation  
RT: Broadband antennas

## UHF radio propagation

USE: UHF propagation

## UHF technology

UF: Ultra-high-frequency  
technology  
BT: Communications  
technology  
RT: UHF measurements  
NT: UHF antennas  
UHF circuits  
UHF communication  
UHF devices  
UHF integrated circuits

## UHMWPE

UF: Ultra high molecular weight  
polyethylene  
BT: Thermoplastic polyethylene

## ULSI

USE: Ultra large scale integration

## Ultra HD

USE: UHDTV

## Ultra HD TV

USE: UHDTV

## Ultra high molecular weight polyethylene

USE: UHMWPE

## Ultra large scale integration

UF: ULSI  
BT: Circuits  
Integrated circuits  
Large scale integration

## Ultra low power\*

USE: Low-power electronics

## Ultra violet

USE: Ultraviolet sources

## Ultra wide-band

USE: Ultra wideband technology

## Ultra wideband

USE: Ultra wideband technology

## Ultra wideband antennas

UF: UWB antennas  
Ultrawideband antennas  
BT: Broadband antennas  
Ultra wideband technology  
RT: Ultra wideband radar

## Ultra wideband communication

UF: UWB communication  
Ultrawideband  
communication  
BT: Ultra wideband technology  
RT: Broadband communication  
Military communication  
Multipath channels  
Spread spectrum  
communication

## Ultra wideband radar

UF: UWB radar  
Ultrawideband radar  
BT: Radar  
Ultra wideband technology  
RT: Ground penetrating radar  
Radar detection  
Radar imaging  
Synthetic aperture radar  
Ultra wideband antennas

## Ultra wideband technology

UF: UWB technology  
Ultra wide-band



# 2018 IEEE Thesaurus

Ultra wideband  
Ultra-wide-band  
Ultra-wideband  
Ultrawideband  
Ultrawideband technology  
BT: Communications  
technology  
NT: Ultra wideband antennas  
Ultra wideband  
communication  
Ultra wideband radar

*Ultra-high definition television*  
USE: UHDTV

*Ultra-high definition TV*  
USE: UHDTV

**Ultra-high definition video**  
BT: High definition video

*Ultra-high-frequency circuits*  
USE: UHF circuits

*Ultra-high-frequency communication*  
USE: UHF communication

*Ultra-high-frequency devices*  
USE: UHF devices

*Ultra-high-frequency integrated circuits*  
USE: UHF integrated circuits

*Ultra-high-frequency measurements*  
USE: UHF measurements

*Ultra-high-frequency propagation*  
USE: UHF propagation

*Ultra-high-frequency technology*  
USE: UHF technology

*Ultra-low power\**  
USE: Low-power electronics

*Ultra-violet*  
USE: Ultraviolet sources

*Ultra-wide-band*  
USE: Ultra wideband technology

*Ultra-wideband*  
USE: Ultra wideband technology

*Ultracapacitors*

USE: Supercapacitors

**Ultrafast electronics**  
BT: High-speed electronics

**Ultrafast optics**  
BT: Optics

*Ultrasonic applications*  
USE: Acoustic applications

*Ultrasonic devices*  
USE: Acoustic devices

**Ultrasonic imaging**  
UF: Ultrasonic techniques  
Ultrasound  
BT: Ultrasonics, ferroelectrics,  
and frequency control  
RT: Amniocentesis  
Biomedical imaging  
NT: Ultrasonography

*Ultrasonic techniques*  
USE: Ultrasonic imaging

**Ultrasonic transducer arrays**  
BT: Transducers

**Ultrasonic transducers**  
BT: Ultrasonics, ferroelectrics,  
and frequency control  
RT: Nondestructive testing  
Piezoelectricity  
Sonar

**Ultrasonic variables measurement**  
BT: Measurement

*Ultrasonics*  
USE: Acoustics

**Ultrasonics, ferroelectrics, and frequency control**  
NT: Ferroelectric materials  
Frequency control  
Piezoelectricity  
Pyroelectricity  
Ultrasonic imaging  
Ultrasonic transducers

**Ultrasonography**  
BT: Biomedical image  
processing  
Ultrasonic imaging



# 2018 IEEE Thesaurus

NT:	Sonogram	NT:	Forecast uncertainty
<i>Ultrasound</i>		<i>Underarm</i>	
USE:	Ultrasonic imaging	USE:	Axilla
<b>Ultraviolet sources</b>		<i>Underground communication cables</i>	
UF:	UV sources	USE:	Communication cables
	Ultra violet		
	Ultra-violet	<i>Underground object detection</i>	
BT:	Light sources	USE:	Buried object detection
RT:	Lamps		
	Lasers	<i>Underground objects</i>	
		USE:	Buried object detection
<i>Ultrawideband</i>		<b>Underground power cables</b>	
USE:	Ultra wideband technology	BT:	Power cables
<i>Ultrawideband antennas</i>		<b>Underwater acoustics</b>	
USE:	Ultra wideband antennas	BT:	Acoustics
<i>Ultrawideband communication</i>		<b>Underwater autonomous vehicles</b>	
USE:	Ultra wideband communication	UF:	Autonomous underwater vehicles
<i>Ultrawideband radar</i>		BT:	Unmanned autonomous vehicles
USE:	Ultra wideband radar		
<i>Ultrawideband technology</i>		<b>Underwater cables</b>	
USE:	Ultra wideband technology	UF:	Marine cables
			Sub-sea cables
<b>Umbilical cable</b>			Submarine cables
UF:	Power supplies to apparatus		Subsea cables
BT:	Power supplies	BT:	Cables
			Marine technology
<i>UML</i>		<b>Underwater communication</b>	
USE:	Unified modeling language	BT:	Communication systems
			Marine technology
<i>UMTS</i>			Underwater technology
USE:	3G mobile communication		
<b>Uncertain systems</b>		<i>Underwater drones</i>	
UF:	Parameter uncertainty	USE:	Unmanned underwater vehicles
BT:	Mathematics		
RT:	Control systems	<b>Underwater equipment</b>	
	Linear matrix inequalities	UF:	Diving equipment
	Robustness		Flotation devices
	Uncertainty	BT:	Marine technology
			Underwater technology
<b>Uncertainty</b>		RT:	Underwater vehicles
BT:	Probability	NT:	Rebreathing equipment
RT:	Cognitive science		
	Fuzzy sets	<i>Underwater exploration robots</i>	
	Nonlinear dynamical	USE:	Unmanned underwater vehicles
systems			
	Uncertain systems		





# 2018 IEEE Thesaurus

## *Underwater robots*

USE: Unmanned underwater vehicles

## *Underwater sensor networks*

USE: Wireless sensor networks

## **Underwater structures**

BT: Marine technology  
Underwater technology

## **Underwater technology**

UF: Submarine technology  
BT: Marine technology  
RT: Underwater vehicles  
NT: Underwater communication  
Underwater equipment  
Underwater structures

## **Underwater tracking**

BT: Tracking

## **Underwater vehicles**

UF: Aquatic vehicles  
Submarines  
Submersibles  
BT: Marine vehicles  
RT: Marine technology  
Underwater equipment  
Underwater technology

## **Undulators**

UF: Wiggler magnets  
BT: Magnetic devices  
Synchrotrons  
RT: Free electron lasers  
X-rays

## **Unemployment**

BT: Human resource management

## **Uniaxial strain**

BT: Strain

## **Unicast**

BT: Computer networks  
RT: Streaming media

## **Unified messaging**

BT: Electronic mail  
Electronic messaging

## **Unified modeling language**

UF: UML

BT: Specification languages  
RT: Client-server systems  
Common Information Model  
(electricity)

## *Uniform Resource Identifier*

USE: Uniform resource locators

## **Uniform resource locators**

UF: URL  
Uniform Resource Identifier  
BT: Web sites

## **Uninterruptible power systems**

BT: Power systems  
RT: Batteries  
Emergency power supplies  
Power supplies  
Protection

## *Units (measurement)*

USE: Measurement units

## *Universal mobile telecommunication service*

USE: 3G mobile communication

## **Universal motors**

BT: Motors

## **Universal Serial Bus**

UF: USB  
BT: Communication standards  
Information technology

## *Universities*

USE: Educational institutions

## **Unmanned aerial vehicles**

UF: Aerial robots  
Unmanned air vehicles  
Unmanned airborne

vehicles

BT: Unmanned vehicles  
RT: Mobile robots  
NT: Drones

## *Unmanned air vehicles*

USE: Unmanned aerial vehicles

## *Unmanned airborne vehicles*

USE: Unmanned aerial vehicles

## *Unmanned autonomous cars*

USE: Unmanned autonomous vehicles



# 2018 IEEE Thesaurus

## *Unmanned autonomous vehicle*

USE: Autonomous vehicles

## **Unmanned autonomous vehicles**

UF: Unmanned autonomous cars

BT: Autonomous vehicles  
NT: Autonomous aerial vehicles  
Underwater autonomous

vehicles

## **Unmanned underwater vehicles**

UF: Underwater drones  
Underwater exploration

robots

BT: Underwater robots  
Unmanned vehicles

## **Unmanned vehicles**

UF: Remotely guided vehicles  
Remotely operated

automobiles

BT: Remotely operated cars  
Remotely operated vehicles  
Intelligent vehicles  
NT: Unmanned aerial vehicles  
Unmanned underwater

vehicles

## *Unsolicited e-mail*

USE: Unsolicited electronic mail

## **Unsolicited electronic mail**

UF: Junk e-mail  
Junk email  
Spam  
Spamming  
Unsolicited e-mail  
Unsolicited email  
BT: Electronic mail  
RT: Computer crime  
Invasive software  
Office automation

## *Unsolicited email*

USE: Unsolicited electronic mail

## **Unsupervised learning**

BT: Learning systems  
RT: Formal concept analysis  
Semisupervised learning

## **Uplink**

BT: Satellite communication

## **Upper bound**

BT: Boundary conditions

## **Uranium**

BT: Chemical elements

## **Urban areas**

UF: Cities and towns  
City  
Metropolitan areas  
Urban environments  
BT: Geography  
RT: Public infrastructure  
Public transportation  
NT: Smart cities  
Urban planning

## *Urban environments*

USE: Urban areas

## *Urban heat islands*

USE: Thermal pollution

## *Urban modeling*

USE: Urban planning

## **Urban planning**

UF: City planning  
Urban modeling  
BT: Urban areas  
RT: Public infrastructure  
NT: Urban policy

## **Urban policy**

BT: Urban planning

## **Urban pollution**

BT: Pollution

## *Urinary calculosis*

USE: Kidney stones

## *URL*

USE: Uniform resource locators

## **Urogenital system**

BT: Anatomy  
NT: Bladder  
Kidney

## *US activities*

USE: IEEE United States activities



# 2018 IEEE Thesaurus

## US Department of Agriculture

BT: US Government

## US Department of Commerce

BT: US Government

NT: NIST

## US Department of Defense

UF: DoD

BT: US Government

## US Department of Energy

UF: DoE

BT: US Government

## US Department of Transportation

UF: DOT

BT: US Government

## US Government

BT: Government

NT: US Department of

Agriculture

US Department of

Commerce

US Department of Defense

US Department of Energy

US Department of

Transportation

US Government agencies

US local government

## US Government agencies

BT: US Government

RT: Patents

NT: FAA

FCC

NASA

## US local government

BT: US Government

## Usability

BT: Software design

## USB

USE: Universal Serial Bus

## User centered design

UF: User-centered design

User-centred design

BT: Design methodology

## User computer interfaces

USE: User interfaces

## User friendliness

USE: Human computer interaction

## User generated content

USE: User-generated content

## User interfaces

UF: Man-machine interfaces

User computer interfaces

User-computer interfaces

BT: Systems, man, and cybernetics

RT: Adaptive learning

Ambient intelligence

Browsers

Computer interfaces

Computer peripherals

Displays

Gaze tracking

Web design

NT: Audio user interfaces

Brain-computer interfaces

Data visualization

Emotion recognition

Exoskeletons

Graphical user interfaces

Human computer

interaction

Human-robot interaction

Human-vehicle systems

Smart cards

## User-centered design

USE: User centered design

## User-centred design

USE: User centered design

## User-computer interfaces

USE: User interfaces

## User-created content

USE: User-generated content

## User-generated content

UF: Consumer-generated

media

User generated content

User-created content

BT: Data acquisition

## Utility programs

BT: System software



# 2018 IEEE Thesaurus

<b>Utility theory</b>		Leak detection
BT:	Mathematics	Vacuum arcs
RT:	Supply and demand	Vacuum breakdown
		NT: Gettering
<i>UV sources</i>		<b>Vacuum technology</b>
USE:	Ultraviolet sources	BT: Electron devices
		RT: Field emitter arrays
<i>UWB antennas</i>		Gettering
USE:	Ultra wideband antennas	Space charge
		NT: Photomultipliers
<i>UWB communication</i>		Vacuum electronics
USE:	Ultra wideband communication	Vacuum systems
<i>UWB radar</i>		<i>Vacuum tubes</i>
USE:	Ultra wideband radar	USE: Electron tubes
<i>UWB technology</i>		<i>VAD</i>
USE:	Ultra wideband technology	USE: Voice activity detection
<i>V2G</i>		<i>Valuation</i>
USE:	Vehicle-to-grid	USE: Cost accounting
<i>V2V</i>		<b>Valves</b>
USE:	Vehicular ad hoc networks	BT: Fluid flow
		Hydraulic equipment
		Machine components
		RT: Fluid flow control
		Manifolds
		NT: Microvalves
<b>Vaccines</b>		
BT: Medical services		
<b>Vacuum arc remelting</b>		<b>Vanadium</b>
BT: Melt processing		BT: Chemical elements
<b>Vacuum arcs</b>		<i>Vanes</i>
BT: Vacuum breakdown		USE: Blades
RT: Electron emission		
Thermionic emission		
Vacuum systems		<i>VANET</i>
		USE: Vehicular ad hoc networks
<b>Vacuum breakdown</b>		<i>Vapour deposition</i>
BT: Dielectric breakdown		USE: Chemical vapor deposition
RT: Electron emission		
Vacuum systems		
NT: Vacuum arcs		<i>VAR</i>
		USE: Reactive power
<b>Vacuum electronics</b>		<b>Varactors</b>
BT: Vacuum technology		BT: Capacitors
		Semiconductor diodes
<i>Vacuum energy</i>		
USE: Elementary particle vacuum		<i>Variable frequency drives</i>
		USE: Variable speed drives
<b>Vacuum systems</b>		<i>Variable optical attenuators</i>
BT: Vacuum technology		USE: Optical attenuators
RT: Bellows		
Casimir effect		



# 2018 IEEE Thesaurus

<i>Variable selection</i>		RT: Eigenvalues and eigenfunctions	Signal processing
USE: Input variables			
<b>Variable speed drives</b>		<b>Vegetable oils</b>	
UF: Variable frequency drives		BT: Oils	
BT: Drives		RT: Food products	
RT: Magnetic gears		<b>Vegetation</b>	
Motor drives		UF: Trees (botanical)	
NT: Pitch control (audio)		BT: Biology	
		RT: Forestry	
<b>Variable structure systems</b>		Vegetation mapping	
BT: Adaptive systems		NT: Crops	
		Marine vegetation	
<b>Varistors</b>		<b>Vegetation mapping</b>	
BT: Resistors		BT: Geoscience and remote sensing	
RT: Arresters		RT: Agriculture	
Semiconductor devices		Forestry	
<i>Vascular system</i>		Geophysical measurement	
USE: Circulatory system		techniques	
<b>VCO</b>		Remote sensing	
USE: Voltage-controlled oscillators		Terrain mapping	
<b>VCR</b>		Vegetation	
USE: Video recording		<b>Vehicle crash testing</b>	
<b>VCSEL</b>		BT: Automotive engineering	
USE: Vertical cavity surface emitting lasers		Product safety engineering	
<i>Vector optimization</i>		RT: Vehicles	
USE: Pareto optimization		<b>Vehicle detection</b>	
<b>Vector processors</b>		BT: Automotive engineering	
BT: Microprocessors		<b>Vehicle driving</b>	
<i>Vector quantisation</i>		BT: Automotive engineering	
USE: Vector quantization		<b>Vehicle dynamics</b>	
<b>Vector quantization</b>		BT: Automotive engineering	
UF: Vector quantisation		RT: Hardware-in-the loop	
BT: Quantization (signal)		simulation	
RT: Codes		Vehicles	
Encoding		<b>Vehicle routing</b>	
Image coding		BT: Traffic control	
MPEG 4 Standard		RT: Intelligent vehicles	
Speech coding		Path planning	
Transform coding		<b>Vehicle safety</b>	
Video coding		BT: Automotive engineering	
<b>Vectors</b>		Safety	
BT: Linear algebra		NT: Advanced driver assistance systems	



# 2018 IEEE Thesaurus

## *Vehicle to vehicle communication*

USE: Vehicular ad hoc networks

## **Vehicle-to-grid**

UF: V2G  
BT: Electric vehicles  
Smart grids  
RT: Battery powered vehicles  
Demand-side management  
Distributed power

generation

Fuel cell vehicles  
Hybrid electric vehicles  
Load management  
Propulsion  
Solar powered vehicles

## *Vehicle-to-vehicle*

USE: Vehicular ad hoc networks

## **Vehicles**

BT: Transportation  
Vehicular and wireless

technologies

RT: Mobile robots  
Tires  
Vehicle crash testing  
Vehicle dynamics  
Vehicular ad hoc networks  
NT: Intelligent vehicles  
Land vehicles  
Military vehicles  
Space vehicles

## **Vehicular ad hoc networks**

UF: V2V  
VANET  
Vehicle to vehicle

communication

BT: Vehicle-to-vehicle  
Ad hoc networks  
RT: Mobile communication  
Vehicles  
Vehicular automation

## **Vehicular and wireless technologies**

UF: Vehicular technologies  
NT: Automotive engineering  
Land mobile radio

equipment

Navigation  
Propulsion  
Vehicles  
Wireless sensor networks

## **Vehicular automation**

BT: Automation  
RT: Autonomous vehicles  
Intelligent vehicles  
Mechatronics  
Mobile robots  
Multi-agent systems  
Vehicular ad hoc networks

## *Vehicular technologies*

USE: Vehicular and wireless technologies

## **Veins**

BT: Blood vessels

## **Velocity control**

UF: Rotational measurement  
Rotational speed  
Speed control  
BT: Mechanical variables

control

RT: Aerospace control  
Angular velocity  
Cruise control  
Motion control  
Motor drives  
Servosystems  
NT: Angular velocity control

## **Velocity measurement**

UF: Speed measurement  
BT: Mechanical variables  
measurement  
RT: Angular velocity  
Doppler measurement  
Flowmeters  
Motion measurement  
Slow light  
Tracking

## **Ventilation**

BT: Cooling  
RT: Air conditioning  
Temperature control  
Vents  
NT: Fans

## **Ventricle system**

BT: Brain

## **Vents**

BT: Mechanical products  
RT: Air conditioning  
Buildings





# 2018 IEEE Thesaurus

RT: Modal analysis  
Vibration control  
Vibrations  
Vibrometers

## *Vibrational signal processing*

USE: Signal processing

## **Vibrations**

UF: Mechanical vibrations  
Tuning forks  
Vibrating bodies  
BT: Mechanical factors  
RT: Acoustic noise  
Acoustics  
Damping  
Dynamics  
Elastodynamics  
Nanogenerators  
Oscillators  
Resonance  
Vibration control  
Vibration measurement

## **Vibrometers**

BT: Meters  
RT: Vibration measurement

## *Video annotation*

USE: Image annotation

## **Video codecs**

BT: Codecs  
Communication equipment  
Video equipment  
RT: Decoding  
Image coding  
MPEG 4 Standard  
MPEG standards  
Video coding

## **Video coding**

UF: Advanced video coding  
Videocoding  
BT: Video signal processing  
RT: Image coding  
MPEG 4 Standard  
MPEG standards  
Rate distortion theory  
Streaming media  
Transcoding  
Vector quantization  
Video codecs  
NT: DVD  
High efficiency video coding

## **Video compression**

BT: Video signal processing  
RT: Data compression

## **Video equipment**

UF: Camcorders  
BT: Communication equipment  
RT: Consumer electronics  
TV equipment  
Video recording  
NT: Optical projectors  
Video codecs  
Videos

## *Video games*

USE: Games

## **Video on demand**

BT: Streaming media  
RT: Broadband communication  
Digital multimedia

## broadcasting

## **Video recording**

UF: VCR  
VTR  
BT: Recording  
RT: DVD  
Image storage  
Video equipment  
NT: High definition video  
Videos  
Webcams

## **Video reviews**

BT: IEEE indexing

## *Video sequence*

USE: Video sequences

## **Video sequences**

UF: Video sequence  
BT: Computer graphics  
RT: Image databases  
Image processing  
Multimedia computing

## **Video sharing**

BT: Information retrieval  
RT: Internet  
NT: Facebook  
MySpace  
YouTube





# 2018 IEEE Thesaurus

## Video signal processing

BT: Multidimensional signal processing  
 RT: Authentication  
 Firewire  
 Gaze tracking  
 IEEE 1394 Standard  
 Image annotation  
 Image recognition  
 MPEG 4 Standard  
 MPEG standards  
 Object tracking  
 Streaming media  
 Time-frequency analysis  
 NT: Motion artifacts  
 Video coding  
 Video compression

## Video streaming

USE: Streaming media

## Video surveillance

BT: Surveillance

## Video tracking

BT: Image motion analysis  
 Tracking

## Videocoding

USE: Video coding

## Videoconferences

BT: Collaborative tools

## Videoconferencing

USE: Teleconferencing

## Videophone systems

UF: Picture phones  
 Picturephones  
 BT: Communication systems  
 RT: Image communication  
 Telephony  
 Visual communication

## Videos

UF: Multimedia products  
 BT: Video equipment  
 Video recording

## Videotex

UF: Viewdata  
 BT: Communication systems  
 Information services  
 RT: Data communication

Teletext

## Viewdata

USE: Videotex

## Virtual artifact

BT: Artificial intelligence  
 Brain  
 Digital systems  
 Virtual reality

## Virtual colonoscopy

BT: Colonoscopy

## Virtual currency

USE: Online banking

## Virtual enterprises

BT: Computer applications  
 Data processing  
 Economics  
 Operations research  
 Electronic commerce  
 Internet  
 Research and development  
 Virtual manufacturing  
 Virtual reality  
 RT: Virtual reality

## Virtual environments

BT: Virtual reality  
 RT: Internet of Things  
 Management information

## base

NT: Virtualization

## Virtual factories

USE: Virtual manufacturing

## Virtual groups

UF: Virtual teams  
 BT: Collaboration

## Virtual machine monitors

UF: Hypervisors  
 VMMs  
 BT: Computers and information

## processing

RT: Platform virtualization

## Virtual machines

USE: Virtual machining

## Virtual machining

UF: Virtual machines  
 BT: Machining



# 2018 IEEE Thesaurus

networking	RT:	Virtual manufacturing	Avatars	
		Software defined	Extended reality	
		Virtual prototyping	Virtual artifact	
		Virtual reality	Virtual environments	
<b>Virtual manufacturing</b>				
manufacturing	UF:	Digital factories		
		Virtual factories		
	BT:	Computer applications		
	RT:	CADCAM		
		Computer integrated		
		Concurrent engineering		
		Research and development		
		Virtual enterprises		
		Virtual prototyping		
		Virtual reality		
	NT:	Virtual machining		
<i>Virtual office</i>				
	USE:	Teleworking		
<b>Virtual private networks</b>				
	UF:	VPN		
	BT:	Computer networks		
	RT:	Data security		
		Internet		
		Local area networks		
		Wide area networks		
	NT:	Extranets		
<b>Virtual prototyping</b>				
	BT:	Design methodology		
	RT:	Product development		
		Prototypes		
		Rapid prototyping		
		Research and development		
		Virtual machining		
		Virtual manufacturing		
		Virtual reality		
	<b>Virtual reality</b>			
		UF:	Mixed reality	
BT:		Computer graphics		
		Graphics		
RT:		Cyberspace		
		Solid modeling		
		Virtual enterprises		
		Virtual machining		
		Virtual manufacturing		
		Virtual prototyping		
		Virtualization		
	NT:	Augmented reality		
		Augmented virtuality		
<i>Virtual teams</i>				
	USE:	Virtual groups		
<b>Virtualization</b>				
networking	BT:	Virtual environments		
	RT:	Software defined		
		Virtual reality		
<i>Viruses (computer)</i>				
	USE:	Computer viruses		
<b>Viruses (medical)</b>				
	BT:	Organisms		
	NT:	Influenza		
<i>Viruses (microorganisms)</i>				
	USE:	Microorganisms		
<i>Visa gold</i>				
	USE:	Credit cards		
<b>Viscera</b>				
	BT:	Body regions		
<b>Viscosity</b>				
	BT:	Fluids		
		Measurement		
		Resistance		
	RT:	Navier-Stokes equations		
		Rheology		
<b>Visible light communication</b>				
	BT:	Data communication		
		Optical fiber communication		
	RT:	Light emitting diodes		
		Light fidelity		
		Lighting		
<i>Vision</i>				
	USE:	IEEE mission and vision		
<i>Vision (biological)</i>				
	USE:	Visual systems		
<i>Vision Based Robot Control</i>				
	USE:	Visual servoing		
<b>Vision defects</b>				
	UF:	Amblyopia		



# 2018 IEEE Thesaurus

	Color blindness		
	Myopia		
BT:	Visual systems	<b>Visual servoing</b>	
		UF:	Vision Based Robot Control
		BT:	Motion control
			Robot vision systems
<b>Vision sensors</b>			
BT:	Sensors		
RT:	Image processing	<b>Visual systems</b>	
		UF:	Vision (biological)
<i>Vision systems (nonbiological)</i>		BT:	Sense organs
USE:	Machine vision	RT:	Head
			Machine vision
<i>Visual</i>			Saliency detection
USE:	Visualization	NT:	Vision defects
			Visual perception
<b>Visual analytics</b>			
BT:	Visualization	<i>Visualisation</i>	
RT:	Information representation	USE:	Visualization
<b>Visual BASIC</b>		<b>Visualization</b>	
BT:	Computer languages	UF:	Visual
RT:	Software engineering		Visualisation
	Software tools	BT:	Computer graphics
	System software		Graphics
		RT:	Animation
			Design tools
<b>Visual communication</b>			Educational technology
BT:	Communication systems		Image forensics
RT:	Image communication	NT:	Curve fitting
	Image resolution		Surface reconstruction
	TV		Visual analytics
	Videophone systems		
<b>Visual databases</b>		<b>Viterbi algorithm</b>	
UF:	Moving object databases	BT:	Algorithms
BT:	Databases	RT:	Dynamic programming
			Information theory
<b>Visual effects</b>			Mathematics
BT:	Image generation		Multiaccess communication
RT:	Animation		Probability
	Computer graphics		Speaker recognition
			Stochastic processes
			Turbo codes
<b>Visual odometry</b>			
BT:	Computer vision	<b>Vitrification</b>	
	Robots	BT:	Chemical technology
<b>Visual perception</b>		RT:	Radioactive waste disposal
BT:	Visual systems		
		<b>Vivaldi antennas</b>	
<i>Visual prostheses</i>		UF:	Vivaldi-antennas
USE:	Visual prosthesis	BT:	Broadband antennas
<b>Visual prosthesis</b>		<i>Vivaldi-antennas</i>	
UF:	Electronic visual prosthesis	USE:	Vivaldi antennas
	Visual prostheses		
BT:	Prosthetics	<b>VLIW</b>	
RT:	Blindness	UF:	Very long instruction word



# 2018 IEEE Thesaurus

	BT:	Very-long-instruction-word Central Processing Unit	<i>Voice-over-Internet protocol</i> USE:	Internet telephony
<i>VLSI</i>	USE:	Very large scale integration	<i>Voicegram</i> USE:	Spectrogram
<i>VMMs</i>	USE:	Virtual machine monitors	<i>Voiceprint</i> USE:	Spectrogram
<b>Vocabulary</b>	BT:	Information retrieval	<i>VOIP</i> USE:	Internet telephony
	RT:	Ranking (statistics)		
<b>Vocational training</b>	UF:	NVQ National vocational qualification	<b>Volatile organic compounds</b> BT:	Organic compounds
	BT:	Training	<b>Volcanic activity</b> BT:	Volcanoes
	RT:	Industrial training Multiskilling	<b>Volcanic ash</b> BT:	Volcanoes
<b>Vocoders</b>	BT:	Communication equipment Telephone equipment		Ash
	RT:	Speech codecs Speech coding	<i>Volcano</i> USE:	Volcanoes
<b>Voice activity detection</b>	UF:	Speech activity detection Speech detection VAD	<b>Volcanoes</b> UF:	Volcano
	BT:	Speech processing	BT:	Geoscience
	RT:	Speech coding Speech recognition Speech synthesis	NT:	Planetary volcanoes Volcanic activity Volcanic ash
<b>Voice mail</b>	BT:	Message systems	<b>Voltage</b> BT:	Electric variables
	RT:	Electronic mail Office automation	RT:	Automatic voltage control Capacitance-voltage characteristics
<i>Voice over Internet protocol</i> USE:	Internet telephony		NT:	Phase frequency detector Voltage control Voltage measurement Breakdown voltage Dynamic voltage scaling Threshold voltage Voltage fluctuations
<i>Voice over IP</i> USE:	Internet telephony			
<i>Voice print</i> USE:	Spectrogram		<i>Voltage breakdown</i> USE:	Dielectric breakdown
<i>Voice response systems</i> USE:	Speech synthesis		<b>Voltage control</b> UF:	Voltage mode control Voltage regulation Voltage-mode control
<i>Voice tract</i> USE:	Larynx		BT:	Electric variables control
			RT:	Electric current control



# 2018 IEEE Thesaurus

	Limiting		
	Motor drives		
	On load tap changers		
	Phase frequency detector		
	Power factor correction		
	Reactive power control		
	Regulators		
	Three-phase electric power		
	Voltage		
	Voltage multipliers		
NT:	Automatic voltage control	<b>Voltage-controlled oscillators</b>	
		UF:	VCO
			Voltage controlled
<i>Voltage controlled oscillators</i>		oscillators	
USE:	Voltage-controlled	BT:	Oscillators
oscillators			
<b>Voltage fluctuations</b>		<i>Voltage-mode control</i>	
BT:	Voltage	USE:	Voltage control
RT:	Power systems		
<b>Voltage measurement</b>		<b>Voltage-source converters</b>	
BT:	Electric variables	UF:	Modular multi-level
measurement		converters	
RT:	Automatic voltage control		VSC
	Potentiometers		Voltage-source convertors
	Voltage	BT:	Converters
	Voltage transformers		Power conversion
	Voltmeters	RT:	AC-DC power converters
NT:	Low voltage		HVDC transmission
	Medium voltage		Power electronics
			Pulse width modulation
<i>Voltage mode control</i>		converters	
USE:	Voltage control		
<b>Voltage multipliers</b>		<i>Voltage-source converters</i>	
BT:	Circuits	USE:	Voltage-source converters
RT:	AC-DC power converters		
	Charge pumps	<b>Voltmeters</b>	
	Particle accelerators	BT:	Meters
	Rectifiers	RT:	Voltage measurement
	Transformers		
	Voltage control	<i>Volume estimation</i>	
NT:	Capacitors	USE:	Volume measurement
	Diodes		
<i>Voltage regulation</i>		<b>Volume measurement</b>	
USE:	Voltage control	UF:	Volume estimation
		BT:	Mechanical variables
<i>Voltage sags</i>		measurement	
USE:	Power quality	RT:	Size measurement
		<b>Volume relaxation</b>	
<b>Voltage transformers</b>		BT:	Mechanical factors
UF:	Potential transformers		
BT:	Instrument transformers	<i>Volunteer computing</i>	
RT:	Voltage measurement	USE:	Computer applications AND
			Distributed processing
		<i>Vortices, optical</i>	
		USE:	Optical vortices
		<b>Voting</b>	
		BT:	Government
		NT:	Electronic voting
		<i>VPN</i>	
		USE:	Virtual private networks



# 2018 IEEE Thesaurus

<i>VPU</i>			<b>Warehousing</b>		
	USE:	Graphics processing units	BT:	Material storage	
			RT:	Production facilities	
<i>VSC</i>				Stacking	
	USE:	Voltage-source converters		Storage automation	
<i>VTR</i>			<b>Warning systems</b>		
	USE:	Video recording	USE:	Alarm systems	
<b>W3C</b>			<b>Warranties</b>		
	UF:	World Wide Web	UF:	Product warranties	
Consortium				Product warranty	
	BT:	Standards organizations	BT:	Product liability	
<b>W3C Standards</b>			<b>Washing machines</b>		
	BT:	Standards publications	BT:	Electric machines	
<b>Wafer bonding</b>				Electrical products	
	BT:	Bonding processes		Home appliances	
		Semiconductor device		Home automation	
manufacture			<b>Waste compaction</b>		
<i>Wafer level packaging</i>			USE:	Waste reduction	
	USE:	Wafer scale integration	<b>Waste disposal</b>		
<b>Wafer scale integration</b>			BT:	Waste management	
	UF:	Wafer level packaging	RT:	Effluents	
		Wafer-level packaging		Pollution	
	BT:	Circuits		Radioactive waste	
		Integrated circuits		Sanitary engineering	
		Large scale integration	NT:	Slag	
		Very large scale integration		Incineration	
<i>Wafer-level packaging</i>				Radioactive waste disposal	
	USE:	Wafer scale integration	<b>Waste electrical and electronic equipment</b>		
<i>Walking</i>			USE:	Electronic waste	
	USE:	Legged locomotion	<b>Waste handling</b>		
<i>WAMS</i>			BT:	Waste management	
	USE:	Wide area measurements	RT:	Radioactive waste disposal	
<i>WAN</i>				Waste reduction	
	USE:	Wide area networks	NT:	Sewage treatment	
<i>WANs</i>				Sludge treatment	
	USE:	Wide area networks		Waste handling equipment	
<i>WAP</i>				Wastewater treatment	
	USE:	Wireless access points	<b>Waste handling equipment</b>		
<i>AND</i>			BT:	Waste handling	
		Wireless application	RT:	Materials handling	
protocol			equipment		
				Remote handling	
			equipment		
			<b>Waste heat</b>		
			BT:	Energy conversion	
			RT:	Boilers	



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	Cogeneration		RT:	Industrial waste
	Energy conservation			Sanitary engineering
	Industrial waste			Sludge treatment
	Thermal pollution			Wastewater treatment
<i>Waste incineration</i>				Water
USE:	Incineration			Water pollution
<b>Waste management</b>		<b>Wastewater treatment</b>		
BT:	Environmental	UF:		Dissolved air flotation
management		BT:		Waste handling
RT:	Biodegradation	RT:		Rubber products
	Effluents			Sanitary engineering
	Production management			Sludge treatment
	Radioactive waste			Waste management
	Sanitary engineering			Wastewater
	Slag			Water conservation
	Waste materials			Water pollution
	Wastewater treatment	NT:		Ozonation
NT:	Waste disposal	<b>Watches</b>		
	Waste handling	BT:		Clocks
	Waste recovery	RT:		Consumer products
	Waste reduction			Time measurement
<b>Waste materials</b>		<b>Water</b>		
UF:	Refuse	UF:		H2O
BT:	Materials	BT:		Liquids
RT:	Fuels	RT:		Hydrodynamics
	Radioactive pollution			Hydrologic measurements
	Sanitary engineering			Hydrology
	Waste management			Lakes
	Waste recovery			Oceans
	Water pollution			Reservoirs
NT:	Effluents			Rivers
	Electronic waste			Steam engines
	Industrial waste			Wastewater
	Radioactive waste			Water heating
	Slurries			Water pollution
	Wastewater			Water resources
				Water storage
				Wetlands
<b>Waste recovery</b>		<b>Water conservation</b>		
BT:	Waste management	UF:		Water recycling
RT:	Waste materials	BT:		Environmental
	Waste reduction	management		
<b>Waste reduction</b>		RT:		Wastewater treatment
UF:	Waste compaction			Water resources
BT:	Waste management			Water storage
RT:	Design for disassembly	NT:		Desalination
	Waste handling	<b>Water heating</b>		
	Waste recovery	BT:		Heating systems
NT:	Compaction	RT:		Water
<b>Wastewater</b>				
BT:	Waste materials			



# 2018 IEEE Thesaurus

## Water jet cutting

UF: Abrasive water jet cutting  
BT: Cutting tools

## Water pollution

BT: Oceanic engineering and marine technology

RT: Pollution  
Effluents  
Industrial pollution  
Lakes  
Oils  
Rivers  
Sanitary engineering  
Sewage treatment  
Thermal pollution  
Waste materials  
Wastewater  
Wastewater treatment  
Water  
Water resources  
NT: Marine pollution

## Water recycling

USE: Water conservation

## Water resources

BT: Environmental management

RT: Lakes  
Remote sensing  
Rivers  
Water  
Water conservation  
Water pollution  
NT: Desalination  
Reservoirs

## Water storage

BT: Material storage  
RT: Crops  
Lakes  
Land use planning  
Water  
Water conservation  
NT: Reservoirs

## Water trees

USE: Trees - insulation

## Watermark

USE: Watermarking

## Watermarking

UF: Audio watermarking

Digital watermarking  
Image watermarking  
Watermark

BT: Security  
RT: Embossing  
Internet of Things

## Watt hour meters

USE: Watthour meters

## Watt-hour meters

USE: Watthour meters

## Watthour meters

UF: Watt hour meters  
Watt-hour meters  
BT: Meters  
RT: Energy measurement

## Wattmeters

BT: Meters  
RT: Power measurement

## WAVE

USE: Wireless Access in Vehicular Environments

## Wave diffraction

USE: Diffraction

## Wave equations

USE: Propagation

## Wave functions

BT: Waves  
RT: Conformal mapping  
Elementary particle

## exchange interactions

NT: Functional analysis  
Wavelet analysis  
Wavelet domain

## Wave power

BT: Energy resources  
Ocean waves  
RT: Renewable energy sources

## Wave propagation

USE: Propagation

## Wave scattering

USE: Scattering

## Waveform analysis

USE: Signal analysis





# 2018 IEEE Thesaurus

## *Waveform generators*

USE: Signal generators

## **Waveguide components**

BT: Electromagnetic  
waveguides  
RT: Circulators  
Conformal mapping  
Helical antennas  
Waveguide theory  
NT: Optical waveguides  
Power combiners  
Power dividers

## **Waveguide discontinuities**

UF: Irises  
Waveguide obstacles  
BT: Transmission line  
discontinuities  
RT: Electromagnetic  
waveguides  
Loaded waveguides  
Waveguide theory  
NT: Reflection coefficient  
Waveguide transitions

## **Waveguide junctions**

BT: Junctions

## **Waveguide lasers**

BT: Electromagnetic  
waveguides  
RT: Lasers  
NT: Substrate integrated  
waveguides

## *Waveguide obstacles*

USE: Waveguide discontinuities

## **Waveguide theory**

UF: Guided electromagnetic  
wave propagation  
BT: Electromagnetic  
waveguides  
RT: Antennas  
Conformal mapping  
Mathematics  
Mode matching methods  
Waveguide components  
Waveguide discontinuities  
Waveguide transitions

## **Waveguide transitions**

BT: Waveguide discontinuities

RT: Waveguide theory

## **Wavelength assignment**

BT: Optical fiber networks

## **Wavelength conversion**

BT: Optical fibers  
RT: Wavelength converters

## **Wavelength converters**

UF: Wavelength convertors  
BT: Converters  
RT: Wavelength conversion

## *Wavelength convertors*

USE: Wavelength converters

## *Wavelength division multiplexed*

USE: Wavelength division  
multiplexing

## **Wavelength division multiplexing**

UF: WDM  
Wavelength division  
multiplexed  
Wavelength-division  
multiplexing  
BT: Multiplexing  
RT: Bragg gratings  
Multicast communication  
NT: WDM networks

## **Wavelength measurement**

BT: Measurement  
RT: Acoustic measurements  
Electromagnetic  
measurements  
Frequency measurement  
Hyperspectral sensors  
Optical variables  
measurement

## **Wavelength routing**

BT: Routing

## *Wavelength-division multiplexing*

USE: Wavelength division  
multiplexing

## **Wavelet analysis**

BT: Wave functions  
RT: Wavelet transforms  
NT: Multiresolution analysis

## **Wavelet coefficients**



# 2018 IEEE Thesaurus

	BT:	Wavelet transforms		BT:	Wavelength division multiplexing
<b>Wavelet domain</b>				<b>Weapons</b>	
	BT:	Wave functions		UF:	Bomb Munitions Ordinance
<i>Wavelet neural networks</i>				BT:	Military equipment
	USE:	Neural networks		RT:	Defense industry Electronic countermeasures Terrorism
<b>Wavelet packets</b>				NT:	Guns Missiles Nuclear weapons Projectiles
	BT:	Wavelet transforms			
<b>Wavelet transforms</b>					
	BT:	Transforms			
	RT:	Harmonic analysis Signal analysis Signal processing Signal representation Wavelet analysis			
	NT:	Biorthogonal modulation Continuous wavelet transforms			
		Discrete wavelet transforms Wavelet coefficients Wavelet packets			
<b>Waves</b>				<b>Wearable Computers</b>	
	BT:	Physics		BT:	Computers
	RT:	Acoustic propagation Acoustic scattering Electromagnetic propagation		NT:	Smart glasses
		Electromagnetic radiation Electromagnetic scattering Time-domain analysis		<b>Wearable computers</b>	
	NT:	Atmospheric waves Berry phase Doppler effect Electrodynamics Magnetostatic waves Matter waves Plasma waves Propagation Reflectivity Seismic waves Shock waves Solitons Surface acoustic waves Wave functions		UF:	Wearable Health Monitoring System Wearable computing Wearable electronics
<i>WDM</i>				BT:	Computers Pervasive computing
	USE:	Wavelength division multiplexing		RT:	Soft electronics
<b>WDM networks</b>				<i>Wearable computing</i>	
				USE:	Wearable computers
				<i>Wearable electronics</i>	
				USE:	Wearable computers
				<i>Wearable Health Monitoring System</i>	
				USE:	Wearable computers
				<b>Wearable sensors</b>	
				BT:	Sensors
				<i>Weather</i>	
				USE:	Meteorology
				<b>Weather forecasting</b>	
				UF:	Weather prediction
				BT:	Meteorology
				NT:	Wind forecasting
				<i>Weather prediction</i>	
				USE:	Weather forecasting
				<b>Weaving</b>	
				BT:	Textile technology
				RT:	Cotton



# 2018 IEEE Thesaurus

	Fabrics		Web services
	Textile fibers		
	Textile industry	<b>Web services</b>	
	Textiles	BT:	Internet
<b>Web 2.0</b>			Middleware
BT:	Internet	RT:	Asynchronous
<b>Web and internet services</b>		communication	Service computing
UF:	Internet services		Webcams
BT:	Web services	NT:	Cloud computing
<i>Web browsers</i>			Mashups
USE:	Browsers		Message service
<i>Web cams</i>		architecture	Service-oriented
USE:	Webcams	protocol	Simple object access
<b>Web design</b>			WS-BPEL
UF:	Web site design		Web TV
BT:	Web sites		Web and internet services
RT:	Authoring systems		Web servers
	Content management		WebRTC
	Software design	<i>Web services business process execution language</i>	
	User interfaces	USE:	WS-BPEL
NT:	Web page design	<i>Web site design</i>	
	Web pages	USE:	Web design
<i>Web filters</i>		<b>Web sites</b>	
USE:	Information filters	BT:	Computer applications
<b>Web mining</b>			Information retrieval
BT:	Data mining	RT:	Computer networks
<i>Web ontology language</i>			Content management
USE:	OWL		Extranets
<b>Web page design</b>			Internet
BT:	Web design		Portals
<b>Web pages</b>			Social network services
BT:	Web design	NT:	Wikipedia
<i>Web real-time communications</i>			Facebook
USE:	WebRTC		MySpace
<i>Web robot</i>			Uniform resource locators
USE:	Bot (Internet)		Web design
<b>Web search</b>			YouTube
BT:	Search methods	<i>Web television</i>	
NT:	Crawlers	USE:	Web TV
<b>Web servers</b>		<b>Web TV</b>	
BT:	Servers	UF:	Web television
		BT:	Broadcasting
			TV
			Web services
		<b>Webcams</b>	



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UF:	Web cams		
BT:	Cameras		
	Video recording		
RT:	Web services		
<b>Webinars</b>			
BT:	Seminars		
<b>WebRTC</b>			
UF:	Web real-time		
communications			
BT:	Application programming		
interfaces			
	Real-time systems		
	Web services		
<b>WEEE</b>			
USE:	Electronic waste		
<b>Weibull distribution</b>			
BT:	Statistical distributions		
RT:	Failure analysis		
	Probability		
	Reliability engineering		
	Statistics		
<b>Weibull fading channels</b>			
BT:	Fading channels		
<b>Weight control</b>			
BT:	Mechanical variables		
control			
<b>Weight measurement</b>			
BT:	Mechanical variables		
measurement			
<b>Welding</b>			
BT:	Fabrication		
	Joining processes		
RT:	Bonding processes		
	Brazing		
	Fasteners		
	Manufacturing		
	Materials processing		
NT:	Spot welding		
<b>Well logging</b>			
BT:	Geophysics		
	Petroleum industry		
RT:	Oil drilling		
	Seismology		
<b>Wet etching</b>			
BT:	Etching		
<b>Wetlands</b>			
BT:	Ecosystems		
	Geoscience		
RT:	Hydrology		
	Lakes		
	Rivers		
	Water		
<b>Whales</b>			
BT:	Marine animals		
<b>Wheelchairs</b>			
BT:	Assistive technology		
<b>Wheels</b>			
BT:	Mechanical products		
RT:	Automobile manufacture		
	Automotive components		
	Automotive engineering		
	Axles		
	Flanges		
	Machine components		
	Manufacturing		
	Production		
	Steering systems		
	Structural plates		
	Tires		
<b>Whispering gallery modes</b>			
UF:	Whispering-gallery modes		
BT:	Optics		
RT:	Microcavities		
<i>Whispering-gallery modes</i>			
USE:	Whispering gallery modes		
<b>White blood cells</b>			
BT:	Blood		
<b>White matter</b>			
BT:	Central nervous system		
RT:	Action potentials		
	Axons		
	Brain		
	Learning systems		
<b>White noise</b>			
BT:	Noise		
RT:	AWGN channels		
	Music		
	Random number		
generation			
NT:	AWGN		



# 2018 IEEE Thesaurus

## White spaces

BT: Radio spectrum  
management

## Whole body imaging

BT: Biomedical image  
processing

## Whole-body PET

BT: Positron emission  
tomography

## wi-fi

USE: Wireless fidelity

## Wi-Max

USE: WiMAX

## Wide area measurement systems

USE: Wide area measurements

## Wide area measurements

UF: WAMS  
Wide area measurement  
systems  
Wide-area measurement  
systems  
Wide-area measurements  
BT: Measurement

## Wide area networks

UF: WAN  
WANs  
BT: Communication systems  
Computer networks  
RT: Electronic learning  
Frame relay  
IEEE 802.3 Standard  
Internetworking  
LAN interconnection  
Multiprocessor  
interconnection  
Open systems  
Protocols  
Token networks  
Virtual private networks

## Wide band gap semiconductors

BT: Semiconductor materials  
RT: Gallium alloys  
Silicon compounds

## Wide-area measurement systems

USE: Wide area measurements

## Wide-area measurements

USE: Wide area measurements

## Wideband

BT: Bandwidth  
Communication systems  
RT: Narrowband

## Wideband amplifiers

USE: Broadband amplifiers

## Wideband antennas

USE: Broadband antennas

## Wiener filters

BT: Noise reduction

## wifi

USE: Wireless fidelity

## Wiggler magnets

USE: Undulators

## Wikipedia

UF: Wikis  
BT: Information services  
RT: Collaboration  
Encyclopedias  
Internet  
Web sites

## Wikis

USE: Wikipedia

## Wild fires

USE: Fires

## Wildfires

USE: Fires

## Wildlife

BT: Animals

## WiMax

USE: WiMAX

## Wimax

USE: WiMAX

## WiMAX

UF: Wi-Max  
WiMax  
Wimax  
Worldwide Interoperability  
for Microwave Access



# 2018 IEEE Thesaurus

	BT:	Wireless communication	<b>Wind power generation</b>	UF:	Wind power
	RT:	IEEE 802.16 Standard		BT:	Power generation
<b>Winches</b>				RT:	Turbogenerators
					Wind
equipment	BT:	Materials handling			Wind energy
	RT:	Cables			
		Lifting equipment	<i>Wind power grid integration</i>	USE:	Wind energy integration
<b>Wind</b>					
	BT:	Meteorology	<b>Wind speed</b>	BT:	Wind
	RT:	Sea surface			
		Wind energy	<b>Wind tunnels</b>	BT:	Aerospace testing
		Wind power generation			Test facilities
	NT:	Wind forecasting		RT:	Aerodynamics
		Wind speed			Aerospace simulation
<b>Wind energy</b>			<b>Wind turbines</b>	BT:	Turbines
	UF:	Wind-energy		RT:	Doubly fed induction
	BT:	Energy resources	generators		Wind energy
	RT:	Turbines			Wind energy generation
		Wind			Wind forecasting
		Wind forecasting			
		Wind power generation			
		Wind turbines			
<b>Wind energy generation</b>			<i>Wind-energy</i>	USE:	Wind energy
	BT:	Power generation			
	RT:	Wind forecasting	<b>Windings</b>	UF:	Transformer windings
		Wind turbines		BT:	Electromagnetic fields
	NT:	Wind energy integration		RT:	AC machines
<b>Wind energy integration</b>					Coils
	UF:	Wind power grid integration			Electric machines
	BT:	Power systems			Magnetic circuits
		Wind energy generation			Power transformers
	RT:	Power grids			Rotating machines
<i>Wind farm</i>					Transformers
	USE:	Wind farms		NT:	Machine windings
<b>Wind farms</b>			<b>Windows</b>	BT:	Building materials
	UF:	Wind farm			Manufactured products
	BT:	Energy resources		RT:	Glass products
<b>Wind forecasting</b>					Vents
	BT:	Weather forecasting	<i>Windscreen wipers</i>	USE:	Automotive components
		Wind			
	RT:	Wind energy	<i>Windscreens</i>	USE:	Automotive components
		Wind energy generation			
		Wind turbines	<i>Windshield wipers</i>		
<i>Wind power</i>					
	USE:	Wind power generation			



# 2018 IEEE Thesaurus

USE:	Automotive components	BT:	Wireless networks
<i>Windshields</i>		<i>Wireless charging</i>	
USE:	Automotive components	USE:	Inductive charging
<b>Windup</b>		<b>Wireless communication</b>	
BT:	Feedback control	UF:	Wireless systems
<b>Wine industry</b>		BT:	Communication systems
BT:	Industry applications	RT:	Bluetooth
NT:	Wineries		Dynamic spectrum access
<b>Wineries</b>			IEEE 802.11 Standard
BT:	Wine industry		IEEE 802.11p Standard
<b>Wire</b>			IEEE 802.22 Standard
BT:	Materials		Inductive charging
RT:	Communication cables		Light fidelity
	Conductors		Location awareness
	Wiring		Long Term Evolution
<b>Wire drawing</b>		communications	Machine-to-machine
BT:	Wires		Mobile applications
RT:	Manufacturing		Paging strategies
	Production		Regional area networks
<b>Wireless Access in Vehicular Environments</b>			Wireless LAN
UF:	WAVE		Wireless fidelity
BT:	Wireless networks	NT:	Cognitive radio
RT:	IEEE 802.11p Standard		Cooperative communication
	Intelligent vehicles		GSM
<i>Wireless access networks</i>			Open wireless architecture
USE:	Wireless networks		Roaming
<b>Wireless access points</b>			Smart devices
UF:	WAP		Spatial diversity
BT:	Computer networks		WRAN
	Hardware		WiMAX
	Mobile computing		Wireless access points
	Wireless communication		Wireless application
RT:	IEEE 802.11 Standard	protocol	Wireless networks
	Routing protocols		
	Wireless LAN	<i>Wireless energy transmission</i>	
	Wireless fidelity	USE:	Wireless power transfer
<i>Wireless ad hoc network</i>		<b>Wireless fidelity</b>	
USE:	Mobile ad hoc networks	UF:	wi-fi
<b>Wireless application protocol</b>			wifi
UF:	WAP	BT:	Wireless LAN
BT:	Protocols	RT:	IEEE 802.11 Standard
	Wireless communication		Light fidelity
<b>Wireless cellular systems</b>			Radio frequency
			Wireless access points
			Wireless communication
		<i>Wireless handheld devices</i>	
		USE:	Handheld computers
		<b>Wireless LAN</b>	



# 2018 IEEE Thesaurus

UF: Radio LAN  
WLAN  
Wireless Metropolitan Area  
Networks  
Wireless local area  
networks

BT: Local area networks  
RT: Ad hoc networks  
Bluetooth  
Butler matrices  
IEEE 802.11 Standard  
IEEE 802.11e Standard  
IEEE 802.11g Standard  
IEEE 802.11n Standard  
IEEE 802.15 Standard  
LAN interconnection  
Personal area networks  
Radio communication  
Time-varying channels  
Wireless access points  
Wireless communication  
Wireless sensor networks  
NT: Light fidelity  
Wireless fidelity

*Wireless local area networks*  
USE: Wireless LAN

## Wireless mesh networks

BT: Communication systems  
RT: Wireless sensor networks

*Wireless Metropolitan Area Networks*  
USE: Wireless LAN

## Wireless networks

UF: Wireless access networks  
BT: Wireless communication  
RT: Acoustic communication  
(telecommunication)

IEEE 802.11p Standard  
IEEE 802.22 Standard  
WRAN  
Wireless power

transmission  
NT: AODV  
Self-organizing networks  
Wireless Access in

Vehicular Environments  
Wireless cellular systems

## Wireless personal area networks

UF: WPAN  
BT: Personal area networks

## Wireless power transfer

UF: Wireless energy  
transmission  
BT: Wireless power  
transmission

## Wireless power transmission

BT: Power transmission  
RT: Conductors  
Wireless networks  
NT: Wireless power transfer

## Wireless regional area networks

USE: WRAN

## Wireless security

USE: Communication system  
security

## Wireless sensor networks

UF: Underwater sensor  
networks  
BT: Communication systems  
Vehicular and wireless  
technologies  
RT: Ad hoc networks  
Cyber-physical systems  
Distributed vision networks  
Edge computing  
Internet of Things  
Machine-to-machine

## communications

Microsensors  
Sensors  
Wireless LAN  
Wireless mesh networks  
NT: Body sensor networks  
Event detection

## Wireless systems

USE: Wireless communication

## Wires

BT: Structural shapes  
RT: Nanowires  
Springs  
NT: Wire drawing

## Wiring

BT: Electric variables  
RT: Building services  
Cables  
Conductors  
Layout  
Metallization







# 2018 IEEE Thesaurus

networks  
 UF: Wireless regional area  
 BT: Regional area networks  
 Wireless communication  
 RT: IEEE 802.22 Standard  
 Wireless networks

## Wrapping

BT: Packaging  
 RT: Packaging machines

## Wrist

BT: Arms

## Writing

UF: Business writing  
 Engineering writing  
 Report writing  
 Technical reports  
 Technical writing  
 Professional  
 BT: Professional  
 communication  
 RT: Manuals  
 Proposals  
 NT: Abstracts  
 Bibliographies  
 Biographies  
 Dictionaries  
 Documentation  
 Grammar  
 Readability metrics  
 Resumes  
 Reviews  
 Thesauri

## Written character recognition

USE: Handwriting recognition

## Written characters

USE: Handwriting recognition

## Written-character recognition

USE: Handwriting recognition

## WS-BPEL

UF: Web services business  
 process execution language  
 BT: Computer languages  
 Web services  
 RT: Business process re-  
 engineering  
 Information processing

## WWW

USE: World Wide Web

## WWW robot

USE: Bot (Internet)

## X-ray applications

BT: X-rays  
 RT: Collimators  
 Phantoms  
 X-ray detection  
 NT: X-ray imaging  
 X-ray lasers

## X-ray detection

BT: X-rays  
 RT: Diagnostic radiography  
 Diffraction  
 Electromagnetic radiation  
 Phantoms  
 Radiography  
 X-ray applications  
 X-ray detectors  
 X-ray imaging

## X-ray detectors

BT: Ionizing radiation sensors  
 RT: Crystallography  
 Electromagnetic radiation  
 Gamma-ray detectors  
 Radiation detectors  
 X-ray detection  
 X-ray imaging  
 X-rays

## X-ray diffraction

BT: Electromagnetic diffraction

## X-ray imaging

BT: X-ray applications  
 RT: Gamma-ray detectors  
 Phantoms  
 Radiography  
 X-ray detection  
 X-ray detectors  
 NT: Plasma x-ray sources

## X-ray lasers

BT: Lasers  
 X-ray applications  
 RT: Plasma x-ray sources  
 X-rays

## X-ray lithography

BT: Lithography

## X-ray scattering



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# 2018 IEEE Thesaurus

UF:	XRD	<i>YBa2Cu3O7</i>	
BT:	X-rays	USE:	Yttrium barium copper oxide
<b>X-ray tomography</b>		<i>YBCO</i>	
BT:	X-rays	USE:	Yttrium barium copper oxide
<b>X-rays</b>		<i>Yield estimate</i>	
BT:	Medical services	USE:	Yield estimation
RT:	Collimators		
	Electromagnetic radiation	<b>Yield estimation</b>	
	Synchrotron radiation	UF:	Yield estimate
	Undulators	BT:	Estimation
	X-ray detectors	RT:	Circuit analysis
	X-ray lasers		Crops
NT:	X-ray applications		Microprocessor chips
	X-ray detection		
	X-ray scattering	<i>Young modulus</i>	
	X-ray tomography	USE:	Young's modulus
<i>X3D</i>		<b>Young's modulus</b>	
USE:	ISO Standards	UF:	Young modulus
<b>Xenon</b>		BT:	Solids
BT:	Gases	<b>YouTube</b>	
<i>Xerography</i>		BT:	Social network services
USE:	Electrophotography		Video sharing
			Web sites
<b>XML</b>		<b>Ytterbium</b>	
UF:	Automatic Test Markup Language	BT:	Chemical elements
	Extensible Markup Language	<b>Yttrium</b>	
BT:	Markup languages	BT:	Chemical elements
<i>XRD</i>			Metals
USE:	X-ray scattering	NT:	Yttrium compounds
<i>XSS</i>		<b>Yttrium barium copper oxide</b>	
USE:	Cross-site scripting	UF:	Y-Ba-Cu-O
<i>Y-Ba-Cu-O</i>			YBCO
USE:	Yttrium barium copper oxide		YBa2Cu3O7
		BT:	High-temperature superconductors
<i>Yachts</i>		RT:	Yttrium compounds
USE:	Boats		Barium compounds
<b>Yagi-Uda antennas</b>		<b>Yttrium compounds</b>	
BT:	Antennas	BT:	Yttrium
		RT:	Alloying
<b>Yarn</b>		NT:	Yttrium barium copper oxide
BT:	Textile fibers	<i>ZCS</i>	
RT:	Wool	USE:	Zero current switching



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## Zero current switching

UF: ZCS  
Zero-current switching  
BT: Switching circuits  
RT: Inverters  
Switching converters

## Zero voltage switching

UF: ZVS  
Zero-voltage switching  
BT: Switching circuits  
RT: Inverters  
Switching converters

## Zero-current switching

USE: Zero current switching

## Zero-voltage switching

USE: Zero voltage switching

## Zeros

USE: Poles and zeros

## ZigBee

BT: Radio communication  
RT: Automation  
Biomedical equipment  
Bluetooth  
IEEE 802.15 Standard  
Personal area networks  
Personal communication  
networks  
Smoke detectors

## Zinc

UF: Zn  
BT: Metals  
NT: Zinc compounds

## Zinc compounds

BT: Zinc  
NT: Zinc oxide

## Zinc oxide

UF: ZnO  
BT: Zinc compounds  
NT: Indium gallium zinc oxide

## ZINDO

USE: Computational modeling

## Zip fasteners

USE: Fasteners

## Zirconium

BT: Chemical elements

## Zn

USE: Zinc

## ZnO

USE: Zinc oxide

## Zoology

BT: Biology  
NT: Animals

## ZVS

USE: Zero voltage switching

