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## IEEE Taxonomy: A Subset Hierarchical Display of IEEE Thesaurus Terms

The IEEE Taxonomy comprises the first three hierarchical 'levels' under each term-family (or branch) that is formed from the top-most terms of the IEEE Thesaurus. In this document these term-families are arranged alphabetically and denoted by boldface type. Each term family's hierarchy goes to no more than three sublevels, denoted by indents (in groups of four dots) preceding the next level terms. A term can appear in more than one hierarchical branch and can appear more than once in any particular hierarchy. The IEEE Taxonomy is defined in this way so that it is always a subset of the IEEE Thesaurus.

**Aerospace and electronic systems**

- ....Aerospace control
- .....Air traffic control
- .....Attitude control
- .....Ground support
- ....Aerospace engineering
- .....Aerospace biophysics
- .....Aerospace electronics
- .....Aerospace safety
- .....Air safety
- .....Aerospace simulation
- .....Aerospace testing
- .....Wind tunnels
- .....Artificial satellites
- .....Earth Observing System
- .....Low earth orbit satellites
- .....Military satellites
- .....Space stations
- .....Space technology
- .....Payloads
- .....Space debris
- .....Space exploration
- ....Aerospace materials
- .....Aerospace components
- ....Aircraft manufacture
- ....Aircraft navigation
- ....Aircraft propulsion
- .....Propellers
- ....Command and control systems
- ....Electronic warfare
- .....Electronic countermeasures
- .....Jamming
- .....Radar countermeasures
- ....Military equipment
- .....Military aircraft
- .....Payloads
- .....Military satellites
- .....Military vehicles
- .....Weapons

- .....Biological weapons
- .....Chemical weapons
- .....Guns
- .....Missiles
- .....Nuclear weapons
- .....Projectiles
- .....Weapons of mass destruction
- ....Sensor systems
- .....Activity recognition
- .....Human activity recognition
- .....Gunshot detection systems
- ....Sonar
- .....Sonar applications
- .....Sonar detection
- .....Sonar measurements
- .....Sonar equipment
- .....Synthetic aperture sonar
- ....Telemetry
- .....Biomedical telemetry

**Antennas and propagation**

- ....Antennas
- .....Antenna accessories
- .....Radomes
- .....Antenna arrays
- .....Adaptive arrays
- .....Butler matrices
- .....Linear antenna arrays
- .....Log periodic antennas
- .....Microstrip antenna arrays
- .....Microwave antenna arrays
- .....Phased arrays
- .....Planar arrays
- .....Antenna radiation patterns
- .....Near-field radiation pattern
- .....Antenna theory
- .....Frequency selective surfaces
- .....Antenna-in-package
- .....Apertures



- .....Aperture antennas
- .....Aperture coupled antennas
- .....Broadband antennas
- .....Ultra wideband antennas
- .....Vivaldi antennas
- .....Dielectric resonator antennas
- .....Dipole antennas
- .....Directional antennas
- .....Directive antennas
- .....Feeds
- .....Antenna feeds
- .....Fractal antennas
- .....Helical antennas
- .....Horn antennas
- .....Leaky wave antennas
- .....Loaded antennas
- .....Log-periodic dipole antennas
- .....Loop antennas
- .....Microstrip antennas
- .....Microwave antennas
- .....Mobile antennas
- .....Multifrequency antennas
- .....Omnidirectional antennas
- .....Optical antennas
- .....Nanoantennas
- .....Patch antennas
- .....Radar antennas
- .....Receiving antennas
- .....Rectennas
- .....Reflector antennas
- .....Satellite antennas
- .....Slot antennas
- .....Steerable antennas
- .....Textile antennas
- .....Transmission line antennas
- .....Transmitting antennas
- .....UHF antennas
- .....Wearable antennas
- .....Yagi-Uda antennas
- ....Electromagnetic propagation
- .....Electromagnetic diffraction
- .....Optical diffraction
- .....Physical theory of diffraction
- .....X-ray diffraction
- .....Electromagnetic propagation in absorbing media
- .....Electromagnetic reflection
- .....Optical reflection
- .....Microwave propagation
- .....Millimeter wave propagation
- .....Optical propagation

- .....Optical surface waves
- .....Optical waveguides
- .....Propagation constant
- .....Propagation losses
- .....Radio propagation
- .....Radiowave propagation
- .....NVIS
- .....Submillimeter wave propagation
- .....UHF propagation
- ....Radio astronomy

## Broadcast technology

- ....Broadcasting
- .....Digital audio broadcasting
- .....Digital audio players
- .....Digital Radio Mondiale
- .....Digital multimedia broadcasting
- .....Digital video broadcasting
- .....Motion pictures
- .....NVIS
- .....Radio broadcasting
- .....Frequency modulation
- .....Radio networks
- .....Satellite broadcasting
- .....Web TV

## Circuits and systems

- ....Circuits
- .....Active circuits
- .....Active inductors
- .....Gyrators
- .....Operational amplifiers
- .....Adders
- .....Analog circuits
- .....Analog integrated circuits
- .....Analog processing circuits
- .....Application specific integrated circuits
- .....System-on-chip
- .....Asynchronous circuits
- .....Bipolar transistor circuits
- .....BiCMOS integrated circuits
- .....Bipolar integrated circuits
- .....Bistable circuits
- .....Latches
- .....Bridge circuits
- .....Charge pumps
- .....Circuit analysis
- .....Circuit analysis computing
- .....Coupled mode analysis



.....Nonlinear network analysis	.....Photonic integrated circuits
.....Circuit faults	.....Power integrated circuits
.....Electrical fault detection	.....Radiofrequency integrated circuits
.....Circuit noise	.....Submillimeter wave integrated circuits
.....Thermal noise	.....Superconducting integrated circuits
.....Circuit simulation	.....Thick film circuits
.....Circuit synthesis	.....Thin film circuits
.....High level synthesis	.....Three-dimensional integrated circuits
.....Integrated circuit synthesis	.....Through-silicon vias
.....Coproductors	.....UHF integrated circuits
.....Counting circuits	.....Ultra large scale integration
.....Coupling circuits	.....Very high speed integrated circuits
.....Digital circuits	.....Very large scale integration
.....Circuit topology	.....Wafer scale integration
.....Digital integrated circuits	.....Isolators
.....Digital signal processors	.....Large scale integration
.....Distributed parameter circuits	.....Ultra large scale integration
.....Driver circuits	.....Very large scale integration
.....Electronic circuits	.....Wafer scale integration
.....Breadboard	.....Linear circuits
.....Central Processing Unit	.....Logic arrays
.....Multivibrators	.....Programmable logic arrays
.....Stripboard circuit	.....Logic circuits
.....Equivalent circuits	.....Combinational circuits
.....Feedback	.....Logic arrays
.....Feedback circuits	.....Programmable logic arrays
.....Negative feedback	.....Superconducting logic circuits
.....Neurofeedback	.....Magnetic circuits
.....Hybrid integrated circuits	.....Microprocessors
.....Integrated circuits	.....Automatic logic units
.....Analog integrated circuits	.....Biomimetics
.....Analog-digital integrated circuits	.....Coproductors
.....Application specific integrated circuits	.....Microcontrollers
.....CMOS integrated circuits	.....Microprocessor chips
.....Coproductors	.....Vector processors
.....Current-mode circuits	.....Microwave circuits
.....Digital integrated circuits	.....Millimeter wave circuits
.....FET integrated circuits	.....Millimeter wave integrated circuits
.....Field programmable gate arrays	.....Millimeter wave integrated circuits
.....Hybrid integrated circuits	.....MIMICs
.....Integrated circuit interconnections	.....Monolithic integrated circuits
.....Integrated circuit modeling	.....MIMICs
.....Integrated circuit noise	.....MMICs
.....Integrated circuit synthesis	.....MOSFET circuits
.....Large scale integration	.....CMOSFET circuits
.....MESFET integrated circuits	.....MOS integrated circuits
.....Microprocessors	.....Power MOSFET
.....Microwave integrated circuits	.....Multiplying circuits
.....Millimeter wave integrated circuits	.....Neural circuits
.....Monolithic integrated circuits	



.....Nonlinear circuits	.....Ultra large scale integration
.....Nonlinear network analysis	.....Very large scale integration
.....Passive circuits	.....Neuromorphics
.....Phase shifters	.....VHF circuits
.....Phase transformers	.....Voltage multipliers
.....Power dissipation	.....Capacitors
.....Power integrated circuits	.....Diodes
.....Printed circuits	.....Wafer scale integration
.....Flexible printed circuits	....Contacts
.....Memory modules	.....Brushes
.....Surface mount technology	.....Contact resistance
.....Programmable circuits	.....Ohmic contacts
.....Field programmable analog arrays	....Filtering
.....Programmable logic arrays	.....Filters
.....Programmable logic devices	.....Active filters
.....Programmable logic arrays	.....Anisotropic
.....Programmable logic devices	.....Bragg gratings
.....Pulse circuits	.....Channel bank filters
.....Flip-flops	.....Comb filters
.....Quantum circuit	.....Digital filters
.....Radiation detector circuits	.....Equalizers
.....Rail to rail operation	.....Filtering theory
.....Rail to rail amplifiers	.....Gabor filters
.....Rail to rail inputs	.....Harmonic filters
.....Rail to rail outputs	.....IIR filters
.....Rectifiers	.....Kalman filters
.....RLC circuits	.....Low-pass filters
.....Sampled data circuits	.....Matched filters
.....Sequential circuits	.....Microstrip filters
.....Silicon-on-insulator	.....Nonlinear filters
.....Silicon on sapphire	.....Notch filters
.....Submillimeter wave circuits	.....Particle filters
.....Submillimeter wave integrated	.....Power filters
circuits	.....Resonator filters
.....Summing circuits	.....Spatial filters
.....Switched circuits	.....Superconducting filters
.....Switched capacitor circuits	.....Transversal filters
.....Switching circuits	.....Information filtering
.....Choppers (circuits)	.....Information filters
.....Logic circuits	.....Recommender systems
.....Switching converters	....Integrated circuit technology
.....Zero current switching	.....Beyond CMOS
.....Zero voltage switching	.....CMOS technology
.....Thick film circuits	.....CMOS process
.....Thin film circuits	.....Silicon on sapphire
.....Thyristor circuits	.....Moore's Law
.....Time varying circuits	....Logic devices
.....Trigger circuits	.....Logic gates
.....UHF circuits	.....Programmable logic devices
.....UHF integrated circuits	....Oscillators
.....UHF integrated circuits	.....Digital-controlled oscillators



- .....Injection-locked oscillators
- .....Local oscillators
- .....Microwave oscillators
- .....Phase noise
- .....Ring oscillators
- .....Voltage-controlled oscillators
- ....Single electron devices
- .....Single electron memory
- .....Hetero-nanocrystal memory
- .....Single electron transistors
- ....Tunable circuits and devices
- .....RLC circuits
- .....Tuned circuits

### Communications technology

- ....Communication equipment
- .....Auditory displays
- .....Codecs
- .....Speech codecs
- .....Video codecs
- .....Modems
- .....On board unit
- .....Optical communication equipment
- .....Optical transmitters
- .....Radio communication equipment
- .....Base stations
- .....Ham radios
- .....Land mobile radio equipment
- .....Radio transceivers
- .....Transponders
- .....Receivers
- .....Optical receivers
- .....RAKE receivers
- .....Receiving antennas
- .....Repeaters
- .....Speech codecs
- .....Telephone equipment
- .....Cellular phones
- .....Landline
- .....Telephone sets
- .....Vocoders
- .....Transceivers
- .....Radio transceivers
- .....Transmitters
- .....Auxiliary transmitters
- .....Diversity methods
- .....Neurotransmitters
- .....Optical transmitters
- .....Radio transmitters
- .....Transmitting antennas

- .....Transponders
- .....TV equipment
- .....Large screen displays
- .....TV receivers
- .....Video codecs
- .....Video equipment
- .....Optical projectors
- .....Video codecs
- .....Videos
- .....Vocoders
- ....Communication switching
- .....Code division multiplexing
- .....Electronic switching systems
- .....Frame relay
- .....Handover
- .....Multiprotocol label switching
- .....Packet switching
- .....Burst switching
- .....Frame relay
- .....Multiprotocol label switching
- .....Packet loss
- ....Communication systems
- .....ARPANET
- .....Biomedical communication
- .....Biomedical telemetry
- .....Telemedicine
- .....Broadband communication
- .....B-ISDN
- .....Broadband amplifiers
- .....Communication networks
- .....Central office
- .....Cyberspace
- .....Industrial communication
- .....Maritime communications
- .....Radio access technologies
- .....Relay networks
- .....Telecommunication network performance
- .....Virtual links
- .....Communication system control
- .....Telecommunication control
- .....Communication system security
- .....Denial-of-service attack
- .....Impersonation attacks
- .....Quantum key distribution
- .....Radio communication countermeasures
- .....Communication system signaling
- .....Received signal strength indicator
- .....Communication system software
- .....Streaming media



.....Communication system traffic	.....Passband
.....Communication system traffic control	.....Portable media players
.....Computer networks	.....SONET
.....Ad hoc networks	.....Spread spectrum communication
.....Computer network management	.....Duplex communication systems
.....Content distribution networks	.....Full-duplex system
.....Cyberspace	.....Half-duplex system
.....Diffserv networks	.....Facsimile
.....Domain Name System	.....FDDI
.....Ethernet	.....Indoor communication
.....Heterogeneous networks	.....Indoor environment
.....Internet	.....Internet
.....Intserv networks	.....Bot (Internet)
.....IP networks	.....Botnet
.....Metropolitan area networks	.....Cloud computing
.....Multiprocessor interconnection	.....Crowdsourcing
networks	.....Dark Web
.....Network function virtualization	.....Instant messaging
.....Network servers	.....Internet of Things
.....Next generation networking	.....Internet privacy
.....Overlay networks	.....Internet security
.....Peer-to-peer computing	.....Internet telephony
.....Software defined networking	.....Internet topology
.....Storage area networks	.....Linked data
.....Token networks	.....Middleboxes
.....Unicast	.....Semantic Web
.....Virtual private networks	.....Social computing
.....Wide area networks	.....Web 2.0
.....Wireless access points	.....Web services
.....Cross layer design	.....IP networks
.....Data buses	.....TCPIP
.....Backplanes	.....ISDN
.....Data communication	.....B-ISDN
.....Asynchronous communication	.....Local area networks
.....Asynchronous transfer mode	.....Virtual LAN
.....Data buses	.....Wireless LAN
.....Data transfer	.....Low latency communication
.....Telecommunication buffers	.....Ultra reliable low latency
.....Telemetry	communication
.....Teleprinting	.....Machine-to-machine communications
.....Visible light communication	.....Massive machine type
.....Device-to-device communication	communications
.....Digital communication	.....Magnetic communication
.....Baseband	.....Metropolitan area networks
.....DICOM	.....Microwave communication
.....Digital audio broadcasting	.....Rectennas
.....Digital images	.....Military communication
.....Digital multimedia broadcasting	.....Reconnaissance
.....Digital video broadcasting	.....MIMO communication
.....DSL	.....Massive MIMO
.....ISDN	.....Rician channels





.....MISO communication	.....Protocols
.....Mobile communication	.....Access protocols
.....3G mobile communication	.....Asynchronous transfer mode
.....4G mobile communication	.....Border Gateway Protocol
.....5G mobile communication	.....Consensus protocol
.....6G mobile communication	.....Cryptographic protocols
.....Ambient networks	.....InterPlanetary File System
.....Cellular technology	.....Main-secondary
.....Dual band	.....Multicast protocols
.....Land mobile radio	.....Multiprotocol label switching
.....Location awareness	.....Proof of Work
.....Mobile learning	.....Routing protocols
.....Mobile nodes	.....Smart contracts
.....Mobile security	.....Transport protocols
.....Mobile video	.....Wireless application protocol
.....Mobility models	.....Zero knowledge proof
.....Software radio	.....Quality of experience
.....Ultra-dense networks	.....Quality of service
.....Molecular communication	.....Admission control
.....Multiaccess communication	.....Quantum communication
.....Access charges	.....Quantum circuit
.....Direct-sequence code-division	.....Quantum networks
multiple access	.....Radio communication
.....Frequency division multiaccess	.....Baseband
.....Multicarrier code division multiple	.....Bluetooth
access	.....Cellular technology
.....Subscriber loops	.....Indoor radio communication
.....Time division multiple access	.....Land mobile radio
.....Time division synchronous code	.....Millimeter wave communication
division multiple access	.....Near field communication
.....Zero correlation zone	.....Packet radio networks
.....Multicast communication	.....Passband
.....Multicast VPN	.....Personal area networks
.....Multimedia communication	.....Radio broadcasting
.....Hypermedia	.....Radio communication
.....Nanocommunication	countermeasures
.....Narrowband	.....Radio frequency
.....NOMA	.....Radio links
.....Optical fiber communication	.....Radio spectrum management
.....FDDI	.....Satellite communication
.....Free-space optical communication	.....Satellite ground stations
.....Optical buffering	.....Software radio
.....Optical fiber networks	.....Zigbee
.....Optical fiber subscriber loops	.....Regional area networks
.....Optical interconnections	.....WRAN
.....Optical packet switching	.....Routing
.....Optical wavelength conversion	.....Wavelength routing
.....Scheduling algorithms	.....Satellite communication
.....SONET	.....Downlink
.....Visible light communication	.....Satellite broadcasting
.....Personal communication networks	.....Satellite ground stations





.....Uplink	.....Roaming
.....Satellite ground stations	.....Smart devices
.....SIMO communication	.....Spatial diversity
.....SISO communication	.....WiMAX
.....Spatial diversity	.....Wireless access points
.....Submillimeter wave communication	.....Wireless application protocol
.....Subscriber loops	.....Wireless networks
.....Switching systems	.....WRAN
.....Electronic switching systems	.....Wireless mesh networks
.....Switching frequency	.....Wireless sensor networks
.....Switching loss	.....Body sensor networks
.....Telecommunication switching	.....Event detection
.....Synchronous digital hierarchy	....Couplers
.....Telecommunications	.....Directional couplers
.....Ambient intelligence	....High-speed electronics
.....Feedback communications	.....High-speed integrated circuits
.....IP networks	.....High-speed networks
.....Radio access networks	.....Ultrafast electronics
.....Railway communication	....Image communication
.....Space communications	.....Facsimile
.....Telecommunication computing	.....Picture archiving and communication systems
.....Telecommunication network topology	....Information and communication technology
.....Telecommunication services	.....Ambient assisted living
.....Telematics	....Message systems
.....Teleconferencing	.....Electronic mail
.....Telegraphy	.....Unified messaging
.....Telephony	.....Unsolicited e-mail
.....Teleprinting	.....Electronic messaging
.....Teletext	.....Instant messaging
.....Terahertz communications	.....Unified messaging
.....Token networks	.....Postal services
.....UHF communication	.....Publish subscribe systems
.....Underwater communication	.....Voice mail
.....Vehicle-to-everything	....Modulation
.....Vehicle-to-infrastructure	.....Amplitude modulation
.....Video conferencing	.....Amplitude shift keying
.....Videophone systems	.....Quadrature amplitude modulation
.....Videotex	.....Chirp modulation
.....Visual communication	.....Demodulation
.....Wide area networks	.....Digital modulation
.....Low-power wide area networks	.....Constellation diagram
.....Wideband	.....Partial response signaling
.....Wireless communication	.....Frequency modulation
.....Cognitive radio	.....Frequency shift keying
.....Cooperative communication	.....Magnetic modulators
.....Dedicated short range communication	.....Modulation coding
.....GSM	.....Interleaved codes
.....Open wireless architecture	.....Optical modulation
.....Point-to-multipoint communications	.....Cross-phase modulation



- .....Intensity modulation
- .....Optical modulators
- .....Electro-absorption modulators
- .....Electro-optic modulators
- .....Phase modulation
- .....Continuous phase modulation
- .....Cross-phase modulation
- .....Differential phase shift keying
- .....Phase shift keying
- .....Pulse modulation
- .....Pulse width modulation
- .....Pulse width modulation inverters
- .....Space vector pulse width modulation
- ....Multiplexing
- .....Code division multiplexing
- .....Demultiplexing
- .....Frequency division multiplexing
- .....Layered division multiplexing
- .....Multiplexing equipment
- .....Add-drop multiplexers
- .....OFDM
- .....Multiple access interference
- .....OFDM modulation
- .....Partial transmit sequences
- .....Peak to average power ratio
- .....Space division multiplexing
- .....Time division multiplexing
- .....Wavelength division multiplexing
- .....WDM networks
- ....Network topology
- .....Complex networks
- .....Computer network reliability
- .....Fault tolerant computer networks
- .....Network architecture
- .....Active networking
- .....Information-centric networking
- .....Network function virtualization
- .....Network slicing
- ....Presence network agents
- ....TV
- .....Analog TV
- .....Cable TV
- .....Must-carry regulations
- .....Color TV
- .....Digital TV
- .....HDTV
- .....IPTV
- .....Mobile TV
- .....Smart TV
- .....Three-dimensional television

- .....Web TV
- ....UHF technology
- .....UHF antennas
- .....UHF circuits
- .....UHF integrated circuits
- .....UHF communication
- .....UHF devices
- .....UHF integrated circuits
- ....Ultra wideband technology
- .....Ultra wideband antennas
- .....Ultra wideband communication
- .....Ultra wideband radar
- ....VHF devices

### **Components, packaging, and manufacturing technology**

- ....Component architectures
- ....Electronic components
- .....Capacitors
- .....Ceramic capacitors
- .....Power capacitors
- .....Varactors
- .....Coils
- .....Superconducting coils
- .....Connectors
- .....Plugs
- .....Sockets
- .....Diodes
- .....Active matrix organic light emitting diodes
- .....Diode lasers
- .....Light emitting diodes
- .....Organic light emitting diodes
- .....P-i-n diodes
- .....Schottky diodes
- .....Semiconductor lasers
- .....Superluminescent diodes
- .....Electrodes
- .....Anodes
- .....Cathodes
- .....Microelectrodes
- .....Fuses
- .....Inductors
- .....Active inductors
- .....Thick film inductors
- .....Thin film inductors
- .....Resistors
- .....Memristors
- .....Switched capacitor networks
- .....Varistors



- .....Structural plates
- .....Switches
- .....Contactors
- .....Microswitches
- .....Optical switches
- .....Transducers
- .....Acoustic transducers
- .....Biomedical transducers
- .....Capacitive transducers
- .....Chemical transducers
- .....Inductive transducers
- .....Piezoelectric transducers
- .....Resistive transducers
- .....Ultrasonic transducer arrays
- ....Electronic equipment manufacture
- .....Damascene integration
- .....Micromachining
- .....Radiation hardening (electronics)
- .....Semiconductor device manufacture
- .....Diffusion processes
- .....Flip-chip devices
- .....High-k gate dielectrics
- .....Physical unclonable function
- .....Semiconductor device doping
- .....Semiconductor epitaxial layers
- .....Semiconductor growth
- .....Silicidation
- .....Wafer bonding
- ....Electronics packaging
- .....Antenna-in-package
- .....Ball grid arrays
- .....Chip scale packaging
- .....System-in-package
- ....Environmentally friendly manufacturing techniques
- ....Integrated circuit manufacture
- .....Surface mount technology
- .....Ball grid arrays
- ....Integrated circuit packaging
- .....Multichip modules
- .....Plastic integrated circuit packaging
- ....Semiconductor device packaging
- ....Thermal management of electronics
- .....Electronic packaging thermal management
- .....Electronics cooling

### Computational and artificial intelligence

- ....Artificial intelligence
- .....Affective computing

- .....AI accelerators
- .....Autonomous robots
- .....Bio-inspired computing
- .....Cognitive systems
- .....Commonsense reasoning
- .....Context awareness
- .....Cooperative systems
- .....Decision support systems
- .....Intelligent systems
- .....Autonomous systems
- .....Collective intelligence
- .....Hyper-intelligent systems
- .....Intelligent automation
- .....Intelligent robots
- .....Knowledge based systems
- .....Expert systems
- .....Mobile agents
- .....Knowledge engineering
- .....Inference mechanisms
- .....Knowledge acquisition
- .....Knowledge discovery
- .....Knowledge representation
- .....Learning (artificial intelligence)
- .....Distance learning
- .....Naive Bayes methods
- .....Nearest neighbor methods
- .....Learning systems
- .....Backpropagation
- .....Cognitive systems
- .....Electronic learning
- .....Hybrid learning
- .....Learning automata
- .....Learning management systems
- .....Self-supervised learning
- .....Semisupervised learning
- .....Supervised learning
- .....Unsupervised learning
- .....Machine learning
- .....Adversarial machine learning
- .....Boosting
- .....Deep learning
- .....Dimensionality reduction
- .....Ensemble learning
- .....Federated learning
- .....Hyperparameter optimization
- .....Multi-armed bandit problem
- .....Random forests
- .....Reinforcement learning
- .....Relevance vector machines
- .....Representation learning
- .....Robot learning



- .....Statistical learning
- .....Transfer learning
- .....Prediction methods
- .....Linear predictive coding
- .....Predictive coding
- .....Predictive encoding
- .....Predictive models
- .....Virtual artifact
- ....Autonomous mental development
- ....Computational intelligence
- .....Computation theory
- .....Computational complexity
- .....Concurrent computing
- .....Greedy algorithms
- .....Support vector machines
- .....Turing completeness
- .....Evolutionary computation
- .....Evolutionary robotics
- .....Particle swarm optimization
- .....Fuzzy systems
- .....Fuzzy control
- .....Fuzzy neural networks
- .....Hybrid intelligent systems
- .....Genetic algorithms
- ....Logic
- .....Fuzzy logic
- .....Takagi-Sugeno model
- .....Multivalued logic
- .....Probabilistic logic
- .....Sufficient conditions
- ....Machine intelligence
- .....Pattern analysis
- ....Neural networks
- .....Artificial neural networks
- .....Convolutional neural networks
- .....Hebbian theory
- .....Long short term memory
- .....Residual neural networks
- .....Self-organizing feature maps
- .....Biological neural networks
- .....Cellular neural networks
- .....Feedforward neural networks
- .....Extreme learning machines
- .....Multilayer perceptrons
- .....Graph neural networks
- .....Multi-layer neural network
- .....Neural network compression
- .....Neural network hardware
- .....Perception evolution networks
- .....Radial basis function networks
- .....Recurrent neural networks

- .....Hopfield neural networks

## Computers and information processing

- ....Approximate computing
- ....Computer applications
- .....Application virtualization
- .....Edge computing
- .....Big Data applications
- .....Bot (Internet)
- .....Computer aided analysis
- .....Computer aided engineering
- .....Computer aided instruction
- .....Hybrid learning
- .....Learning management systems
- .....Computer generated music
- .....Computer integrated manufacturing
- .....Control engineering computing
- .....Engineering computing
- .....Green computing
- .....High energy physics instrumentation computing
- .....Linear particle accelerator
- .....Knowledge management
- .....Knowledge transfer
- .....Mathematics computing
- .....Matlab
- .....Medical information systems
- .....Electronic medical records
- .....Military computing
- .....Mobile applications
- .....Mobility as a service
- .....Physics computing
- .....Power engineering computing
- .....Power system analysis computing
- .....Publishing
- .....Bibliometrics
- .....Desktop publishing
- .....Electronic publishing
- .....Journalism
- .....Open Access
- .....Scientific publishing
- .....Scientific computing
- .....Telecommunication computing
- .....Internetworking
- .....Soft switching
- .....Virtual assistants
- .....Personal voice assistants
- .....Virtual enterprises
- .....Virtual manufacturing
- .....Virtual machining



.....Web sites	.....Vehicular ad hoc networks
.....Uniform resource locators	.....Computer network management
.....Web design	.....Computer network reliability
.....World Wide Web	.....Disruption tolerant networking
.....Bot (Internet)	.....Management information base
.....Mashups	.....Middleboxes
....Computer architecture	.....Network address translation
.....Accelerator architectures	.....Network synthesis
.....Data structures	.....Content distribution networks
.....Arrays	.....Cyberspace
.....Binary decision diagrams	.....Cyberbullying
.....Null value	.....Diffserv networks
.....Octrees	.....Domain Name System
.....Persistent identifiers	.....Ethernet
.....Table lookup	.....Energy efficient ethernet
.....Tree data structures	.....EPON
.....Dynamic voltage scaling	.....Heterogeneous networks
.....Memory architecture	.....Internet
.....Memory management	.....Bot (Internet)
.....In-memory computing	.....Botnet
.....Neural network compression	.....Cloud computing
.....Multiprocessor interconnection	.....Crowdsourcing
.....Hypercubes	.....Dark Web
.....Parallel architectures	.....Instant messaging
.....Multicore processing	.....Internet of Things
.....Reconfigurable architectures	.....Internet privacy
....Computer interfaces	.....Internet security
.....Application programming interfaces	.....Internet telephony
.....Restful API	.....Internet topology
.....WebRTC	.....Linked data
.....Browsers	.....Middleboxes
.....Field buses	.....Semantic Web
.....Firewire	.....Social computing
.....Haptic interfaces	.....Web 2.0
.....Data gloves	.....Web services
.....Force feedback	.....Intserv networks
.....Grasping	.....IP networks
.....Tactile Internet	.....TCPIP
.....Hypertext systems	.....Metropolitan area networks
.....Input devices	.....Multiprocessor interconnection
.....Interface phenomena	networks
.....Network interfaces	.....Network function virtualization
.....Interface states	.....Cloud radio access networks
.....Musical instrument digital interfaces	.....Virtual LAN
.....Ports (computers)	.....Network servers
.....System buses	.....Next generation networking
....Computer networks	.....Overlay networks
.....Ad hoc networks	.....Dark Web
.....AODV	.....Peer-to-peer computing
.....Mesh networks	.....InterPlanetary File System
.....Mobile ad hoc networks	.....Software defined networking



.....Service function chaining	.....Counterfeiting
.....Virtual LAN	.....Cyber terrorism
.....Storage area networks	.....Cyber threat intelligence
.....Token networks	.....Cyberattack
.....Unicast	.....SQL injection
.....Virtual private networks	.....Computer hacking
.....Extranets	.....Cross-site scripting
.....Wide area networks	.....Cyber espionage
.....Low-power wide area networks	.....Cyber warfare
.....Wireless access points	.....Cyberattack
....Computer performance	.....Data integrity
.....Computer errors	.....Non-repudiation
.....Computer crashes	.....Denial-of-service attack
.....Hardware acceleration	.....Distributed denial-of-service attack
.....Performance loss	.....Firewalls (computing)
....Computer peripherals	.....Honey pot (computing)
.....Disk drives	.....Identity management systems
.....Keyboards	.....Federated identity
.....Modems	.....Internet security
.....Printers	.....Mobile security
.....Laser printers	.....Passwords
....Computer science	.....Penetration testing
.....Computational neuroscience	.....Permission
.....Formal languages	.....Phishing
.....Computer languages	.....Proof of Work
.....Runtime library	.....Trusted computing
.....Network theory (graphs)	....Computers
.....Programming	.....Analog computers
.....Augmented reality	.....Calculators
.....Automatic programming	.....Difference engines
.....Concatenated codes	.....Digital computers
.....Functional programming	.....Mainframes
.....Granular computing	.....Microcomputers
.....Integer linear programming	.....Portable computers
.....Logic programming	.....Workstations
.....Microprogramming	.....Parallel machines
.....Object oriented methods	.....Supercomputers
.....Object oriented programming	.....Exascale computing
.....Opportunistic software systems	.....Tablet computers
development	.....Wearable computers
.....Parallel programming	.....Smart glasses
.....Performance analysis	.....Wearable antennas
.....Programming profession	.....Wearable Health Monitoring
.....Robot programming	Systems
....Computer security	....Concurrency control
.....Application security	.....Processor scheduling
.....Authentication	.....Scheduling algorithms
.....Multi-factor authentication	....Data systems
.....Nonfungible tokens	.....Buffer storage
.....Cloud computing security	.....Triples (Data structure)
.....Computer crime	.....Data acquisition





.....Data transparency	.....Internet
.....Fastbus	.....Bot (Internet)
.....User-generated content	.....Botnet
.....Data centers	.....Cloud computing
.....Data center power	.....Crowdsourcing
.....Data compression	.....Dark Web
.....Adaptive coding	.....Instant messaging
.....Audio compression	.....Internet of Things
.....Huffman coding	.....Internet privacy
.....Neural network compression	.....Internet security
.....Point cloud compression	.....Internet telephony
.....Source coding	.....Internet topology
.....Test data compression	.....Linked data
.....Transform coding	.....Middleboxes
.....Data conversion	.....Semantic Web
.....Analog-digital conversion	.....Social computing
.....Digital-analog conversion	.....Web 2.0
.....Data engineering	.....Web services
.....Data handling	.....ISDN
.....Data assimilation	.....B-ISDN
.....Data augmentation	.....Local area networks
.....Data dissemination	.....Virtual LAN
.....Data encapsulation	.....Wireless LAN
.....Data governance	.....Metropolitan area networks
.....Data integrity	.....Smart agriculture
.....Document handling	.....Token networks
.....Merging	.....Virtual artifact
.....Open data	.....Distributed computing
.....Sorting	.....Client-server systems
.....Turing completeness	.....Middleware
.....Data processing	.....Servers
.....Associative processing	.....Cluster computing
.....Business data processing	.....Decentralized applications
.....Data analysis	.....Diffserv networks
.....Data collection	.....Distributed databases
.....Data integration	.....Blockchains
.....Data preprocessing	.....Distributed information systems
.....Data transfer	.....Distributed management
.....Information exchange	.....Publish-subscribe
.....Spreadsheet programs	.....Internet
.....Text processing	.....Bot (Internet)
.....Virtual enterprises	.....Botnet
.....Data warehouses	.....Cloud computing
.....Database machines	.....Crowdsourcing
.....Digital systems	.....Dark Web
.....Digital preservation	.....Instant messaging
.....Digital storage	.....Internet of Things
.....Solid state drives	.....Internet privacy
.....Digital transformation	.....Internet security
.....Fifth Industrial Revolution	.....Internet telephony
.....Fourth Industrial Revolution	.....Internet topology





.....Linked data	.....Image registration
.....Middleboxes	.....Image representation
.....Semantic Web	.....Digital representation
.....Social computing	.....Image resolution
.....Web 2.0	.....High-resolution imaging
.....Web services	.....Spatial resolution
.....Metacomputing	.....Superresolution
.....Grid computing	.....Image restoration
.....Peer-to-peer computing	.....Image sampling
.....InterPlanetary File System	.....Image segmentation
....DNA computing	.....Semantic segmentation
....File servers	.....Image sequences
....Hardware	.....Image stitching
.....Hardware acceleration	.....Image synthesis
.....Hardware security	.....Human image synthesis
.....Input devices	.....Image texture
.....Open source hardware	.....Image transformation
.....Reconfigurable devices	.....Image augmentation
.....Wireless access points	.....Image morphing
....High performance computing	.....Image skeletonization
.....Exascale computing	.....Image thinning
....Image processing	.....Machine vision
.....Active shape model	.....Object recognition
.....Blob detection	.....Object segmentation
.....Corner detection	.....Morphological operations
.....Feature detection	.....Image morphing
.....Feature extraction	.....Image thinning
.....Fiducial markers	.....Optical feedback
.....Geophysical image processing	.....Pansharpening
.....Gray-scale	.....Saliency detection
.....Image analysis	.....Smart pixels
.....Image classification	.....Spatial coherence
.....Image motion analysis	.....Structure from motion
.....Image quality	.....Table lookup
.....Image sequence analysis	.....Text detection
.....Image texture analysis	.....Thresholding (Imaging)
.....Object detection	....Memory
.....Subtraction techniques	.....Analog memory
.....Image annotation	.....Associative memory
.....Image capture	.....Cache memory
.....Image coding	.....Cache storage
.....Image color analysis	.....Content addressable storage
.....Image decomposition	.....Flash memories
.....Image denoising	.....Flash memory cells
.....Image enhancement	.....Magnetic memory
.....Image filtering	.....Floppy disks
.....Image fusion	.....Hard disks
.....Image preprocessing	.....Memory management
.....Image recognition	.....In-memory computing
.....Image edge detection	.....Neural network compression
.....Image reconstruction	.....Nonvolatile memory



.....Phase change memory	.....Text analysis
.....Phase change random access memory	.....Text mining
.....Random access memory	.....Web mining
.....DRAM chips	.....Face recognition
.....Phase change random access memory	.....Fingerprint recognition
.....Resistive RAM	.....Gesture recognition
.....SDRAM	.....Sign language
.....SRAM cells	.....Handwriting recognition
.....SRAM chips	.....Forgery
.....Read only memory	.....Nearest neighbor methods
.....PROM	.....Pattern matching
.....Read-write memory	.....Image matching
.....Registers	.....Sound recognition
.....Shift registers	.....Speech recognition
.....Scanning probe data storage	.....Automatic speech recognition
.....Semiconductor memory	.....Personal voice assistants
.....Integrated memory circuits	.....Speech analysis
....Mobile computing	.....Text recognition
.....Multi-access edge computing	....Pervasive computing
.....Wireless access points	.....Ubiquitous computing
....Molecular computing	.....Context-aware services
....Multitasking	.....Wearable computers
.....Parametric study	.....Smart glasses
....Open systems	.....Wearable antennas
.....Open Access	.....Wearable Health Monitoring
.....Public domain software	Systems
.....Open Educational Resources	....Petascale computing
.....Physical layer	....Platform virtualization
.....Physical layer security	....Probabilistic computing
....Optical computing	....Probability computing
....Parallel processing	....Quantum computing
.....Multiprocessing systems	.....Quantum algorithm
.....Data flow computing	.....Quantum annealing
.....Processor scheduling	.....Quantum cellular automata
.....Systolic arrays	.....Quantum chemistry
.....Multithreading	.....Quantum circuit
.....Parallel algorithms	.....Quantum networks
.....Pipeline processing	.....Quantum simulation
....Pattern recognition	.....Qubit
.....Active shape model	....Real-time systems
.....Activity recognition	.....Telexistence
.....Human activity recognition	.....WebRTC
.....Character recognition	....Software
.....Clustering methods	.....Anti-virus software
.....Pattern clustering	.....Application software
.....Data mining	.....Decentralized applications
.....Anomaly detection	.....Closed box
.....Association rules	.....Embedded software
.....Data privacy	.....Freeware
	.....Glass box
	.....Malware



- .....Computer viruses
- .....Computer worms
- .....Ransomware
- .....Rootkit
- .....Trojan horses
- .....Middleware
- .....Mediation
- .....Message-oriented middleware
- .....Web services
- .....Open source software
- .....Open banking
- .....Optical character recognition
- .....License plate recognition
- .....Privacy-invasive software
- .....Spyware
- .....Public domain software
- .....Python
- .....R language
- .....Soft sensors
- .....Software agents
- .....Agent-based modeling
- .....Autonomous agents
- .....Botnet
- .....Intelligent agents
- .....Software as a service
- .....Software debugging
- .....Software design
- .....Software maintenance
- .....Software packages
- .....EMTDC
- .....PSCAD
- .....SPICE
- .....Software performance
- .....Software quality
- .....Software reusability
- .....Software safety
- .....Software systems
- .....Software tools
- .....Authoring systems
- .....System software
- .....File systems
- .....Operating systems
- .....Program processors
- .....Utility programs
- .....Software engineering
- .....Capability maturity model
- .....Computer aided software engineering
- .....Formal verification
- .....Full stack
- .....Programming environments
- .....Release engineering

- .....Runtime
- .....Dynamic compiler
- .....Runtime environment
- .....Software architecture
- .....Client-server systems
- .....Deep architecture
- .....Dew computing
- .....Microarchitecture
- .....Representational state transfer
- .....Restful API
- .....Software libraries
- .....Software product lines
- ....System recovery
- .....Checkpointing
- .....Core dumps
- .....Debugging
- ....Time sharing computer systems
- ....Virtual machine monitors

### Consumer electronics

- ....Ambient intelligence
- ....Audio systems
- .....3D audio
- .....Audio tapes
- .....Audio-visual systems
- .....Auditory displays
- .....Headphones
- .....Immersive audio
- .....Loudspeakers
- .....Microphones
- .....Microphone arrays
- .....Pitch control (audio)
- .....Portable media players
- .....Sonification
- .....Spatial audio
- .....Video description
- ....Home automation
- .....Portable media players
- .....Refrigerators
- .....Smart homes
- .....Washing machines
- ....Home computing
- ....Low-power electronics
- ....Microwave ovens
- ....Multimedia systems
- .....Multimedia communication
- .....Hypermedia
- .....Multimedia computing
- .....Multimedia databases



**Control systems**

....Admittance control	.....Added delay
....Automatic control	.....Delay lines
.....Power generation control	....Digital control
....Automatic generation control	.....Programmable control
....Automotive control	.....Flow graphs
....Autopilot	....Fault tolerant control
....Bidirectional control	....Feedback
....Block signalling	.....Feedback circuits
....Brakes	.....Output feedback
....CAMAC	.....Negative feedback
....Centralized control	.....Neurofeedback
....Closed loop systems	....Feedback linearization
....Control design	....Fluid flow control
....Control engineering	....Fluidics
.....Control system security	.....Microfluidics
.....Physical unclonable function	.....Nanofluidics
....Control equipment	....Gaze tracking
.....Actuators	.....Electrooculography
.....Dielectric elastomer actuators	....Homeostasis
.....Electrostatic actuators	....Linear feedback control systems
.....Electrothermal actuators	.....Frequency locked loops
.....Hydraulic actuators	.....Phase locked loops
.....Intelligent actuators	.....State feedback
.....Microactuators	.....Tracking loops
.....Piezoelectric actuators	....Magnetic variables control
.....Pneumatic actuators	....Mechanical variables control
.....Fasteners	.....Displacement control
.....Microcontrollers	.....Force control
.....Regulators	.....Level control
.....Remote control	.....Gyroscopes
.....Servosystems	.....Motion control
.....Servomotors	.....Collision avoidance
.....Switches	.....Collision mitigation
.....Contactors	.....Formation control
.....Microswitches	.....Kinetic theory
.....Optical switches	.....Motion planning
.....Switchgear	.....Path planning
.....Circuit breakers	.....Visual servoing
.....Interrupters	.....Pitch control (position)
.....Relays	.....Position control
.....Telecontrol equipment	.....Nanopositioning
.....Thermostats	.....Shape control
....Control system synthesis	.....Size control
....Controllability	.....Strain control
....Cruise control	.....Stress control
....Decentralized control	.....Thickness control
.....Consensus control	.....Torque control
.....Distributed parameter systems	.....Velocity control
....Delay systems	.....Angular velocity control
	.....Vibration control
	.....Weight control



- ....Medical control systems
- ....Missile control
- ....Moisture control
  - .....Humidity control
- ....Motion compensation
- ....Networked control systems
- ....Nonlinear control systems
- ....Open loop systems
- ....Optical control
  - .....Lighting control
  - .....Optical variables control
  - .....Optogenetics
- ....Optimal control
  - .....Bang-bang control
  - .....Infinite horizon
- ....PD control
- ....PI control
- ....Pneumatic systems
- ....Positive train control
- ....Pressure control
- ....Proportional control
- ....Radio control
- ....Robot control
  - .....Robot motion
  - .....3-DOF
  - .....5-DOF
  - .....6-DOF
- ....SCADA systems
- ....Sensorless control
- ....Sliding mode control
- ....Supervisory control
  - .....SCADA systems
- ....Thermal variables control
  - .....HVAC
  - .....Temperature control
    - .....Cooling
    - .....Heating systems
  - .....Thermal analysis
  - .....Thermomechanical processes
- ....Traffic control
  - .....Advanced driver assistance systems
  - .....Queueing analysis
  - .....Road traffic control
  - .....Road traffic
  - .....Vehicle routing

## Dielectrics and electrical insulation

- ....Dielectrics
  - .....Dielectric constant
  - .....High-k gate dielectrics

- .....Dielectric devices
  - .....Capacitors
  - .....Ferroelectric devices
  - .....Piezoelectric devices
  - .....Pyroelectric devices
- .....Dielectric losses
- .....Dielectric substrates
- .....Dielectrophoresis
- .....Electrohydrodynamics
- .....Electrokinetics
- .....Electrostriction
- ....Electric breakdown
  - .....Avalanche breakdown
  - .....Corona
  - .....Dielectric breakdown
  - .....Arc discharges
  - .....Discharges (electric)
  - .....Electrostatic discharges
  - .....Flashover
  - .....Glow discharges
  - .....Partial discharges
  - .....Surface discharges
  - .....Vacuum breakdown
- .....Sparks
- ....Insulation
  - .....Cable insulation
  - .....Power cable insulation
  - .....Ceramics
  - .....Bioceramics
  - .....Porcelain
  - .....Gas insulation
  - .....Sulfur hexafluoride
  - .....Insulators
  - .....Metal-insulator structures
  - .....Plastic insulators
  - .....Rubber
  - .....Topological insulators
  - .....Trees - insulation
  - .....Isolation technology
  - .....Oil insulation
  - .....Oil filled cables
  - .....Plastic insulation

## Education

- ....Adaptive learning
- ....Career development
  - .....Continuing education
  - .....Jobs listings
  - .....Mentoring
- ....Educational courses



- .....Curriculum development
- .....Open Educational Resources
- ....Educational institutions
- .....Museums
- .....Virtual museums
- ....Educational programs
- .....Accreditation
- .....Continuing education
- .....Pre-college engineering
- .....Scholarships
- .....Self-study courses
- .....Seminars
- .....Webinars
- .....STEM
- .....Tutorials
- ....Educational technology
- .....Computer aided instruction
- .....Hybrid learning
- .....Learning management systems
- .....Courseware
- .....Electronic learning
- .....Mobile learning
- ....Engineering education
- .....Biomedical engineering education
- .....Communication engineering education
- .....Computer science education
- .....Control engineering education
- .....Electrical engineering education
- .....Electronics engineering education
- .....Engineering students
- .....Physics education
- .....Power engineering education
- .....Student experiments
- .....Systems engineering education
- ....Humanities
- .....Archeology
- .....Art
- .....Digital art
- .....Fractal art
- .....History
- .....Music
- .....Acoustics
- .....Computer generated music
- .....Electronic music
- .....Musical instrument digital interfaces
- .....Rhythm
- .....Timbre
- .....Natural languages
- .....Linguistics
- .....Natural language processing
- .....Social sciences

- .....Anthropology
- .....Behavioral sciences
- .....Psychology
- .....Sociology
- ....Training
- .....Certification
- .....Industrial training
- .....Management training
- .....On the job training
- .....Qualifications
- .....Vocational training

### **Electromagnetic compatibility and interference**

- ....Electromagnetic compatibility
- .....Immunity testing
- .....Reverberation chambers
- ....Electromagnetics
- .....Electromagnetic analysis
- .....Air gaps
- .....Characteristic mode analysis
- .....Computational electromagnetics
- .....Delay effects
- .....Electromagnetic fields
- .....Electromagnetic forces
- .....Electromagnetic refraction
- .....Permeability
- .....Spark gaps
- .....Time-domain analysis
- .....Electromagnetic coupling
- .....Mutual coupling
- .....Optical coupling
- .....Electromagnetic devices
- .....Baluns
- .....Electromagnetic induction
- .....Eddy currents
- .....Inductive power transmission
- .....Electromagnetic metamaterials
- .....Microwave metamaterials
- .....Terahertz metamaterials
- .....Electromagnetic radiation
- .....Bremsstrahlung
- .....Correlators
- .....Electromagnetic wave absorption
- .....Frequency
- .....Gamma-rays
- .....Line-of-sight propagation
- .....Terahertz radiation
- .....Electromagnetic shielding
- .....Cable shielding





- .....Magnetic shielding
- .....Electromagnetic transients
- .....EMP radiation effects
- .....EMTDC
- .....EMTP
- .....Power system transients
- .....Surges
- .....Proximity effects
- .....Interference
- .....Clutter
- .....Crosstalk
- .....Diffraction
- .....Electron backscatter diffraction
- .....Echo interference
- .....Electromagnetic interference
- .....Radiofrequency interference
- .....Specific absorption rate
- .....Electromagnetic radiative interference
- .....Electrostatic interference
- .....Immunity testing
- .....Interchannel interference
- .....Interference cancellation
- .....Interference channels
- .....Interference constraints
- .....Interference elimination
- .....Interference suppression
- .....Intersymbol interference
- .....Rain fading
- .....Terrain factors
- .....TV interference
- ....Radar
- .....Airborne radar
- .....Bistatic radar
- .....Cognitive radar
- .....Doppler radar
- .....Ground penetrating radar
- .....High frequency radar
- .....Laser radar
- .....Meteorological radar
- .....Millimeter wave radar
- .....Multistatic radar
- .....MIMO radar
- .....Passive radar
- .....Quantum radar
- .....Radar applications
- .....Radar countermeasures
- .....Radar detection
- .....Radar imaging
- .....Radar measurements
- .....Radar polarimetry
- .....Radar remote sensing

- .....Radar tracking
- .....Radar clutter
- .....Radar cross-sections
- .....Radar equipment
- .....Radar theory
- .....Spaceborne radar
- .....Spread spectrum radar
- .....Synthetic aperture radar
- .....Inverse synthetic aperture radar
- .....Polarimetric synthetic aperture radar
- .....Ultra wideband radar

### Electron devices

- ....Cathode ray tubes
- ....Electron guns
- ....Electron multipliers
- ....Electron tubes
- .....Field emitter arrays
- .....Klystrons
- .....Magnetrons
- .....Thyratrons
- .....Traveling wave tubes
- ....Mechatronics
- .....Biomechatronics
- ....Microelectromechanical systems
- .....Microelectromechanical devices
- .....Microactuators
- .....Micromotors
- .....Micropumps
- .....Microvalves
- .....Radiofrequency microelectromechanical systems
- ....Microfluidics
- ....Micromechanical devices
- .....Biomedical microelectromechanical systems
- .....Fluidic microsystems
- .....Microfabrication
- ....Photoelectricity
- .....Photovoltaic effects
- .....Shunts (electrical)
- ....Photovoltaic cells
- .....Light trapping
- ....Quantum computing
- .....Quantum algorithm
- .....Quantum annealing
- .....Quantum cellular automata
- .....Quantum chemistry
- .....Quantum circuit





.....Quantum networks	.....Semiconductor-insulator interfaces
.....Quantum simulation	.....Silicon devices
.....Qubit	.....SONOS devices
....Quantum well devices	.....Superluminescent diodes
.....Quantum well lasers	.....Surface emitting lasers
.....Quantum cascade lasers	.....Vertical cavity surface emitting lasers
.....Quantum wells	.....Thermistors
.....Two dimensional hole gas	.....Transistors
....Semiconductivity	.....Field effect transistors
....Semiconductor devices	.....Heterojunction bipolar transistors
.....Flip-chip devices	.....Millimeter wave transistors
.....Gunn devices	.....Phototransistors
.....Hall effect devices	.....Static induction transistors
.....Junctions	....Single electron devices
.....Heterojunctions	.....Single electron memory
.....Hybrid junctions	.....Hetero-nanocrystal memory
.....P-n junctions	.....Single electron transistors
.....Waveguide junctions	....Thick film devices
.....MIS devices	.....Thick film inductors
.....Charge coupled devices	....Thin film devices
.....MOS devices	.....Film bulk acoustic resonators
.....MONOS devices	.....Thin film inductors
.....Piezoresistive devices	.....Thin film transistors
.....P-i-n diodes	.....Organic thin film transistors
.....Power semiconductor devices	....Tunneling
.....Power transistors	.....Gate leakage
.....Power semiconductor switches	.....Josephson effect
.....Bipolar transistors	.....Magnetic tunneling
.....Thyristors	.....Resonant tunneling devices
.....Quantum dots	.....Superconductive tunneling
.....Quantum well lasers	.....Tunneling magnetoresistance
.....Quantum cascade lasers	....Vacuum technology
.....Schottky diodes	.....Photomultipliers
.....Semiconductor counters	.....Vacuum electronics
.....Semiconductor detectors	.....Vacuum systems
.....Semiconductor device modeling	.....Gettering
.....Semiconductor device noise	
.....Semiconductor diodes	
.....P-i-n diodes	
.....Schottky diodes	
.....Semiconductor-metal interfaces	
.....Superluminescent diodes	
.....Varactors	
.....Semiconductor lasers	
.....Laser tuning	
.....Quantum dot lasers	
.....Quantum well lasers	
.....Semiconductor laser arrays	
.....Semiconductor optical amplifiers	
.....Surface emitting lasers	
.....Semiconductor waveguides	
	<b>Electronic design automation and methodology</b>
	....Design automation
	.....CAD/CAM
	.....Logic design
	.....Reconfigurable logic
	.....PSCAD
	....Design methodology
	.....Design for disassembly
	.....Design for experiments
	.....Design for manufacture
	.....Design for quality



- .....Design for testability
- .....Design standards
- .....Design tools
- .....Extensibility
- .....Graphics
- .....Animation
- .....Character generation
- .....Computer graphics
- .....Engineering drawings
- .....Layout
- .....Shape
- .....Symbols
- .....Virtual reality
- .....Visualization
- .....Green design
- .....Ecodesign
- .....Green computing
- .....Integrated design
- .....Process design
- .....Pattern formation
- .....Process modeling
- .....Product design
- .....Prototypes
- .....Breadboard
- .....Rapid prototyping
- .....Technical drawing
- .....Time to market
- .....User centered design
- .....Virtual prototyping

### **Engineering – general**

- ....Acoustical engineering
- ....Agricultural engineering
- ....Bio-inspired engineering
- .....Bio-inspired computing
- .....Bio-inspired control
- .....Bio-inspired robotics
- ....Chemical engineering
- ....Civil engineering
- .....Geotechnical engineering
- .....Excavation
- .....Geotechnical structures
- .....Dams
- .....Railway engineering
- .....Railway safety
- .....Structural engineering
- .....Offshore installations
- ....Concurrent engineering
- ....Design engineering
- .....Design tools

- ....Electrical engineering
- .....Electrical engineering computing
- ....Engineering profession
- .....Professional aspects
- ....Environmental engineering
- ....Maintenance engineering
- .....Maintenance management
- .....Predictive maintenance
- .....Preventive maintenance
- .....Condition monitoring
- .....Systems support
- ....Marine engineering
- ....Mechanical engineering
- .....Mechanical power transmission
- .....Torque converters
- .....Mechanical systems
- .....Mechanical energy
- .....Micromechanical devices
- .....Suspensions (mechanical systems)
- ....Optical engineering
- ....Precision engineering
- ....Production engineering
- .....Production planning
- .....Capacity planning
- .....Materials requirements planning
- .....Process planning
- ....Research and development
- .....Translational research
- ....Reverse engineering
- ....Sanitary engineering
- ....Standardization
- .....Formal specifications
- .....Guidelines
- .....Standards
- .....Standards categories
- .....Standards organizations
- .....Standards publications
- ....Thermal engineering

### **Engineering in medicine and biology**

- ....Biology
- .....Biochemistry
- .....Amino acids
- .....Biochemical analysis
- .....Peptides
- .....Proteins
- .....Receptor (biochemistry)
- .....Biodiversity
- .....Biogeography
- .....Bioelectric phenomena



.....Electric shock	.....DNA computing
.....Biological cells	.....Nanobiotechnology
.....Cell signaling	.....Physiology
.....Cells (biology)	.....Action potentials
.....Chromosome mapping	.....External stimuli
.....Endothelial cells	.....Neuromodulation
.....Fibroblasts	.....Somatosensory
.....RNA	.....Predator prey systems
.....Stem cells	.....Synthetic biology
.....Biological information theory	.....Systematics
.....Biological processes	.....Systems biology
.....Biological interactions	.....Vegetation
.....Chronobiology	.....Crops
.....Circadian rhythm	.....Marine vegetation
.....Coagulation	.....Zoology
.....Molecular biology	.....Animals
.....Symbiosis	.....Entomology
.....Synaptic communication	....Biomedical communication
.....Biological system modeling	.....Biomedical telemetry
.....Biological systems	.....Telemedicine
.....Anatomy	....Biomedical computing
.....Molecular communication	.....Bioinformatics
.....Organisms	.....Neuroinformatics
.....Biology computing	.....Medical expert systems
.....Biophotonics	.....Medical information systems
.....Biophysics	.....Electronic medical records
.....Aerospace biophysics	....Biomedical engineering
.....Biomagnetics	.....Bioimpedance
.....Cellular biophysics	.....Biological techniques
.....Molecular biophysics	.....Biomedical applications of radiation
.....Botany	.....Radiation therapy
.....Cryobiology	.....Biomedical electronics
.....Evolution (biology)	.....Biomedical signal processing
.....Memetics	.....Biomedical image processing
.....Phylogeny	.....Bioprinting
.....Genetics	.....Biotechnology
.....DNA	.....Cloning
.....Epigenetics	.....Drug delivery
.....Gene therapy	.....Targeted drug delivery
.....Genetic communication	.....Neural engineering
.....Genetic expression	.....Neural circuits
.....Genetic programming	.....Neural microtechnology
.....Genomics	.....Neural nanotechnology
.....Optogenetics	.....Neural prosthesis
.....Homeostasis	.....Protein engineering
.....Mechanobiology	.....Tissue engineering
.....Microbiology	.....Regeneration engineering
.....Electroporation	.....Translational research
.....Virology	....Biomedical equipment
.....Microinjection	.....Assistive technologies
.....Nanobioscience	.....Assistive devices



.....Assistive robots	.....Computational systems biology
.....Closed captioning	....Genetic engineering
.....Video description	....Medical services
.....Wheelchairs	.....Assisted living
.....Biomedical electrodes	.....Ambient assisted living
.....Biomedical telemetry	.....Catheterization
.....Biomedical transducers	.....Clinical diagnosis
.....Catheters	.....Clinical neuroscience
.....Endoscopes	.....Cybercare
.....Endomicroscopy	.....Electronic healthcare
.....Gerontechnology	.....Health information management
.....Hypodermic needles	.....Hospitals
.....Implants	.....In vitro
.....Auditory implants	.....In vitro fertilization
.....Brainstem implants	.....In vivo
.....Cochlear implants	.....Internet of Medical Things
.....Microelectronic implants	.....Medical conditions
.....Neural implants	.....Addiction
.....Intracranial pressure sensors	.....Aneurysm
.....Lithotriptors	.....Arrhythmia
.....Medical devices	.....Atrophy
.....Medical instruments	.....Autism
.....Pacemakers	.....Blindness
.....Pulse oximeter	.....Cataracts
.....Stethoscope	.....Chronic kidney disease
.....Surgical instruments	.....Congestive heart failure
.....Laparoscopes	.....Cybersickness
.....Ventilators	.....Deafness
....Biomedical imaging	.....Dementia
.....Angiocardiology	.....Depression
.....Angiography	.....Diabetes
.....Biomedical optical imaging	.....Diseases
.....Cardiology	.....Dyslexia
.....Echocardiography	.....Eczema
.....Electrocardiography	.....Hemorrhaging
.....Phonocardiography	.....Hypertension
.....DICOM	.....Hyperthermia
.....Elastography	.....Injuries
.....Encephalography	.....Kidney stones
.....Mammography	.....Motion sickness
.....Medical diagnostic imaging	.....Muscular dystrophy
.....Anatomical structure	.....Obesity
.....Radionuclide imaging	.....Paralysis
.....Molecular imaging	.....Pregnancy
.....Phantoms	.....Scoliosis
.....Photoacoustic imaging	.....Sepsis
....Bionanotechnology	.....Sleep apnea
....Bioterrorism	.....Stroke (medical condition)
....Computational biology	.....Thrombosis
.....Computational biochemistry	.....Tumors
.....Computational biophysics	.....Visual impairment



.....Medical diagnosis	.....Organ transplantation
.....Autopsy	.....Point of care
.....Bronchoscopy	.....Prosthetics
.....Colonography	.....Artificial biological organs
.....Computer aided diagnosis	.....Artificial limbs
.....Medical signal detection	.....Knee replacement
.....Nanomedicine	.....Neuroprostheses
.....Plethysmography	.....Prosthetic hand
.....Sensitivity and specificity	.....Prosthetic limbs
.....Medical tests	.....Visual prosthesis
.....Amniocentesis	.....Public healthcare
.....Biopsy	.....Sensory aids
.....Cancer detection	.....Hearing aids
.....Colonoscopy	.....Smart healthcare
.....Pregnancy test	.....Wearable Health Monitoring
.....Medical treatment	Systems
.....Acupuncture	.....Vaccines
.....Anesthesia	.....X-rays
.....Angioplasty	.....X-ray applications
.....Brachytherapy	.....X-ray astronomy
.....Brain stimulation	.....X-ray detection
.....Cancer treatment	.....X-ray scattering
.....Chemotherapy	.....X-ray telescopes
.....Clinical trials	.....X-ray tomography
.....Cryotherapy	.....Medical specialties
.....Defibrillation	.....Anesthesiology
.....Dentistry	.....Cardiology
.....Electrical stimulation	.....Cardiac tissue
.....Electronic medical prescriptions	.....Dermatology
.....Electroporation	.....Endocrinology
.....Embolization	.....Gastroenterology
.....Fibrillation	.....Gerontology
.....Geriatrics	.....Gerontechnology
.....Hepatectomy	.....Gynecology
.....Hospitals	.....Immunology
.....Hyperthermia	.....Antigens
.....Immunotherapy	.....Neonatology
.....Intubation	.....Nephrology
.....Lithotripsy	.....Neurology
.....Magnetic stimulation	.....Dyslexia
.....Neuromuscular stimulation	.....Neurorehabilitation
.....Neutron capture therapy	.....Obstetrics
.....Noninvasive treatment	.....Oncology
.....Orthopedic procedures	.....Radiation therapy
.....Orthotics	.....Ophthalmology
.....Patient rehabilitation	.....Pathology
.....Pharmaceuticals	.....Histopathology
.....Precision medicine	.....Neuropathology
.....Proton therapy	.....Pathological processes
.....Surgery	.....Pediatrics
.....Occupational medicine	.....Psychiatry



- .....Mental disorders
- .....Pulmonology
- .....Spirometry
- .....Radiology
- .....Neuroradiology
- ....Nuclear medicine
- ....Synthetic biology

## Engineering management

- ....Business
- .....Business data processing
- .....Business intelligence
- .....Commerce and trade
- .....Free economic zones
- .....Product delivery
- .....Disruptive innovation
- .....Entrepreneurship
- .....Franchising
- .....Industrial relations
- .....Management
- .....Asset management
- .....Best practices
- .....Building management systems
- .....Business continuity
- .....Business process management
- .....Business process re-engineering
- .....Communication system operations and management
- .....Conference management
- .....Content management
- .....Contingency management
- .....Contract management
- .....Contracts
- .....Customer relationship management
- .....Decision making
- .....Dependability management
- .....Distributed management
- .....Enterprise resource planning
- .....Facilities management
- .....Financial management
- .....Governmental factors
- .....Human resource management
- .....Information management
- .....Interface management
- .....International collaboration
- .....Knowledge management
- .....Marketing management
- .....Organizational aspects
- .....Outsourcing
- .....Process planning

- .....Production management
- .....Program management
- .....Project management
- .....Public relations
- .....Quality management
- .....Requirements management
- .....Research and development management
- .....Resource management
- .....Risk analysis
- .....Safety management
- .....Security management
- .....Storage management
- .....Supply chain management
- .....Technical management
- .....Technology management
- .....Operations research
- .....Inventory control
- .....Virtual enterprises
- .....Organizations
- .....BNSC
- .....Companies
- .....Decentralized autonomous organization
- .....European Space Agency
- .....Government
- .....Sociotechnical systems
- .....United Kingdom Space Agency
- ....Commercialization
- ....Consortia
- ....Economics
- .....Access charges
- .....Costs
- .....Cost benefit analysis
- .....Developing countries
- .....Econometrics
- .....Economic forecasting
- .....Economic indicators
- .....Share prices
- .....Electronic commerce
- .....Environmental economics
- .....Carbon tax
- .....Emissions trading
- .....Exchange rates
- .....Free economic zones
- .....Freeports
- .....Fuel economy
- .....International trade
- .....Macroeconomics
- .....Privatization
- .....Microeconomics





- .....Economies of scale
- .....Industrial economics
- .....Monopoly
- .....Oligopoly
- .....Power generation economics
- .....Electricity supply industry deregulation
- .....Profitability
- .....Sharing economy
- .....Shared transport
- .....Stock markets
- .....Supply and demand
- .....Trade agreements
- .....Venture capital
- .....Virtual enterprises
- ....Innovation management
- .....Creativity
- ....Legal factors
- .....Copyright protection
- .....Intellectual property
- .....Software protection
- .....Law
- .....Censorship
- .....Commercial law
- .....Consumer protection
- .....Contract law
- .....Criminal law
- .....Employment law
- .....Forensics
- .....Fraud
- .....Law enforcement
- .....Patent law
- .....Trademarks
- .....Patents
- .....Product liability
- .....Warranties
- .....Software protection
- .....Trademarks
- ....Market research
- ....Planning
- .....Meeting planning
- .....Schedules
- .....Strategic planning
- .....Roadmaps (technology planning)
- .....Technical planning
- .....Technology planning
- ....Product development
- .....Graphical user interfaces
- .....Avatars
- .....Product customization
- .....Product lifecycle management

- .....Prognostics and health management
- .....Software product lines
- .....Time to market
- ....Project engineering
- .....Scheduling
- .....Adaptive scheduling
- .....Dynamic scheduling
- .....Job shop scheduling
- .....Single machine scheduling
- .....Turnkey project
- ....Research and development management
- .....Innovation management
- .....Creativity
- ....Research initiatives
- ....Software development management
- .....Agile project management
- .....Agile software development
- .....Scrum (Software development)
- .....Model-driven development

### **Geoscience and remote sensing**

- ....Environmental factors
- .....Biosphere
- .....Climate change
- .....Global warming
- .....Ecology
- .....Ecosystems
- .....Wetlands
- .....Environmental economics
- .....Carbon tax
- .....Emissions trading
- .....Environmental monitoring
- .....Global warming
- .....Green manufacturing
- .....Green products
- .....Green buildings
- .....Green cleaning
- .....Green transportation
- .....Pollution
- .....Air pollution
- .....Emissions trading
- .....Industrial pollution
- .....Land pollution
- .....Oil pollution
- .....Radioactive pollution
- .....Thermal pollution
- .....Urban pollution
- .....Water pollution





....Geographic information systems	.....Meteorology
.....Geospatial analysis	.....Moisture
.....Gunshot detection systems	.....Seismology
....Geophysical measurement techniques	.....Surface waves
.....Geophysical image processing	.....Well logging
....Geophysical measurements	.....Ice
.....Geodesy	.....Ice shelf
.....Level measurement	.....Ice surface
.....Sea measurements	.....Ice thickness
.....Geoacoustic inversion	.....Sea ice
.....Seismic measurements	.....Lakes
....Geophysical signal processing	.....Land surface
....Geoscience	.....Watersheds
.....Antarctica	.....Levee
.....South Pole	.....Meteorological factors
.....Arctic	.....Natural resources
.....North Pole	.....Oceanography
.....Atmosphere	.....Ocean circulation
.....Air quality	.....Ocean dynamics
.....Atmospheric modeling	.....Oceans
.....Atmospheric waves	.....Ocean salinity
.....Biosphere	.....Ocean temperature
.....Continents	.....Sea coast
.....Africa	.....Sea floor
.....Asia	.....Sea level
.....Australia	.....Sea surface
.....Europe	.....Tides
.....North America	.....Rivers
.....South America	.....Sediments
.....Cyclones	.....Soil
.....Hurricanes	.....Soil moisture
.....Tropical cyclones	.....Soil properties
.....Earth	.....Soil texture
.....Earthquakes	.....Tornadoes
.....Earthquake engineering	.....Tsunami
.....Forestry	.....Volcanoes
.....Geochemistry	.....Volcanic activity
.....Geoengineering	.....Volcanic ash
.....Geography	.....Wetlands
.....Rural areas	....Land surface temperature
.....Urban areas	....Photometry
.....Geology	....Radiometry
.....Biogeochemistry	.....Microwave radiometry
.....Landslides	.....Radiometers
.....Minerals	.....Spectroradiometers
.....Rocks	....Remote sensing
.....Geophysics	.....Hyperspectral sensors
.....EMTDC	.....Hyperspectral imaging
.....Extraterrestrial phenomena	.....Passive microwave remote sensing
.....Geodynamics	.....Quantum radar
.....Geophysics computing	.....Remote monitoring



- ....Terrain mapping
- .....Digital elevation models
- ....Terrestrial atmosphere
- .....Clouds
- .....Global warming
- .....Ionosphere
- .....Magnetosphere
- ....Vegetation mapping

## IEEE organization

- ....IEEE activities
  - .....IEEE Awards activities
    - .....IEEE Corporate awards
    - .....IEEE Society awards
    - .....IEEE Standards awards
    - .....National Society Agreement awards
  - .....IEEE Conference activities
  - .....IEEE Corporate activities
  - .....Humanitarian activities
  - .....IEEE Educational activities
  - .....IEEE Intersociety activities
  - .....IEEE Local activities
  - .....IEEE Member and Geographic activities
  - .....IEEE Professional activities
  - .....IEEE publishing
  - .....IEEE Standards activities
  - .....IEEE Technical activities
  - .....IEEE United States activities
- ....IEEE entities
  - .....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 governance
  - .....IEEE bylaws
  - .....IEEE Constitution
  - .....IEEE policy and procedures
  - .....IEEE staff
  - ....IEEE indexing
  - .....Awards

- .....Nobel Prize
- .....Book reviews
- .....Interviews
- .....Obituaries
- .....Software reviews
- .....Special issues and sections
- .....Tutorials
- .....Video reviews
- ....IEEE members
  - .....IEEE Associate Members
  - .....IEEE Fellows
  - .....IEEE Life Members
  - .....IEEE Senior Members
- ....IEEE news
  - .....IEEE Society news
- ....IEEE products
  - .....IEEE catalogs
  - .....IEEE Collabratec
  - .....IEEE educational products
  - .....IEEE merchandise
  - .....IEEE publications
    - .....IEEE books
    - .....IEEE conference proceedings
    - .....IEEE directories
    - .....IEEE journals
    - .....IEEE magazines
    - .....IEEE newsletters
    - .....IEEE online publications
    - .....IEEE transactions
- .....Notice of Violation
- .....IEEE Xplore
- .....IEL

## Imaging

- ....Biomedical imaging
  - .....Angiocardiology
  - .....Angiography
  - .....Biomedical optical imaging
  - .....Cardiology
    - .....Echocardiography
    - .....Electrocardiology
    - .....Phonocardiography
  - .....DICOM
  - .....Elastography
  - .....Encephalography
  - .....Mammography
  - .....Medical diagnostic imaging
    - .....Anatomical structure
    - .....Radionuclide imaging
    - .....Molecular imaging



- .....Phantoms
- .....Photoacoustic imaging
- ....Cameras
  - .....Digital cameras
  - .....Smart cameras
  - .....Webcams
- ....Focusing
- ....Ground penetrating radar
- ....Holography
- ....Image converters
  - .....Image intensifiers
- ....Image sensors
  - .....Active pixel sensors
  - .....CCD image sensors
  - .....Charge-coupled image sensors
  - .....CMOS image sensors
  - .....Infrared image sensors
- ....Image storage
- ....Infrared imaging
- .....Night vision
- ....Magnetic resonance imaging
  - .....Diffusion tensor imaging
  - .....Functional magnetic resonance imaging
  - .....Magnetic resonance elastography
  - .....Magnetic resonance fingerprinting
  - .....Magneto electrical resistivity imaging technique
- ....Microscopy
  - .....Atomic force microscopy
  - .....Electron microscopy
    - .....Photoelectron microscopy
    - .....Scanning electron microscopy
    - .....Transmission electron microscopy
  - .....Endomicroscopy
  - .....Scanning microwave microscopy
  - .....Scanning probe microscopy
  - .....Scanning thermal microscopy
- ....Microwave imaging
- ....Multispectral imaging
- ....Nuclear imaging
  - .....Energy resolution
  - .....Ion emission
- ....Optical imaging
  - .....Optical flow
  - .....Optical projectors
  - .....Talbot effect
  - .....Thermoreflectance imaging
- ....Photography
  - .....Cinematography
  - .....Digital photography

- .....Image forensics
- .....Photomicrography
- .....Photorealism
- ....Radiation imaging
  - .....Radionuclide imaging
- ....Radiography
  - .....Diagnostic radiography
- ....Stereo vision
  - .....Stereo image processing
- ....Terahertz wave imaging
- ....Tomography
  - .....Computed tomography
    - .....Single photon emission computed tomography
  - .....Electrical capacitance tomography
  - .....Electrical impedance tomography
  - .....Magnetic particle imaging
  - .....Optical coherence tomography
  - .....Positron emission tomography
    - .....Whole-body PET
  - .....Reconstruction algorithms

### Industrial electronics

- ....Assembly systems
  - .....Flexible electronics
  - .....Robotic assembly
- ....Computer aided manufacturing
  - .....CAD/CAM
  - .....Silicon compiler
- ....Cryogenic electronics
- ....Industrial control
  - .....Process control
    - .....Predictive control
    - .....Three-term control
    - .....Two-term control
  - .....Production control
    - .....Continuous production
    - .....Lot sizing
    - .....Optimized production technology
    - .....Scheduling
- ....Integrated manufacturing systems
- ....Machine control
  - .....Machine vector control
- ....Manufacturing automation
  - .....Computer aided manufacturing
    - .....CAD/CAM
    - .....Silicon compiler
  - .....Computer integrated manufacturing
  - .....Computer numerical control
  - .....Flexible manufacturing systems



- ....Testing
  - .....Aerospace testing
  - .....Wind tunnels
  - .....Automatic testing
  - .....Automatic test pattern generation
  - .....Ring generators
  - .....Benchmark testing
  - .....Built-in self-test
  - .....Circuit testing
  - .....Integrated circuit measurements
  - .....Conformance testing
  - .....Electronic equipment testing
  - .....Immunity testing
  - .....Error analysis
  - .....Bit error rate
  - .....Finite wordlength effects
  - .....Error-free operations
  - .....Failure analysis
  - .....Equipment failure
  - .....Semiconductor device breakdown
  - .....Frequency response
  - .....Impulse testing
  - .....Insulator testing
  - .....Insulation testing
  - .....Integrated circuit testing
  - .....Integrated circuit yield
  - .....Logic testing
  - .....Life testing
  - .....Materials testing
  - .....Accelerated aging
  - .....Acoustic testing
  - .....Adhesive strength
  - .....Bonding forces
  - .....Delamination
  - .....Elastic recovery
  - .....Nondestructive testing
  - .....Optical fiber testing
  - .....Remaining life assessment
  - .....Ring generators
  - .....Semiconductor device testing
  - .....Shear testing
  - .....Software testing
  - .....Combinatorial testing
  - .....Fuzzing
  - .....System testing
  - .....Model checking
  - .....Test equipment
  - .....Automatic test equipment
  - .....Test facilities
  - .....Anechoic chambers
  - .....Laboratories

- .....Large Hadron Collider
- .....Open area test sites
- .....TEM cells
- .....Wind tunnels

### Industry applications

- ....Accident prevention
  - .....Accidents
    - .....Aerospace accidents
    - .....Electrical accidents
    - .....Industrial accidents
    - .....Marine accidents
    - .....Railway accidents
    - .....Road accidents
- ....Chemical technology
  - .....Chemical reactions
  - .....Bioreactors
  - .....Catalysis
  - .....Chemical reduction
  - .....Continuous-stirred tank reactor
  - .....Hydrolysis
  - .....Ignition
  - .....Solvation
- ....Chemical sensors
  - .....Crystallizers
  - .....Distillation equipment
  - .....Fluidization
  - .....Pharmaceutical technology
  - .....Vitrification
- ....Cryogenics
  - .....Liquid nitrogen
- ....Electrochemical devices
  - .....Amperometric sensors
  - .....Batteries
    - .....Lead acid batteries
    - .....Lithium batteries
    - .....Lithium-ion batteries
    - .....Lithium-sulfur batteries
    - .....Nickel cadmium batteries
    - .....Solid state batteries
  - .....Battery management systems
- ....Fuel cells
  - .....Supercapacitors
- ....Electrochemical processes
  - .....Electromechanical systems
- ....Cruise control
  - .....Electromechanical devices
- .....Armature
- .....SAW filters
- ....Electrostatic devices



....Electrostatic precipitators	.....Agriculture
....Electrostatic processes	.....Aeroponics
.....Aerosols	.....Agricultural products
.....Electrophotography	.....Agrochemicals
.....Electrostatic analysis	.....Aquaculture
.....Electrostatic induction	.....Greenhouses
.....Electrostatics	.....Irrigation
.....Electrostatic levitation	.....Smart agriculture
.....Particle charging	.....Airline industry
.....Particle production	.....Architecture
.....Space charge	.....Beverage industry
.....Surface charging	.....Chemical industry
.....Triboelectricity	.....Coal industry
.....Triboelectricity	.....Communication industry
....Engines	.....Computer industry
.....Heat engines	.....Construction
.....Steam engines	.....Buildings
.....Stirling engines	.....Green buildings
.....Internal combustion engines	.....Modular construction
.....Diesel engines	.....Prefabricated construction
.....Ignition	.....Stairs
.....Jet engines	.....Construction industry
....Environmental management	.....Prefabricated construction
.....Biodegradation	.....Defense industry
.....Biodegradable materials	.....Electrical engineering industry
.....Land use planning	.....Entertainment industry
.....Pest control	.....Sports
.....Pollution control	.....Farming
.....Recycling	.....Financial industry
.....Renewable energy sources	.....Banking
.....Biomass	.....Financial services
.....Sustainable development	.....Gas industry
.....Waste management	.....Horticulture
.....Waste disposal	.....Hydroponics
.....Waste handling	.....Information industry
.....Waste recovery	.....Manufacturing industries
.....Waste reduction	.....Aerospace industry
.....Water conservation	.....Cement industry
.....Desalination	.....Ceramics industry
.....Water resources	.....Clothing industry
.....Desalination	.....Electrical products industry
.....Reservoirs	.....Electronics industry
.....Stormwater	.....Food industry
.....Water monitoring	.....Footwear industry
....Food technology	.....Fuel processing industries
.....Food preservation	.....Glass industry
....High-temperature techniques	.....Machinery production industries
.....Rapid thermal processing	.....Metal product industries
....Industrial engineering	.....Plastics industry
.....Industrial communication	.....Pulp and paper industry
....Industries	.....Rubber industry



.....Shipbuilding industry	.....Fans
.....Textile industry	.....Furnaces
.....Toy manufacturing industry	.....Blast furnaces
.....Metals industry	.....Kilns
.....Mining industry	.....Gears
.....Coal mining	.....Magnetic gears
.....Natural gas industry	.....Hydraulic systems
.....Petroleum industry	.....Electrohydraulics
.....Oil drilling	.....Hydraulic equipment
.....Oil refineries	.....Hydraulic fluids
.....Well logging	.....Machine components
.....Power industry	.....Air cleaners
.....Electrical equipment industry	.....Belts
.....Electricity supply industry	.....Cams
.....Nuclear facility regulation	.....Engine cylinders
.....Power system interconnection	.....Exhaust systems
.....Steel industry	.....Impellers
.....Sugar industry	.....Intake systems
.....Sugar refining	.....Manifolds
.....Textile technology	.....Mechanical splines
.....Spinning	.....Pistons
.....Weaving	.....Rotors
.....Tourism industry	.....Shafts
.....Toy industry	.....Valves
.....Transportation industry	.....Motors
.....Wood industry	.....AC motors
.....Inspection	.....Brushless motors
.....Automatic optical inspection	.....Commutation
.....Machinery	.....DC motors
.....Agricultural machinery	.....Electric motors
.....Agricultural robots	.....Hysteresis motors
.....Ball bearings	.....Induction motors
.....Belts	.....Micromotors
.....Drives	.....Permanent magnet motors
.....Hydraulic drives	.....Servomotors
.....Motor drives	.....Traction motors
.....Variable speed drives	.....Universal motors
.....Electric machines	.....Printing machinery
.....AC machines	.....Pumps
.....Alternators	.....Fuel pumps
.....Brushless machines	.....Heat pumps
.....Compressors	.....Insulin pumps
.....Conductors	.....Micropumps
.....DC machines	.....Water pumps
.....Electric fences	.....Textile machinery
.....Generators	.....Spinning machines
.....Permanent magnet machines	.....Manufacturing
.....Rotating machines	.....Assembly
.....Rotors	.....Fitting
.....Stators	.....Microassembly
.....Washing machines	.....Preforms



.....Soldering	.....Job production systems
.....Assembly systems	.....Joining processes
.....Flexible electronics	.....Layered manufacturing
.....Robotic assembly	.....Lean production
.....Embossing	.....Manufacturing processes
.....Fabrication	.....Mass production
.....Bonding processes	.....Melt processing
.....Microfabrication	.....Pulp manufacturing
.....Optical device fabrication	.....Sheet metal processing
.....Soldering	.....Thermoforming
.....Welding	.....Three-dimensional printing
.....Fourth Industrial Revolution	.....Mass customization
.....Green manufacturing	.....Smart manufacturing
.....Lithography	.....Tolerance analysis
.....Colloidal lithography	....Packaging
.....Extreme ultraviolet lithography	.....Bagging
.....Interferometric lithography	.....Bottling
.....Nanolithography	.....Canning
.....Soft lithography	.....Encapsulation
.....Stereolithography	.....Food packaging
.....X-ray lithography	.....Labeling
.....Manufactured products	.....Multichip modules
.....Ceramic products	.....Nanopackaging
.....Chemical products	.....Plastic packaging
.....Consumer products	.....Wrapping
.....Electrical products	....Paper technology
.....Food products	....Production
.....Fuels	.....Ball milling
.....Glass products	.....Compression molding
.....Mechanical products	.....Embossing
.....Metal products	.....Food products
.....Paper products	.....Dairy products
.....Paper pulp	.....Fats
.....Plastic products	.....Food security
.....Rubber products	.....Food waste
.....Sports equipment	.....Sugar
.....Textile products	.....Group technology
.....Tools	.....Injection molding
.....Windows	.....Materials processing
.....Manufacturing systems	.....Annealing
.....Agile manufacturing	.....Bleaching
.....Automobile manufacture	.....Casting
.....Batch production systems	.....Coatings
.....Blanking	.....Curing
.....Cellular manufacturing	.....Etching
.....Flow production systems	.....Heat treatment
.....Food manufacturing	.....Joining processes
.....Forging	.....Lamination
.....Glass manufacturing	.....Laser materials processing
.....Integrated manufacturing systems	.....Machining
.....Intelligent manufacturing systems	.....Melt processing





.....Plasma materials processing	.....Machine tools
.....Plating	.....Mining equipment
.....Pressing	.....Molding equipment
.....Punching	.....Packaging machines
.....Refining	.....Paper making machines
.....Shearing	.....Polishing machines
.....Smelting	.....Soldering equipment
.....Softening	.....Production facilities
.....Swaging	.....Foundries
.....Vapor deposition	.....Greenhouses
.....Mechanical products	.....Industrial facilities
.....Automotive components	.....Industrial plants
.....Axles	.....Machine shops
.....Bellows	.....Paper mills
.....Blades	.....Production management
.....Brakes	.....Control charts
.....Couplings	.....Inventory management
.....Fasteners	.....Lead time reduction
.....Flanges	.....Logistics
.....Gears	.....Process planning
.....Hoses	.....Production planning
.....Machine components	.....Production materials
.....Mechanical guides	.....Abrasives
.....Needles	.....Aerospace materials
.....Orifices	.....Automotive materials
.....Pistons	.....Inhibitors
.....Pressure vessels	.....Ink
.....Seals	.....Joining materials
.....Springs	.....Lubricants
.....Steering systems	.....Retardants
.....Structural shapes	.....Production systems
.....Tires	.....Assembly systems
.....Vents	.....Exhaust systems
.....Wheels	.....Intelligent manufacturing systems
.....Process planning	.....Lean production
.....Business process integration	.....Manufacturing systems
.....Business process management	.....Steering systems
.....Cause effect analysis	.....Productivity
.....Root cause analysis	.....Shafts
.....Production control	.....Camshafts
.....Continuous production	.....Springs
.....Lot sizing	.....Transfer molding
.....Optimized production technology	....Safety
.....Scheduling	.....Aerospace safety
.....Production engineering	.....Air safety
.....Production planning	.....Domestic safety
.....Production equipment	.....Fall detection
.....Applicators	.....Emergency services
.....Clamps	.....Explosion protection
.....Cutting tools	.....Fire safety
.....Fixtures	.....Hazards



.....Biohazards	.....Cyber espionage
.....Chemical hazards	.....Cyber warfare
.....Explosions	.....Cyberattack
.....Fires	.....Data integrity
.....Flammability	.....Denial-of-service attack
.....Floods	.....Firewalls (computing)
.....Hazardous areas	.....Honey pot (computing)
.....Hazardous materials	.....Identity management systems
.....Toxicology	.....Internet security
.....Health and safety	.....Mobile security
.....Occupational health	.....Passwords
.....Occupational safety	.....Penetration testing
.....Personal protective equipment	.....Permission
.....Marine safety	.....Phishing
.....Product safety	.....Proof of Work
.....Protection	.....Trusted computing
.....Electrostatic discharge protection	.....Control system security
.....Explosion protection	.....Physical unclonable function
.....Lightning protection	.....Cryptography
.....Radiation protection	.....Blockchains
.....Radiation safety	.....Ciphers
.....Radiation protection	.....Cryptocurrency
.....Radiofrequency safety	.....Cryptographic hash function
.....Safety devices	.....Encryption
.....Eye protection	.....Multi-party computation
.....Fire extinguishers	.....Public key
.....Protective clothing	.....Quantum cryptography
.....Safety management	.....Random number generation
.....Vehicle safety	.....Side-channel attacks
.....Advanced driver assistance systems	.....Steganography
.....Lane departure warning systems	.....Zero knowledge proof
.....Lane detection	.....Data security
.....Security	.....Cryptography
.....Access control	.....Message authentication
.....Accesslists	.....Tokenization
.....Authorization	.....Digital signatures
.....Blocklists	.....Food security
.....Multi-factor authentication	.....Hardware security
.....Non-repudiation	.....Information security
.....Passwords	.....Cyber espionage
.....Alarm systems	.....Data breach
.....Smoke detectors	.....Intrusion detection
.....Capability-based security	.....Phishing
.....Computer security	.....Privacy breach
.....Application security	.....Social engineering (security)
.....Authentication	.....SQL injection
.....Cloud computing security	.....Trust management
.....Computer crime	.....Network security
.....Computer hacking	.....Network reconnaissance
.....Cross-site scripting	.....Power system security
	.....Reconnaissance



- .....Security management
- .....Terrorism
  - .....Bioterrorism
  - .....Cyber terrorism
  - .....National security
- .....Watermarking
- .....Zero Trust
- ....Wine industry
- .....Wineries

## Information theory

- ....Audio coding
- ....Biological information theory
- ....Channel coding
  - .....Block codes
    - .....Linear codes
    - .....Polar codes
  - .....Combined source-channel coding
  - .....Turbo codes
- ....Codes
  - .....Binary codes
    - .....Reflective binary codes
  - .....Convolutional codes
  - .....Cyclic redundancy check codes
  - .....Error correction codes
    - .....Reed-Muller codes
    - .....Reed-Solomon codes
  - .....Parity check codes
  - .....Iterative decoding
  - .....Product codes
    - .....Bar codes
  - .....Space-time codes
  - .....Zero correlation zone
- ....Communication channels
  - .....Channel allocation
    - .....Spectral efficiency
  - .....Channel capacity
  - .....Channel estimation
  - .....Channel models
  - .....Channel spacing
  - .....Channel state information
  - .....Gaussian channels
    - .....AWGN channels
  - .....Multipath channels
  - .....Multiuser channels
  - .....Partial response channels
  - .....Quantum channels
  - .....Throughput
  - .....Time-varying channels
- ....Decoding

- .....Maximum likelihood decoding
- ....Encoding
  - .....Audio coding
  - .....Channel coding
    - .....Block codes
    - .....Combined source-channel coding
    - .....Turbo codes
  - .....Code refractoring
  - .....Digital representation
  - .....Entropy coding
    - .....Huffman coding
  - .....Precoding
  - .....Source coding
    - .....Speech coding
  - .....Transcoding
- ....Error compensation
- ....Genetic communication
- ....Hamming distances
- ....Hamming weight
- ....Information entropy
- ....Mutual information
- ....Network coding
- ....Rate distortion theory
  - .....Channel rate control
- ....Rate-distortion
- ....Source coding
  - .....Speech coding
- ....Technology acceptance model

## Instrumentation and measurement

- ....Computerized instrumentation
- ....Electric variables
  - .....Admittance
    - .....Admittance control
  - .....Capacitance
    - .....Parasitic capacitance
    - .....Quantum capacitance
  - .....Capacitance-voltage characteristics
  - .....Conductivity
    - .....Photoconductivity
    - .....Semiconductivity
  - .....Transconductance
- ....Current
  - .....Bioimpedance
  - .....Current slump
  - .....Dark current
  - .....Fault currents
  - .....Inrush current
  - .....Leakage currents
  - .....Persistent currents



.....Short-circuit currents	.....Probes
.....Threshold current	.....Telescopes
.....Current-voltage characteristics	.....Gamma-ray telescopes
.....Electric potential	.....X-ray telescopes
.....Gain	.....Theodolites
.....Impedance	.....Tuners
.....Impedance matching	....Measurement
.....Baluns	.....Accelerometers
.....Inductance	.....Acoustic measurements
.....Permittivity	.....Antenna measurements
.....Piezoresistance	.....Anthropometry
.....Q-factor	.....Area measurement
.....Resistance	.....Atmospheric measurements
.....Electric resistance	.....Atomic measurements
.....Piezoresistance	.....Bathymetry
.....Surface resistance	.....Biomedical measurement
.....Thermal resistance	.....Biomarkers
.....Viscosity	.....Biomedical monitoring
.....Voltage	.....Electroencephalography
.....Breakdown voltage	.....Electromyography
.....Dynamic voltage scaling	.....Electrooculography
.....Threshold voltage	.....Electrophysiology
.....Voltage fluctuations	.....Photoplethysmography
.....Wiring	.....Plethysmography
...High energy physics instrumentation	.....Pulse oximeter
computing	.....Sensitivity and specificity
.....Linear particle accelerator	.....Spirometry
....Instruments	.....Calorimetry
.....Barometers	.....Coordinate measuring machines
.....Compass	.....Density measurement
.....Medical instruments	.....Hydrometers
.....Meters	.....Distance measurement
.....Dynamometers	.....Euclidean distance
.....Flowmeters	.....Odometers
.....Goniometers	.....Distortion measurement
.....Potentiometers	.....Total harmonic distortion
.....Radiometers	.....Doppler measurement
.....Tachometers	.....Dosimetry
.....Vibrometers	.....Dynamic range
.....Voltmeters	.....High dynamic range
.....Wattmeters	.....Electric variables measurement
.....Microscopy	.....Admittance measurement
.....Atomic force microscopy	.....Ammeters
.....Electron microscopy	.....Attenuation measurement
.....Endomicroscopy	.....Capacitance measurement
.....Scanning microwave microscopy	.....Conductivity measurement
.....Scanning probe microscopy	.....Current measurement
.....Network analyzers	.....Dielectric measurement
.....Odometers	.....Electrical resistance measurement
.....Oscilloscopes	.....Electrostatic measurements
.....Pressure gauges	.....Energy measurement



.....Impedance measurement	.....Measurement errors
.....Inductance measurement	.....Measurement techniques
.....Partial discharge measurement	.....Calibration
.....Phasor measurement units	.....Dynamic equilibrium
.....Power measurement	.....Measurement uncertainty
.....Q measurement	.....Measurement units
.....Rydberg atoms	.....International System of Units
.....Transmission line measurements	.....Nanometers
.....Voltage measurement	.....Mechanical variables measurement
.....Electromagnetic measurements	.....Angular velocity
.....Electromagnetic modeling	.....Displacement measurement
.....Linearity	.....Force measurement
.....Microwave measurement	.....Motion measurement
.....Millimeter wave measurements	.....Position measurement
.....Parameter extraction	.....Rotation measurement
.....Polarimetry	.....Strain measurement
.....Radiometry	.....Stress measurement
.....Submillimeter wave measurements	.....Thickness measurement
.....Extraterrestrial measurements	.....Torque measurement
.....Fluid flow measurement	.....Velocity measurement
.....Frequency measurement	.....Vibration measurement
.....Frequency estimation	.....Volume measurement
.....Frequency-domain analysis	.....Weight measurement
.....Gain measurement	.....Micrometers
.....Gas chromatography	.....Moisture measurement
.....Geologic measurements	.....Humidity measurement
.....Geophysical measurements	.....Noise measurement
.....Geodesy	.....Multiple signal classification
.....Sea measurements	.....Noise figure
.....Seismic measurements	.....Noise shaping
.....Interferometry	.....Nuclear measurements
.....Fabry-Perot	.....Particle tracking
.....Interferometers	.....Optical variables measurement
.....Optical interferometry	.....Ellipsometry
.....Phase shifting interferometry	.....Photometry
.....Radar interferometry	.....Reflection coefficient
.....Radio interferometry	.....Refractive index
.....Sagnac interferometers	.....Particle beam measurements
.....Key performance indicator	.....Particle measurements
.....Length measurement	.....Performance evaluation
.....Lifetime estimation	.....Key performance indicator
.....Loss measurement	.....pH measurement
.....Packet loss	.....Phase measurement
.....Lumen	.....Plasma measurements
.....Magnetic variables measurement	.....Pollution measurement
.....Magnetic anomaly detection	.....Pressure measurement
.....Magnetic field measurement	.....Altimetry
.....Magnetometers	.....Tire pressure
.....Permeability measurement	.....Pulse measurements
.....Measurement by laser beam	.....Reflectometry
.....Laser velocimetry	.....Replicability



.....Reproducibility of results	.....Infrared surveillance
.....Scintillation counters	.....Video surveillance
.....Solid scintillation detectors	.....Water monitoring
.....Sea state	....Pulse oximetry
.....Semiconductor device measurement	....Testing
.....Sensitivity	.....Aerospace testing
.....Sensitivity analysis	.....Wind tunnels
.....Shape measurement	.....Automatic testing
.....Size measurement	.....Automatic test pattern generation
.....Functional point analysis	.....Ring generators
.....Software measurement	.....Benchmark testing
.....Soil measurements	.....Built-in self-test
.....Salinity (geophysical)	.....Circuit testing
.....Spectral efficiency	.....Integrated circuit measurements
.....Spectroscopy	.....Conformance testing
.....Deep level transient spectroscopy	.....Electronic equipment testing
.....Diffuse reflectance spectroscopy	.....Immunity testing
.....Electrochemical impedance spectroscopy	.....Error analysis
.....Electron paramagnetic resonance	.....Bit error rate
.....Fourier transform infrared spectroscopy	.....Finite wordlength effects
.....Functional near-infrared spectroscopy	.....Error-free operations
.....Kirchhoff's Law	.....Failure analysis
.....Mass spectroscopy	.....Equipment failure
.....MERIS	.....Semiconductor device breakdown
.....Neutron spin echo	.....Frequency response
.....Photoacoustic effects	.....Impulse testing
.....Resonance light scattering	.....Insulator testing
.....Thermal variables measurement	.....Insulation testing
.....Temperature measurement	.....Integrated circuit testing
.....Time measurement	.....Integrated circuit yield
.....Clocks	.....Logic testing
.....Time dissemination	.....Life testing
.....Timing	.....Materials testing
.....UHF measurements	.....Accelerated aging
.....Ultrasonic variables measurement	.....Acoustic testing
.....Viscosity	.....Adhesive strength
.....Wavelength measurement	.....Bonding forces
.....Wide area measurements	.....Delamination
....Monitoring	.....Elastic recovery
.....Computerized monitoring	.....Nondestructive testing
.....Environmental monitoring	.....Optical fiber testing
.....Load monitoring	.....Remaining life assessment
.....Patient monitoring	.....Ring generators
.....Process monitoring	.....Semiconductor device testing
.....Radiation monitoring	.....Shear testing
.....Radiation dosage	.....Software testing
.....Remote monitoring	.....Combinatorial testing
.....Surveillance	.....Fuzzing
	.....System testing
	.....Model checking
	.....Test equipment





- .....Automatic test equipment
- .....Test facilities
- .....Anechoic chambers
- .....Laboratories
- .....Large Hadron Collider
- .....Open area test sites
- .....TEM cells
- .....Wind tunnels

### Intelligent transportation systems

- ....Automated highways
- ....Geographic information systems
- .....Geospatial analysis
- .....Gunshot detection systems
- ....Intelligent vehicles
- .....Autonomous vehicles
- .....Autonomous aerial vehicles
- .....Autonomous automobiles
- .....Autonomous driving
- .....Autonomous underwater vehicles
- .....Vehicle-to-everything
- .....Vehicle-to-infrastructure
- ....Navigation
- .....Aircraft navigation
- .....Course correction
- .....Dead reckoning
- .....Indoor navigation
- .....Inertial navigation
- .....Marine navigation
- .....Radio navigation
- .....Satellite navigation systems
- .....Global navigation satellite system
- .....Global Positioning System
- .....Satellite constellations
- .....Sonar navigation
- ....Transportation
- .....Air transportation
- .....Aircraft
- .....Airports
- .....Escalators
- .....Green transportation
- .....Land transportation
- .....Rail transportation
- .....Road transportation
- .....Public transportation
- .....Seaports
- .....Shared transport
- .....Smart transportation
- .....Vehicles
- .....Connected vehicles

- .....Hydrogen powered vehicles
- .....Hypersonic vehicles
- .....Intelligent vehicles
- .....Internet of Vehicles
- .....Land vehicles
- .....Military vehicles
- .....Remotely guided vehicles
- .....Space vehicles

### Lasers and electrooptics

- ....Electro-optic effects
- .....Electrochromism
- .....Kerr effect
- .....Optical bistability
- .....Stark effect
- ....Electro-optic devices
- .....Electrochromic devices
- .....Electro-optic deflectors
- ....Lasers
- .....Atom lasers
- .....Chemical lasers
- .....Diode lasers
- .....Free electron lasers
- .....Gas lasers
- .....Laser applications
- .....Dark states
- .....Distributed feedback devices
- .....Laser ablation
- .....Laser beam cutting
- .....Laser beam machining
- .....Laser fusion
- .....Laser theory
- .....Magnetooptic recording
- .....Laser excitation
- .....Optical pumping
- .....Laser modes
- .....Laser mode locking
- .....Laser stability
- .....Laser transitions
- .....Power lasers
- .....Pump lasers
- .....Quantum well lasers
- .....Quantum cascade lasers
- .....Ring lasers
- .....Fiber lasers
- .....Semiconductor lasers
- .....Laser tuning
- .....Quantum dot lasers
- .....Quantum well lasers
- .....Semiconductor laser arrays



.....Semiconductor optical amplifiers	.....Nonlinear optics
.....Surface emitting lasers	.....Fiber nonlinear optics
.....Solid lasers	.....Nonlinear optical devices
.....Microchip lasers	.....Optical mixing
.....Quantum well lasers	.....Optical saturation
.....Semiconductor lasers	.....Photorefractive effect
.....Surface emitting lasers	.....Raman scattering
.....Surface emitting lasers	.....Supercontinuum generation
.....Vertical cavity surface emitting lasers	.....Optical amplifiers
.....X-ray lasers	.....Doped fiber amplifiers
....Optics	.....Erbium-doped fiber amplifiers
.....Adaptive optics	.....Semiconductor optical amplifiers
.....Aspherical optics	.....Optical antennas
.....Birefringence	.....Nanoantennas
.....Brightness	.....Optical crosstalk
.....Brightness temperature	.....Optical design
.....Color	.....Optical design techniques
.....Color gamut	.....Optical devices
.....Color temperature	.....Bragg gratings
.....Pigmentation	.....Collimators
.....Electron optics	.....Displays
.....Extinction coefficients	.....Holographic optical components
.....Extinction ratio	.....Lenses
.....Fiber optics	.....Light deflectors
.....Fiber nonlinear optics	.....Lighting
.....Optical fibers	.....Luminescent devices
.....Fluorescence	.....Mirrors
.....Four-wave mixing	.....Optical arrays
.....Geometrical optics	.....Optical attenuators
.....Ray tracing	.....Optical collimators
.....Integrated optics	.....Optical device fabrication
.....Light fields	.....Optical filters
.....Light sources	.....Optical modulators
.....Electroluminescent devices	.....Optical resonators
.....Fast light	.....Optical sensors
.....Luminescent devices	.....Retroreflectors
.....Phosphors	.....Thermo-optical devices
.....Slow light	.....Optical distortion
.....Stray light	.....Optical engineering
.....Superluminescent diodes	.....Optical fiber applications
.....Ultraviolet sources	.....Optical fiber devices
.....Luminescence	.....Optical harmonic generation
.....Bioluminescence	.....Optical losses
.....Electroluminescence	.....Optical microscopy
.....Fluorescence	.....Optical mixing
.....Phosphorescence	.....Multiwave mixing
.....Photoluminescence	.....Optical polarization
.....Thermoluminescence	.....Polarization shift keying
.....Microoptics	.....Stokes parameters
.....Micromirrors	.....Optical pulses
	.....Optical retarders



- .....Optical saturation
- .....Optical solitons
- .....Optical tuning
- .....Optogenetics
- .....Particle beam optics
- .....Atom optics
- .....Electron optics
- .....Stimulated emission
- .....Photoluminescence
- .....Physical optics
- .....Optical refraction
- .....Optical vortices
- .....Ray tracing
- .....Stray light
- .....Ultrafast optics
- .....Whispering gallery modes
- ....Optoelectronic devices
- .....Charge-coupled image sensors
- .....Integrated optoelectronics
- .....Light emitting diodes
- .....Inorganic light emitting diodes
- .....LED lamps
- .....Organic light emitting diodes
- .....Superluminescent diodes
- .....Photoconducting devices
- .....Electrophotography
- .....Photodetectors
- .....Photodiodes
- .....Phototransistors
- .....Superconducting photodetectors
- .....Superluminescent diodes
- ....Photonics
- .....Biophotonics
- .....Microwave photonics
- .....Nanobiophotonics
- .....Nanophotonics
- .....Photochromism
- .....Photothermal effects
- .....Silicon photonics
- .....Spontaneous emission
- .....Radiative recombination

## Magnetics

- ....Biomagnetics
- .....Magnetoencephalography
- ....Demagnetization
- ....Gyromagnetism
- ....Magnetic analysis
- .....Magnetization
- ....Magnetic anisotropy

- .....Magnetic domain walls
- .....Magnetic domains
- .....Magnetic moments
- .....Perpendicular magnetic anisotropy
- ....Magnetic devices
- .....Accelerator magnets
- .....Ferrite devices
- .....Circulators
- .....Magnetic cores
- .....Transformer cores
- .....Magnetic gears
- .....Magnetic heads
- .....Magnetic memory
- .....Floppy disks
- .....Hard disks
- .....Magnetic modulators
- .....Magneto optic devices
- .....Magnetoresistive devices
- .....Magnetostriuctive devices
- .....Solenoids
- .....Transformer cores
- .....Undulators
- ....Magnetic fields
- .....Geomagnetism
- .....Geomagnetic storms
- .....Magnetic reconnection
- .....Magnetic separation
- .....Magnetostatics
- .....Toroidal magnetic fields
- ....Magnetic flux
- .....Flux pinning
- .....Magnetic flux density
- .....Magnetic flux leakage
- ....Magnetic force microscopy
- ....Magnetic forces
- .....Coercive force
- ....Magnetic hysteresis
- ....Magnetic levitation
- .....Magnetic levitation vehicles
- ....Magnetic losses
- ....Magnetic materials
- .....Amorphous magnetic materials
- .....Antiferromagnetic materials
- .....Diamagnetic materials
- .....Ferrimagnetic films
- .....Ferrimagnetic materials
- .....Ferrimagnetic films
- .....Ferrite films
- .....Ferrites
- .....Garnet films
- .....Garnets



- .....Ferrite films
- .....Ferrites
- .....Ferrite films
- .....Ferrofluid
- .....Ferromagnetic materials
- .....Garnet films
- .....Garnets
- .....Garnet films
- .....Magnetic films
- .....Ferrimagnetic films
- .....Ferrite films
- .....Garnet films
- .....Magnetic liquids
- .....Magnetic semiconductors
- .....Magnetic superlattices
- .....Paramagnetic materials
- .....Superparamagnetic iron oxide nanoparticles
- .....Soft magnetic materials
- ....Magnetic multilayers
- ....Magnetic particles
- ....Magnetic properties
- ....Magnetic sensors
- .....Spin valves
- ....Magnetic susceptibility
- ....Magnetic switching
- ....Magnetization processes
- .....Magnetization reversal
- .....Saturation magnetization
- ....Magnetoacoustic effects
- ....Magnetoelectric effects
- .....Hall effect
- .....Magnetic tunneling
- .....Magnetoelectronics
- .....Spin polarized transport
- .....Magnetoresistance
- .....Anisotropic magnetoresistance
- .....Colossal magnetoresistance
- .....Enhanced magnetoresistance
- .....Extraordinary magnetoresistance
- .....Giant magnetoresistance
- .....Ordinary magnetoresistance
- .....Tunneling magnetoresistance
- .....Spintronics
- ....Magnetomechanical effects
- ....Magnetic field induced strain
- ....Magnetoelasticity
- .....Magnetostriction
- .....Magnetostriction
- ....Magnetooptic effects
- .....Faraday effect

- .....Gyrotropism
- ....Magnets
- .....Electromagnets
- .....Superconducting magnets
- .....Micromagnetics
- .....Permanent magnets
- ....Magnonics
- ....Microwave magnetics
- ....Nanomagnetics
- ....Nonlinear magnetics
- ....Remanence
- ....Spin systems

### **Materials, elements, and compounds**

- ....Atoms
- .....Ultracold atoms
- ....Chemical elements
- .....Aluminum
- .....Aluminum alloys
- .....Aluminum compounds
- .....Americium
- .....Antimony
- .....Arsenic
- .....Arsenic compounds
- .....Beryllium
- .....Boron
- .....Boron alloys
- .....Bromine
- .....Bromine compounds
- .....Californium
- .....Carbon
- .....Carbon nanotubes
- .....Diamonds
- .....Fullerenes
- .....Graphene
- .....Graphite
- .....Cerium
- .....Cesium
- .....Chlorine
- .....Chlorine compounds
- .....Dysprosium
- .....Europium
- .....Fluorine
- .....Fluorine compounds
- .....Gadolinium
- .....Gadolinium oxide
- .....Hafnium
- .....Hafnium compounds
- .....Helium
- .....Holmium



.....Hydrogen	.....Yttrium
.....Deuterium	.....Yttrium compounds
.....Iodine	.....Zirconium
.....Iodine compounds	....Compounds
.....Iridium	.....Bismuth compounds
.....Isotopes	.....Gallium compounds
.....Krypton	.....Aluminum gallium nitride
.....Lutetium	.....Gallium arsenide
.....Mercury (metals)	.....Gallium nitride
.....Molybdenum	.....Indium gallium arsenide
.....Neon	.....Indium gallium nitride
.....Neptunium	.....Indium compounds
.....Nitrogen	.....Indium gallium arsenide
.....Nitrogen compounds	.....Indium tin oxide
.....Silicon nitride	.....Inorganic compounds
.....Osmium	.....Transition metal compounds
.....Oxygen	.....Lead compounds
.....Phosphorus	.....Organic compounds
.....Plutonium	.....Carbon compounds
.....Polonium	.....Organic semiconductors
.....Potassium	.....Volatile organic compounds
.....Praseodymium	.....Silicon compounds
.....Promethium	.....Silicides
.....Protactinium	.....Silicon carbide
.....Radium	.....Silicon nitride
.....Radon	....Material storage
.....Rhenium	.....Bulk storage
.....Rhodium	.....Containers
.....Roentgenium	.....Freight containers
.....Rubidium	.....Fuel storage
.....Ruthenium	.....Secure storage
.....Scandium	.....Stacking
.....Selenium	.....Storage automation
.....Sodium	.....Warehousing
.....Sulfur	.....Water storage
.....Sulfur compounds	.....Dams
.....Tantalum	.....Reservoirs
.....Technetium	....Materials
.....Tellurium	.....Acoustic materials
.....Terbium	.....Additives
.....Thallium	.....Aggregates
.....Thorium	.....Amorphous materials
.....Thulium	.....Diamond-like carbon
.....Titanium	.....Glass
.....Titanium alloys	.....Auxetic materials
.....Titanium compounds	.....Bio-inspired materials
.....Titanium dioxide	.....Self-assembly
.....Titanium nitride	.....Biological materials
.....Uranium	.....Bioceramics
.....Vanadium	.....Biofilms
.....Ytterbium	.....Biomedical materials



.....Bioceramics	.....Polymer films
.....Biomembranes	.....Semiconductor films
.....Building materials	.....Thick films
.....Asphalt	.....Thin films
.....Concrete	.....Fluids
.....Floors	.....Ferrofluid
.....Mortar	.....Fluid dynamics
.....Tiles	.....Gases
.....Windows	.....Hydraulic fluids
.....Catalysts	.....Liquids
.....Electrocatalysts	.....Viscosity
.....Photocatalysts	.....Hazardous materials
.....Ceramics	.....Inorganic materials
.....Bioceramics	.....Intelligent materials
.....Porcelain	.....Lacquers
.....Composite materials	.....Laminates
.....Cermet	.....Magnetic materials
.....Conducting materials	.....Amorphous magnetic materials
.....Electrolytes	.....Antiferromagnetic materials
.....Corrosion inhibitors	.....Diamagnetic materials
.....Crystalline materials	.....Ferrimagnetic films
.....Martensite	.....Ferrimagnetic materials
.....Nanocrystals	.....Ferrite films
.....Perovskites	.....Ferrites
.....Superlattices	.....Ferrofluid
.....Crystals	.....Ferromagnetic materials
.....Colloidal crystals	.....Garnet films
.....Crystal microstructure	.....Garnets
.....Crystallography	.....Magnetic films
.....Grain boundaries	.....Magnetic liquids
.....Grain size	.....Magnetic semiconductors
.....Liquid crystals	.....Magnetic superlattices
.....Quartz crystals	.....Paramagnetic materials
.....Dielectric materials	.....Soft magnetic materials
.....Dielectric films	.....Material properties
.....Dielectric liquids	.....Creep
.....Electrets	.....Elasticity
.....Epoxy resins	.....Elongation
.....High-k dielectric materials	.....Resilience
.....Piezoelectric materials	.....Rigidity
.....Films	.....Media
.....Conductive films	.....Fake news
.....Dielectric films	.....Nonhomogeneous media
.....Epitaxial layers	.....Photorealism
.....Ferrimagnetic films	.....Random media
.....Ferrite films	.....Mesoporous materials
.....Garnet films	.....Metal foam
.....Magnetic films	.....Metallic materials
.....Optical films	.....Metamaterials
.....Piezoelectric films	.....Electromagnetic metamaterials
.....Plastic films	.....Optical cloaking





.....Optical metamaterials	.....Radioactive decay
.....Nanostructured materials	.....Radioactive waste
.....Nanocomposites	.....Raw materials
.....Nanoporous materials	.....Resins
.....Oils	.....Epoxy resins
.....Lubricating oils	.....Resists
.....Vegetable oils	.....Semiconductor materials
.....Optical materials	.....Amorphous semiconductors
.....Colloidal nanocrystals	.....Deep level transient spectroscopy
.....Optical cloaking	.....Elemental semiconductors
.....Optical polymers	.....Gallium
.....Optical retarders	.....Gallium arsenide
.....Optical superlattices	.....Germanium
.....Photorefractive materials	.....III-V semiconductor materials
.....Organic inorganic hybrid materials	.....II-VI semiconductor materials
.....Organic materials	.....Indium gallium arsenide
.....Paints	.....Indium phosphide
.....Paper pulp	.....Magnetic semiconductors
.....Petrochemicals	.....Organic semiconductors
.....Phase change materials	.....Semiconductor superlattices
.....Photoconducting materials	.....Silicon
.....Plastics	.....Silicon germanium
.....Epoxy resins	.....Substrates
.....Fiber reinforced plastics	.....Transition metal dichalcogenides
.....Plastic films	.....Wide band gap semiconductors
.....Plastic optical fiber	.....Sheet materials
.....Polymer foams	.....Smart materials
.....Polymer gels	.....Biomimetic materials
.....Polymers	.....Smart textiles
.....Azobenzene	.....Solids
.....Biopolymers	.....Young's modulus
.....Cellulose	.....Superconducting materials
.....Elastomers	.....Granular superconductors
.....Hydrogels	.....High-temperature superconductors
.....Liquid crystal polymers	.....Multifilamentary superconductors
.....Optical polymers	.....Niobium-tin
.....Polycaprolactone	.....Superconducting filaments
.....Polyethylene	.....Superconducting wires
.....Polyimides	.....Type II superconductors
.....Polymer fibers	.....Surfactants
.....Production materials	.....Terahertz materials
.....Abrasives	.....Terahertz metamaterials
.....Aerospace materials	.....Textiles
.....Automotive materials	.....Cotton
.....Inhibitors	.....Fabrics
.....Ink	.....Textile fibers
.....Joining materials	.....Wool
.....Lubricants	.....Thermoelectric materials
.....Retardants	.....Waste materials
.....Radioactive materials	.....Effluents
.....Nuclear fuels	.....Electronic waste



.....Food waste	.....Gratings
.....Industrial waste	.....Photonic crystals
.....Radioactive waste	.....Pigmentation
.....Slurries	.....Pigments
.....Wastewater	.....Separation processes
.....Wire	.....Electrophoresis
...Materials science and technology	.....Fractionation
.....Absorption	.....Particle separators
.....Aging	.....Surface engineering
.....Accelerated aging	.....Surfaces
.....Chemical analysis	.....Corrosion
.....Activation analysis	.....Corrugated surfaces
.....Chemical processes	.....Metasurfaces
.....Chemicals	.....Rough surfaces
.....Electronic noses	.....Surface impedance
.....pH measurement	.....Surface morphology
.....Computational materials science	.....Surface resistance
.....Contamination	.....Surface roughness
.....Surface contamination	.....Surface soil
.....Degradation	.....Surface stress
.....Filtration	.....Surface structures
.....Microfiltration	.....Surface tension
.....Hysteresis	.....Surface texture
.....Impurities	.....Surface topography
.....Semiconductor impurities	.....Surface treatment
.....Materials handling	...Metals
.....Cleaning	.....Alloying
.....Decontamination	.....Intermetallic
.....Freight handling	.....Shape memory alloys
.....Materials handling equipment	.....Aluminum
.....Pallets	.....Aluminum alloys
.....Remote handling	.....Aluminum compounds
.....Sieving	.....Barium
.....Materials preparation	.....Barium compounds
.....Doping	.....Bismuth
.....Firing	.....Boron
.....Ion implantation	.....Boron alloys
.....Laser sintering	.....Cadmium
.....Sputtering	.....Cadmium compounds
.....Materials reliability	.....Calcium
.....Materials testing	.....Calcium compounds
.....Accelerated aging	.....Chromium
.....Acoustic testing	.....Chromium alloys
.....Adhesive strength	.....Cobalt
.....Bonding forces	.....Cobalt alloys
.....Delamination	.....Copper
.....Elastic recovery	.....Copper alloys
.....Nondestructive testing	.....Copper compounds
.....Metallurgy	.....Digital alloys
.....Microstructure	.....Erbium
.....Periodic structures	.....Gallium



.....Gallium alloys  
 .....Germanium  
 .....Germanium alloys  
 .....Gold  
 .....Gold alloys  
 .....Hafnium  
 .....Hafnium compounds  
 .....Indium  
 .....Iron  
 .....Cast iron  
 .....Iron alloys  
 .....Lanthanum  
 .....Lanthanum compounds  
 .....Lead  
 .....Lead isotopes  
 .....Lithium  
 .....Lithium compounds  
 .....Magnesium  
 .....Magnesium compounds  
 .....Manganese  
 .....Manganese alloys  
 .....Mercury (metals)  
 .....Metallization  
 .....Integrated circuit metallization  
 .....Neodymium  
 .....Neodymium alloys  
 .....Neodymium compounds  
 .....Nickel  
 .....Nickel alloys  
 .....Nickel compounds  
 .....Niobium  
 .....Niobium alloys  
 .....Niobium compounds  
 .....Palladium  
 .....Platinum  
 .....Platinum alloys  
 .....Rare earth metals  
 .....Samarium  
 .....Samarium alloys  
 .....Samarium compounds  
 .....Silver  
 .....Steel  
 .....Martensite  
 .....Strontium  
 .....Strontium compounds  
 .....Tin  
 .....Tin alloys  
 .....Tin compounds  
 .....Titanium  
 .....Titanium alloys  
 .....Titanium compounds

.....Titanium dioxide  
 .....Titanium nitride  
 .....Tungsten  
 .....Yttrium  
 .....Yttrium compounds  
 .....Zinc  
 .....Zinc compounds

## Mathematics

....Accuracy  
 ....Algebra  
 .....Abstract algebra  
 .....Galois fields  
 .....Modules (abstract algebra)  
 .....Boolean algebra  
 .....Boolean functions  
 .....Linear algebra  
 .....Linear programming  
 .....Matrices  
 .....Vectors  
 .....Set theory  
 .....Fuzzy set theory  
 .....Fuzzy sets  
 .....Rough sets  
 ....Algorithms  
 .....Adaptive algorithms  
 .....Adaptation models  
 .....Algorithm design and analysis  
 .....Algorithmic efficiency  
 .....Generative adversarial networks  
 .....Algorithm design and theory  
 .....Backtracking  
 .....Consensus algorithm  
 .....Approximation algorithms  
 .....Artificial bee colony algorithm  
 .....Backpropagation algorithms  
 .....Basis algorithms  
 .....Change detection algorithms  
 .....Classification algorithms  
 .....Relevance vector machines  
 .....Clustering algorithms  
 .....Compression algorithms  
 .....Density estimation robust algorithm  
 .....Detection algorithms  
 .....Distributed algorithms  
 .....Dynamic programming  
 .....Filtering algorithms  
 .....Genetic algorithms  
 .....Hash functions  
 .....Cryptographic hash function



.....Heuristic algorithms	.....Shortest path problem
.....Inference algorithms	.....Tree graphs
.....Machine learning algorithms	.....Steiner trees
.....Matching pursuit algorithms	....Computational efficiency
.....Maximum likelihood detection	....Conformal mapping
.....MLFMA	....Convergence
.....Multicast algorithms	....Convex functions
.....Parallel algorithms	.....Semidefinite programming
.....Partitioning algorithms	....Cyclic redundancy check
.....Prediction algorithms	.....Cyclic redundancy check codes
.....Projection algorithms	....Dynamical systems
.....Pursuit algorithms	.....Nonlinear dynamical systems
.....Signal processing algorithms	....Eigenvalues and eigenfunctions
.....Software algorithms	....Equations
.....Viterbi algorithm	.....Boltzmann equation
.....Whale optimization algorithms	.....Difference equations
....Arithmetic	.....Integrodifferential equations
.....Digital arithmetic	.....Maxwell equations
.....Fixed-point arithmetic	.....Nonlinear equations
.....Floating-point arithmetic	.....Bifurcation
....Azimuth	.....Polynomials
.....Azimuthal angle	.....Riccati equations
.....Azimuthal component	....Estimation
.....Azimuthal current	.....Estimation error
.....Azimuthal harmonics	.....Estimation theory
.....Azimuthal plane	.....Cramer-Rao bounds
....Boundary value problems	.....Maximum a posteriori estimation
.....Boundary conditions	.....Functional point analysis
.....Upper bound	.....Life estimation
....Calculus	.....Maximum likelihood estimation
.....Differential equations	.....Pose estimation
.....Differential algebraic equations	.....State estimation
.....Differential operators	.....Observers
.....Navier-Stokes equations	.....Yield estimation
.....Ordinary differential equations	....Euclidean distance
.....Partial differential equations	.....Hilbert space
.....Transfer functions	....Finite difference methods
.....Integral equations	....Finite element analysis
.....Probability density function	....Fourier series
.....Level set	....Functional analysis
....Chemical reaction network theory	....Geometry
....Closed-form solutions	.....Computational geometry
....Combinatorial mathematics	.....Fractals
.....Graph theory	.....Geometric modeling
.....Bipartite graph	.....Elliptic curves
.....Conditional random fields	.....Elliptic design
.....Directed acyclic graph	.....Ellipsoids
.....Directed graphs	.....Information geometry
.....Graph neural networks	.....Projective geometry
.....Optimal matching	.....Surface topography
.....Reachability analysis	.....Nanotopography



....Gradient methods	.....Approximation methods
....Graph theory	.....Approximation error
.....Bipartite graph	.....Chebyshev approximation
.....Conditional random fields	.....Curve fitting
.....Directed acyclic graph	.....Extrapolation
.....Directed graphs	.....Function approximation
.....Fuzzy cognitive maps	.....Interpolation
.....Graph neural networks	.....Linear approximation
.....Optimal matching	.....Mean square error methods
.....Reachability analysis	.....Perturbation methods
.....Shortest path problem	.....Convergence of numerical methods
.....Tree graphs	.....Finite difference methods
....Harmonic analysis	.....Finite element analysis
....Iterative methods	.....Finite volume methods
.....Expectation-maximization algorithms	.....Gradient methods
.....Iterative algorithms	.....Independent component analysis
.....Iterative closest point algorithm	.....Iterative methods
.....Sum product algorithm	.....Expectation-maximization algorithms
.....Iterative learning control	.....Iterative algorithms
....Kernel	.....Iterative learning control
.....Null space	.....Least squares approximations
.....System kernels	.....Least mean squares methods
....Laplace equations	.....Method of moments
....Lattices	.....Mode matching methods
.....Lattice Boltzmann methods	.....Multigrid methods
....Limit-cycles	.....Newton method
....Linear matrix inequalities	.....Numerical simulation
....Linear systems	.....Numerical stability
....Linearization techniques	.....Relaxation methods
....Mathematical models	.....Sparse matrices
.....Geometric modeling	.....Splines (mathematics)
.....Mathematical analysis	.....Surface fitting
.....Formal concept analysis	.....Response surface methodology
.....Fractional calculus	.....Symmetric matrices
.....Modal analysis	.....Transmission line matrix methods
....Mathematical programming	....Optimization
....Method of moments	.....Cost function
....Minimization	.....Metaheuristics
.....Minimization methods	.....Quantum annealing
....Mode matching methods	.....Optimal scheduling
....Network theory (graphs)	.....Optimization methods
....Nonlinear equations	.....Affordances
.....Bifurcation	.....Circuit optimization
....Nonlinear systems	.....Concave programming
.....Chaos	.....Design optimization
.....Chaotic communication	.....Fireworks algorithm
.....Complexity theory	.....Gradient methods
.....Spatiotemporal phenomena	.....H infinity control
....Nonlinear dynamical systems	.....Lagrangian functions
....Numerical analysis	.....Mathematical programming
.....Adaptive mesh refinement	



.....Optimized production technology	....Simulated annealing
.....Pareto optimization	....Smoothing methods
.....Quadratic programming	....Spirals
.....Simulated annealing	....Statistics
.....Trajectory optimization	.....Adaptive estimation
....Piecewise linear techniques	.....Autoregressive processes
....Piecewise linear approximation	.....Boltzmann distribution
....Predator prey systems	.....Lattice Boltzmann methods
....Probability	.....Correlation
.....Ant colony optimization	.....Autocorrelation
.....Bayes methods	.....Correlation coefficient
.....Naive Bayes methods	.....Covariance matrices
.....Recursive estimation	.....Differential privacy
.....Error probability	.....Dimensionality reduction
.....Forecasting	.....Manifold learning
.....Demand forecasting	.....Ensemble learning
.....Economic forecasting	.....Fish schools
.....Forecast uncertainty	.....Gamma distribution
.....Technology forecasting	.....Gaussian mixture model
.....Memoryless systems	.....Higher order statistics
.....Multi-armed bandit problem	.....Histograms
.....Pairwise error probability	.....Linear discriminant analysis
.....Possibility theory	.....Maximum likelihood estimation
.....Probability distribution	.....Minimax techniques
.....Exponential distribution	.....Mixture models
.....Heavily-tailed distribution	.....Nonparametric statistics
.....Lightly-tailed distribution	.....Nearest neighbor methods
.....Log-normal distribution	.....Parametric statistics
.....Maxwell-Boltzmann distribution	.....Prediction theory
.....Nakagami distribution	.....Ranking (statistics)
.....Random variables	.....Root mean square
.....Statistical distributions	.....Sampling methods
.....Distribution functions	.....Compressed sensing
.....Gaussian distribution	.....Nonuniform sampling
.....Weibull distribution	.....Synthetic data
.....Uncertainty	.....Statistical analysis
.....Evidence theory	.....Analysis of variance
.....Forecast uncertainty	.....Conditional random fields
....Quaternions	.....Mean field theory
....Random processes	.....Mode matching methods
.....Brownian motion	.....Monte Carlo methods
.....Conditional random fields	.....Parameter estimation
.....Random forests	.....Pareto analysis
....Root mean square	.....Predictive analytics
....Sequences	.....Principal component analysis
.....Binary sequences	.....Regression analysis
.....Random sequences	.....Static analysis
....Set theory	.....Surveys
.....Fuzzy set theory	.....Time series analysis
.....Fuzzy sets	....Stochastic processes
.....Rough sets	.....Gaussian processes





- .....Gaussian mixture model
- .....Markov processes
- .....Markov random fields
- ....Superposition calculus
- ....Taylor series
- ....Tensors
- ....Topology
- ....Transforms
- .....Discrete transforms
- .....Discrete cosine transforms
- .....Discrete Hartley transforms
- .....Empirical mode decomposition
- .....Fourier transforms
- .....Discrete Fourier transforms
- .....Fast Fourier transforms
- .....Fourier transform infrared spectroscopy
- .....Karhunen-Loeve transforms
- .....Poincare invariance
- .....Wavelet transforms
- .....Biorthogonal modulation
- .....Continuous wavelet transforms
- .....Discrete wavelet transforms
- .....Wavelet coefficients
- .....Wavelet packets
- ....Transmission line matrix methods
- ....Uncertain systems
- ....Utility theory

### **Microwave theory and techniques**

- ....Microwave technology
- .....Baluns
- .....Beam steering
- .....Steerable antennas
- .....Circulators
- .....Masers
- .....Gyrotrons
- .....Microwave bands
- .....C-band
- .....K-band
- .....L-band
- .....Microwave circuits
- .....Microwave communication
- .....Rectennas
- .....Microwave devices
- .....Masers
- .....Microwave amplifiers
- .....Microwave filters
- .....Microwave transistors
- .....Microwave generation

- .....High power microwave generation
- .....Microwave photonics
- .....Microwave sensors
- ....Millimeter wave technology
- .....Millimeter wave circuits
- .....Millimeter wave integrated circuits
- .....Millimeter wave devices
- .....Millimeter wave transistors
- .....Millimeter wave integrated circuits
- .....MIMICs
- .....Millimeter wave radar
- ....Submillimeter wave technology
- .....Submillimeter wave circuits
- .....Submillimeter wave integrated circuits
- .....Submillimeter wave communication
- .....Submillimeter wave devices
- .....Submillimeter wave filters
- .....Submillimeter wave integrated circuits

### **Nanotechnology**

- ....Bionanotechnology
- ....Casimir effect
- ....Molecular computing
- ....Molecular electronics
- ....Nanobioscience
- .....DNA computing
- .....Nanobiotechnology
- .....Nanobiophotonics
- ....Nanocommunication
- ....Nanoelectromechanical systems
- ....Nanoelectronics
- .....Junctionless nanowire transistors
- ....Nanofabrication
- ....Nanofluidics
- ....Nanolithography
- ....Nanomagnetics
- ....Nanomaterials
- .....Nanocarriers
- ....Nanopackaging
- ....Nanopatterning
- .....Colloidal lithography
- ....Nanophotonics
- ....Nanoplasmonics
- ....Nanopositioning
- ....Nanoscale technology
- .....Nanopores
- .....Nanoscale devices
- .....Nanoantennas
- .....Nanocontacts



- .....Nanotube devices
- ....Nanosensors
- ....Nanostructured materials
- .....Nanocomposites
- .....Nanoporous materials
- .....Nanostructures
- .....Nanoparticles
- .....Magnetic nanoparticles
- .....Nanocrystals
- .....Nanoribbons
- .....Nanorods
- .....Nanotubes
- .....Carbon nanotubes
- .....Semiconductor nanotubes
- .....Nanowires
- .....Semiconductor nanostructures
- ....Self-assembly
- .....Electrostatic self-assembly
- ....Self-replicating machines

### **Nuclear and plasma sciences**

- ....Biomedical applications of radiation
- .....Radiation therapy
- ....Colliding beam devices
- .....Colliding beam accelerators
- .....Muon colliders
- ....Electron emission
- .....Ballistic transport
- .....Electronic ballasts
- ....Elementary particles
- .....Charge carriers
- .....Charge carrier density
- .....Charge carrier lifetime
- .....Charge carrier mobility
- .....Charge carrier processes
- .....Hot carriers
- .....Electrons
- .....Electron sources
- .....Quantum wells
- .....Trions
- .....Elementary particle exchange interactions
- .....Elementary particle vacuum
- .....Ions
- .....Ion sources
- .....Ionization
- .....Trapped ions
- .....Mesons
- .....Neutrino sources
- .....Neutrons

- .....Particle beams
- .....Atomic beams
- .....Electron beams
- .....Ion beams
- .....Particle collisions
- .....Phonons
- .....Positrons
- .....Protons
- ....Fusion power generation
- ....Fusion reactors
- .....Fusion reactor design
- .....Tokamaks
- .....Tokamak devices
- ....Gamma-rays
- .....Gamma-ray bursts
- .....Gamma-ray detection
- .....Gamma-ray effects
- ....Gas discharge devices
- .....Glow discharge devices
- ....High energy physics instrumentation computing
- .....Linear particle accelerator
- ....Ion beam applications
- .....Ion implantation
- .....Plasma immersion ion implantation
- ....Nuclear electronics
- ....Nuclear imaging
- .....Energy resolution
- .....Ion emission
- ....Nuclear medicine
- ....Nuclear physics
- .....Alpha particles
- .....Beta rays
- .....Ignition
- .....Ion sources
- .....Isotopes
- .....Nuclear phase transformations
- .....Nuclear thermodynamics
- .....Relativistic effects
- .....Optical flow
- ....Particle accelerators
- .....Accelerator magnets
- .....Colliding beam accelerators
- .....Cyclotrons
- .....Electron accelerators
- .....Ion accelerators
- .....Linear accelerators
- .....Photon collider
- .....Plasma accelerators
- .....Proton accelerators
- .....Storage rings



- .....Synchrocyclotrons
- .....Synchrotrons
- .....Synchrotron radiation
- .....Undulators
- ....Particle beam handling
- ....Particle beam injection
- ....Plasmas
- .....Atmospheric-pressure plasmas
- .....Low-temperature plasmas
- .....Microwave plasmas
- .....Plasma applications
- .....Plasma devices
- .....Plasma immersion ion implantation
- .....Plasma welding
- .....Tokamaks
- .....Plasma confinement
- .....Inertial confinement
- .....Magnetic confinement
- .....Plasma diagnostics
- .....Plasma properties
- .....Dusty plasmas
- .....Plasma chemistry
- .....Plasma density
- .....Plasma sheaths
- .....Plasma stability
- .....Plasma temperature
- .....Plasmons
- .....Plasma simulation
- .....Plasma sources
- .....Plasma transport processes
- .....Plasma-assisted combustion
- ....Radiation effects
- .....Biological effects of radiation
- .....Gamma-ray effects
- .....Ion radiation effects
- .....Neutron radiation effects
- .....Scintillators
- .....Single event latchup
- .....Space radiation
- .....Terahertz radiation
- .....Total ionizing dose
- ....Radiation hardening (electronics)
- ....Radiation monitoring
- ....Radiation dosage
- ....Radiation safety
- .....Radiation protection
- .....Radiofrequency safety
- ....Reactor instrumentation
- ....Scintillation counters
- ....Solid scintillation detectors
- ....Thermionic emission

## Oceanic engineering and marine technology

- ....Marine navigation
- ....Marine technology
- .....Marine equipment
- .....Marine transportation
- .....Marine vehicles
- .....Underwater cables
- .....Underwater communication
- .....Underwater equipment
- .....Rebreathing equipment
- .....Underwater structures
- .....Underwater technology
- .....Marine robots
- .....Underwater communication
- .....Underwater equipment
- .....Underwater structures
- ....Ocean temperature
- ....Oceanographic techniques
- ....Water pollution
- .....Marine pollution

## Power electronics

- ....Converters
- .....AC-AC converters
- .....DC-AC power converters
- .....Digital-to-frequency converters
- .....Frequency conversion
- .....Mixers
- .....Optical frequency conversion
- .....Multilevel converters
- .....Power conversion
- .....AC-AC converters
- .....AC-DC power converters
- .....DC-AC power converters
- .....DC-DC power converters
- .....Matrix converters
- .....Power conversion harmonics
- .....Voltage-source converters
- .....Pulse width modulation converters
- .....Resonant converters
- .....Static power converters
- .....Voltage-source converters
- .....Wavelength converters
- ....Current limiters
- .....Fault current limiters
- ....Gate drivers
- ....Inverters
- .....Multilevel inverters



- .....Pulse inverters
- .....Resonant inverters
- .....Voltage source inverters
- ....Phase control
- ....Power conditioning
- .....Power smoothing
- ....Power semiconductor devices
- .....Power transistors
- ....Power semiconductor switches
- .....Bipolar transistors
- .....Insulated gate bipolar transistors
- .....Kirk field collapse effect
- .....Thyristors
- .....Photothyristors
- ....Snubbers
- ....Three-phase electric power

### **Power engineering and energy**

- ....Electric variables control
- .....Current control
- .....Electric current control
- .....Electrical ballasts
- .....Gain control
- .....Power control
- .....Power system control
- .....Bidirectional power flow
- .....Load flow control
- .....SCADA systems
- .....Reactive power control
- .....Voltage control
- .....Automatic voltage control
- ....Energy
- .....Energy barrier
- .....Energy capture
- .....Energy consumption
- .....Energy conversion
- .....Atomic batteries
- .....Batteries
- .....Fuel cells
- .....Motors
- .....Photovoltaic cells
- .....Potential well
- .....Solar heating
- .....Thermoelectricity
- .....Waste heat
- .....Wave energy conversion
- .....Wind energy conversion
- .....Energy dissipation
- .....Energy exchange
- .....Inductive charging

- .....Energy harvesting
- .....Nanogenerators
- .....Energy management
- .....Demand side management
- .....Energy conservation
- .....Energy efficiency
- .....Energy informatics
- .....Energy management systems
- .....Load management
- .....Transactive energy
- .....Energy resources
- .....Fuels
- .....Geothermal energy
- .....Nuclear fuels
- .....Solar energy
- .....Wave power
- .....Wind energy
- .....Wind farms
- .....Energy states
- .....Band structures
- .....Effective mass
- .....Fermi level
- .....Orbital calculations
- .....Polaritons
- .....Quasi-Fermi level
- .....Surface states
- .....Energy storage
- .....Batteries
- .....Flywheels
- .....Fuel cells
- .....Hydrogen storage
- .....Supercapacitors
- .....Superconducting magnetic energy storage
- ....Power engineering
- .....Ferroresonance
- .....High-voltage techniques
- .....Power engineering computing
- .....Power system simulation
- ....Power generation
- .....Automatic generation control
- .....Cogeneration
- .....Distributed power generation
- .....Virtual power plants
- .....Geothermal power generation
- .....Hydroelectric power generation
- .....Hydroelectric-thermal power generation
- .....Microhydro power
- .....Picohydro power
- .....Wave energy conversion



.....Magnetohydrodynamic power generation	.....Traction power supplies
.....Nuclear power generation	.....Umbilical cable
.....Atomic batteries	.....Power system analysis computing
.....Fission reactors	.....Power system dynamics
.....Fusion power generation	.....Power system economics
.....Power generation control	.....Low-carbon economy
.....Power generation dispatch	.....Power system faults
.....Power generation planning	.....Power system harmonics
.....Power generation reliability	.....Power harmonic filters
.....Solar power generation	.....Power system management
.....Maximum power point trackers	.....Load flow
.....Photovoltaic systems	.....Power system measurements
.....Solar panels	.....Meter reading
.....Trigeneration	.....Power system planning
.....Turbomachinery	.....Power demand
.....Turbines	.....Power distribution planning
.....Turbogenerators	.....Power system protection
.....Wind energy generation	.....Electrical safety
.....Wind energy integration	.....Substation protection
.....Wind power generation	.....Surge protection
.....Wind energy conversion	.....Power system reliability
....Power systems	.....Power distribution reliability
.....Data center power	.....Power system stability
.....Energy Internet	.....Power transmission
.....Hybrid power systems	.....Common Information Model (electricity)
.....Industrial power systems	.....DC power transmission
.....Power distribution	.....Flexible AC transmission systems
.....DC distribution systems	.....HVDC transmission
.....Power distribution control	.....Inductive power transmission
.....Power distribution faults	.....Static VAR compensators
.....Power distribution lines	.....Transmission lines
.....Power distribution networks	.....Wireless power transmission
.....Power distribution planning	.....PSCAD
.....Power distribution reliability	.....Pulsed power systems
.....Simultaneous wireless information and power transfer	.....Pulsed power supplies
.....Power grids	.....Reactive power
.....Microgrids	.....Substations
.....Smart grids	.....Substation automation
.....Power supplies	.....Substation protection
.....Battery chargers	.....Transformers
.....Charging stations	.....Baluns
.....Current supplies	.....Current transformers
.....Emergency power supplies	.....Flyback transformers
.....Inductive charging	.....High-frequency transformers
.....Islanding	.....Instrument transformers
.....Power demand	.....Phase transformers
.....Power quality	.....Power transformers
.....Power system restoration	.....Pulse transformers
.....Switched mode power supplies	.....Tap changers
	.....Uninterruptible power systems



.....Wind energy integration

## **Product safety engineering**

....Consumer protection  
 ....Power system protection  
 .....Electrical safety  
 .....Fault protection  
 .....Grounding  
 .....Substation protection  
 .....Surge protection  
 .....Arresters  
 ....Safety  
 .....Aerospace safety  
 .....Air safety  
 .....Domestic safety  
 .....Fall detection  
 .....Emergency services  
 .....Explosion protection  
 .....Fire safety  
 .....Hazards  
 .....Biohazards  
 .....Chemical hazards  
 .....Explosions  
 .....Fires  
 .....Flammability  
 .....Floods  
 .....Hazardous areas  
 .....Hazardous materials  
 .....Toxicology  
 .....Health and safety  
 .....Occupational health  
 .....Occupational safety  
 .....Personal protective equipment  
 .....Marine safety  
 .....Product safety  
 .....Protection  
 .....Electrostatic discharge protection  
 .....Explosion protection  
 .....Lightning protection  
 .....Radiation protection  
 .....Radiation safety  
 .....Radiation protection  
 .....Radiofrequency safety  
 .....Safety devices  
 .....Eye protection  
 .....Fire extinguishers  
 .....Protective clothing  
 .....Safety management  
 .....Vehicle safety

.....Advanced driver assistance systems  
 .....Lane departure warning systems  
 .....Lane detection  
 ....Vehicle crash testing

## **Professional communication**

....Collaboration  
 .....Collaborative tools  
 .....Call conference  
 .....Collaborative software  
 .....Videoconferences  
 .....Discussion forums  
 .....Teamwork  
 .....Virtual groups  
 ....Communication aids  
 .....Closed captioning  
 ....Communication effectiveness  
 ....Communication symbols  
 .....Semiotics  
 .....Pragmatics  
 .....Semantics  
 .....Syntactics  
 ....Context  
 ....Databases  
 .....Database systems  
 .....Audio databases  
 .....Deductive databases  
 .....Image databases  
 .....Indexes  
 .....Multimedia databases  
 .....NoSQL databases  
 .....Object oriented databases  
 .....Query processing  
 .....Sharding  
 .....Deductive databases  
 .....Distributed databases  
 .....Blockchains  
 .....Image databases  
 .....Image retrieval  
 .....Multimedia databases  
 .....Object oriented databases  
 .....Relational databases  
 .....Spatial databases  
 .....Transaction databases  
 .....Itemsets  
 .....Visual databases  
 .....Point cloud compression  
 ....Global communication  
 .....Cross-cultural communication





.....Geographic information systems	.....Document delivery
.....Geospatial analysis	.....Encyclopedias
.....Gunshot detection systems	.....Libraries
....Grammar	.....Software libraries
....Information analysis	.....Teletext
.....Decision analysis	.....Videotex
.....Indexing	....Information systems
....Information integrity	.....Data systems
....Information resources	.....Buffer storage
....Information retrieval	.....Data acquisition
.....Blogs	.....Data centers
.....Content-based retrieval	.....Data compression
.....Dimensionality reduction	.....Data conversion
.....Manifold learning	.....Data engineering
.....Hypertext systems	.....Data handling
.....Information filtering	.....Data processing
.....Information filters	.....Data warehouses
.....Recommender systems	.....Database systems
.....Information rates	.....Audio databases
.....Music information retrieval	.....Deductive databases
.....Online services	.....Image databases
.....Mobility as a service	.....Indexes
.....Online banking	.....Multimedia databases
.....Search engines	.....NoSQL databases
.....Search methods	.....Object oriented databases
.....Keyword search	.....Query processing
.....Metasearch	.....Sharding
.....Search problems	.....Distributed information systems
.....Semantic search	.....Distributed management
.....Web search	.....Publish-subscribe
.....Social networking (online)	.....Identity management systems
.....Community networks	.....Federated identity
.....Computer mediated communication	.....Informatics
.....Cyberbullying	.....Bioinformatics
.....Second Life	.....Cognitive informatics
.....Tagging	.....Energy informatics
.....Tag clouds	.....Neuroinformatics
.....Taxonomy	.....Information architecture
.....Terminology	.....Enterprise architecture
.....Dictionaries	management
.....Visual information retrieval	.....Information management
.....Vocabulary	.....Common Information Model
.....Web sites	(computing)
.....Uniform resource locators	.....Common Information Model
.....Web design	(electricity)
....Information science	.....Competitive intelligence
.....Quantum information science	.....Digital preservation
.....Quantum channels	.....Document handling
.....Quantum circuit	.....Enterprise architecture
....Information services	management
.....Dictionaries	.....Information security



- .....Information sharing
- .....Knowledge transfer
- .....Information processing
- .....Electronic healthcare
- .....Informatics
- .....Information exchange
- .....Smart agriculture
- .....Sonification
- .....Management information systems
- .....Portals
- .....Medical information systems
- .....Electronic medical records
- ....Information technology
- .....Bring your own device
- .....Information age
- .....Information and communication technology
- .....Ambient assisted living
- .....Information representation
- .....Digital representation
- .....Printing
- .....Digital printing
- .....Ink jet printing
- .....Teleprinting
- .....Three-dimensional printing
- .....Semantic technology
- .....Service computing
- .....Service level agreements
- .....Telematics
- .....Universal Serial Bus
- ....Manuals
- ....Meetings
- .....Conferences
- ....Oral communication
- .....Public speaking
- .....Speech
- .....Hate speech
- ....Plagiarism
- ....Portfolios
- ....Professional societies
- ....Public speaking
- ....Rhetoric
- ....Writing
- .....Abstracts
- .....Bibliographies
- .....Biographies
- .....Autobiographies
- .....Braille
- .....Dictionaries
- .....Documentation
- .....Point of care

- .....Grammar
- .....Readability metrics
- .....Resumes
- .....Reviews
- .....Thesauri

## Reliability

- ....Availability
- ....Fault diagnosis
- .....Dissolved gas analysis
- .....Fault location
- ....Fault tolerance
- .....Fault tolerant computer networks
- .....Fault tolerant computing
- .....Fault tolerant control
- .....Redundancy
- ....Fluctuations
- ....Integrated circuit reliability
- ....Maintenance
- ....Maldistribution
- ....Materials reliability
- ....Reliability engineering
- ....Reliability theory
- ....Robustness
- ....Semiconductor device reliability
- ....Software reliability
- ....Stability
- .....Circuit stability
- .....Robust stability
- .....Stability analysis
- .....Stability criteria
- .....Thermal stability
- ....Telecommunication network reliability
- .....Diversity schemes

## Resonance

- ....Ferroresonance
- ....Magnetic resonance
- .....Antiferromagnetic resonance
- .....Ferromagnetic resonance
- .....Nuclear magnetic resonance
- .....Paramagnetic resonance
- ....Resonance light scattering
- ....Stochastic resonance

## Robotics and automation

- ....Animatronics
- ....Automation



.....Automated highways	.....Intelligent robots
.....Automatic generation control	.....Manipulators
.....Automatic testing	.....End effectors
.....Automatic test pattern generation	.....Manipulator dynamics
.....Ring generators	.....Micromanipulators
.....Autonomous networks	.....Marine robots
.....Building automation	.....Medical robotics
.....Fifth Industrial Revolution	.....Assistive robots
.....Fourth Industrial Revolution	.....Military robotics
.....Intelligent automation	.....Mobile robots
.....Manufacturing automation	.....Climbing robots
.....Computer aided manufacturing	.....Legged locomotion
.....Computer integrated manufacturing	.....Orbital robotics
.....Computer numerical control	.....Parallel robots
.....Flexible manufacturing systems	.....Quadrupedal robots
.....Office automation	.....Rescue robots
.....Workflow management software	.....Robot control
.....Storage automation	.....Robot motion
.....Vehicular automation	.....Robot kinematics
....Autonomous systems	.....Motion analysis
.....Autonomous networks	.....Robot learning
.....Autonomous robots	.....Robot programming
.....Autonomous vehicles	.....Robot sensing systems
.....Autonomous aerial vehicles	.....Proprioception
.....Autonomous automobiles	.....Robot vision systems
.....Autonomous driving	.....Simultaneous localization and mapping
.....Autonomous underwater vehicles	.....Stereognosis
....Multi-robot systems	.....Tactile sensors
.....Swarm robotics	.....Service robots
....Robots	.....Assistive robots
.....Agricultural robots	.....Snake robots
.....Androids	.....Social robots
.....Aquatic robots	.....Soft robotics
.....Automata	.....Telerobotics
.....Turing machines	.....Teleoperators
.....Autonomous robots	.....Visual odometry
.....Bio-inspired robotics	.....Wearable robots
.....Cognitive robotics	
.....Computer vision	
.....Active appearance model	
.....Blob detection	
.....Corner detection	
.....Face detection	
.....Feature detection	
.....Interest point detection	
.....Smart cameras	
.....Visual odometry	
.....Educational robots	
.....Evolutionary robotics	
.....Humanoid robots	
.....Industrial robots	

### Science – general

....Astronomy  
.....Astrophysics  
.....Dark matter  
.....Orbits  
.....Stellar dynamics  
.....Extrasolar planets  
.....Exoplanet  
.....Gravitational waves  
.....Observatories  
.....Radio astronomy



.....Solar system	.....Memetics
.....Kuiper belt	.....Phylogeny
.....Planets	.....Genetics
.....Satellites	.....DNA
.....Sun	.....Epigenetics
.....Stars	.....Gene therapy
.....Neutron stars	.....Genetic communication
.....X-ray astronomy	.....Genetic expression
....Biology	.....Genetic programming
.....Biochemistry	.....Genomics
.....Amino acids	.....Optogenetics
.....Biochemical analysis	.....Homeostasis
.....Peptides	.....Mechanobiology
.....Proteins	.....Microbiology
.....Receptor (biochemistry)	.....Electroporation
.....Biodiversity	.....Virology
.....Biogeography	.....Microinjection
.....Bioelectric phenomena	.....Nanobioscience
.....Electric shock	.....DNA computing
.....Biological cells	.....Nanobiotechnology
.....Cell signaling	.....Physiology
.....Cells (biology)	.....Action potentials
.....Chromosome mapping	.....External stimuli
.....Endothelial cells	.....Neuromodulation
.....Fibroblasts	.....Somatosensory
.....RNA	.....Predator prey systems
.....Stem cells	.....Synthetic biology
.....Biological information theory	.....Systematics
.....Biological processes	.....Systems biology
.....Biological interactions	.....Vegetation
.....Chronobiology	.....Crops
.....Circadian rhythm	.....Marine vegetation
.....Coagulation	.....Zoology
.....Molecular biology	.....Animals
.....Symbiosis	.....Entomology
.....Synaptic communication	...Chemistry
.....Biological system modeling	.....Astrochemistry
.....Biological systems	.....Biochemistry
.....Anatomy	.....Amino acids
.....Molecular communication	.....Biochemical analysis
.....Organisms	.....Peptides
.....Biology computing	.....Proteins
.....Biophotonics	.....Receptor (biochemistry)
.....Biophysics	.....Biogeochemistry
.....Aerospace biophysics	.....Chemical analysis
.....Biomagnetics	.....Activation analysis
.....Cellular biophysics	.....Chemical processes
.....Molecular biophysics	.....Chemicals
.....Botany	.....Electronic noses
.....Cryobiology	.....pH measurement
.....Evolution (biology)	.....Chemical compounds



.....Anti-freeze	.....Cyclones
.....Bromine compounds	.....Hurricanes
.....Chalcogenides	.....Tropical cyclones
.....Ethanol	.....Earth
.....Methanol	.....Earthquakes
.....Radiotracer	.....Earthquake engineering
.....Electrochemistry	.....Forestry
.....Electrocatalysis	.....Geochemistry
.....Geochemistry	.....Geoengineering
.....Inorganic chemicals	.....Geography
.....Interstellar chemistry	.....Rural areas
.....Organic chemicals	.....Urban areas
.....Hydrocarbons	.....Geology
.....Photochemistry	.....Biogeochemistry
.....Photobleaching	.....Landslides
.....Photocatalysis	.....Minerals
.....Physical chemistry	.....Rocks
.....Quantum chemistry	.....Geophysics
....Electricity	.....EMTDC
.....Photoelectricity	.....Extraterrestrial phenomena
.....Photovoltaic effects	.....Geodynamics
.....Piezoelectricity	.....Geophysics computing
.....Piezoelectric effect	.....Meteorology
.....Piezoelectric polarization	.....Moisture
.....Pyroelectricity	.....Seismology
.....Thermoelectricity	.....Surface waves
.....Electrothermal effects	.....Well logging
.....Peltier effect	.....Ice
.....Thermoelectric devices	.....Ice shelf
.....Thermoelectric materials	.....Ice surface
.....Triboelectricity	.....Ice thickness
....Epidemiology	.....Sea ice
.....Epidemics	.....Lakes
.....Pandemics	.....Land surface
....Geoscience	.....Watersheds
.....Antarctica	.....Levee
.....South Pole	.....Meteorological factors
.....Arctic	.....Natural resources
.....North Pole	.....Oceanography
.....Atmosphere	.....Ocean circulation
.....Air quality	.....Ocean dynamics
.....Atmospheric modeling	.....Oceans
.....Atmospheric waves	.....Ocean salinity
.....Biosphere	.....Ocean temperature
.....Continents	.....Sea coast
.....Africa	.....Sea floor
.....Asia	.....Sea level
.....Australia	.....Sea surface
.....Europe	.....Tides
.....North America	.....Rivers
.....South America	.....Sediments



.....Soil	.....Particle beams
.....Soil moisture	.....Biophysics
.....Soil properties	.....Aerospace biophysics
.....Soil texture	.....Biomagnetics
.....Tornadoes	.....Cellular biophysics
.....Tsunami	.....Molecular biophysics
.....Volcanoes	.....Dark energy
.....Volcanic activity	.....Entropy
.....Volcanic ash	.....Fluid flow
.....Wetlands	.....Fluid dynamics
....Life sciences	.....Hydraulic diameter
....Metrology	.....Hydrology
.....Optical metrology	.....Pipelines
....Neuroscience	.....Supersonic flow
.....Clinical neuroscience	.....Valves
.....Cognitive neuroscience	.....Geophysics
.....Computational neuroscience	.....EMTDC
.....Neuroinformatics	.....Extraterrestrial phenomena
.....Neuromarketing	.....Geodynamics
.....Neuroprostheses	.....Geophysics computing
.....Systems neuroscience	.....Meteorology
.....Transcranial direct current stimulation	.....Moisture
.....Transcranial magnetic stimulation	.....Seismology
....Physics	.....Surface waves
.....Acoustics	.....Well logging
.....Acoustic applications	.....High energy physics
.....Acoustic devices	.....Kinetic theory
.....Acoustic emission	.....Kinetic energy
.....Acoustic field	.....Levitation
.....Acoustic noise	.....Electrostatic levitation
.....Acoustic phonetics	.....Magnetic levitation
.....Acoustic propagation	.....Lorentz covariance
.....Acoustic pulses	.....Mechanical factors
.....Acoustic waves	.....Aerodynamics
.....Acoustooptic effects	.....Bending
.....Biomedical acoustics	.....Biomechanics
.....Cepstral analysis	.....Damping
.....Nonlinear acoustics	.....Deformation
.....Psychoacoustics	.....Dynamics
.....Reverberation	.....Fatigue
.....Spectral shape	.....Force
.....Underwater acoustics	.....Friction
.....Astrophysics	.....Hydrodynamics
.....Dark matter	.....Kinematics
.....Orbits	.....Lubrication
.....Stellar dynamics	.....Magnetohydrodynamics
.....Beams	.....Photoelasticity
.....Acoustic beams	.....Pressure effects
.....Laser beams	.....Shock (mechanics)
.....Molecular beams	.....Strain
.....Optical beams	.....Stress





.....Surface cracks  
 .....Surface stress  
 .....Torque  
 .....Vibrations  
 .....Volume relaxation  
 .....Workability  
 .....Network theory (graphs)  
 .....Physics education  
 .....Quantum mechanics  
 .....Coherence time  
 .....Density functional theory  
 .....Proton effects  
 .....Quantum capacitance  
 .....Quantum cryptography  
 .....Quantum decoherence  
 .....Quantum entanglement  
 .....Quantum information science  
 .....Quantum key distribution  
 .....Quantum optics  
 .....Quantum sensing  
 .....Quantum simulation  
 .....Quantum state  
 .....Quantum system  
 .....Relativistic quantum mechanics  
 .....Schrodinger equation  
 .....Stationary state  
 .....Teleportation  
 .....Tunneling  
 .....Rydberg atoms  
 .....Solid-state physics  
 .....String theory  
 .....Thermal factors  
 .....Temperature  
 .....Temperature dependence  
 .....Thermal conductivity  
 .....Thermal expansion  
 .....Thermal management  
 .....Thermal stresses  
 .....Thermoelasticity  
 .....Thermoelectricity  
 .....Thermolysis  
 .....Thermooptic effects  
 .....Thermoresistivity  
 .....Waves  
 .....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  
 ....Social sciences  
 .....Anthropology  
 .....Behavioral sciences  
 .....Animal behavior  
 .....Cognition  
 .....Consumer behavior  
 .....Psychiatry  
 .....Psychology  
 .....Social intelligence  
 .....Psychology  
 .....Active perception  
 .....Emotional responses  
 .....Industrial psychology  
 .....Mental health  
 .....Mood  
 .....Neuropsychology  
 .....Psychometric testing  
 .....Sociology  
 .....Digital divide  
 .....Social groups  
 .....Social intelligence  
 ....Thermodynamics  
 .....Adiabatic processes  
 .....Enthalpy  
 .....Fermi level  
 .....Isobaric processes  
 .....Isothermal processes  
 .....Quasi-Fermi level

### Sensors

....Acoustic sensors  
 ....Chemical and biological sensors  
 .....Biosensors  
 .....Gas detectors  
 .....Amperometric sensors  
 ....Electromechanical sensors  
 .....Microsensors  
 ....Force sensors  
 ....Glucose sensors  
 ....Inertial sensors  
 ....Infrared sensors  
 ....Intelligent sensors  
 ....Intracranial pressure sensors



- ....Ionizing radiation sensors
- .....Position sensitive particle detectors
- .....Radiation detectors
- .....Bolometers
- .....Gamma-ray detectors
- .....Infrared detectors
- .....Photodetectors
- .....Semiconductor radiation detectors
- .....Silicon radiation detectors
- .....X-ray detectors
- ....Magnetic sensors
- ....Spin valves
- ....Mechanical sensors
- .....Capacitive sensors
- ....Multimodal sensors
- ....Nanosensors
- ....Optical sensors
- .....Optical detectors
- .....Bar codes
- .....Optical fiber sensors
- ....Optoelectronic and photonic sensors
- ....Pressure sensors
- ....Quantum sensing
- ....Sensor phenomena and characterization
- ....Sensor placement
- ....Sensor systems and applications
- .....Detectors
- .....Envelope detectors
- .....Semiconductor detectors
- .....Electric sensing devices
- .....Leak detection
- .....Radiofrequency identification
- .....RFID tags
- .....Robot sensing systems
- .....Proprioception
- .....Robot vision systems
- .....Simultaneous localization and mapping
- .....Stereognosis
- .....Tactile sensors
- .....Sensor arrays
- .....Sensor fusion
- .....Sensor systems
- .....Activity recognition
- .....Gunshot detection systems
- ....Soft sensors
- ....Thermal sensors
- .....Electrothermal actuators
- .....Temperature sensors
- .....Thermocouples
- .....Thermometers

- ....Thick film sensors
- ....Thin film sensors
- ....Vision sensors
- ....Wearable sensors

### Signal processing

- ....Acoustic signal processing
- .....Active noise reduction
- .....Echo cancellers
- .....Speech processing
- .....Human voice
- .....Speech enhancement
- .....Speech synthesis
- .....Voice activity detection
- ....Adaptive signal processing
- .....Adaptive filters
- .....Adaptive signal detection
- ....Amplifiers
- .....Broadband amplifiers
- .....Differential amplifiers
- .....Distributed amplifiers
- .....Low-noise amplifiers
- .....Operational amplifiers
- .....Feedback amplifiers
- .....Power amplifiers
- .....High power amplifiers
- .....Predistortion
- .....Preamplifiers
- .....Pulse amplifiers
- .....Radiofrequency amplifiers
- .....Resonators
- .....Cavity resonators
- .....Split ring resonators
- ....Array signal processing
- ....Attenuators
- .....Optical attenuators
- ....Chirp
- ....Convolution
- .....Convolver
- ....Decorrelation
- ....Digital signal processing
- .....Delta modulation
- .....Delta-sigma modulation
- .....Sigma-delta modulation
- .....Digital signal processing chips
- ....Dispersion
- .....Chromatic dispersion
- .....Optical fiber dispersion
- ....Distortion
- .....Acoustic distortion



.....Four-wave mixing	.....Amplitude modulation
.....Jitter	.....Amplitude shift keying
.....Timing jitter	.....Quadrature amplitude modulation
.....Nonlinear distortion	.....Chirp modulation
.....Harmonic distortion	.....Demodulation
.....Intermodulation distortion	.....Digital modulation
.....Phase distortion	.....Constellation diagram
....Error correction	.....Partial response signaling
.....Forward error correction	.....Frequency modulation
....Fading channels	.....Frequency shift keying
.....Frequency-selective fading channels	.....Magnetic modulators
.....Rayleigh channels	.....Modulation coding
.....Weibull fading channels	.....Interleaved codes
....Filters	.....Optical modulation
.....Active filters	.....Cross-phase modulation
.....Band-pass filters	.....Intensity modulation
.....Anisotropic	.....Optical modulators
.....Bragg gratings	.....Electro-absorption modulators
.....Fiber gratings	.....Electro-optic modulators
.....Channel bank filters	.....Phase modulation
.....Comb filters	.....Continuous phase modulation
.....Digital filters	.....Cross-phase modulation
.....Finite impulse response filters	.....Differential phase shift keying
.....Equalizers	.....Phase shift keying
.....Adaptive equalizers	.....Pulse modulation
.....Blind equalizers	.....Pulse width modulation
.....Decision feedback equalizers	.....Pulse width modulation inverters
.....Filtering theory	.....Space vector pulse width modulation
.....Collaborative filtering	....Multidimensional signal processing
.....Image filtering	.....Video signal processing
.....Gabor filters	.....Motion artifacts
.....Harmonic filters	.....Text detection
.....IIR filters	.....Video coding
.....Kalman filters	.....Video compression
.....Low-pass filters	....Noise
.....Matched filters	.....1/f noise
.....Microstrip filters	.....Additive noise
.....Nonlinear filters	.....Additive white noise
.....Notch filters	.....AWGN
.....Particle filters	.....Colored noise
.....Power filters	.....Gaussian noise
.....Spurline	.....AWGN
.....Resonator filters	.....Laser noise
.....Spatial filters	.....Laser feedback
.....Superconducting filters	.....Low-frequency noise
.....Transversal filters	.....Noise cancellation
....Frequency locked loops	.....Phase noise
....Geophysical signal processing	.....Signal to noise ratio
....Limiting	.....PSNR
....Local field potentials	.....Superconducting device noise
....Modulation	



- .....White noise
- .....AWGN
- ....Optical signal processing
- .....Laser noise
- .....Laser feedback
- ....Optical wavelength conversion
- ....Phase locked loops
- ....Pulse compression methods
- .....Optical pulse compression
- ....Pulse shaping methods
- .....Optical pulse shaping
- ....Quantization (signal)
- .....Vector quantization
- ....Radar signal processing
- ....Received signal strength indicator
- ....Recording
- .....Audio recording
- .....Digital recording
- .....Disk recording
- .....Flight recording
- .....Magnetic recording
- .....Digital magnetic recording
- .....Heat-assisted magnetic recording
- .....Magnetic noise
- .....Magneto optic recording
- .....Microwave-assisted magnetic recording
- .....Perpendicular magnetic recording
- .....Shingled magnetic recording
- .....Optical recording
- .....CD recording
- .....Video recording
- .....High definition video
- .....Videos
- .....Webcams
- ....RF signals
- ....Signal analysis
- .....Discrete-event systems
- .....Harmonic analysis
- .....Parameter estimation
- .....Amplitude estimation
- .....Direction-of-arrival estimation
- .....Frequency estimation
- .....Motion estimation
- .....Phase estimation
- .....Time of arrival estimation
- .....Signal mapping
- .....Sound recognition
- .....Spectral analysis
- .....Infrared spectra
- .....Judd-Ofelt theory

- .....Spectroradiometers
- ....Signal design
- ....Signal detection
- .....Acoustic signal detection
- .....Sonar detection
- .....Motion detection
- .....Odometry
- .....Multiuser detection
- .....Optical signal detection
- .....Phase detection
- .....Phase frequency detectors
- .....Radar detection
- ....Signal generators
- .....Noise generators
- .....Pulse generation
- .....Optical pulse generation
- ....Signal integrity
- ....Signal reconstruction
- .....Signal denoising
- ....Signal resolution
- .....Diversity reception
- ....Signal restoration
- ....Signal sampling
- ....Signal synthesis
- ....Source separation
- .....Blind source separation
- ....Spectrogram
- ....Tracking loops

### Social implications of technology

- ....Cultural aspects
- .....Cultural differences
- ....Cultural differences
- ....Environmental factors
- .....Biosphere
- .....Climate change
- .....Global warming
- .....Ecology
- .....Ecosystems
- .....Wetlands
- .....Environmental economics
- .....Carbon tax
- .....Emissions trading
- .....Environmental monitoring
- .....Global warming
- .....Green manufacturing
- .....Green products
- .....Green buildings
- .....Green cleaning
- .....Green transportation



- .....Pollution
- .....Air pollution
- .....Emissions trading
- .....Industrial pollution
- .....Land pollution
- .....Oil pollution
- .....Radioactive pollution
- .....Thermal pollution
- .....Urban pollution
- .....Water pollution
- ....Ethical aspects
- ....Ethics
- .....Cyberethics
- .....Machine ethics
- ....Globalization
- ....International relations
- ....Peace technology
- ....Philosophical considerations
- ....Social factors
- .....Demography
- .....Developing countries
- .....Technology social factors
- .....Privacy
- ....Sustainable development
- ....Technology
- .....Appropriate technology
- .....Disruptive technologies
- .....Machine ethics
- .....Neurotechnology
- .....Technological innovation
- .....Technology social factors
- .....Privacy
- .....Technology transfer
- .....Small business technology transfer
- .....Telepresence
- .....Telexistence

### **Solid state circuits**

- ....Circuit subsystems
- ....Circuit theory
- .....Inductive coupling
- ....FET circuits
- .....FET integrated circuits
- .....Field effect MMIC
- .....MESFET integrated circuits
- .....JFET circuits
- .....JFET integrated circuits
- .....MESFET circuits
- .....MESFET integrated circuits
- .....MODFET circuits

- .....MOSFET circuits
- .....CMOSFET circuits
- .....MOS integrated circuits
- .....Power MOSFET
- ....Gate leakage
- ....Solid state circuit design
- ....Transistors
- .....Field effect transistors
- .....CNTFETs
- .....Double-gate FETs
- .....FeFETs
- .....HEMTs
- .....JFETs
- .....MESFETs
- .....MISFETs
- .....MODFETs
- .....MOSFET
- .....MOSHFETs
- .....OFETs
- .....Schottky gate field effect transistors
- .....TFETs
- .....Thin film transistors
- .....Heterojunction bipolar transistors
- .....Double heterojunction bipolar transistors
- .....Millimeter wave transistors
- .....Phototransistors
- .....Static induction transistors

### **Superconductivity**

- ....Bean model
- ....Critical current density
- ....Flux pinning
- ....Superconducting devices
- .....Josephson junctions
- .....SQUIDs
- .....Superconducting coils
- .....Superconducting magnets
- .....Superconducting microwave devices
- .....Superconducting photodetectors
- ....Superconducting films
- .....Superconducting thin films
- ....Superconducting integrated circuits
- ....Superconducting magnetic energy storage
- ....Superconducting materials
- .....Granular superconductors
- .....High-temperature superconductors
- .....Yttrium barium copper oxide
- .....Multifilamentary superconductors



- .....Niobium-tin
- .....Superconducting filaments
- .....Superconducting wires
- .....Multifilamentary superconductors
- .....Type II superconductors
- ....Superconducting transition temperature
- ....Superconductive tunneling

### **Systems engineering and theory**

- ....Adaptive systems
- .....Adaptive control
- .....Cognitive radar
- .....Line enhancers
- .....Multi-agent systems
- .....Collaborative intelligence
- .....Variable structure systems
- ....Capability engineering
- ....Complex systems
- ....Configuration management
- ....Failure state
- ....Hierarchical systems
- .....Multilevel systems
- ....Integrated design
- ....Interface management
- ....Military systems
- .....Military control
- .....Military robotics
- ....Modeling
- .....Analytical models
- .....Common Information Model (computing)
- .....Atmospheric modeling
- .....Brain modeling
- .....Building information management
- .....Computational modeling
- .....Agent-based modeling
- .....Computational cultural modeling
- .....Computational materials science
- .....Reversible computing
- .....Context modeling
- .....Data models
- .....Data-driven modeling
- .....Metadata
- .....Data-driven modeling
- .....Deformable models
- .....Digital elevation models
- .....Emulation
- .....Graphical models
- .....Green's function methods
- .....Hidden Markov models

- .....Input variables
- .....Integrated circuit modeling
- .....Cutoff frequency
- .....Inverse problems
- .....Deconvolution
- .....Load modeling
- .....Mathematical models
- .....Geometric modeling
- .....Mathematical analysis
- .....Metamodeling
- .....Mobility models
- .....Numerical models
- .....Object oriented modeling
- .....Power system modeling
- .....Load modeling
- .....Process modeling
- .....Semiconductor device modeling
- .....Semiconductor process modeling
- .....Signal representation
- .....Simulation
- .....Computer simulation
- .....Digital simulation
- .....Hardware-in-the-loop simulation
- .....Human in the loop
- .....Medical simulation
- .....Mixed reality
- .....Quantum simulation
- .....Serious games
- .....Systems simulation
- .....Solid modeling
- .....Space mapping
- .....System identification
- .....Systems modeling
- .....Threat modeling
- ....Multidimensional systems
- ....Network systems
- .....Autonomous networks
- .....DC distribution systems
- ....Physical design
- ....Reduced order systems
- ....Requirements engineering
- .....Technical requirements
- ....Requirements management
- ....Service-oriented systems engineering
- .....Solution design
- .....Stochastic systems
- ....System analysis and design
- .....Asymptotic stability
- .....Closed box
- .....Control system analysis
- .....State-space methods





- .....Diakoptics
- .....Distributed processing
- .....Dew computing
- .....Edge computing
- .....Message passing
- .....Sharding
- .....Distributed vision networks
- .....Fault detection
- .....Fault tolerant systems
- .....Glass box
- .....Interconnected systems
- .....Botnet
- .....Large-scale systems
- .....Lyapunov methods
- .....Open systems
- .....Open Access
- .....Open Educational Resources
- .....Physical layer
- .....Petri nets
- .....Physical design
- .....Robust control
- .....Scalability
- .....Scattering parameters
- .....Sequential analysis
- .....Zero correlation zone
- .....Sequential diagnosis
- .....Software prototyping
- .....Static analysis
- .....System dynamics
- .....System performance
- .....Cooperative caching
- .....System-level design
- .....Systems modeling
- .....Threat modeling
- .....Systems Modeling Language
- .....Task analysis
- .....Time factors
- .....Continuous time systems
- .....Discrete-time systems
- .....Time invariant systems
- .....Time-varying systems
- ....System implementation
- ....System improvement
- ....System integration
- ....System of systems
- .....Cyber-physical systems
- .....Digital twins
- ....System realization
- ....System validation
- ....System testing
- .....Model checking

- ....System verification
- .....System testing
- .....Model checking
- ....Systems architecture
- .....Deep architecture
- .....Deep learning
- ....Systems engineering education
- ....Systems operation
- ....Systems simulation
- ....Systems support
- ....Systems thinking
- ....Task analysis
- ....Technical management
- .....Maintenance management
- .....Technical planning

### **Systems, man, and cybernetics**

- ....Behavioral sciences
- .....Animal behavior
- .....Cognition
- .....Activity recognition
- .....Cognitive load
- .....Cognitive neuroscience
- .....Cognitive processes
- .....Commonsense reasoning
- .....Metacognition
- .....Self-aware
- .....Consumer behavior
- .....Neuromarketing
- .....Self-service
- .....Psychiatry
- .....Mental disorders
- .....Psychology
- .....Active perception
- .....Emotional responses
- .....Industrial psychology
- .....Mental health
- .....Mood
- .....Neuropsychology
- .....Psychometric testing
- .....Social intelligence
- ....Biological control systems
- .....Biomarkers
- .....Molecular biomarkers
- ....Computational linguistics
- .....Machine translation
- .....Sentiment analysis
- ....Cybernetics
- .....Adaptive systems
- .....Adaptive control



.....Cognitive radar	.....Forgery
.....Line enhancers	.....Speaker recognition
.....Multi-agent systems	.....Speech recognition
.....Variable structure systems	.....Automatic speech recognition
.....Cognitive informatics	.....Personal voice assistants
.....Cognitive science	.....Speech analysis
.....Human intelligence	....Man-machine systems
.....Problem-solving	.....Digital intelligence
.....Control theory	.....Extended reality
.....Control nonlinearities	.....Interactive systems
.....Iterative learning control	.....External stimuli
.....Observability	....Pervasive computing
.....Decision theory	.....Ubiquitous computing
.....Decision trees	.....Context-aware services
.....TOPSIS	.....Wearable computers
.....Econophysics	.....Smart glasses
.....Emergent phenomena	.....Wearable antennas
.....Intelligent control	.....Wearable Health Monitoring
.....Feedforward systems	Systems
.....Neurocontrollers	....Posthuman
.....Linear feedback control systems	....Remote working
.....Frequency locked loops	....Transhuman
.....Phase locked loops	....User interfaces
.....State feedback	.....Audio user interfaces
.....Tracking loops	.....Brain-computer interfaces
....Ergonomics	.....Data visualization
.....Job design	.....Graph drawing
.....Smart spaces	.....Heat maps
.....User experience	.....Isosurfaces
.....Cyberbullying	.....Emotion recognition
....Human factors	.....Exoskeletons
.....Anthropomorphism	.....Graphical user interfaces
.....Human augmentation	.....Avatars
.....Human image synthesis	.....Human computer interaction
.....Human intelligence	.....Affective computing
.....Digital intelligence	.....Chatbots
.....Hyper-intelligence	.....Extended reality
.....Mental health	.....Gaze tracking
.....Pedestrians	.....Head-mounted displays
.....Technology acceptance model	.....Head-up displays
....Identification of persons	.....Human in the loop
.....Biometrics (access control)	.....Immersive experience
.....Face recognition	.....Telepresence
.....Fingerprint recognition	.....Telexistence
.....Gait recognition	.....Human-robot interaction
.....Iris recognition	.....Social robots
.....Keystroke dynamics	.....Human-vehicle systems
.....Palmprint recognition	.....Smart cards
.....Face recognition	
.....Fingerprint recognition	
.....Handwriting recognition	



**Ultrasonics, ferroelectrics, and frequency control**

- ....Ferroelectric materials
- .....Ferroelectric films
- .....Relaxor ferroelectrics
- ....Frequency control
- .....Automatic frequency control
- .....Tunable circuits and devices
- .....RLC circuits
- .....Tuned circuits
- .....Tuning
- .....Laser tuning
- .....Optical tuning
- .....Tuners
- ....Piezoelectricity
- .....Piezoelectric effect
- .....Piezoelectric polarization
- ....Pyroelectricity
- ....Ultrasonic imaging
- .....Ultrasonography
- .....Sonogram
- ....Ultrasonic transducers

**Vehicular and wireless technologies**

- ....Automotive engineering
- .....Automotive applications
- .....Automotive control
- .....Automotive electronics
- .....Power steering
- .....Vehicle crash testing
- .....Vehicle detection
- .....License plate recognition
- .....Vehicle driving
- .....Autonomous driving
- .....Vehicle dynamics
- .....Rollover
- .....Vehicle safety
- .....Advanced driver assistance systems
- .....Lane departure warning systems
- .....Lane detection
- ....Land mobile radio equipment
- .....Mobile antennas
- ....Navigation
- .....Aircraft navigation
- .....Course correction
- .....Dead reckoning
- .....Indoor navigation
- .....Inertial navigation

- .....Marine navigation
- .....Radio navigation
- .....Satellite navigation systems
- .....Global navigation satellite system
- .....Global Positioning System
- .....Satellite constellations
- .....Sonar navigation
- ....Propulsion
- .....Aerospace propulsion
- .....Aircraft propulsion
- .....Propellers
- .....Electromagnetic launching
- .....Coilguns
- .....Railguns
- .....Electrothermal launching
- .....Rockets
- ....Vehicles
- .....Connected vehicles
- .....Hydrogen powered vehicles
- .....Hypersonic vehicles
- .....Intelligent vehicles
- .....Autonomous vehicles
- .....Vehicle-to-everything
- .....Internet of Vehicles
- .....Land vehicles
- .....Bicycles
- .....Electric vehicles
- .....Road vehicles
- .....Military vehicles
- .....Remotely guided vehicles
- .....Drones
- .....Remotely guided underwater vehicles
- .....Remotely piloted aircraft
- .....Space vehicles
- .....Space shuttles
- ....Wireless sensor networks
- .....Body sensor networks
- .....Event detection.....Optical propagation
- .....Optical surface waves
- .....Optical waveguides
- .....Propagation constant
- .....Propagation losses
- .....Radio propagation
- .....Radiowave propagation
- .....Submillimeter wave propagation
- .....UHF propagation
- ....Radio astronomy



Broadcast technology

- ....Broadcasting
  - .....Digital audio broadcasting
  - .....Digital audio players
  - .....Digital Radio Mondiale
  - .....Digital multimedia broadcasting
  - .....Digital video broadcasting
  - .....Radio broadcasting
  - .....Frequency modulation
  - .....Radio networks
  - .....Satellite broadcasting
  - .....TV broadcasting
  - .....Web TV

Circuits and systems

- ....Circuits
  - .....Active circuits
  - .....Active inductors
  - .....Gyrators
  - .....Operational amplifiers
  - .....Adders
  - .....Analog circuits
  - .....Analog integrated circuits
  - .....Analog processing circuits

