

1979 - 1996

Core words

algorithm
problem
dynamic
linear
time
equation
technique
presented

1979-1981 topic 4

programming
optimization
solving
mathematical
computational
cost

1982-1984 topic 1

property
computation
complexity
polynomial
simple
search type
transformation

1985-1987 topic 4

dimensional
class
image
object

1988-1990 topic 4

force
manipulator
motion
joint
path
vertex
sensor
robot
degree trajectory

1991-1993 topic 7

etx
filter
design

1994-1996 topic 7

modeling
measure
measurement
statistical
distribution
response

1979 - 1996

Core words

dynamic time
linear state
problem
equation
algorithm
control
presented

1979-1981 topic 4

decision
program
programming
cost
computational
optimization
mathematical

1982-1984 topic 9

approximation
theory
heuristic
computer
stochastic
finite
application

1985-1987 topic 4

image
class
object
dimensional

1988-1990 topic 4

manipulator
path
degree joint sensor
robot
motion vertex trajectory
force

1991-1993 topic 7

filter
etx
design

1994-1996 topic 7

statistical
modeling
measurement
response
measure

1979 - 1996

Core words

A circular word cloud diagram centered on the word "software". The word "software" is in large green font. Surrounding it are other words in various colors: "development" (green), "application" (light blue), "interface" (light blue), "support" (light blue), "user" (purple), "tool" (purple), "computer" (teal), "design" (green), and "environment" (light blue). Smaller words like "requirement" and "process" are also visible at the bottom.

1979-1981 topic 12

complex machine
processing controller
display
function processor
performance
operation reliability

1982-1984 topic 2

describes
high
operating

1985-1987 topic 17

ada product
module
package

1988-1990 topic 9

provide area expert
network
service computing
future cost
quality issue

1991-1993 topic 15

methodology
concept
problem
description

1994-1996 topic 1

distributed database
class framework
protocol
retrieval
mechanism
net query

1979 - 1996

Core words

computer
environment
tool user
design
development
process
developed
software
application
interface

1979-1981 topic 12

operation
architecture
processing
complex
controller
machine
display
reliability
function processor

1982-1984 topic 2

describes
high
operating

1985-1987 topic 17

module
ada

1988-1990 topic 9

expert
area
network
service
cost
provide
future

1991-1993 topic 15

oriented
concept
object
structure
problem
description

1994-1996 topic 5

platform
workstation
library
virtual
laboratory
report
work
parallel
version

1979 - 1993

Core words

function error input
frequency
digital power
signal high
performance output phase
time filter
noise

1979-1981 topic 15

test condition flow design
stability estimate
control source load feedback
measure measured

1982-1984 topic 6

case ratio quality interference

1985-1987 topic 18

voltage current cmos component
clock circuit gate switch operation

1988-1990 topic 15

processing simulation receiver transmission
receiver scheme block

1991-1993 topic 16

detection transform sample distribution
correlation spectral

1979 - 2017

Core words

group
education
university
school
student
material
computer
year science

1979-1981 topic 16
resource computing application
medical area department
field center health
service national cost
engineering office state analysis
future industry

1994-1996 topic 2
topic process business text
level reader chapter
process basic topic
business english introduction

2009-2011 topic 14
classroom compound
learner atom ring
child music
ability college title

1982-1984 topic 16
organization document
service
user national
center resource field
communication department
area report planning
technical standard medical

1997-1999 topic 9
reader reference chapter
basic topic
english introduction

2012-2014 topic 1
design english
test
child learner

1985-1987 topic 13
service
survey people
collection area
computing public
file field scientific
national

2000-2002 topic 13
business community
quality issue
social organization
process communication

2015-2017 topic 18
difference grade
higher level high
test strategy academic
participant assessment
classroom ability score feedback

1988-1990 topic 13
good text source list
answer topic
reference report
read collection publication
chapter
people reader

2003-2005 topic 16
process
quality concept
organization resource
knowledge product
problem
design issue
business

1991-1993 topic 13
problem
report technical
issue document
test

2006-2008 topic 5
knowledge
learner
game strategy
problem theory

1979 - 2011

Core words

article
technology
science
computer
development
library work
university year

1979-1981 topic 16
center medical resource
application engineering health
analysis planning department
area field state
national computing cost office
service future industry

1982-1984 topic 16
center user medical field
resource national area
author standard service
communication report document department

1985-1987 topic 13
national public service
educational computing area
medical people field
scientific file survey

1988-1990 topic 13
people good collection
subject source list read
chapter text reader
language publication
report topic reference answer

1991-1993 topic 13
report document
problem test
subject technical

1994-1996 topic 2
experience language
level author skill
educational subject
topic

1997-1999 topic 9
english skill educational
language basic reference
chapter topic reader
author introduction

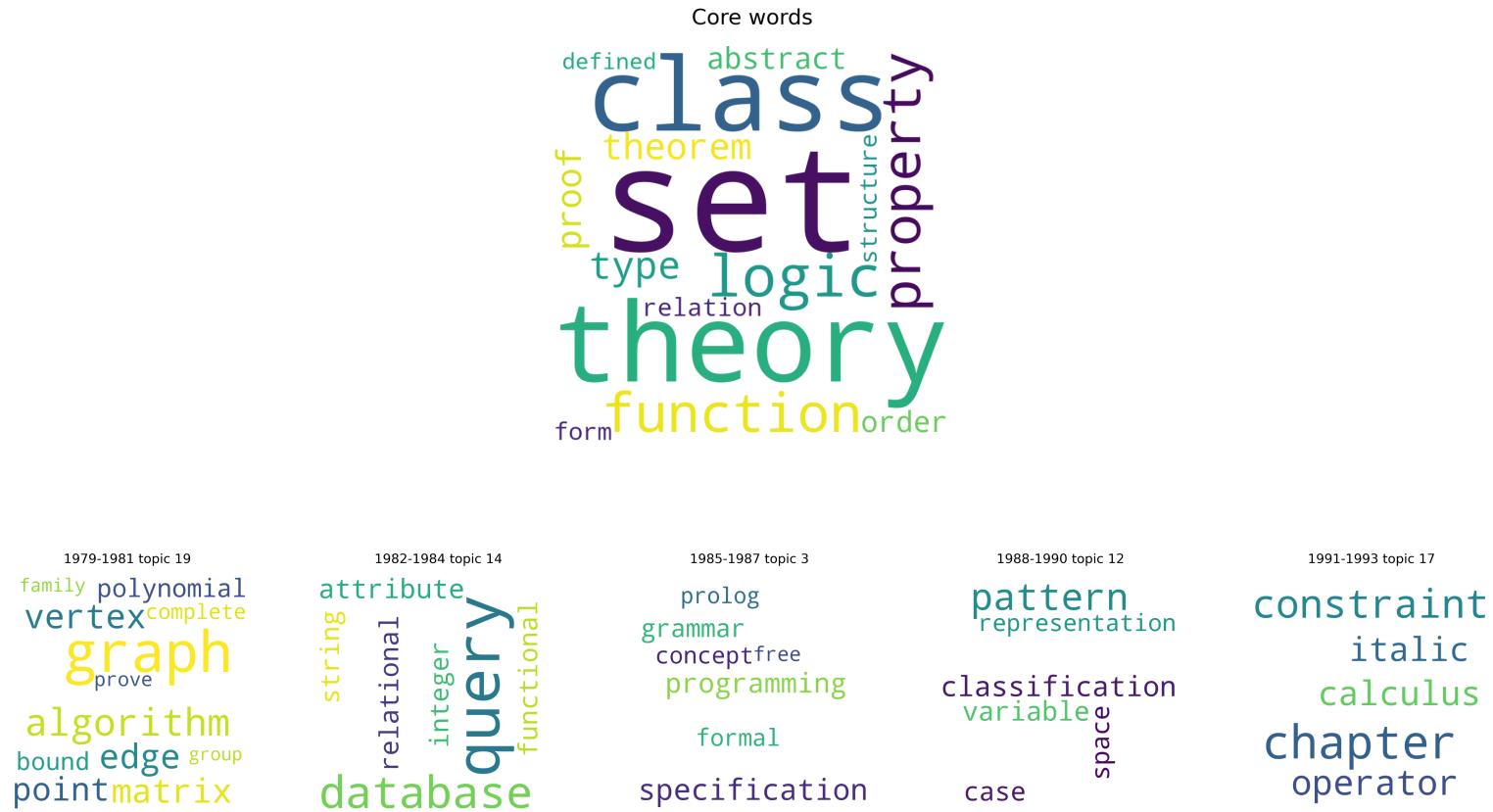
2000-2002 topic 13
experience quality
activity community
social communication
skill

2003-2005 topic 16
activity resource
product experience problem
design knowledge
quality concept

2006-2008 topic 10
quality cost
analysis enterprise customer evaluation
design industry market production
product methodology impact risk
future software tool case

2009-2011 topic 4
industry knowledge internet community
product public digital risk
decision factor company
social website market
people customer communication

1979 - 1993



1982 - 1993

Core words

memory computation
processing execution
multiprocessor implementation
parallel
distributed
processor
performance communication
level
architecture
process operation application
time
machine

1982-1984 topic 12

traffic access
simulation
design
flow
protocol array
real cost presented

1985-1987 topic 20

high
message
hardware computing
number

1988-1990 topic 8

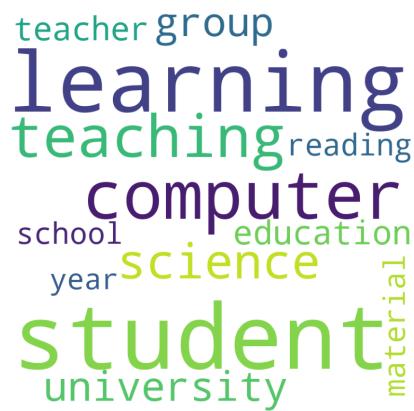
mechanism
environment
representation
expert rule
domain
knowledge
object reasoning

1991-1993 topic 20

compiler analysis
code
net concurrent
petri state
sequential dependency
shared parallelism synchronization

1982 - 2017

Core words



1982-1984 topic 13

microcomputer written
people abstract office analysis
level time readfile
text instruction user
programming task editor

1985-1987 topic 13

collection
medical area
survey
file
field computing
scientific
people
national public
service

1988-1990 topic 13

reference
text
reader list
people
chapter
report
collection
publication
good source topic
read

1991-1993 topic 13

problem
issue
test
document
project
technical report

1994-1996 topic 2

topic
level
process
business

1997-1999 topic 9

english
chapter
basic
author
topic
reader
reference
introduction

2000-2002 topic 13

business
quality community
issue
organization
project
communication social
process
management

2003-2005 topic 16

management knowledge
problem
concept product
issue design
organization quality
project
process resource
business

2006-2008 topic 5

author
learner
knowledge
problem
theory
game
strategy

2009-2011 topic 14

ability
title atom ring
classroom compound
college
child course
learner

2012-2014 topic 1

child learner test design english

2015-2017 topic 18

strategy difference
level academic feedback
classroom ability score higher
assessment grade
test participant high

1982 - 2011

Core words

student
year article
computer
science work
technology
development

1982-1984 topic 13

analysis
file written time
office read
instruction
text user training editor
level abstract programming
microcomputer task

1985-1987 topic 13

educational file scientific
service
medical survey
national
area computing
collection

1988-1990 topic 13

good text topic
collection
language
read report
source answer
chapter list
reference

1991-1993 topic 13

technical report test
problem document

1994-1996 topic 2

educational text
level skill
language topic
author

1997-1999 topic 9

topic reader
basic reference
chapter
author skill english
educational
language introduction

2000-2002 topic 13

organization community
skill communication
social activity
quality

2003-2005 topic 16

resource problem
design knowledge concept
activity

2006-2008 topic 10

analysis cost
design production enterprise factor
software market methodology
product decision industry impact
quality engineering future evaluation

2009-2011 topic 4

organization communication digital
decision risk industry customer
product knowledge market internet
public website

1982 - 1990

Core words

test distribution
techniques sample
parameter estimate
estimation
analysis factor
procedure statistical

1985 - 2011

Core words

traffic delay
service performance packet
control link
protocol communication
time
network

1985-1987 topic 9
distribution wave
surface satellite
local point
optical
switching curve area
radio queue
voice neuron

1988-1990 topic 7
neural learning
local presented
interconnection
cache etx
neuron

1991-1993 topic 2
fault failure load
etx high
multiple

1994-1996 topic 9
atm call receiver
radio source
signal antenna
buffer switch
cell

1997-1999 topic 17
multicast reliability
high quality
cell allocation
atm loss

2000-2002 topic 7
algorithm path cache
flow

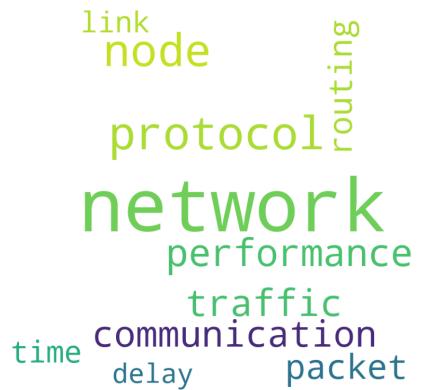
2003-2005 topic 1
load path
algorithm scheduling
ad hoc peer

2006-2008 topic 8
user device
internet management
request client
server technology

2009-2011 topic 3
agent framework
server smart device platform
internet environment
user computing support provide grid peer
management game technology cloud

1985 - 2017

Core words



1985-1987 topic 9

queues switching area
voice radio
surface curve
satellite wave
local point
optical distribution

1988-1990 topic 7

interconnection
cache
connection
architecture
neural
etx local learning
presented neuron

1991-1993 topic 2

application multiple high load etx failure station fault architecture

1994-1996 topic 9

switch
source
call
cell
buffer
signal
antenna
station
atm
radio
receiver
connection

1997-1999 topic 17

multicast qos high
quality cell allocation
ip reliability
resource buffer loss

2000-2002 topic 7

```

graph TD
    A[application] --> B[cache]
    B --> C[resource]
    C --> D[flow]

```

2003-2005 topic 1

scheduling resource load
ip hoc peer
qos

2006-2008 topic 19

energy power
efficient
multiple
cost compared optimal
multi complexity
sensor
problem
error capacity
technique interference

2009-2011 topic 9

topology
attack
route
key
energy

sensor
problem
security

2012-2014 topic 4

route mobility hoc
fuzzy topology
agent multi
destination dynamic
neural problem
connectivity

2015-2017 topic 12

medium player content
people urban community
user interaction smart
interaction online city
social game internet
device thing agent route
iot behavior recommendation

1988 - 2002

Core words

optimization
problem
search solution presented efficient
cost
algorithm
function
optimal time number

1988-1990 topic 3

computing
matrix
finding lower array find
polynomial equation

1991-1993 topic 14

node class
graph

1994-1996 topic 6

scheme controller adaptive input
dynamic task control

1997-1999 topic 5

circuit fault approximation
test vector

2000-2002 topic 19

parameter procedure numerical
decision solve rule process analysis

1988 - 2020

Core words

function space
number point bound
class set time
algorithm
linear matrix optimal
problem
solution property

1988-1990 topic 3
efficient
cost lower solving
size
parallel computation
search
array processor heuristic
computing scheduling

1991-1993 topic 14
presented
neural
efficient size path
node parallel
network
learning training search

1994-1996 topic 16
vertex
size
minimum path
filter

1997-1999 topic 13
abstract
prove theorem
vertex
edge

2000-2002 topic 15
element
vertex
prove mesh
dimensional

2003-2005 topic 9
search
cost
efficient
computation

2006-2008 topic 18
fuzzy dynamic
nonlinear
parameter
neural

2009-2011 topic 17
solving
particle robot genetic
parameter

2012-2014 topic 18
filter error
random input
parameter
nonlinear control
distribution estimation
probability

2015-2017 topic 7
math computational
solve
solving

2018-2020 topic 17
provide
abstract
agent quantum
distribution
probability
framework analysis

1988 - 2020

Core words

number
problem
solution
space
function
algorithm
time
set
matrix
case
bound
linear

1988-1990 topic 3
solving heuristic finding
size parallel computation
search scheduling array cost
efficient lower processor

1991-1993 topic 14
learning neural path size
network parallel presented search

1994-1996 topic 16
minimum vertex structure path
size

1997-1999 topic 13
prove edge vertex theorem
theory abstract

2000-2002 topic 15
structure prove element mesh
dimensional vertex approximation

2003-2005 topic 9
computation structure
constraint search
efficient cost

2006-2008 topic 18
numerical theory
dynamic neural fuzzy
constraint

2009-2011 topic 17
particle constraint
approximation solving
numerical theory

2012-2014 topic 18
estimation numerical error
control input probability
simulation random distribution

2015-2017 topic 13
performance analysis
error input scheme
adaptive effectiveness
loop phase
dynamic strategy
design presented mode
stability feedback controller

2018-2020 topic 1
error stability tracking effectiveness
dynamic input output performance
loop simulation event
design fuzzy feedback disturbance
control uncertainty
controller adaptive estimation

1988 - 2014

Core words

chip
voltage
low
device
circuit
output
high
power
current
cmos

1988-1990 topic 5

electrical
etx_{me}
beam logic
transistor
element
antenna

1991-1993 topic 10

architecture
operation
processing
implementation
parallel time
hardware
performance
control
memory
processor
module

1994-1996 topic 15

noise
measurement
time
radar
spl
band
filter

1997-1999 topic 7

single
radar
measurement
surface
area
sensor
measured
developed

2000-2002 topic 2

cost
process
stage
chain
load

2003-2005 topic 20

spl

2006-2008 topic 13

process
area
flow
attack
water bus
battery
integrated

2009-2011 topic 8

filter
simulation
gene
pulse

2012-2014 topic 9

pressure
force
pulse
light
noise
battery
source
surface
material
element
panel
electrical

1988 - 2017

Core words

science group
education teacher skill
learning
teaching university year school
student
writing computer
material

1988-1990 topic 10

knowledge theory
role medical
human strategy
task decision

1991-1993 topic 13

technical test
report document
project

1994-1996 topic 2

business language
topic level author
text

1997-1999 topic 9

reference introduction
english author chapter
language basic topic reader

2000-2002 topic 13

social management
organization community
business communication project quality

2003-2005 topic 16

business design concept
project product
resource knowledge
online management organization

2006-2008 topic 5

learner author theory
online knowledge game
strategy

2009-2011 topic 14

ability college
learner music child
compound classroom
ring title course atom

2012-2014 topic 1

design english
language online
test learner child

2015-2017 topic 18

high score
grade ability
feedback assessment
strategy participant
classroom higher difference level

1988 - 2011

Core words

student issue
technology
development year
education work
computer teaching science
learning process

1988-1990 topic 10

training
medical
role strategy
theory
human task

1991-1993 topic 13

technical report
document
reading test

1994-1996 topic 2

educational language
topic level
reading text
author

1997-1999 topic 9

topic reader
reference educational
introduction author chapter
english basic language

2000-2002 topic 13

communication
social
community

2003-2005 topic 16

resource
design
online concept

2006-2008 topic 10
design software risk analysis
tool engineering methodology case
production evaluation future
impact cost
market enterprise factor industry
customer

2009-2011 topic 4

market company customer
risk online communication
enterprise public
social community people industry
factor digital internet

1988 - 1996

Core words

object

language

design

use

programming

interface

oriented

specification

structure

support

environment

1988 - 1996

Core words

user
interface
programming
software
tool
development
environment

1988 - 2020

Core words

feature
segmentation
image
technique
algorithm
object
detection

1988-1990 topic 19
presented
edge
etx boundary
target sequence field

1991-1993 topic 5
presented sensor
edge field
position joint etx
robot imaging control manipulator force

1994-1996 topic 20
presented matching
edge scale
target field

1997-1999 topic 10
compression texture
graphic
wavelet

2000-2002 topic 1
wavelet
time compression
frame quality

2003-2005 topic 10
frame imaging
wavelet

2006-2008 topic 15
pattern mining

2009-2011 topic 10
adaptive neural
filter time
error sample compared
parameter noise
prediction target
estimation

2012-2014 topic 10
similarity pattern
prediction dataset
dataset extraction
training
machine tracking sample

2015-2017 topic 14
training
problem machine
neural dataset art
network task state deep

2018-2020 topic 12
deep neural training
dataset network prediction
state datasets multi
task problem

1991 - 2011

Core words

text

type

rule

language

structure

concept

semantic

1991-1993 topic 4
classification
learning document
query process
database expert
pattern retrieval

2006-2008 topic 12
lexical uml
syntactic land
corpus vocabulary category
road meaning city
dictionary phrase
linguistic urban
analysis satellite

1994-1996 topic 18
constraint case
expert process
learning order
framework

2009-2011 topic 19
phrase recognition
dictionary speaker
speech syntactic
corpus feature
linguistic vocabulary
fuzzy meaning lexical

1997-1999 topic 16
framework query
process order
learning application
framework decision
constraint agent
specification action
database description
class view
property oriented

2000-2002 topic 11
mining machine
diagram pattern
class code
specification specification

2003-2005 topic 7
analysis fuzzy
fault verification
property checking

1991 - 2005

Core words

scheme rate
technique noise
error
time frequency
signal
coding code bit
performance

1991-1993 topic 9
frame segment visual transform
speaker pattern symbol
Speech source feature
picture image
recognition quantization
word wavelet

1994-1996 topic 3
digital
number
ratio
cache
memory

1997-1999 topic 19

estimate

2000-2002 topic 4

transmission
fault
antenna

2003-2005 topic 19

control
feedback
delay
output
linear
design
loop
input
controller

1994 - 2002

Core words

application resource
service
internet provide
user
management
web
library multimedia
access
electronic

1994 - 2008

Core words

mechanism
vehicle
direction
position
portion
body
member
surface
sideforce
contact
utility
provided
assembly
device
element

1994-1996 topic 12

trajectory
robot
human

1997-1999 topic 15

grid
air
mobile

2000-2002 topic 3

molecular
compound
chemical
protein
temperature
cell
fluid
layer

2003-2005 topic 4

satellite
driving

2006-2008 topic 7

light
comprises
arranged
positioning

1994 - 2002

Core words

display
input unit
user output
device
memory card
provided

1994 - 2011

Core words

tool level
design
development framework
software
application support
process technique

1994-1996 topic 19

generation
circuit synthesis
fault set
high processor
visualization

1997-1999 topic 12

project
quality

2000-2002 topic 17

management
virtual
interface

2003-2005 topic 5

platform
programming
program computing
grid

2006-2008 topic 4

interaction
security
context
behavior book
ontology
rule resource

2009-2011 topic 5

structure
specific
web
complex

1994 - 2017

Core words

architecture
software
level
design
real
time
tool
implementation
application
performance
hardware

1994-1996 topic 19
visualization
circuit
methodology
set synthesis
generation
fault

2009-2011 topic 20
efficiency efficient
algorithm
number optimization
speed
optimal
cost flow
multi computational

1997-1999 topic 12
issue
knowledge quality
methodology
engineering
work project
concept case

2012-2014 topic 2
power
energy
operation low dynamic
cost
control consumption
grid efficiency speed

2000-2002 topic 17
distributed
technology
concept
object
interface virtual
agent computer user management

2015-2017 topic 8
operation logic
code
work low
circuit
implemented block

2003-2005 topic 5
grid
distributed computing
object
platform technology

2006-2008 topic 14
dynamic platform
algorithm
computing code

1994 - 2020

Core words

architecture
real
technique
design
time
application
performance

1994-1996 topic 19
generation
methodology
visualization
set
circuit fault synthesis

1997-1999 topic 12
issue quality
knowledge
methodology
case work
concept project
engineering

2000-2002 topic 17
concept
virtual
object
computer
agent
interface

2003-2005 topic 5
grid
program
object
programming

2006-2008 topic 14
dynamic
program
programming
code

2009-2011 topic 20
memory
multi core
optimization optimal
speed flow
efficient number computational

2012-2014 topic 2
energy
grid low dynamic
power operation load
consumption control
memory cores speed

2015-2017 topic 15
access efficient
storage demand
cloud
resource
network
solution
service
policy energy
device consumption

2018-2020 topic 11
blockchain
network
edge mobile challenge
cloud iot device internet
resource smart storage
service
solution thing

1994 - 2020

Core words

architecture
time
application
design
performance

1994-1996 topic 19

visualization
methodology
synthesis set
fault circuit
generation

1997-1999 topic 12

knowledge
engineering
methodology
quality case
work issue
concept project

2000-2002 topic 17

concept agent
object
management
virtual user
interface computer
technology

2003-2005 topic 5

technology
platform
object
program
programming grid

2006-2008 topic 14

code
platform
programming
program
dynamic

2009-2011 topic 20

efficient
optimal
speed memory multi core
flow number
computational optimization

2012-2014 topic 2

dynamic speed
power
grid
memory core
control load
operation

2015-2017 topic 15

user access
storage management
network
efficient policy
service
resource
cloud
solution

2018-2020 topic 16

strategy
number search
decision optimal
multi constraint
solution demand
clustering order
optimization
objective
resource compared
solve selection

1997 - 2020

Core words

accuracy
technique
classification
vector ^{experimental} performance
set learning analysis
experiment clustering
recognition classifier
feature
detection

1997-1999 topic 2
character
error rate
parameter hidden
speech acoustic
extraction rule
speaker test
automatic input

2012-2014 topic 10
extraction
tracking
face

2000-2002 topic 8
statistical sequence
cluster class
sound word
distribution probability

2015-2017 topic 14
deep state
network
problem art
datasets

2003-2005 topic 12
selection comparison
statistical test
evaluation number factor
criterion cluster testing
metric distance compared correlation
quality

2018-2020 topic 12
problem
network
datasets
deep multi
art video state

2006-2008 topic 15
map mining real
face spatial point
spatial region
color space 3d

2009-2011 topic 10
adaptive estimate
error compared
noise target
time estimation
filter parameter

2003 - 2011

Core words

network
user
mobile
service
management
internet
device
application
control
server
access

2003 - 2014

Core words

processing
device
unit
display

input screen operation
signal terminal apparatus
comprises time
receiving storage

2003-2005 topic 8
measurement sensor recording
detection detecting area
location medium monitoring sensing

2006-2008 topic 11
electronic authentication
card connected key module

2009-2011 topic 11
set table cell access
read configuration

2012-2014 topic 12
video server audio
camera mobile 3d
frame object position

2003 - 2020

Core words

numerical space
point linear
number order
solution
state set
function
problem property
casematrix

2003-2005 topic 17

field calculation
boundary spectral
simulation process
flow water
curve dimensional
surface element
mesh estimate

2006-2008 topic 18

fuzzy
neural

2009-2011 topic 17

robot
genetic

2012-2014 topic 18

error
input random
control
estimation
filter

2015-2017 topic 7

solve
math
complexity
computational

2018-2020 topic 17

general
framework
agent provide
quantum
abstract

2003 - 2020

Core words

time
order
parameter
condition
linear
state

2003-2005 topic 17

mesh
element
surface
curve
field
flow

structure
spectral
calculation
water
process
estimate
dimensional

2006-2008 topic 18

class
neural
graph

2009-2011 topic 17

approximation
genetic
solving
robot

2012-2014 topic 18

random
probability

2015-2017 topic 13

designed
presented
mode
strategy
phase
scheme

2018-2020 topic 1

uncertainty
event

disturbance

2009 - 2020

Core words

multiple noise antenna
spectrum receiver wireless radio
band power rate high
time error communication simulation
simulation interference
signal channel frequency performance

2009-2011 topic 1

mimo
carrier
multi
gain
modulation

2012-2014 topic 5

bandwidth
access
cell
delay
throughput

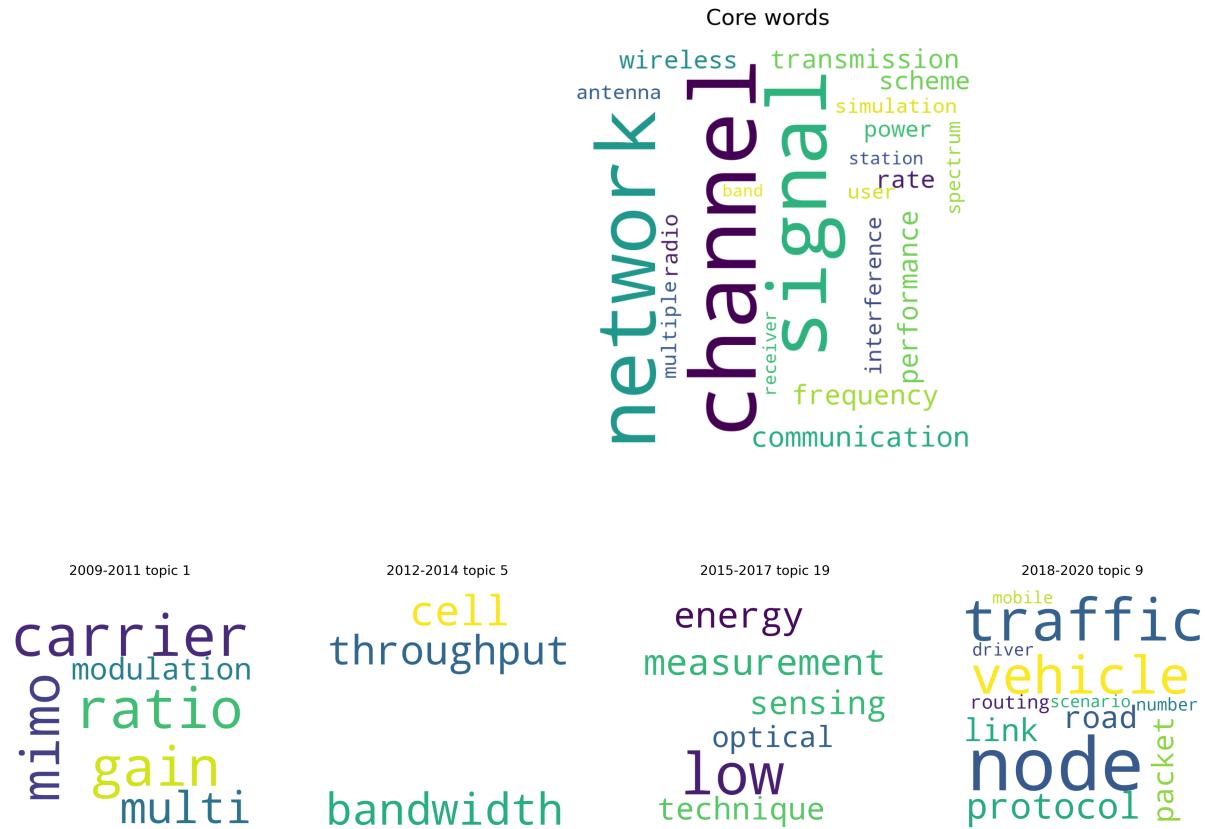
2015-2017 topic 19

optical
sensor
energy
sensing

2018-2020 topic 7

structure
phase
parameter
flow algorithm
analysis
numerical wave
filter element
field coefficient
order equation

2009 - 2020



2009 - 2020

Core words

connected driving
control
signal motor
electric circuit output
device
power
unit battery operation
module

2009-2011 topic 16

display
structure
screen
interface

2012-2014 topic 7

side
intelligent
driver
drive
switch frame assembly

2015-2017 topic 4

switching
inverter
supply

2018-2020 topic 4

fault phase
simulation wind
design low generation
high frequency

2012 - 2020

Core words

application
cloud
user storage
service
resource
environment
computing

2012 - 2020

Core words

demand

cost

resource

2012 - 2020

Core words

user technique
privacy authentication
secure
security
attack

2012 - 2020

Core words

constraint
set function
number

algorithm
problem<sup>point
order</sup>
solution

2012 - 2020

Core words



design
analysis product
technology
process project
development
software tool

2012 - 2020

Core words

development
challenge
analysis
knowledge
tool
design
management
support

process

technology