

1979 - 1996

1979-1981 topic 4

problem program computational general
procedure solving abstract
decision time
linear optimization variable
function cost efficient
constraint algorithm
case equation technique
number set optimal point
process dynamic programming

1982-1984 topic 1

general type matrix efficient
program property linear
simple structure
problem
procedure search transformation
case
point abstract function
tree complexity
polynomial number order
set decision algorithm
process presented technique
time computation

1985-1987 topic 4

edge solution state
technique abstract dynamic
controller
problem tree constraint
space point dimensional image
control equation optimal
time matrix set
adaptive algorithm class
structure presented number
linear graph object order

1988-1990 topic 4

manipulator nonlinear
robot problem
tree sensor scheme
control
feedback state presented
equation trajectory
graph path algorithm
space motion
time vertex
dynamic parameter
degree edge force stability
joint controller
linear structure

1991-1993 topic 7

nonlinear controller parameter algorithm control estimation equation linear adaptive simulation performance matrix dynamic design filter numerical stability error analysis state time problem presented scheme estimate technique etx

1994-1996 topic 7

numerical simulation analysis process parameter time

dynamic statistical variable order measure estimation equation distribution condition control

problem case technique presented modeling performance procedure response nonlinear estimate

solution state distribution response error measurement

1979 - 1996

1979-1981 topic 4

problem
solution
algorithm
graph
control

computational general
solving abstract
linear time
function optimization variable
cost constraint
case efficient
number set
process dynamic
dynamic programming

1982-1984 topic 9

optimal solving
numerical linear
stochastic control
computer nonlinear
theory number
process finite
algorithm time
general state
function condition
solution heuristic
application equation
dynamic

1985-1987 topic 4

edge solution state
technique abstract dynamic
problem controller
tree space image
control optimal
equation time matrix set
algorithm adaptive
structure number
linear graph object order

1988-1990 topic 4

manipulator nonlinear problem
robot sensor
tree scheme
Control algorithm
feedback state
equation presented
space trajectory
graph motion
dynamic path
degree vertex
joint edge force stability
linear controller structure

1991-1993 topic 7

nonlinear dynamic
matrix condition feedback
controller design
error numerical filter
parameter analysis
state time
estimate problem
scheme presented
etc. algorithm
technique adaptive
linear simulation
Control order
estimation performance
equation

1994-1996 topic 7

dynamic problem
simulation statistical case
numerical technique
order measure presented modeling
analysis estimation
process state error
distribution procedure
parameter response
control nonlinear
time estimate measurement

1979 - 1996

1979-1981 topic 12

developed management capability
design integrated interface
software
technique operation
architecture controller reliability
computer
display application
modeling environment machine
processing complex
process development tool
control
function processor
abstract implementation
hardware

1982-1984 topic 2

integrated interface
application
capability discussed
software
development implemented environment
implementation developed describes
design
hardware engineering level technology high
computer graphic
tool technique communication abstract
user

1985-1987 topic 17

product requirement analysis
project module language package
process component developed
support tool graphic hardware
design
interface user computer
control program engineering abstract
user
computer
software
development environment specification

1988-1990 topic 9

communication expert interface
tool computer control
area design service
issue user cost
software
application integrated provide
discussed network future
engineering computing project
technology
requirement management quality
development
environment support

1991-1993 topic 15

analysis programming language
modeling description
software
tool process
developed oriented specification requirement concept
application
development component support interface
design
object user level problem methodology implementation
engineering environment technique

1994-1996 topic 1

level class user structure
protocol framework mechanism
object
support interface language
distributed
application
design specification implementation requirement net process
programming environment query architecture
database
retrieval communication

1979 - 1996

1979-1981 topic 12

developed management capability
design integrated interface
software
technique operation
architecture controller reliability
computer
display application
modeling environment machine
processing process development complex
control function processor
abstraction abstract implementation
hardware

1982-1984 topic 2

integrated interface
application
capability discussed
software
development implementation developed environment
design
hardware engineering describes
computer level technology high
tool technique graphic
abstract communication requirement specification
user

1985-1987 topic 17

product application
project module requirement analysis
process component developed
support tool interface
graphic hardware language package
hardware program ada
user
computer
software
engineering abstract
environment specification

1988-1990 topic 9

communication expert interface
tool computer control
area design service
user integrated cost
software
application management future
discussed engineering
technology computing project
development
environment support

1991-1993 topic 15

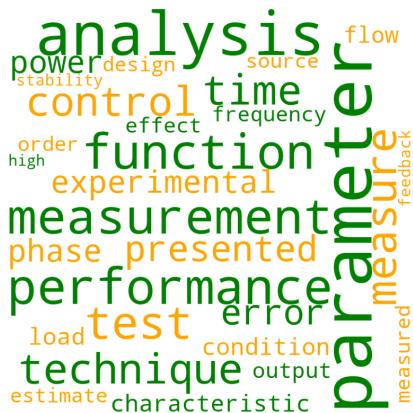
analysis programming language
modeling description
software
tool process
developed oriented specification requirement concept
application
development component support interface
design
object user level problem methodology
engineering environment implementation
user

1994-1996 topic 5

implementation tool development platform
interface programming package
standard project user
environment program laboratory code process
software
performance virtual computer report
work parallel workstation
application
version engineering developed
library

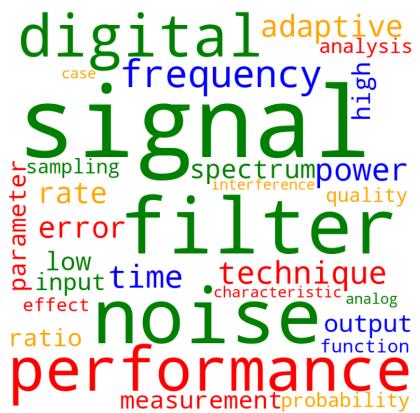
1979 - 1993

1979-1981 topic 15



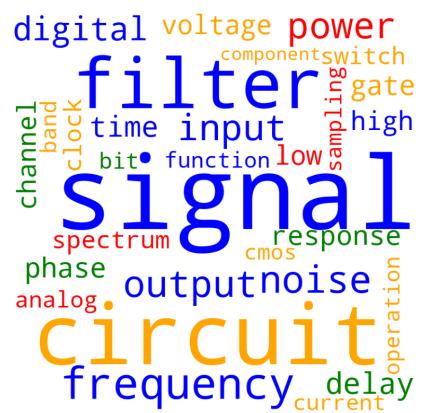
analysis, power, design, stability, control, time, effect, frequency, order, high, function, experimental, measurement, phase, presented, performance, load, test, error, technique, condition, output, estimate, characteristic, parameter, measured, source, flow.

1982-1984 topic 6



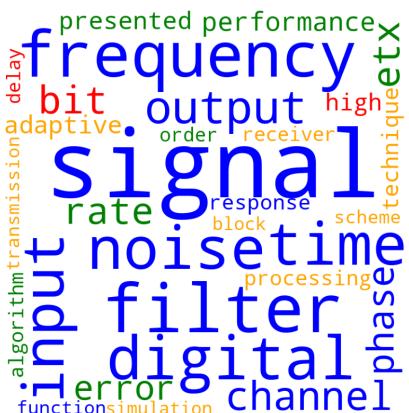
digital, adaptive, analysis, frequency, high, signal, sampling, spectrum, power, interference, quality, parameter, rate, error, low, input, time, technique, characteristic, analog, ratio, noise, output, function, measurement, probability.

1985-1987 topic 18



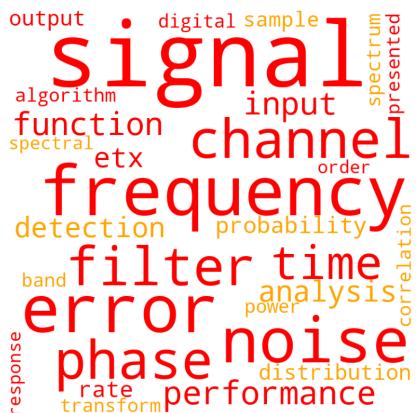
digital, voltage, power, components, switch, gate, filter, time, input, bit, function, low, sampling, high, signal, spectrum, cmos, response, phase, output, noise, circuit, frequency, delay, current, operation.

1988-1990 topic 15



frequency, presented, performance, bit, output, high, adaptive, order, receiver, Signal, rate, response, block, scheme, noise, time, processing, filter, digital, channel, error, functionsimulation, channel, algorithm, transmission, delay, etx.

1991-1993 topic 16



output, digital, sample, signal, spectrum, presented, algorithm, input, function, spectral, etx, channel, frequency, order, detection, probability, band, filter, time, error, power, noise, correlation, response, rate, transform, distribution, performance.

1979 - 2017

1979-1981 topic 16



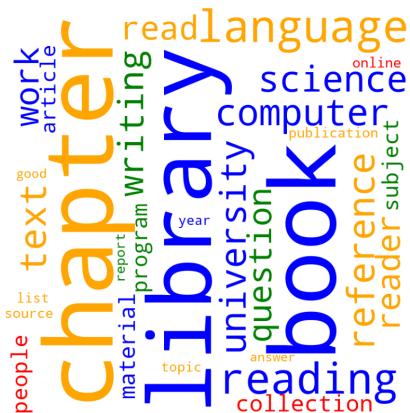
1982-1984 topic 16



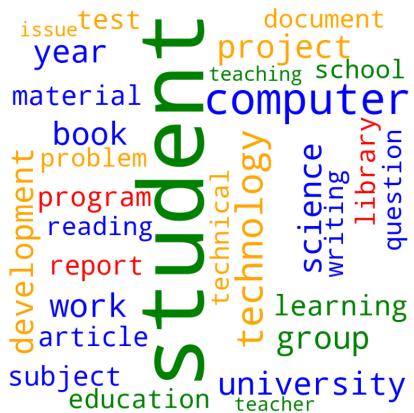
1985-1987 topic 13



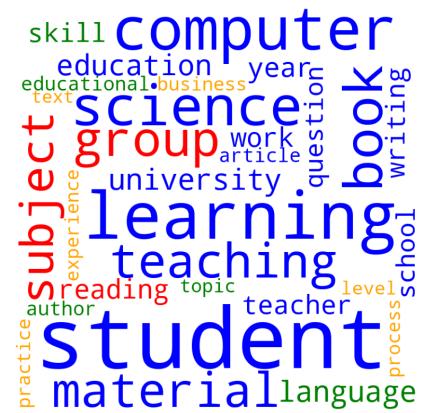
1988-1990 topic 13



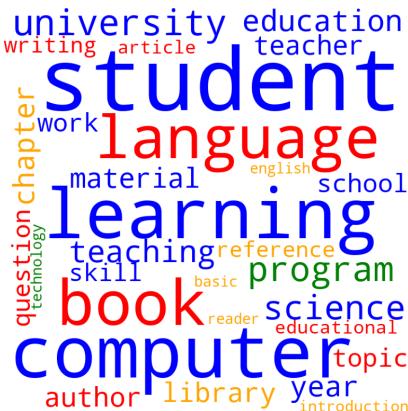
1991-1993 topic 13



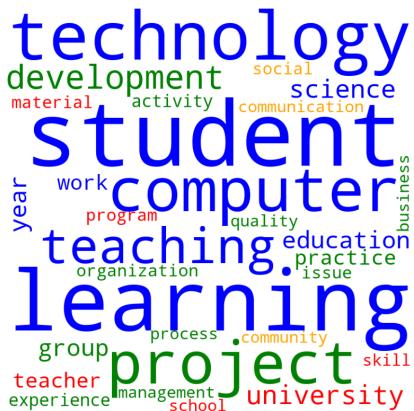
1994-1996 topic 2



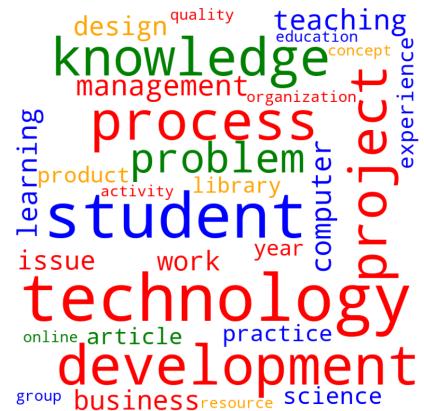
1997-1999 topic 9



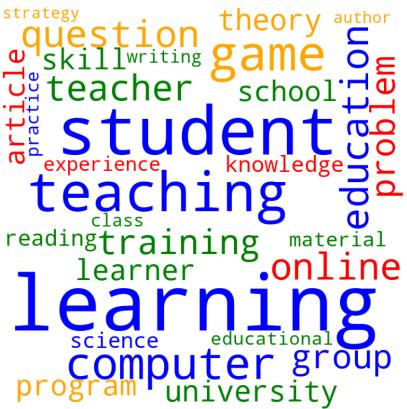
2000-2002 topic 13



2003-2005 topic 16



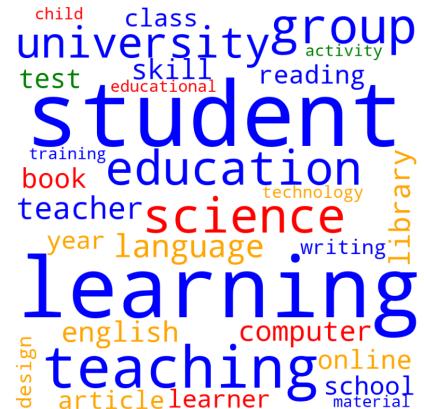
2006-2008 topic 5



2009-2011 topic 14



2012-2014 topic 1



2015-2017 topic 18

learning
class school subject
classroom grade ability
student
activity high education
difference writing level
university participant
group reading score
skill teacher training
strategy material

1979 - 2011

1979-1981 topic 16

education
engineering
future
resource
management
application
service
cost
area
center
analysis
department
development
center
area
school
office
computer
medical
national
planning
library
state
project
university
field
industry
technology
year

1982-1984 topic 16

document computer
library resource department
work report standard activity
area organization national
technology planning user project
year field management
university author communication article
service medical center
development material group technical

1985-1987 topic 13

university
educational school computing
computer
group year public medical
book reading development
people teacher scientific
article collection library
service file
science field survey work
online technology
material area national student

1988-1990 topic 13

language online
science computer publication subject
reference reader
collection reading
question answer
topic
university
year
writing
program
report
material
source
list
people
text
good
article
work

1991-1993 topic 13

A word cloud centered around the word "student" in large green font. Other words include "test", "year", "material", "book", "problem", "program", "reading", "report", "work", "article", "subject", "education", "technical", "technology", "learning", "group", "university", "teacher", "document", "project", "teaching", "School", "computer", "science", "writing", "Library", and "question". The words are in various colors including orange, blue, red, and yellow.

1994-1996 topic 2

A word cloud centered around education and learning, with words like computer, education, science, group, university, learning, teaching, reading, student, material, teacher, and language.

1997-1999 topic 9

A word cloud centered around the word "student". Other prominent words include "language", "learning", "book", "computer", and "teacher". The words are in various colors (blue, red, yellow, green) and sizes, representing their frequency or importance.

2000-2002 topic 13

technology development social science communication

material activity

student work computer

program quality

teaching education practice

organization issue

learning project skill

teacher experience management school university

group process community

year organization

2003-2005 topic 16

A word cloud diagram centered around the word "knowledge". The words are arranged in a circular pattern, with "knowledge" at the top center. Other prominent words include "process", "student", "technology", "development", "learning", "issue", "work", "year", "product", "activity", "library", "article", "group", "business", "resource", "science", "design", "quality", "management", "organization", "teaching", "education", "concept", "computer", and "experience". The words are colored in various shades of red, green, blue, and yellow.

2006-2008 topic 10

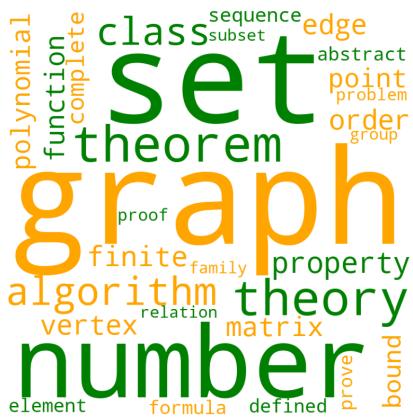
A word cloud diagram illustrating concepts related to project management, methodology, and technology. The words are arranged in a cluster, with larger and bolder fonts indicating higher frequency or importance. The words include: project, process, methodology, evaluation, software, quality, design, decision, analysis, market, development, engineering, technology, tool, enterprise, management, production, risk, customer, industry, cost, impact, future, business, work, case, practice, issue.

2009-2011 topic 4

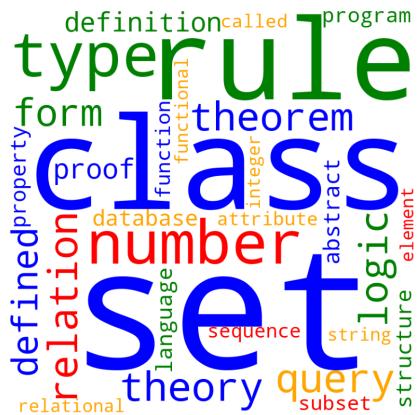
knowledge decision website
risk process customer
technology
industry development year
management internet
library project
organization digital market
company
SOCIAL factor communication public enterprise
product article community online people issue
business

1979 - 1993

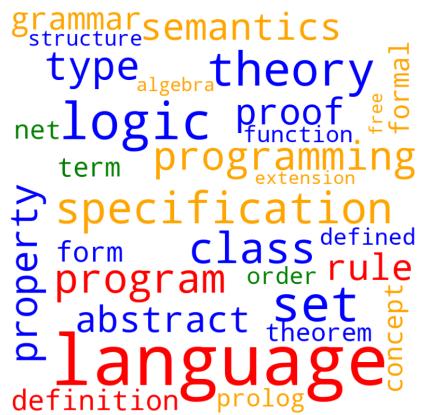
1979-1981 topic 19



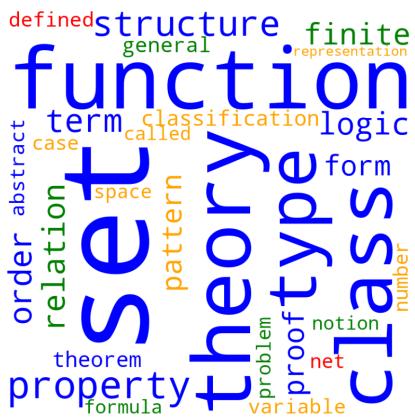
1982-1984 topic 14



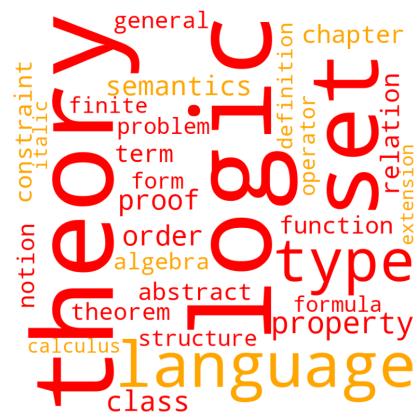
1985-1987 topic 3



1988-1990 topic 12



1991-1993 topic 17



1982 - 1993

1982-1984 topic 12

computer
time performance
application presented technique
array communication
algorithm process
flow parallel real
level cost access traffic
network operation design
processor
architecture
simulation protocol
control memory problem
processing distributed

1985-1987 topic 20

performance processing
level time control
hardware message computer
computing machine problem
communication implementation
network memory application
distributed operation
processor multiprocessor
task execution program
high process number
parallel computation algorithm

1988-1990 topic 8

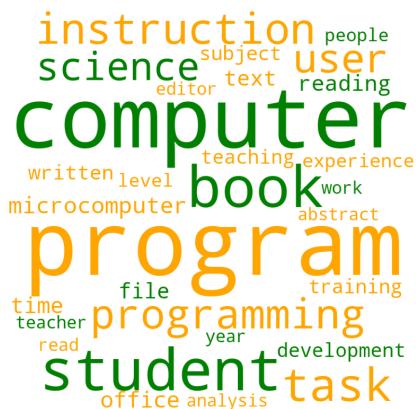
task processing communication
parallel operation
memory time level expert
application domain rule
knowledge machine performance
processor environment
object representation language
architecture execution
distributed implementation mechanism

1991-1993 topic 20

programming processor concurrent
multiprocessor sequential dependency
machine time state
implementation petri
program structure transformation
computation process language
net synchronization
parallelism memory analysis
code shared compiler
parallel technique performance
execution

1982 - 2017

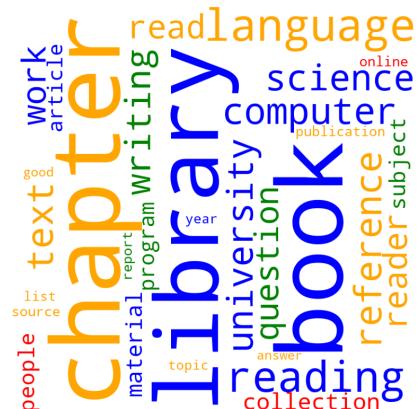
1982-1984 topic 13



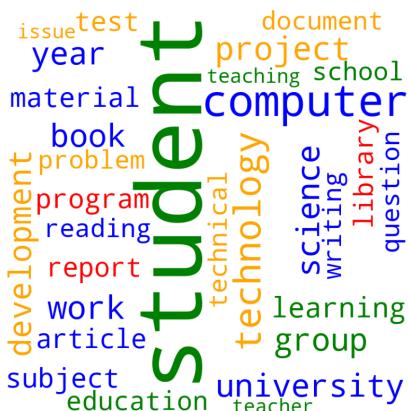
1985-1987 topic 13



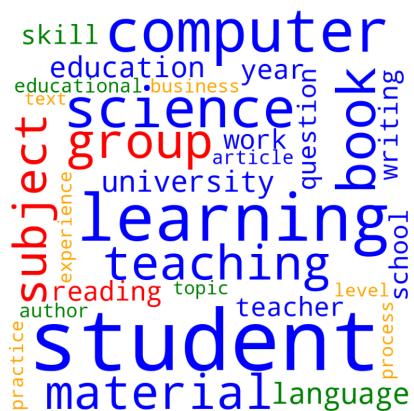
1988-1990 topic 13



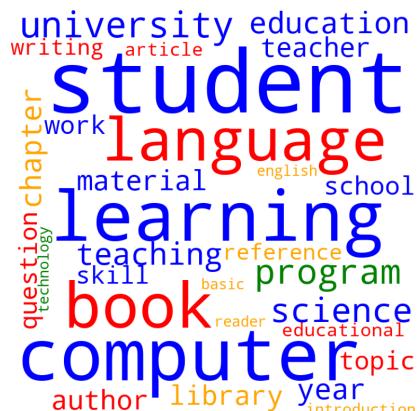
1991-1993 topic 13



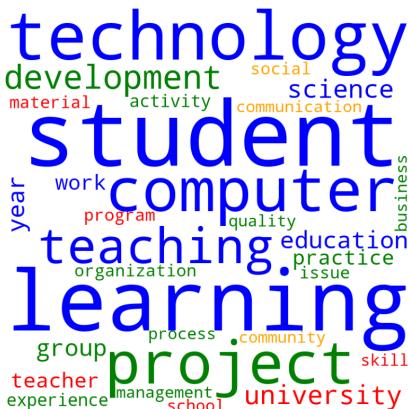
1994-1996 topic 2



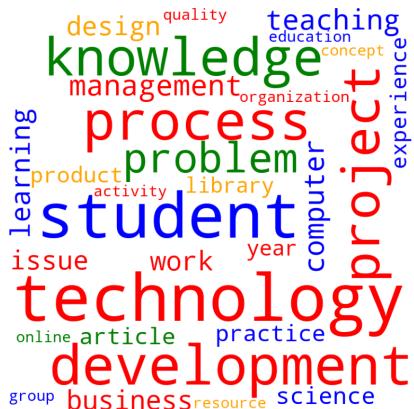
1997-1999 topic 9



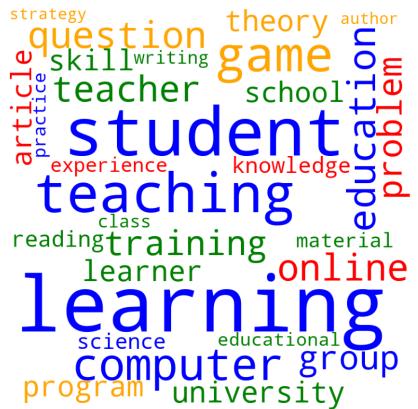
2000-2002 topic 13



2003-2005 topic 16



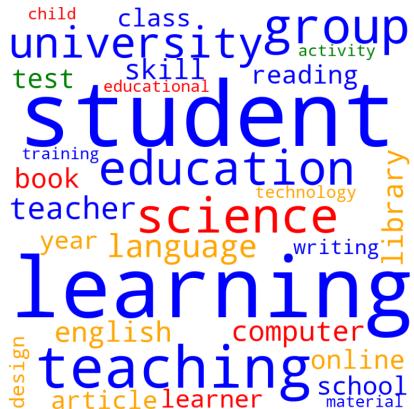
2006-2008 topic 5



2009-2011 topic 14



2012-2014 topic 1

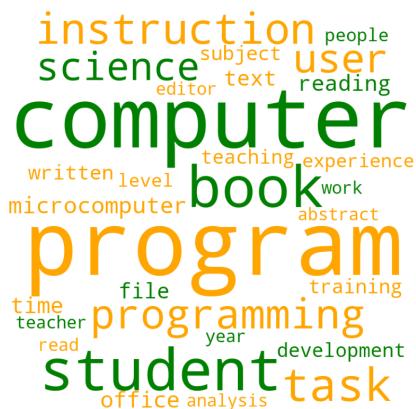


2015-2017 topic 18



1982 - 2011

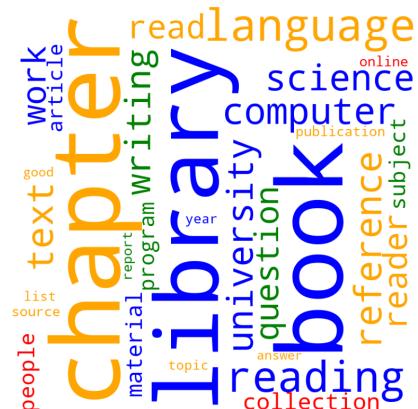
1982-1984 topic 13



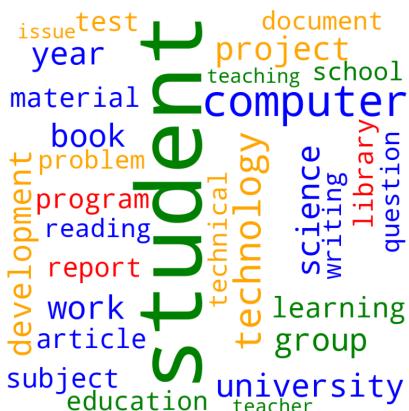
1985-1987 topic 13



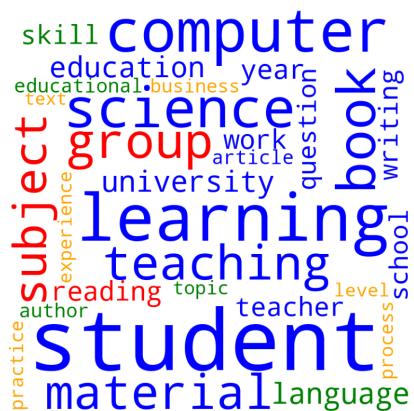
1988-1990 topic 13



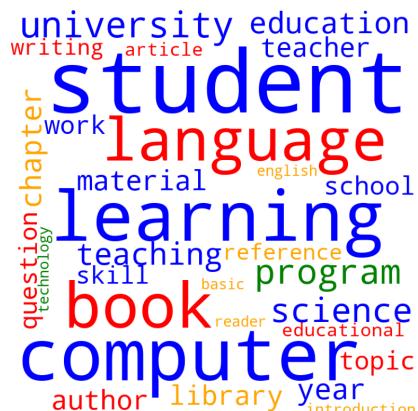
1991-1993 topic 13



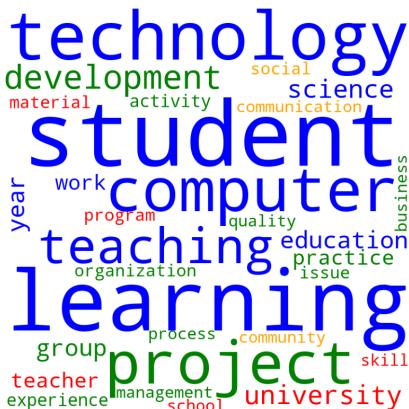
1994-1996 topic 2



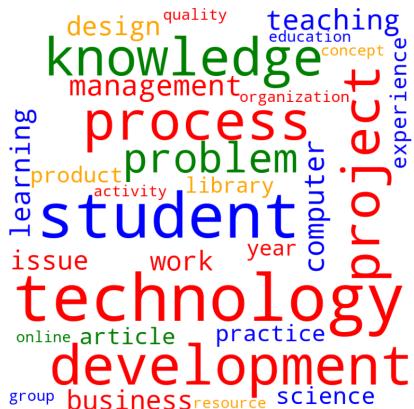
1997-1999 topic 9



2000-2002 topic 13



2003-2005 topic 16



2006-2008 topic 10



2009-2011 topic 4



1982 - 1990

1982-1984 topic 15

estimation sample statistic methodology procedure
estimate vector measurement
analysis
developed classification measure
factor application
statistical
parameter testing
process level
problem technique presented
evaluation distribution test
simulation modeling

1985-1987 topic 14

assumption reliability simulation
estimate function procedure
error transform size test
time probability estimation
analysis
sample random prediction coefficient variable number
algorithm distribution performance

1988-1990 topic 14

experiment coding code detection
compared accuracy measure prediction
factor quality etx
error probability procedure
measurement distribution estimate
performance
ratio test technique
vector estimation time
statistical presented

1985 - 2011

1985-1987 topic 9

packet channel
distribution area link node
optical time voice
delay service
point surface
local wave access
protocol switching
satellite number routing
communication
radio curve
network
queue transmission

1988-1990 topic 7

transmission
etx access traffic
time presented
message neuron
local interconnection node
protocol service
learning simulation
performance neural number
delay routing link
network
scheme cache architecture
packet communication connection
channel

1991-1993 topic 2

control simulation
communication
node time etx
message delay failure
link load
traffic application
station routing
fault service
channel packet high
network protocol distributed
access scheme transmission

1994-1996 topic 9

antenna time rate
packet bandwidth source
bandwidth atm station radio
control call cell traffic
cell protocol service
service mobile switch
switch wireless delay
delay performance transmission
transmission communication
signal network

1997-1999 topic 17

qos cell performance
multicast loss bandwidth
quality ip
control connection
mechanism high scheme
rate atm delay link
resource allocation buffer routing
traffic service protocol network
time transmission reliability

2000-2002 topic 7

bandwidth service communication
access resource simulation
application packet mobile
network link
routing mechanism
time cache node
performance wireless control
ip distributed algorithm
scheme protocol path qos
layer traffic

2003-2005 topic 1

ad layer traffic
communication simulation
bandwidth mechanism time
qos performance service path
node link peer load
resource packet delay
network

2006-2008 topic 8

station wireless mechanism
ip connection node
user network
management resource server
communication technology
request time client layer
mobile internet
message application
device
traffic protocol
qos control access
service transmission packet

2009-2011 topic 3

virtual application framework
architecture cloud smart
peer user device
resource web
management grid agent game
technology provide computing
support mobile server
internet access platform
service
network environment

1985 - 2017

1985-1987 topic 9

packet channel
distribution area link time node
optical rate
delay service
point surface
local access
protocol switching
satellite number routing
communication
radio curve
network
queue transmission

1988-1990 topic 7

transmission etx access traffic presented
time message local interconnection node
protocol learning neural simulation
performance number link layer
delay routing network
application station routing fault service
channel packet communication connection
network
scheme cache architecture
channel multiple packet

1991-1993 topic 2

control simulation
communication
node time etx
message delay failure load
traffic application station routing
fault service channel high
network protocol distributed
access scheme transmission

1994-1996 topic 9

antenna time rate
packet bandwidth source
bandwidth atm station radio
control call cell traffic
cell protocol service
service mobile switch
switch wireless delay
delay performance transmission
transmission communication
signal
network
communication

1997-1999 topic 17

qos cell performance loss
multicast bandwidth
quality traffic service ip
mechanism control connection
control scheme connection
rate allocation atm delay link
buffer layer transmission reliability
network
time routing routing

2000-2002 topic 7

bandwidth service resource simulation
access application mobile
network
routing mechanism time
node cache performance
wireless control ip distributed algorithm
scheme path qos layer traffic

2003-2005 topic 1

layer traffic simulation
time mechanism performance
path qos service path
link scheduling peer
control load
routing algorithm
hoc protocol
ip distributed
node wireless
resource packet delay
network

2006-2008 topic 19

efficient interference
compared path channel
number multi optimal
sensor node error
complexity cost transmission
time problem scheme
problem simulation
technique algorithm
energy delay routing
power wireless network multiple capacity
network

2009-2011 topic 9

communication route path
network
topology node algorithm
delay transmission
link mobile security
attack mechanism key
packet control traffic
problem simulation time
sensor wireless performance energy layer
protocol
scheme

2012-2014 topic 4

topology mobile communication
wireless traffic destination
network
path distributed
problem protocol
link routing
ad neural
mobility
mechanism
node message
mechanism
agent route
dynamic number layer
simulation
link
fuzzy
protocol
node multi
ad interaction
content
social
iot device
player smart
internet
mobile
node route
recommendation
online
user
behavior
thing
communication
user
recommendation
online
node route
mobile
internet
smart
player
social
iot device
ad interaction
content

2015-2017 topic 12

medium community city
link agent message
network
protocol game
people urban
thing communication
user
recommendation
online
node route
mobile internet
smart player
social
iot device
ad interaction
content

1988 - 2002

1988-1990 topic 3

complexity bound
lower number linear
solution efficient
computation parallel
matrix optimal
scheduling computing
tree polynomial
finding cost
processor log
case size
find heuristic
search solving

1997-1999 topic 5

point presented
approximation search
optimization cost
vector genetic
time computational
linear efficient
problem fault
heuristic size
solution set
constraint technique
function optimal circuit
number space

1991-1993 topic 14

problem optimization
set solution case
learning node
parallel space
represented
network training
graph class
size linear point
bound neural
algorithm tree search optimal
path function efficient
complexity log number

1994-1996 topic 6

task solution optimization
dynamic control presented
processor fuzzy strategy
algorithm number training function
parallel input scheduling cost
neural search time genetic
network learning scheme controller
performance adaptive

2000-2002 topic 19

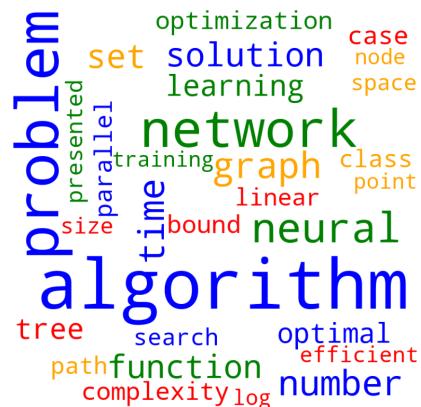
parameter efficient performance
genetic solution set process
optimization strategy
cost constraint
number decision
fuzzy rule
procedure analysis
search optimal time
computational presented
problem case
function numerical
algorithm solve solving
technique

1988 - 2020

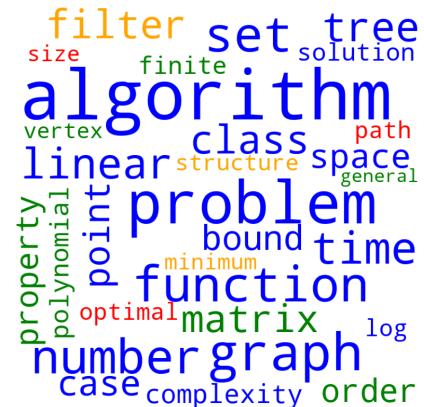
1988-1990 topic 3



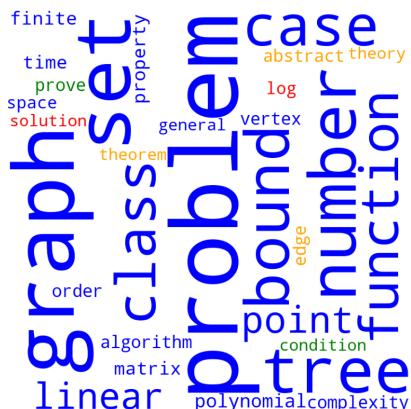
1991-1993 topic 14



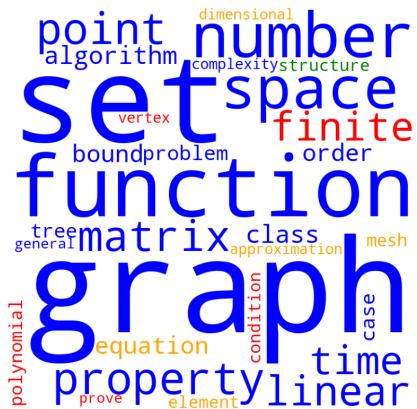
1994-1996 topic 16



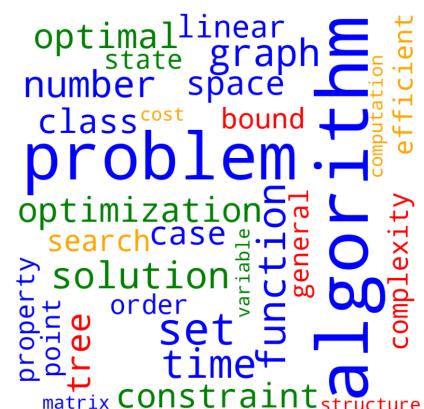
1997-1999 topic 13



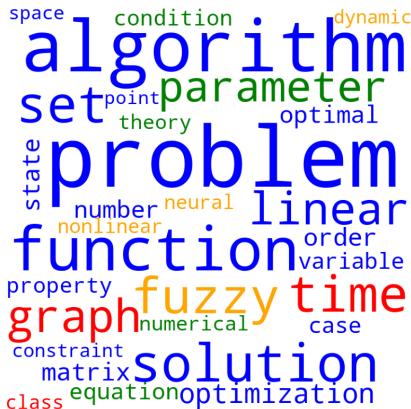
2000-2002 topic 15



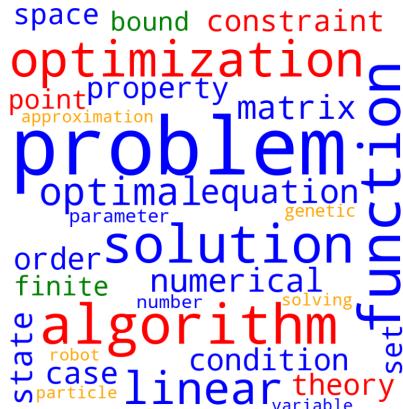
2003-2005 topic 9



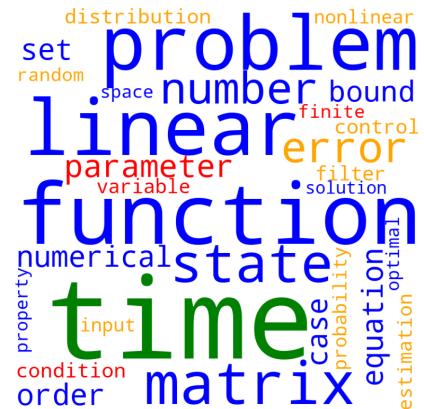
2006-2008 topic 18



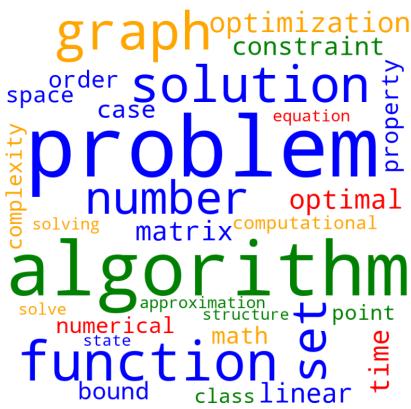
2009-2011 topic 17



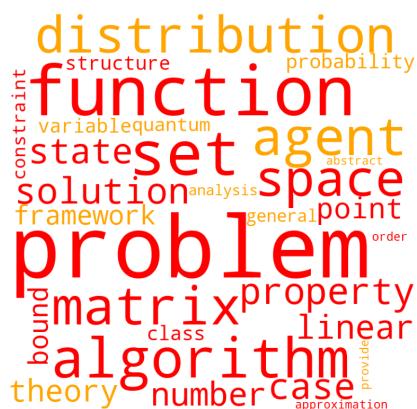
2012-2014 topic 18



2015-2017 topic 7



2018-2020 topic 17



1988 - 2020



1988 - 2014

1988-1990 topic 5

element array beam device
design speed logic
circuit
gate analog switch mode
chip optical voltage cell
power antenna low cmos
current wave test technology etx

1991-1993 topic 10

processor current
design hardware high
input parallel analog
operation chip processing level
implementation output
circuit array time
speed power device
digital memory cell
performance signal etx
signal etx cell
architecture control

1994-1996 topic 15

digital voltage spl chip low
band noise measurement
circuit current
high power time
filter radar clock
phase energy output range analog
frequency temperature speed
cmos

1997-1999 topic 7

temperature range wave radar
single cell technology test
energy measured developed
measurement current
power chip
optical frequency device phase field
circuit
voltage sensor area
surface

2000-2002 topic 2

level supply stage test
technology load switch
high analog
low converter clock
output voltage energy
cmos consumption device
circuit current cost
input process chip
chip chain mode design gate
gate

2003-2005 topic 20

energy frequency speed
high speed
clock gate
signal analog
analog output
chip converter digital
low phase
cmos cell
power current design
consumption

2006-2008 topic 13

digital flow integrated
speed converter output gate
cmos attack temperature water
voltage high energy
area current bus supply
battery consumption process
circuit

2009-2011 topic 8

high output range
array pulse low digital input
design simulation supply
clock frequency
voltage converter
cmos signal gene
optical filter temperature
power current
circuit energy chip consumption
phase technology

2012-2014 topic 9

optical noise high
material surface light
array element battery
flow frequency output
force signal range pulse
panel pressure source field structure
circuit current cell
voltage temperature

1988 - 2017

1988-1990 topic 10

human group
teacher activity theory
problem university
science education
student decision
school knowledge strategy
Computer year
year role task issue
skill training work
learning teaching process
teaching subject development

1991-1993 topic 13

issue test document
year project teaching school
material computer
book problem
program reading
reading report
work technical science
article learning writing library
subject technology question
education group
university teacher

1994-1996 topic 2

skill computer
education business year
text science
group work article
university question
learning reading topic
teaching teacher level
subject reading author
student process school
material language

1997-1999 topic 9

university education writing
writing article teacher
student work
language material english school
learning technology
teaching skill basic program
book reader educational
Computer topic
author library year introduction

2000-2002 topic 13

technology development social
development material science
activity communication
student work
computer program quality
teaching education
learning organization practice
project process community
group teacher management skill
experience school university

2003-2005 topic 16

design quality teaching
knowledge education concept
management organization
process product activity
problem library student computer
student issue work year
technology online article practice
development group business resource science

2006-2008 topic 5

strategy question theory author
practice skill writing game
teacher school
student experience knowledge
teaching education problem
reading training material
learner online
learning science educational
computer group
program university

2009-2011 topic 14

teacher group practice
writing reading compound
education university material class
book title course computer
student college child music skill
school atom learner
learning classroom science
teaching ability training educational ring

2012-2014 topic 1

child class group
university activity test skill reading
test educational book
student training teacher science
education year language writing
learning english computer library
teaching design article learner
online school material

2015-2017 topic 18

academic assessment feedback
learning class school subject
classroom grade ability
student higher
activity high education
difference writing
teaching level
university participant
group reading score
skill strategy test
teacher training material

1988 - 2011

1988-1990 topic 10

human group
teacher activity theory
problem university
science education
student experience
school knowledge strategy
Computer decision
year role task issue
skill training work
learning teaching process
teaching subject development

1991-1993 topic 13

issue test document
year project teaching school
material computer
book problem
program reading library
reading report question
work technical science
article learning group
subject university teacher
education teacher

1994-1996 topic 2

skill computer
education business year
text science
group work article
university question
learning reading topic
teaching teacher level
subject reading author
student process school
material language

1997-1999 topic 9

university education writing article teacher
student work language
material english school
learning teaching reference
skill basic program
book reader educational
Computer topic
author library year introduction

2000-2002 topic 13

technology development social science
student material activity communication
computer work program quality
teaching organization education
learning process community practice
project group teacher management skill
experience school university

2003-2005 topic 16

design quality teaching
knowledge education concept
management organization
process product library
problem activity computer
student work year
technology online article practice
development group business resource science

2006-2008 topic 10

issue evaluation methodology
process work case
practice business cost quality
design impact future
product analysis
development customer industry market
technology production risk engineering
management tool enterprise

2009-2011 topic 4

knowledge decision website
risk process customer
technology development year
management internet organization
library digital market
SOCIAL company communication public factor
product article enterprise
community online people issue

1988 - 1996

1988-1990 topic 11

structure development
knowledge representation
User description
design tool document support
relational formal abstract
specification
retrieval interface
language
query definition
programming graphical object concept
database
environment standard attribute oriented software rule

1991-1993 topic 15

analysis programming language
modeling description
software
developed process
specification oriented
tool
application
computer requirement concept
development
component support interface
design
engineering level problem methodology
object user environment technique implementation

1994-1996 topic 1

level class
protocol control
object user structure mechanism
support framework management component
distributed
design specification implementation net process
application
environment programming query architecture
database
retrieval communication

1988 - 1996

1988-1990 topic 11

structure development
knowledge representation
User description
design tool support
relational formal abstract
specification
retrieval interface
language
query definition
programming graphical
object concept
database
environment oriented software rule attribute

1991-1993 topic 15

analysis programming language
modeling description
software
developed process
specification oriented
tool
application
computer development
component support interface
design
engineering level problem methodology
object user environment implementation
user

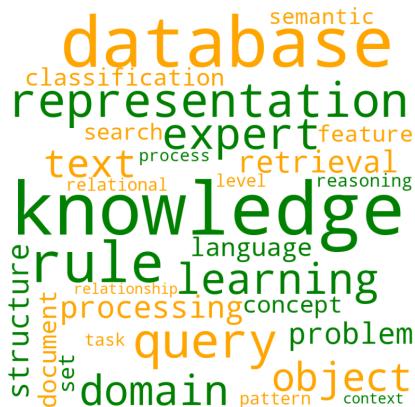
1994-1996 topic 5

implementation platform package
tool
development
interface
standard programming user
environment program
laboratory code process
software
performance virtual report
computer
work product workstation
parallel
application
library version engineering developed

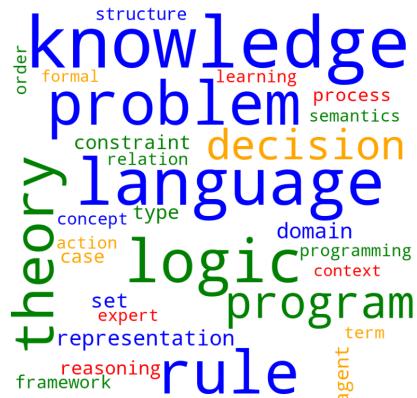


1991 - 2011

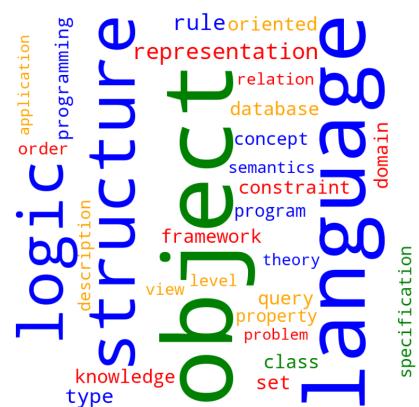
1991-1993 topic 4



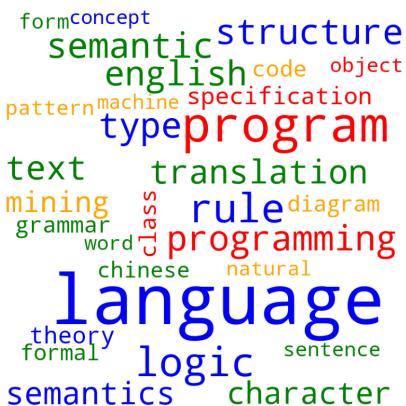
1994-1996 topic 18



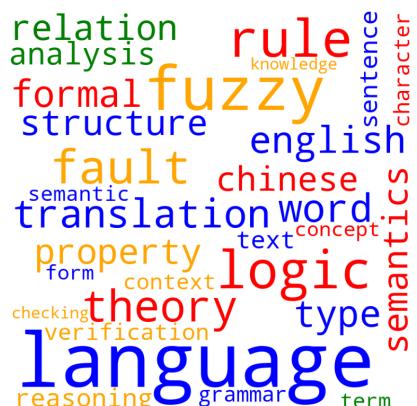
1997-1999 topic 16



2000-2002 topic 11



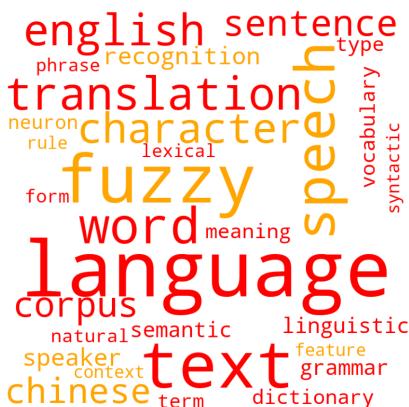
2003-2005 topic 7



2006-2008 topic 12

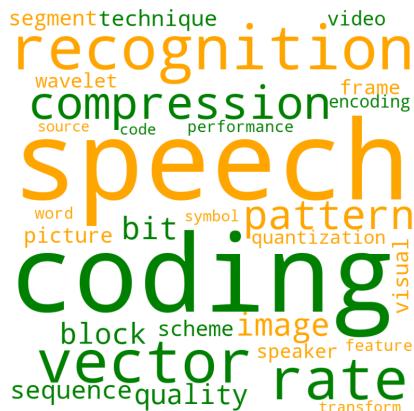


2009-2011 topic 19

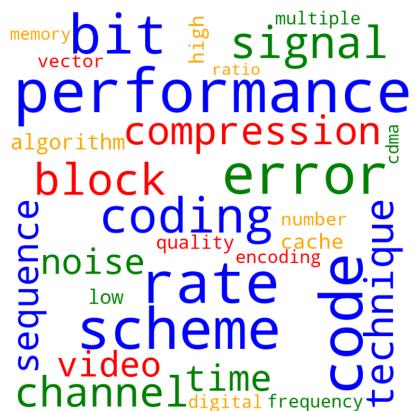


1991 - 2005

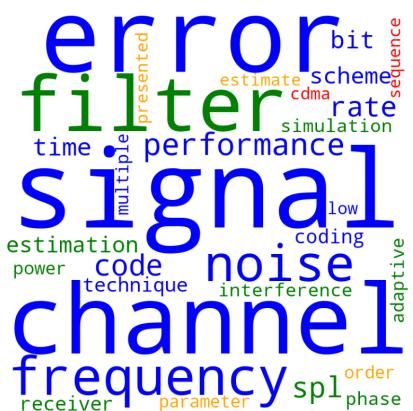
1991-1993 topic 9



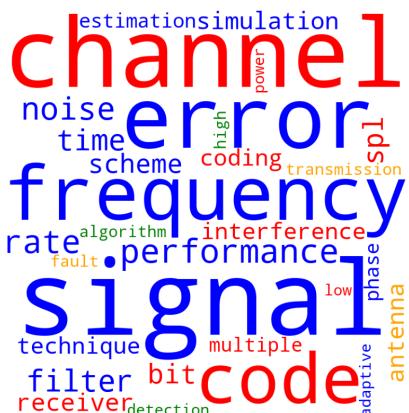
1994-1996 topic 3



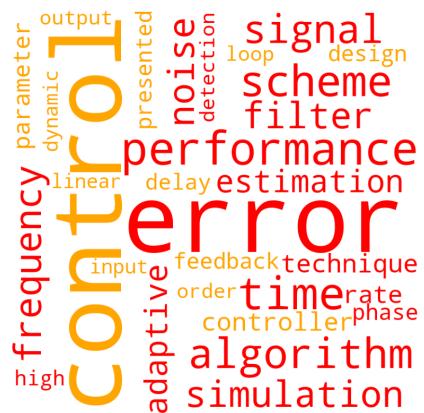
1997-1999 topic 19



2000-2002 topic 4



2003-2005 topic 19



1994 - 2002

1994-1996 topic 4

electronic computer service
work future area support
technology
application
problem multimedia
development cost
internet library standard
resource user web
management organization
wide provide communication
issue network medium

1997-1999 topic 18

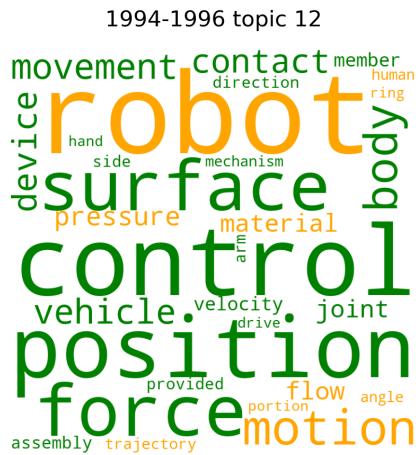
communication network development
access web support
internet electronic server computer
user distributed mobile
interface multimedia business
technology standard client
environment library site
application management virtual

2000-2002 topic 16

public internet document file
service server key resource
web query commerce
user management transaction
database retrieval site
collection application multimedia
security provide xml

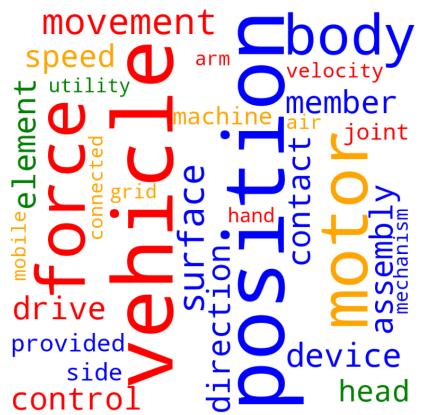
1994 - 2008

1994-1996 topic 12



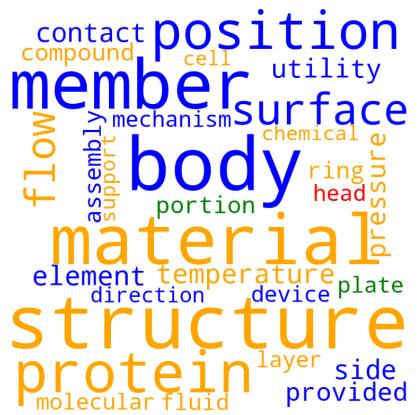
movement contact member human
robot direction ring
surface hand mechanism
control side pressure material
position vehicle velocity drive joint
force provided portion flow angle
assembly trajectory motion

1997-1999 topic 15



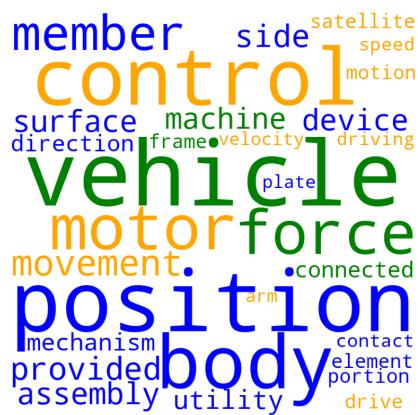
movement speed arm velocity
force utility machine member
vehicle connected grid joint
position surface hand assembly
drive direction contact motor
provided side control device
control head

2000-2002 topic 3



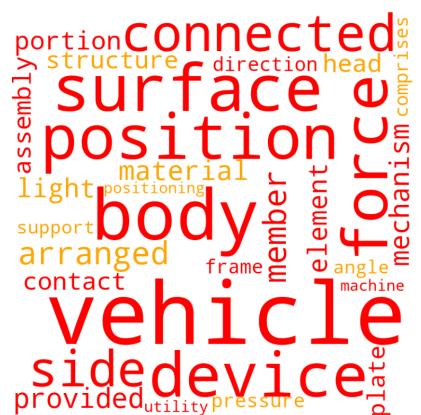
contact compound cell utility
member assembly mechanism chemical
body portion head
material element temperature device plate
structure layer side provided
protein molecular fluid

2003-2005 topic 4



member side satellite
control speed motion
surface machine device
direction frame velocity driving
vehicle plate
motor force
movement connected
position arm
body contact element portion
provided drive
assembly utility

2006-2008 topic 7



connected structure direction head
surface position comprises
body material positioning
force light support
vehicle arranged contact frame member
device angle machine

1994 - 2002

1994-1996 topic 14

display computer game
storage address output
video user file processor interface
memory card window
program operation disk
device unit copy screen color
command access time stored audio

1997-1999 topic 11

input card recording mode memory
frame transmission storage
audio signal apparatus plurality apparatus
display digital stream station terminal
video output control communication processing

2000-2002 topic 14

control number user interface
signal card computer memory
terminal mobile game program output
display station provided input connected
device receiving plurality transmission includes

1994 - 2011

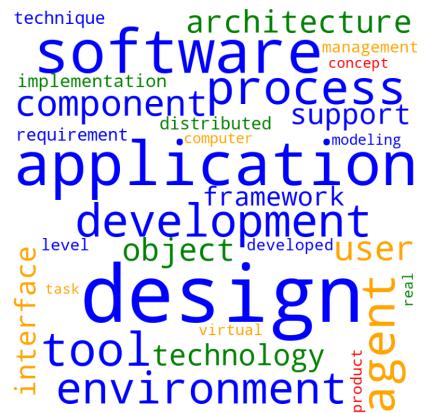
1994-1996 topic 19



1997-1999 topic 12



2000-2002 topic 17



2003-2005 topic 5



2006-2008 topic 4



2009-2011 topic 5



1994 - 2017

1994-1996 topic 19



1997-1999 topic 12



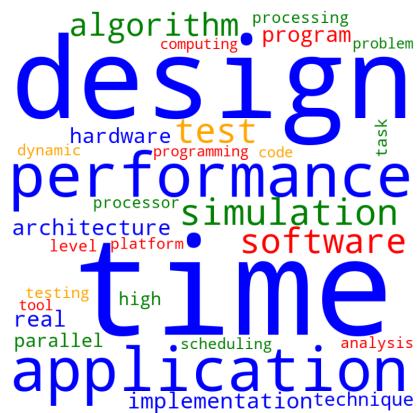
2000-2002 topic 17



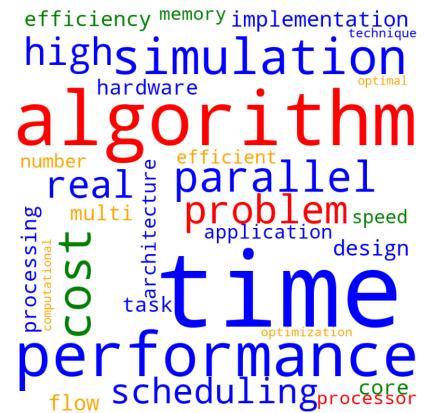
2003-2005 topic 5



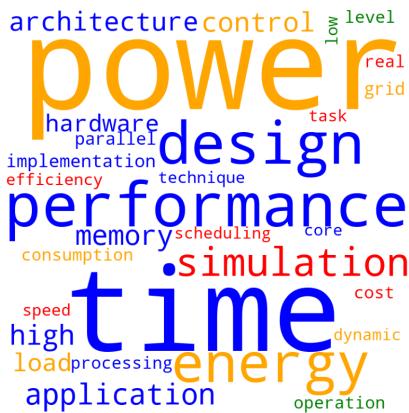
2006-2008 topic 14



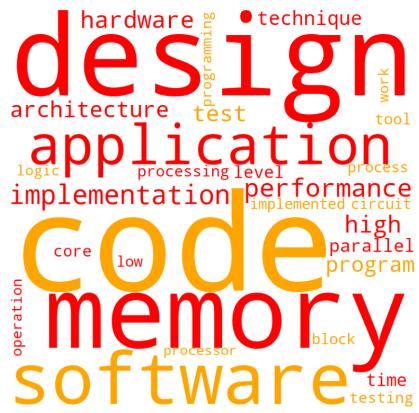
2009-2011 topic 20



2012-2014 topic 2



2015-2017 topic 8



1994 - 2020

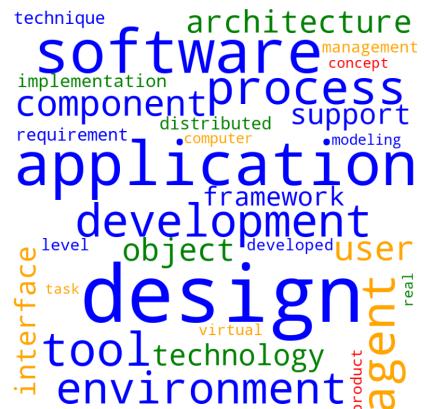
1994-1996 topic 19



1997-1999 topic 12



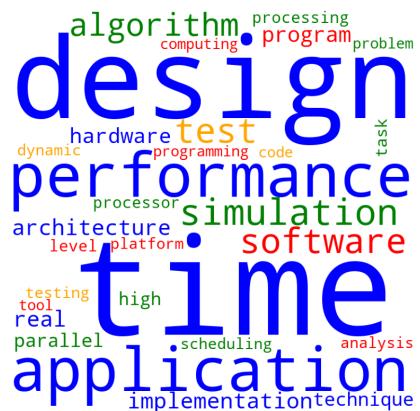
2000-2002 topic 17



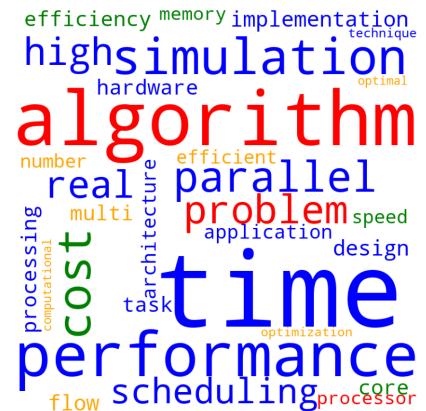
2003-2005 topic 5



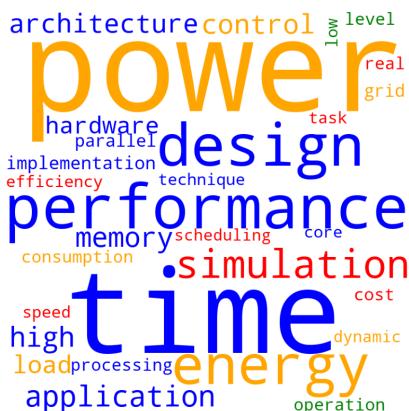
2006-2008 topic 14



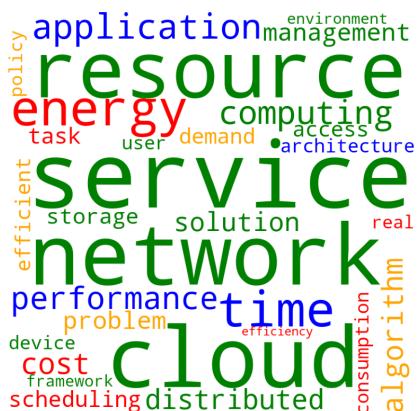
2009-2011 topic 20



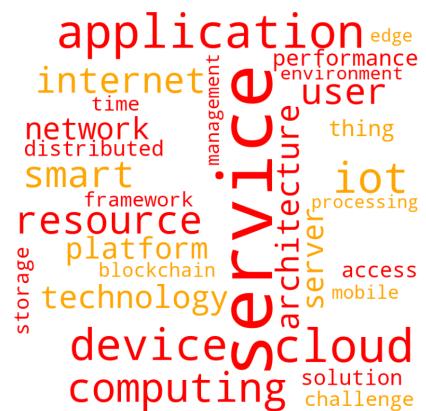
2012-2014 topic 2



2015-2017 topic 15



2018-2020 topic 11



1994 - 2020

1994-1996 topic 19



1997-1999 topic 12



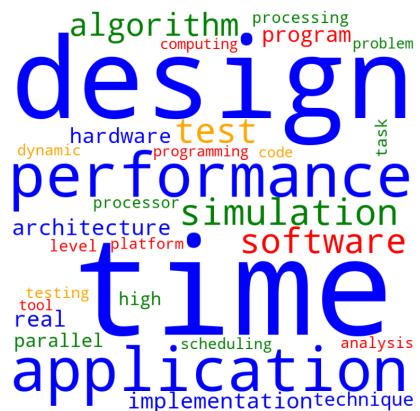
2000-2002 topic 17



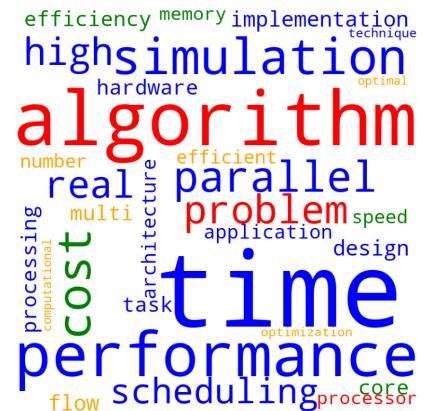
2003-2005 topic 5



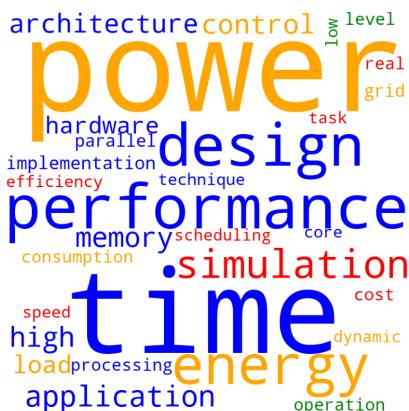
2006-2008 topic 14



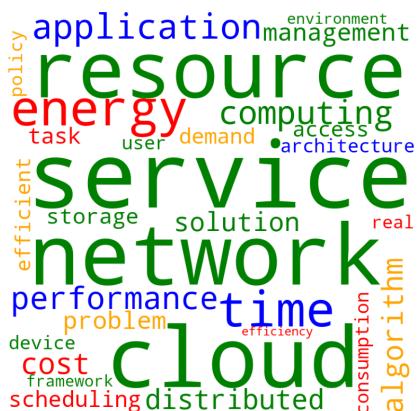
2009-2011 topic 20



2012-2014 topic 2



2015-2017 topic 15



2018-2020 topic 16



1997 - 2020

1997-1999 topic 2

A word cloud showing topics from 1997 to 1999. The most prominent words are 'pattern', 'learning', 'speech', 'feature', 'classification', and 'recognition'. Other visible words include 'parameter', 'set', 'task', 'hidden', 'rate', 'rule', 'speaker', 'analysis', 'detection', 'acoustic', 'character', 'experiment', 'neural', 'automatic', and 'error'. The words are colored in various shades of green, blue, red, and orange.

2000-2002 topic 8

A word cloud showing topics from 2000 to 2002. The most prominent words are 'classification', 'feature', 'recognition', 'learning', 'training', 'pattern', 'vector', 'distribution', 'measure', 'task', 'clustering', 'probability', 'set', 'sequence', 'classifier', 'performance', 'analysis', 'prediction', 'word', 'sound', 'sample', 'accuracy', 'similarity', and 'statistical'. The words are colored in various shades of red, blue, green, and orange.

2003-2005 topic 12

A word cloud showing topics from 2003 to 2005. The most prominent words are 'performance', 'analysis', 'classification', 'measure', 'test', 'feature', 'evaluation', 'distance', 'number', 'experimental', 'technique', 'statistical', 'accuracy', 'factor', 'clustering', 'sample', 'pattern', 'metric', 'compared', 'selection', 'testing', 'criterion', 'experiments', 'cluster', 'vector', 'similarity', and 'comparison'. The words are colored in various shades of red, blue, green, and orange.

2006-2008 topic 15

A word cloud showing topics from 2006 to 2008. The most prominent words are 'image', 'feature', 'algorithm', 'classification', 'detection', 'vector', 'high', 'set', 'spatial', 'technique', 'analysis', 'mining', 'space', 'pattern', 'color', 'map', 'classifier', 'recognition', 'face', '3d', and 'clustering'. The words are colored in various shades of red, blue, green, and orange.

2009-2011 topic 10

A word cloud showing topics from 2009 to 2011. The most prominent words are 'accuracy', 'analysis', 'error', 'parameter', 'vector', 'estimation', 'time', 'adaptive', 'classifier', 'performance', 'classification', 'algorithm', 'target', 'detection', 'filter', 'clustering', 'feature', 'estimate', 'neural', 'noise', 'sample', 'prediction', 'technique', 'experimental', 'compared', and 'learning'. The words are colored in various shades of red, blue, green, and orange.

2012-2014 topic 10

A word cloud showing topics from 2012 to 2014. The most prominent words are 'image', 'feature', 'classification', 'recognition', 'algorithm', 'learning', 'vector', 'analysis', 'technique', 'dataset', 'classifier', 'tracking', 'experiment', 'sample', 'experimental', 'similarity', and 'extraction'. The words are colored in various shades of red, blue, green, and orange.

2015-2017 topic 14

A word cloud showing topics from 2015 to 2017. The most prominent words are 'algorithm', 'feature', 'image', 'learning', 'network', 'deep', 'art', 'experiment', 'high', 'state', 'technique', 'problem', 'clustering', 'detection', 'experimental', 'performance', 'vector', 'problem', 'recognition', 'dataset', 'dataset', 'segmentation', and 'classification'. The words are colored in various shades of red, blue, green, and orange.

2018-2020 topic 12

A word cloud showing topics from 2018 to 2020. The most prominent words are 'image', 'feature', 'network', 'learning', 'classification', 'performance', 'dataset', 'prediction', 'experimental', 'training', 'segmentation', 'accuracy', 'state', 'problem', 'multi', 'object', 'video', 'task', 'recognition', 'deep', 'machine', 'datasets', 'high', 'problem', 'neural', 'algorithm', 'Cart', 'classifier', and 'object'. The words are colored in various shades of red, blue, green, and orange.

2003 - 2011

2003-2005 topic 6

key management
computer server request broadcast content
cache card client
mobile service
application message
user device
access interface
authentication
communication
control network module
protocol terminal internet

2006-2008 topic 8

station wireless mechanism
ip connection node
user resource server technology
network communication
time client layer
request mobile internet
message application
device traffic protocol
qos control access
service packet
transmission

2009-2011 topic 3

virtual framework
architecture cloud smart
peer user device
resource game distributed
management grid computing
technology provide support
internet access platform
application service
network environment mechanism

2003 - 2014

2003-2005 topic 8

device
unit
sensor
signal

area medium location screen
input control provided output
detecting target measurement time state
operation apparatus recording sensing plurality
monitoring storage includes window
detection mode includes window

2006-2008 topic 11

storage
device
processing
input
module
display
user
terminal
unit
image

comprises electronic provided time
operation comprising file connected card
memory authentication receiving configuration
user signal key apparatus receiving plurality
terminal output interface apparatus includes screen
unit

2009-2011 topic 11

communication
device
user processing
mode memory
cell storage
unit operation time

terminal state equipment read
user processing configuration plurality
mode apparatus comprises target access includes input
cell table request set
window control comprising target
unit operation time

2012-2014 topic 12

display
image
video
device
unit user

screen input display signal frame
time equipment audio position
includes mobile receiving operation
file server interface
request target object comprises
processing communication camera

2003 - 2020

2003-2005 topic 17

A word cloud representing the topics of 2003-2005, topic 17. The words are primarily in orange, green, and blue. Key terms include simulation, equation, function, parameter, analysis, and distribution. Smaller words include estimate, finite, spectral, surface, order, point, water, structure, dynamic, time, mesh, numerical, field, dimensional, boundary, element, calculation, curve, solution, process, linear, and non-linear.

2006-2008 topic 18

A word cloud representing the topics of 2006-2008, topic 18. The words are primarily in green, blue, and yellow. Key terms include algorithm, problem, function, graph, fuzzy, time, solution, and optimization. Other terms include space, condition, dynamic, set, point, parameter, theory, optimal, state, number, neural, linear, order, variable, property, matrix, numerical, case, constraint, matrix, equation, optimization, class, and curve.

2009-2011 topic 17

A word cloud representing the topics of 2009-2011, topic 17. The words are primarily in red, blue, and yellow. Key terms include space, bound, constraint, optimization, problem, solution, algorithm, and function. Other terms include point, property, approximation, matrix, optimal, equation, genetic, order, numerical, solving, robot, condition, linear, theory, variable, state, case, particle, and class.

2012-2014 topic 18

A word cloud representing the topics of 2012-2014, topic 18. The words are primarily in blue, red, and green. Key terms include problem, linear, function, time, matrix, and state. Other terms include distribution, nonlinear, set, number, bound, random, space, control, parameter, variable, filter, solution, numerical, case, probability, equation, estimation, input, condition, order, and class.

2015-2017 topic 7

A word cloud representing the topics of 2015-2017, topic 7. The words are primarily in orange, blue, and yellow. Key terms include graph, optimization, constraint, solution, problem, number, optimal, algorithm, function, set, time, and point. Other terms include space, case, equation, property, complexity, solving, matrix, computational, solve, approximation, structure, math, state, numerical, class, linear, and time.

2018-2020 topic 17

A word cloud representing the topics of 2018-2020, topic 17. The words are primarily in red, blue, and yellow. Key terms include distribution, function, set, agent, space, problem, matrix, algorithm, theory, number, case, and approximation. Other terms include structure, probability, variable, quantum, state, solution, framework, general, abstract, point, order, class, linear, and provided.

2003 - 2020

2003-2005 topic 17

simulation
surface
equation
function
parameter
analysis
distribution

estimate finite spectral
order point water
structure dynamic time mesh
numerical field
dimensional boundary
element calculation curve
linear process solution

2006-2008 topic 18

space condition dynamic
set point parameter optimal
state theory
number neural linear
nonlinear order variable
property fuzzy time
graph numerical case
constraint matrix solution
matrix equation optimization
class

2009-2011 topic 17

space bound constraint
optimization
point property matrix
approximation
problem
optimalequation genetic
parameter
order solution
finite numerical solving
number state algorithm condition
case robot solving
particle linear theory
variable

2012-2014 topic 18

distribution nonlinear
set number bound
random space bound
linear control
parameter variable
function filter solution
numerical state
time case probability
matrix equation optimal
property estimation
condition input
order

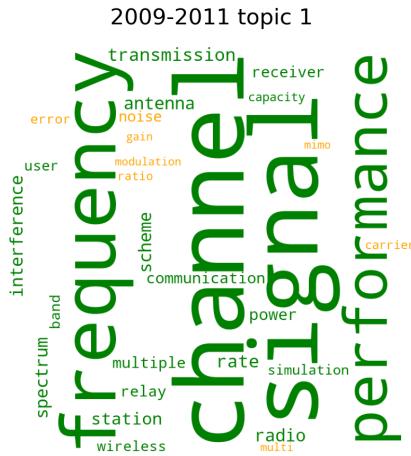
2015-2017 topic 13

presented stability order
tracking scheme
designed simulation
controller analysis
strategy error condition
phase nonlinear input
feedback mode adaptive
controller parameter
design time filter
linear effectiveness
loop state performance output
filter

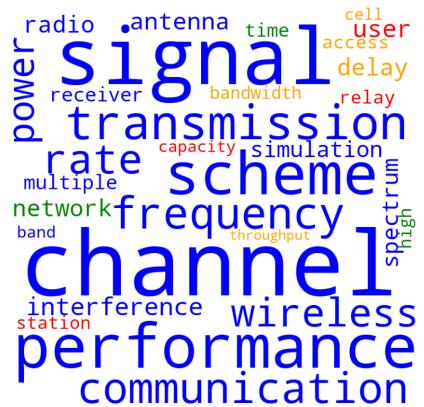
2018-2020 topic 1

conditionfilter feedback
fuzzy effectiveness
parameter input
linear output estimation
controller disturbance
design performance tracking
loop problem adaptive
order event nonlinear time
state uncertainty simulation
stability

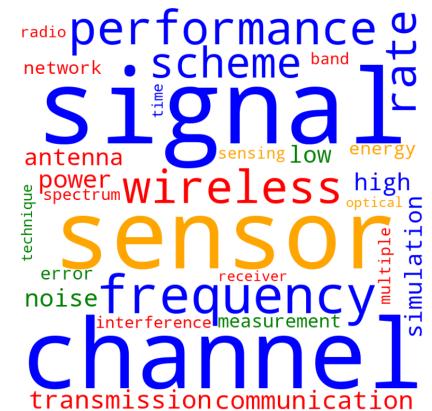
2009 - 2020



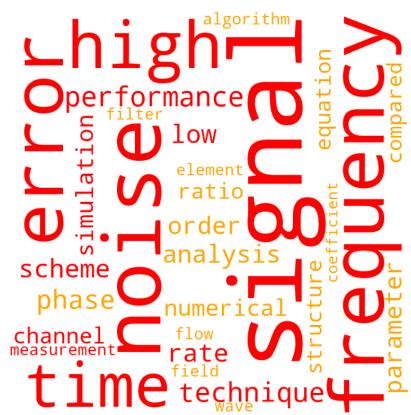
2012-2014 topic 5



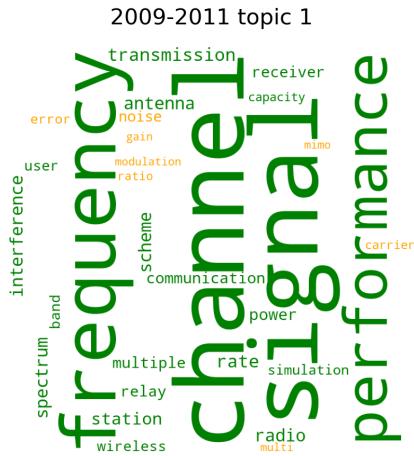
2015-2017 topic 19



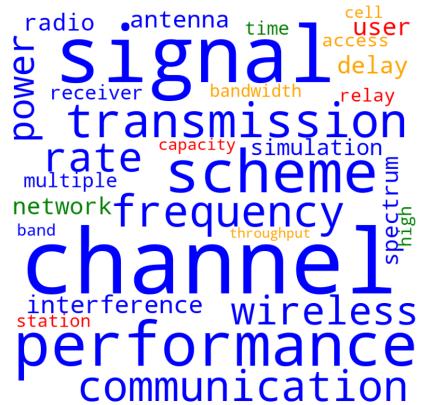
2018-2020 topic 7



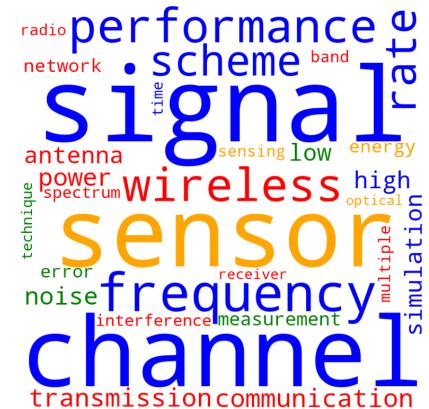
2009 - 2020



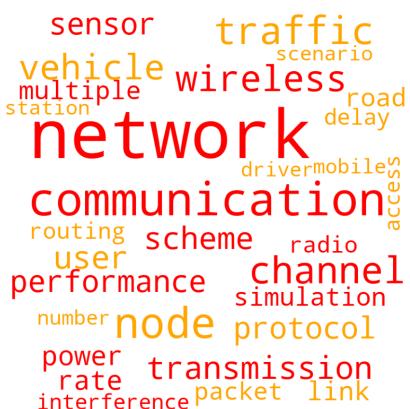
2012-2014 topic 5



2015-2017 topic 19



2018-2020 topic 9



2009 - 2020

2012-2014 topic 7

2015-2017 topic 4

2009-2011 topic 16

power operation machine
signal vehicle
display speed
position module
mechanism comprises
unit output
control
connected
motor sensor
controller interface
provided battery arranged

2012-2014 topic 7

connected
vehicle
module
control
motor
body
device
comprises

2015-2017 topic 4

energy current load
power
unit
grid
voltage
device
control
battery circuit
generator
switching
driving
mode converter
source monitoring
input output
connected sensor electric

2018-2020 topic 4

generator
speed
circuit
power
high
phase
frequency
control device
grid
low
design
operation
load
simulation
source
motor
generation
dc
battery
wind

2012 - 2020

2012-2014 topic 8

recommendation virtual
server game user
customer provider
player cost application
demand stream policy
cloud trust
computing infrastructure
video peer qos
service center
resource attribute
quality storage item
environment transaction

2015-2017 topic 15

application environment
management
resource energy computing
task user demand access
Service architecture
storage solution real
network distributed
smart framework
network time efficiency
performance problem
cost consumption algorithm
device framework
scheduling distributed

2018-2020 topic 11

application edge
internet performance
time user
management environment
distributed thing
smart iot
resource framework processing
platform blockchain
technology server access
mobile
service architecture
devices cloud
computing solution challenge

2012 - 2020

2012-2014 topic 8

recommendation virtual
server game user
customer provider
player cost application
demand stream policy
cloud trust
computing infrastructure
video peer qos
service center
resource attribute
quality storage item
environment transaction

2015-2017 topic 15

application environment
management
resource policy
energy computing
task user demand access
service architecture
storage solution real
network performance time
problem efficiency
cloud consumption algorithm
device framework distributed

2018-2020 topic 16

resource compared performance
cluster order
algorithm constraint efficiency
problem consumption decision multi
optimization real objective clustering
cost task search strategy
solution planning solve number demand
energy selection

2012 - 2020

2012-2014 topic 11

authentication scheme application user security mobile access key
platform technique online secure
medium internet encryption privacy interface
social device attack web communication
content provider technology
attack work smart digital database
public work

2015-2017 topic 2

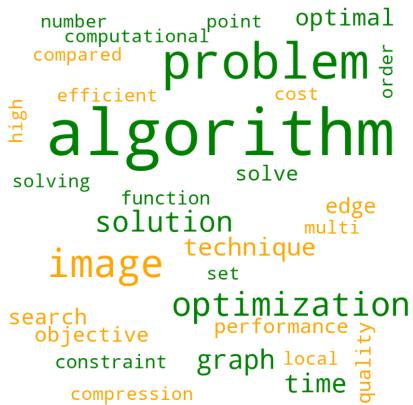
database protection protocol server public
entity encryption user threat document
scheme search authentication
privacy tag query message
location signature vulnerability key
attack web access malicious file

2018-2020 topic 2

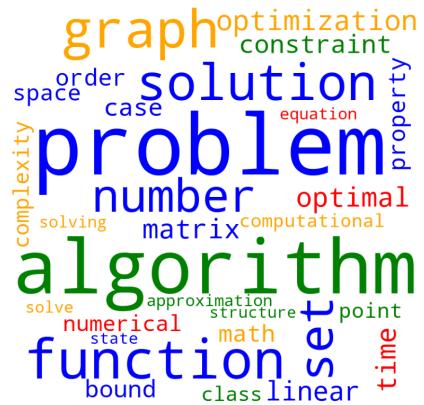
anomaly detection malware physical integrity
secure protection malicious
vulnerability integrity
security authentication attack
child user detect behavior
privacy vr signature
protocol threat analysis
cyber risk trust technique

2012 - 2020

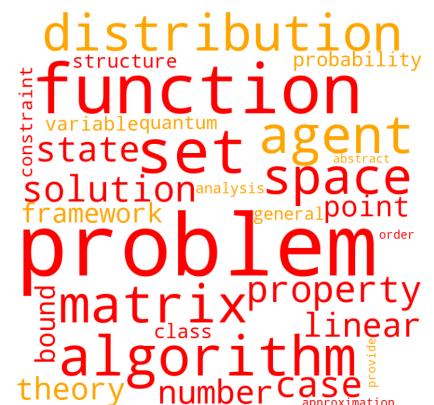
2012-2014 topic 19



2015-2017 topic 7



2018-2020 topic 17



2012 - 2020

2012-2014 topic 20



A word cloud visualization for Topic 20 from 2012 to 2014. The words are arranged in a roughly triangular shape pointing downwards. The most prominent words are 'design', 'project', 'process', 'management', 'development', and 'technology'. Smaller words surrounding them include 'knowledge', 'risk', 'requirement', 'business', 'product', 'quality', 'framework', 'making', 'software', 'engineering', 'support', 'cost', 'organization', 'decision', 'methodology', 'evaluation', 'challenge', 'impact', 'tool', 'level', and 'case'.

2015-2017 topic 16



A word cloud visualization for Topic 16 from 2015 to 2017. The words are arranged in a roughly triangular shape pointing downwards. The most prominent words are 'application', 'development', 'process', 'design', 'technology', and 'analysis'. Smaller words surrounding them include 'user', 'business', 'software', 'support', 'developed', 'challenge', 'review', 'work', 'field', 'knowledge', 'management', 'issue', 'product', 'provide', 'framework', 'environment', 'project', 'tool', 'concept', 'practice', 'engineering', 'future', and 'context'.

2018-2020 topic 5



A word cloud visualization for Topic 5 from 2018 to 2020. The words are arranged in a roughly triangular shape pointing downwards. The most prominent words are 'test', 'tool', 'development', 'design', 'process', 'software', and 'analysis'. Smaller words surrounding them include 'case', 'industry', 'structure', 'machine', 'building', 'product', 'material', 'component', 'simulation', 'manufacturing', 'project', 'complex', 'production', 'operation', 'quality', 'safety', 'developed', 'work', 'requirement', 'application', 'testing', 'engineering', and 'future'.

2012 - 2020

2012-2014 topic 20



2015-2017 topic 16



2018-2020 topic 8

