IEEE Taxonomy: A Subset Hierarchical Display of IEEE Thesaurus Terms

The IEEE Taxonomy comprises the first three hierarchical 'levels' under each term-family (or branch) that is formed from the top-most terms of the IEEE Thesaurus. In this document these term-families are arranged alphabetically and denoted by boldface type. Each term family's hierarchy goes to no more than three sublevels, denoted by indents (in groups of four dots) preceding the next level terms. A term can appear in more than one hierarchical branch and can appear more than once in any particular hierarchy. The IEEE Taxonomy is defined in this way so that it is always a subset of the 2024 IEEE Thesaurus.

Aerospace and electronic systems

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

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

Antennas and propagation

....Antennas
........Antenna accessories
........Radomes
........Antenna arrays
........Adaptive arrays
........Butler matrices
........Linear antenna arrays
........Log periodic antennas
........Microstrip antenna arrays
........Microwave antenna arrays
........Phased arrays
........Planar arrays
........Antenna radiation patterns
........Near-field radiation pattern
........Antenna theory
........Frequency selective surfaces
Antenna-in-package
Apertures
Aperture antennas
Aperture coupled antennas
Broadband antennas
Ultra wideband antennas
Vivaldi antennas
Dielectric resonator antennas
Dipole antennas
Directional antennas
Directive antennas
Feeds
Antenna feeds
Helical antennas
Horn antennas
Leaky wave antennas
Loaded antennas
Log-periodic dipole antennas
Loop antennas
Microstrip antennas
Microwave antennas
Mobile antennas
Multifrequency antennas
Omnidirectional antennas
Optical antennas
Nanoantennas
Patch antennas
Radar antennas
Receiving antennas
Rectennas
Reflector antennas
Satellite antennas
Slot antennas
Steerable antennas
Textile antennas
Transmission line antennas
Transmitting antennas
UHF antennas
Wearable antennas
Yagi-Uda antennas
Electromagnetic propagation
Electromagnetic diffraction
Optical diffraction
Physical theory of diffraction
X-ray diffraction
Electromagnetic propagation in absorbing media
Electromagnetic reflection
Optical reflection
Microwave propagation
Millimeter wave propagation
Optical propagation
Optical surface waves
Optical waveguides
Propagation constant
Propagation losses
Radio propagation
Radiowave propagation
NVIS
Submillimeter wave propagation
UHF propagation
Radio astronomy

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

Circuits and systems
Circuits
Active circuits
Active inductors
Gyrators
Operational amplifiers
Adders
Analog circuits
Analog integrated circuits
Analog processing circuits
Application specific integrated circuits
System-on-chip
Asynchronous circuits
Bipolar transistor circuits
BiCMOS integrated circuits
Bipolar integrated circuits
Bistable circuits
Latches
Bridge circuits
Charge pumps
...Circuit analysis
...Circuit analysis computing
...Coupled mode analysis
...Nonlinear network analysis
...Circuit faults
...Electrical fault detection
...Circuit noise
...Thermal noise
...Circuit simulation
...Circuit synthesis
...High level synthesis
...Integrated circuit synthesis
...Coprocessors
...Counting circuits
...Coupling circuits
...Digital circuits
...Circuit topology
...Digital integrated circuits
...Digital signal processors
...Distributed parameter circuits
...Driver circuits
...Electronic circuits
...Breadboard
...Central Processing Unit
...Multivibrators
...Stripboard circuit
...Equivalent circuits
...Feedback
...Feedback circuits
...Negative feedback
...Neurofeedback
...Hybrid integrated circuits
...Integrated circuits
...Analog integrated circuits
...Analog-digital integrated circuits
...Application specific integrated circuits
...CMOS integrated circuits
...Coprocessors
...Current-mode circuits
...Digital integrated circuits
...FET integrated circuits
...Field programmable gate arrays
...Hybrid integrated circuits
...Integrated circuit interconnections
...Integrated circuit modeling
...Integrated circuit noise
...Integrated circuit synthesis
...Large scale integration
...MESFET integrated circuits
...Microprocessors
...Microwave integrated circuits
...Millimeter wave integrated circuits
...Microwave integrated circuits
...Monolithic integrated circuits
...Photonic integrated circuits
...Power integrated circuits
...Radiofrequency integrated circuits
...SIM card
...Submillimeter wave integrated circuits
...Superconducting integrated circuits
...Thick film circuits
...Thin film circuits
...Three-dimensional integrated circuits
...Through-silicon vias
...UHF integrated circuits
...Ultra large scale integration
...Very high speed integrated circuits
...Very large scale integration
...Wafer scale integration
...Isolators
...Large scale integration
...Ultra large scale integration
...Very large scale integration
...Wafer scale integration
...Linear circuits
...Logic arrays
...Programmable logic arrays
...Logic circuits
...Combinational circuits
...Logic arrays
...Programmable logic arrays
...Superconducting logic circuits
...Magnetic circuits
...Microprocessors
...Automatic logic units
...Biomimetics
...Coprocessors
...Microcontrollers
...Microprocessor chips
...Vector processors
...Microwave circuits
...Millimeter wave circuits
...Millimeter wave integrated circuits
...Millimeter wave integrated circuits
...MIMICs
...Monolithic integrated circuits
...MIMICs
...MMICs
MOSFET circuits
CMOSFET circuits
MOS integrated circuits
Power MOSFET
Multiplying circuits
Neural circuits
Nonlinear circuits
Nonlinear network analysis
Passive circuits
Phase shifters
Phase transformers
Power dissipation
Power integrated circuits
Printed circuits
Flexible printed circuits
Memory modules
Surface mount technology
Programmable circuits
Field programmable analog arrays
Programmable logic arrays
Programmable logic devices
Programmable logic arrays
Programmable logic devices
Pulse circuits
Flip-flops
Quantum circuit
Radiation detector circuits
Rail to rail operation
Rail to rail amplifiers
Rail to rail inputs
Rail to rail outputs
Rectifiers
RLC circuits
Sampled data circuits
Sequential circuits
Silicon-on-insulator
Silicon on sapphire
Submillimeter wave circuits
Submillimeter wave integrated circuits
Summing circuits
Switched circuits
Switched capacitor circuits
Switching circuits
Choppers (circuits)
Logic circuits
Switching converters
Zero current switching
Zero voltage switching
Thick film circuits
Thin film circuits
Thyristor circuits
Time varying circuits
Trigger circuits
UHF circuits
UHF integrated circuits
Ultra large scale integration
Very large scale integration
Neuromorphics
VHF circuits
Voltage multipliers
Capacitors
Diodes
Wafer scale integration
Contacts
Brushes
Contact resistance
Ohmic contacts
Filtering
Filters
Active filters
Anisotropic
Bragg gratings
Channel bank filters
Comb filters
Digital filters
Equalizers
Filtering theory
Gabor filters
Harmonic filters
IIR filters
Kalman filters
Low-pass filters
Microstrip filters
Nonlinear filters
Notch filters
Particle filters
Power filters
Resonator filters
Spatial filters
Superconducting filters
Transversal filters
Information filtering
Information filters
Recommender systems
Integrated circuit technology
Beyond CMOS
CMOS technology
CMOS process
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Silicon on sapphire
Moore's Law
Logic devices
Logic gates
Programmable logic devices
Oscillators
Digital-controlled oscillators
Injection-locked oscillators
Local oscillators
Microwave oscillators
Phase noise
Ring oscillators
Voltage-controlled oscillators
Single electron devices
Single electron memory
Hetero-nanocrystal memory
Single electron transistors
Tunable circuits and devices
RLC circuits
Tuned circuits

Communications technology

Communication equipment
Auditory displays
Codecs
Speech codecs
Video codecs
Modems
On board unit
Optical communication equipment
Optical transmitters
Radio communication equipment
Base stations
Ham radios
Land mobile radio equipment
Radio transceivers
Transponders
Receivers
Optical receivers
RAKE receivers
Receiving antennas
Repeaters
Speech codecs
Telephone equipment
Cellular phones
Landline
Telephone sets
Vocoders
Transceivers
Radio transceivers
Transmitters
Auxiliary transmitters
Diversity methods
Neurotransmitters
Optical transmitters
Radio transmitters
Transmitting antennas
Transponders
TV equipment
Large screen displays
TV receivers
Video codecs
Video equipment
Optical projectors
Video codecs
Videos
Vocoders
Communication switching
Code division multiplexing
Electronic switching systems
Frame relay
Handover
Multiprotocol label switching
Packet switching
Burst switching
Frame relay
Multiprotocol label switching
Packet loss
Communication systems
ARPANET
Biomedical communication
Biomedical telemetry
Telemedicine
Broadband communication
B-ISDN
Broadband amplifiers
Communication networks
Central office
Cyberspace
Industrial communication
Maritime communications
Radio access technologies
Relay networks
Telecommunication network performance
Virtual links
Communication system control
Telecommunication control
Communication system security
Denial-of-service attack
Impersonation attacks
Metropolitan area networks
Microwave communication
Rectennas
Military communication
Reconnaissance
MIMO communication
Massive MIMO
Rician channels
MISO communication
Mobile communication
3G mobile communication
4G mobile communication
5G mobile communication
6G mobile communication
Ambient networks
Cellular technology
Dual band
Land mobile radio
Location awareness
Mobile learning
Mobile nodes
Mobile security
Mobile video
Mobility models
SIM card
Software radio
Ultra-dense networks
Molecular communication
Multiaccess communication
Access charges
Direct-sequence code-division multiple access
Frequency division multiaccess
Multicarrier code division multiple access
Subscriber loops
dTime division multiple access
dTime division synchronous code division multiple access
Zero correlation zone
Multicast communication
Multicast VPN
Multimedia communication
Hypermedia
Nanocommunication
Narrowband
NOMA
Optical fiber communication
FDDI
Free-space optical communication
Optical buffering
Optical fiber networks
Optical fiber subscriber loops
Optical interconnections
Optical packet switching
Optical wavelength conversion
Scheduling algorithms
SONET
Visible light communication
Personal communication networks
Protocols
Access protocols
Asynchronous transfer mode
Border Gateway Protocol
Consensus protocol
Cryptographic protocols
InterPlanetary File System
Main-secondary
Multicast protocols
Multiprotocol label switching
Proof of Work
Routing protocols
Smart contracts
Transport protocols
Wireless application protocol
Zero knowledge proof
Quality of experience
Quality of service
Admission control
Quantum communication
Quantum circuit
Quantum networks
Radio communication
Baseband
Bluetooth
Cellular technology
Indoor radio communication
Land mobile radio
Millimeter wave communication
Near field communication
Packet radio networks
Passband
Personal area networks
Radio broadcasting
Radio communication
countermeasures
Radio frequency
Radio links
Radio spectrum management
Satellite communication
Satellite ground stations
Software radio
Zigbee
Regional area networks
WRAN
Routing
Wavelength routing
Satellite communication
Downlink
Satellite broadcasting
Satellite ground stations
Uplink
Satellite ground stations
SIMO communication
SISO communication
Spatial diversity
Submillimeter wave communication
Subscriber loops
Switching systems
Electronic switching systems
Switching frequency
Switching loss
Telecommunication switching
Synchronous digital hierarchy
Telecommunications
Ambient intelligence
Feedback communications
IP networks
Radio access networks
Railway communication
Space communications
Telecommunication computing
Telecommunication network topology
Telecommunication services
Telematics
Teleconferencing
Telegraphy
Telephony
Teleprinting
Teletext
Terahertz communications
Token networks
UHF communication
Underwater communication
Vehicle-to-everything
Vehicle-to-infrastructure
Video conferencing
Videophone systems
Videotex
Visual communication
Wide area networks
Low-power wide area networks
Wideband
Wireless communication
Cognitive radio
Cooperative communication
Dedicated short range communication
GSM
Open wireless architecture
Point-to-multipoint communications
Roaming
Smart devices
Spatial diversity
WiMAX
Wireless access points
Wireless application protocol
Wireless networks
WRAN
Wireless mesh networks
Wireless sensor networks
Body sensor networks
Event detection
Couplers
Directional couplers
High-speed electronics
High-speed integrated circuits
High-speed networks
Ultrafast electronics
Image communication
Facsimile
Picture archiving and communication systems
Information and communication technology
Ambient assisted living
Message systems
Electronic mail
Unified messaging
Unsolicited e-mail
Electronic messaging
Instant messaging
Unified messaging
Postal services
Publish subscribe systems
Voice mail
Modulation
Amplitude modulation
Amplitude shift keying
Quadrature amplitude modulation
Chirp modulation
Demodulation
Digital modulation
Constellation diagram
Partial response signaling
Frequency modulation
Frequency shift keying
Magnetic modulators
Modulation coding
Interleaved codes
Optical modulation
Cross-phase modulation
Intensity modulation
Optical modulators
Electro-absorption modulators
Electro-optic modulators
Phase modulation
Continuous phase modulation
Cross-phase modulation
Differential phase shift keying
Phase shift keying
Pulse modulation
Pulse width modulation
Pulse width modulation inverters
Space vector pulse width modulation
Multiplexing
Code division multiplexing
Demultiplexing
Frequency division multiplexing
Layered division multiplexing
Multiplexing equipment
Add-drop multiplexers
OFDM
Multiple access interference
OFDM modulation
Partial transmit sequences
Peak to average power ratio
Space division multiplexing
time division multiplexing
Wavelength division multiplexing
WDM networks
Network topology
Complex networks
Computer network reliability
Fault tolerant computer networks
Network architecture
Active networking
Information-centric networking
Network function virtualization
Network slicing
Presence network agents
TV
Analog TV
Cable TV
Must-carry regulations
Color TV
Digital TV
HDTV
IPTV
Mobile TV
Smart TV
Three-dimensional television
Web TV
UHF technology
UHF antennas
UHF circuits
UHF integrated circuits
UHF communication
UHF devices
UHF integrated circuits
Ultra wideband technology
Ultra wideband antennas
Ultra wideband communication
Ultra wideband radar
VHF devices

Components, packaging, and manufacturing technology

Component architectures
Electronic components
Capacitors
Ceramic capacitors
Power capacitors
Varactors
Coils
Superconducting coils
Connectors
Plugs
Sockets
Diodes
Active matrix organic light emitting diodes
Diode lasers
Light emitting diodes
Organic light emitting diodes
P-i-n diodes
Schottky diodes
Semiconductor lasers
Superluminescent diodes
Electrodes
Anodes
Cathodes
Microelectrodes
Fuses
Inductors
Active inductors
Thick film inductors
Thin film inductors
Resistors
Memristors
Switched capacitor networks
Varistors
Structural plates
Switches
Contactors
Microswitches
Optical switches
Transducers
Acoustic transducers
Biomedical transducers
Capacitive transducers
Chemical transducers
Inductive transducers
Piezoelectric transducers
Resistive transducers
Ultrasonic transducer arrays
Electronic equipment manufacture
Damascene integration
Micromachining
Radiation hardening (electronics)
Semiconductor device manufacture
Diffusion processes
Flip-chip devices
High-k gate dielectrics
Physical unclonable function
Semiconductor device doping
Semiconductor epitaxial layers
Semiconductor growth
Silicidation
Wafer bonding
Electronics packaging
Antenna-in-package
Ball grid arrays
Chip scale packaging
System-in-package
Environmentally friendly manufacturing techniques
Integrated circuit manufacture
Surface mount technology
Ball grid arrays
Integrated circuit packaging
Multichip modules
Plastic integrated circuit packaging
Semiconductor device packaging
Thermal management of electronics
Electronic packaging thermal management
Electronics cooling

Computational and artificial intelligence

Artificial intelligence
Affective computing
AI accelerators
Autonomous robots
Bio-inspired computing
Cognitive systems
Commonsense reasoning
Context awareness
Cooperative systems
Intelligent systems
Autonomous systems
Collective intelligence
Hyper-intelligent systems
Intelligent automation
Intelligent robots
Knowledge based systems
Expert systems
Mobile agents
Knowledge engineering
Inference mechanisms
Knowledge acquisition
Knowledge discovery
Knowledge representation
Learning (artificial intelligence)
Distance learning
Naive Bayes methods
Nearest neighbor methods
Learning systems
Backpropagation
Cognitive systems
Electronic learning
Hybrid learning
Learning automata
Learning management systems
Self-supervised learning
Semisupervised learning
Supervised learning
Unsupervised learning
Machine learning
Adversarial machine learning
Boosting
Deep learning
Deep reinforcement learning
Dimensionality reduction
Ensemble learning
Federated learning
Hyperparameter optimization
Multi-armed bandit problem
Random forests
Reinforcement learning
Relevance vector machines
Representation learning
Robot learning
Statistical learning
Transfer learning
Prediction methods
Linear predictive coding
Predictive coding
Predictive encoding
Predictive models
Virtual artifact
Autonomous mental development
Computational intelligence
Computation theory
Computational complexity
Concurrent computing
Greedy algorithms
Support vector machines
Turing completeness
Evolutionary computation
Evolutionary robotics
Particle swarm optimization
Fuzzy systems
Fuzzy control
Fuzzy neural networks
Hybrid intelligent systems
Genetic algorithms
Logic
Fuzzy logic
Takagi-Sugeno model
Multivalued logic
Probabilistic logic
Sufficient conditions
Machine intelligence
Pattern analysis
Neural networks
Artificial neural networks
Convolutional neural networks
Hebbian theory
Long short term memory
Residual neural networks
Self-organizing feature maps
Biological neural networks
Cellular neural networks
Feedforward neural networks
Extreme learning machines
Multilayer perceptrons
Graph neural networks
Multi-layer neural network
Neural network compression
Neural network hardware
Perception evolution networks
Radial basis function networks
Recurrent neural networks
Hopfield neural networks
Computers and information processing
Approximate computing
Computer applications
Application virtualization
Edge computing
Big Data applications
Bot (Internet)
Computer aided analysis
Computer aided engineering
Computer aided instruction
Hybrid learning
Learning management systems
Computer generated music
Computer integrated manufacturing
Control engineering computing
Engineering computing
Green computing
High energy physics instrumentation computing
Linear particle accelerator
Knowledge management
Knowledge transfer
Mathematics computing
Matlab
Medical information systems
Electronic medical records
Military computing
Mobile applications
Mobility as a service
Physics computing
Power engineering computing
Power system analysis computing
Publishing
Bibliometrics
Desktop publishing
Electronic publishing
Journalism
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Space-air-ground integrated networks
IP networks
TCP/IP
Metropolitan area networks
Multiprocessor interconnection networks
Network function virtualization
Cloud radio access networks
Virtual LAN
Network servers
Next generation networking
Overlay networks
Dark Web
Peer-to-peer computing
InterPlanetary File System
Software defined networking
Service function chaining
Virtual LAN
Storage area networks
Token networks
Unicast
Virtual private networks
Extranets
Wide area networks
Low-power wide area networks
Wireless access points
Computer performance
Computer errors
Computer crashes
Hardware acceleration
Performance loss
Computer peripherals
Disk drives
Keyboards
Modems
Printers
Laser printers
Computer science
Computational neuroscience
Formal languages
Computer languages
Runtime library
Network theory (graphs)
Programming
Augmented reality
Automatic programming
Concatenated codes
Functional programming
Granular computing
Integer linear programming
Logic programming
Microprogramming
Object oriented methods
Object oriented programming
Opportunistic software systems development
Parallel programming
Performance analysis
Programming profession
Robot programming
Computer security
Application security
Authentication
Multi-factor authentication
Nonfungible tokens
Cloud computing security
Computer crime
Counterfeiting
Cyber terrorism
Cyber threat intelligence
Cyberattack
SQL injection
Computer hacking
Cross-site scripting
Cyber espionage
Cyber warfare
Cyberattack
Data integrity
Non-repudiation
Denial-of-service attack
Distributed denial-of-service attack
Firewalls (computing)
Honey pot (computing)
Identity management systems
Federated identity
Internet security
Mobile security
Passwords
Penetration testing
Permission
Phishing
Proof of Work
Trusted computing
Computers
Analog computers
Calculators
Difference engines
Digital computers
Mainframes
Microcomputers
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</tr>
<tr>
<td>Data engineering</td>
<td>Data handling</td>
<td>Data assimilation</td>
<td>Data augmentation</td>
<td>Data dissemination</td>
<td>Data encapsulation</td>
<td>Data governance</td>
<td>Data integrity</td>
<td>Document handling</td>
<td>Merging</td>
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<td>Data processing</td>
<td>Turing completeness</td>
<td>Data preprocessing</td>
<td>Data collection</td>
<td>Data integration</td>
<td>Data transfer</td>
<td>Information exchange</td>
<td>Spreadsheet programs</td>
<td>Text processing</td>
<td>Virtual enterprises</td>
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<tr>
<td>Business data processing</td>
<td>ISDN</td>
<td>Internet</td>
<td>B-ISDN</td>
<td>Local area networks</td>
<td>Virtual LAN</td>
<td>Wireless LAN</td>
<td>Metropolitan area networks</td>
<td>Smart agriculture</td>
<td>Token networks</td>
<td>Virtual artifact</td>
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<td>Distributed computing</td>
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<td>Client-server systems</td>
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<td>Middleware</td>
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<td>Servers</td>
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<td>Cluster computing</td>
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</table>

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Decentralized applications
Diffserv networks
Distributed databases
Blockchains
Distributed information systems
Distributed management
Publish-subscribe
Internet
Bot (Internet)
Botnet
Cloud computing
Crowdsourcing
Dark Web
Instant messaging
Internet of Things
Internet privacy
Internet security
Internet telephony
Internet topology
Linked data
Middleboxes
Semantic Web
Social computing
Web 2.0
Web conferencing
Web services
Metacomputing
Grid computing
Peer-to-peer computing
InterPlanetary File System
DNA computing
File servers
Hardware
Hardware acceleration
Hardware security
Input devices
Open source hardware
Reconfigurable devices
Wireless access points
High performance computing
Exascale computing
Image processing
Active shape model
Blob detection
Corner detection
Feature detection
Feature extraction
Fiducial markers
Geophysical image processing
Gray-scale
Image analysis
Image classification
Image motion analysis
Image quality
Image sequence analysis
Image texture analysis
Object detection
Subtraction techniques
Image annotation
Image capture
Image coding
Image color analysis
Image decomposition
Image denoising
Image enhancement
Image filtering
Image fusion
Image pre-processing
Image recognition
Image edge detection
Image reconstruction
Image registration
Image representation
Digital representation
Image resolution
Contrast resolution
High-resolution imaging
Spatial resolution
Super-resolution
Image restoration
Image sampling
Image segmentation
Instance segmentation
Semantic segmentation
Image sequences
Image stitching
Image synthesis
Human image synthesis
Image texture
Image transformation
Image augmentation
Image morphing
Image skeletonization
Image thinning
Machine vision
Object recognition
Object segmentation
Morphological operations
Image morphing
Image thinning
Optical feedback
Pansharpening
Saliency detection
Smart pixels
Spatial coherence
Structure from motion
Table lookup
Text detection
Thresholding (Imaging)
Memory
Analog memory
Associative memory
Cache memory
Cache storage
Content addressable storage
Flash memories
Flash memory cells
Magnetic memory
Floppy disks
Hard disks
Memory management
In-memory computing
Neural network compression
Nonvolatile memory
Phase change memory
Phase change random access memory
Random access memory
DRAM chips
Phase change random access memory
Resistive RAM
SDRAM
SRAM cells
SRAM chips
Read only memory
PROM
Read-write memory
Registers
Shift registers
Scanning probe data storage
Semiconductor memory
Integrated memory circuits
Mobile computing
Multi-access edge computing
Wireless access points
Molecular computing
Multitasking
Parametric study
Open systems
Open Access
Public domain software
Open Educational Resources
Physical layer
Physical layer security
Optical computing
Parallel processing
Multiprocessing systems
Data flow computing
Processor scheduling
Systolic arrays
Multithreading
Parallel algorithms
Pipeline processing
Pattern recognition
Active shape model
Activity recognition
Human activity recognition
Character recognition
Clustering methods
Pattern clustering
Data mining
Association rules
Data privacy
Text analysis
Text mining
Web mining
Face recognition
Fingerprint recognition
Gesture recognition
Sign language
Handwriting recognition
Forgery
Nearest neighbor methods
Pattern matching
Image matching
Sound recognition
Speech recognition
Automatic speech recognition
Personal voice assistants
Speech analysis
Text recognition
Pervasive computing
Ubiquitous computing
Context-aware services
Wearable computers
Smart glasses
Wearable antennas
Wearable Health Monitoring Systems
Petascale computing
Platform virtualization
Probabilistic computing
...Probability computing
...Quantum computing
......Quantum algorithm
......Quantum annealing
......Quantum cellular automata
......Quantum chemistry
......Quantum circuit
......Quantum networks
......Quantum simulation
......Qubit
...Real-time systems
......Telexistence
......WebRTC
...Software
......Anti-virus software
......Application software
......Decentralized applications
......Closed box
......Embedded software
......Freware
......Glass box
......Malware
......Computer viruses
......Computer worms
......Ransomware
......Rootkit
......Trojan horses
......Middleware
......Mediation
......Message-oriented middleware
......Web services
......Open source software
......Open banking
......Optical character recognition
......License plate recognition
......Privacy-invasive software
......Spyware
......Public domain software
......Python
......R language
......Soft sensors
......Software agents
......Agent-based modeling
......Autonomous agents
......Botnet
......Intelligent agents
......Software as a service
......Software debugging
......Software design
......Software maintenance
......Software packages

......EMTDC
......PSCAD
......SPICE
......Software performance
......Software quality
......Software reusability
......Software safety
......Software systems
......Software tools
......Authoring systems
......System software
......File systems
......Operating systems
......Program processors
......Utility programs
......Software engineering
......Capability maturity model
......Computer aided software engineering
......Formal verification
......Full stack
......Programming environments
......Release engineering
......Runtime
......Dynamic compiler
......Runtime environment
......Software architecture
......Client-server systems
......Deep architecture
......Dew computing
......Microarchitecture
......Representational state transfer
......Restful API
......Software libraries
......Software product lines
......System recovery
......Checkpointing
......Core dumps
......Debugging
......Time sharing computer systems
......Virtual machine monitors

Consumer electronics

......Ambient intelligence
......Audio systems
......3D audio
......Audio tapes
......Audio-visual systems
......Auditory displays
......Headphones
January 2024 IEEE Taxonomy

........Immersive audio
........Loudspeakers
........Microphones
........Microphone arrays
........Pitch control (audio)
........Portable media players
........Sonification
........Spatial audio
........Video description
........Home automation
........Portable media players
........Refrigerators
........Smart homes
........Washing machines
........Home computing
........Low-power electronics
........Microwave ovens
........Multimedia systems
........Multimedia communication
........Hypermedia
........Multimedia computing
........Multimedia databases

Control systems

........Admittance control
........Automatic control
........Power generation control
........Automatic generation control
........Automotive control
........Autopilot
........Bidirectional control
........Block signalling
........Brakes
........CAMAC
........Centralized control
........Closed loop systems
........Control design
........Control engineering
........Control system security
........Physical unclonable function
........Control equipment
........Actuators
........Dielectric elastomer actuators
........Electrostatic actuators
........Electrothermal actuators
........Hydraulic actuators
........Intelligent actuators
........Microactuators
........Piezoelectric actuators
........Pneumatic actuators
........Fasteners
........Microcontrollers
........Regulators
........Remote control
........Servosystems
........Servomotors
........Switches
........Contactors
........Microswitches
........Optical switches
........Switchgear
........Circuit breakers
........Interrupters
........Relays
........Telecontrol equipment
........Thermostats
........Control system synthesis
........Controllability
........Cruise control
........Decentralized control
........Consensus control
........Distributed parameter systems
........Delay systems
........Added delay
........Delay lines
........Digital control
........Programmable control
........Flow graphs
........Fault tolerant control
........Feedback
........Feedback circuits
........Output feedback
........Negative feedback
........Neurofeedback
........Feedback linearization
........Fluid flow control
........Fluidics
........Microfluidics
........Nanofluidics
........Gaze tracking
........Electrooculography
........Homeostasis
........Linear feedback control systems
........Frequency locked loops
........Phase locked loops
........State feedback
........Tracking loops
........Magnetic variables control
........Mechanical variables control
........Displacement control
........Force control
Level control
Gyroscopes
Motion control
Collision avoidance
Collision mitigation
Formation control
Kinetic theory
Motion planning
Path planning
Visual servoing
Pitch control (position)
Position control
Nanopositioning
Shape control
Size control
Strain control
Stress control
Thickness control
Torque control
Velocity control
Angular velocity control
Vibration control
Weight control
Medical control systems
Missile control
Moisture control
Humidity control
Motion compensation
Networked control systems
Nonlinear control systems
Open loop systems
Optical control
Lighting control
Optical variables control
Optogenetics
Optimal control
Bang-bang control
Infinite horizon
PD control
PI control
Pneumatic systems
Positive train control
Pressure control
Proportional control
Radio control
Robot control
Robot motion
2-DOF
3-DOF
5-DOF
6-DOF
SCADA systems
Sensorless control
Sliding mode control
Supervisory control
SCADA systems
Thermal variables control
HVAC
Temperature control
Cooling
Heating systems
Thermal analysis
Thermomechanical processes
Traffic control
Advanced driver assistance systems
Queueing analysis
Road traffic control
Road traffic
Vehicle routing

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

Education

........Adaptive learning
........Career development
...........Continuing education
...........Jobs listings
...........Mentoring
...........Educational courses
...........Curriculum development
...........Open Educational Resources
...........Educational institutions
...........Museums
...........Virtual museums
...........Educational programs
...........Accreditation
...........Continuing education
...........Pre-college engineering
...........Scholarships
...........Self-study courses
...........Seminars
...........STEM
...........Tutorials
...........Educational technology
...........Computer aided instruction
...........Hybrid learning
...........Learning management systems
...........Courseware
...........Electronic learning
...........Mobile learning
...........Engineering education
...........Biomedical engineering education
...........Communication engineering
education
...........Computer science education
...........Control engineering education
...........Electrical engineering education
...........Electronics engineering education
...........Engineering students
...........Physics education
...........Power engineering education
...........Student experiments
...........Systems engineering education
...........Humanities
...........Archeology
...........Art
...........Digital art
...........Fractal art
...........History
...........Music
...........Acoustics
...........Computer generated music
...........Electronic music
...........Musical instrument digital interfaces
...........Rhythm
...........Timbre
...........Natural languages
...........Linguistics
...........Natural language processing
...........Social sciences
...........Anthropology
...........Behavioral sciences
...........Psychology
...........Sociology
...........Training
...........Certification
...........Industrial training
...........Management training
...........On the job training
...........Qualifications
...........Vocational training

Electromagnetic compatibility and interference

........Electromagnetic compatibility
...........Immunity testing
...........Reverberation chambers
...........Electromagnetics
...........Electromagnetic analysis
...........Air gaps
...........Characteristic mode analysis
...........Computational electromagnetics
...........Delay effects
...........Electromagnetic fields
...........Electromagnetic forces
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- Electromagnetic refraction
- Permeability
- Spark gaps
- Time-domain analysis
- Electromagnetic coupling
- Mutual coupling
- Optical coupling
- Electromagnetic devices
- Baluns
- Electromagnetic induction
- Eddy currents
- Inductive power transmission
- Electromagnetic metamaterials
- Microwave metamaterials
- Terahertz metamaterials
- Electromagnetic radiation
- Bremsstrahlung
- Correlators
- Electromagnetic wave absorption
- Frequency
- Gamma-rays
- Line-of-sight propagation
- Terahertz radiation
- Electromagnetic shielding
- Cable shielding
- Magnetic shielding
- Electromagnetic transients
- EMP radiation effects
- EMTDC
- EMTP
- Power system transients
- Surges
- Proximity effects
- Interference
- Clutter
- Crosstalk
- Diffraction
- Electron backscatter diffraction
- Echo interference
- Electromagnetic interference
- Radiofrequency interference
- Specific absorption rate
- Electromagnetic radiative interference
- Electrostatic interference
- Immunity testing
- Interchannel interference
- Interference cancellation
- Interference channels
- Interference constraints
- Interference elimination
- Interference suppression
- Intersymbol interference
- Rain fading
- Terrain factors
- TV interference
- Radar
- Airborne radar
- Bistatic radar
- Cognitive radar
- Doppler radar
- Ground penetrating radar
- High frequency radar
- Laser radar
- Meteorological radar
- Millimeter wave radar
- Multistatic radar
- MIMO radar
- Passive radar
- Quantum radar
- Radar applications
- Radar countermeasures
- Radar detection
- Radar imaging
- Radar measurements
- Radar polarimetry
- Radar remote sensing
- Radar tracking
- Radar clutter
- Radar cross-sections
- Radar equipment
- Radar theory
- Spaceborne radar
- Spread spectrum radar
- Synthetic aperture radar
- Inverse synthetic aperture radar
- Polarimetric synthetic aperture radar
- Ultra wideband radar
- Electron devices
  - Cathode ray tubes
  - Electron guns
  - Electron multipliers
  - Electron tubes
  - Field emitter arrays
  - Klystrons
  - Magnetrons
  - Thyatrons
  - Traveling wave tubes
  - Mechatronics

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### Electronic design automation and methodology

- Design automation
  - CAD/CAM
  - Logic design
  - Reconfigurable logic
  - PSCAD
- Design methodology
  - Design for disassembly
  - Design for experiments
  - Design for manufacture
  - Design for quality
  - Design for testability
  - Design standards
- Design tools
  - Extensibility
- Graphics
  - Animation
  - Character generation
  - Computer graphics
  - Engineering drawings
  - Layout
  - Shape
  - Symbols
  - Virtual reality
  - Visualization
- Green design
  - Ecodesign
  - Green computing
  - Integrated design
  - Process design
  - Pattern formation
  - Process modeling
- Product design
  - Prototypes
  - Breadboard
  - Rapid prototyping

### Engineering – general

- Acoustical engineering
- Agricultural engineering
  - Deforestation
  - Bio-inspired engineering
  - Bio-inspired computing
  - Bio-inspired control
  - Bio-inspired robotics
- Chemical engineering
- Civil engineering
  - Geotechnical engineering
  - Excavation
  - Geotechnical structures
  - Dams
- Railway engineering
  - Railway safety
  - Structural engineering
  - Offshore installations
  - Concurrent engineering
- Design engineering
  - Design tools
  - Electrical engineering
  - Electrical engineering computing
  - Engineering profession
  - Professional aspects
- Environmental engineering
- Maintenance engineering
  - Maintenance management
  - Predictive maintenance
  - Preventive maintenance
  - Condition monitoring
- Systems support
- Marine engineering
- Mechanical engineering
  - Mechanical power transmission
  - Torque converters
  - Mechanical systems
  - Mechanical energy
  - Micromechanical devices
  - Suspensions (mechanical systems)
- Optical engineering
- Precision engineering
- Production engineering
  - Production planning
Capacity planning
Materials requirements planning
Process planning
Research and development
Translational research
Reverse engineering
Sanitary engineering
Standardization
Formal specifications
Guidelines
Standards
Standards categories
Standards organizations
Standards publications
Thermal engineering

Engineering in medicine and biology

Biochemistry
Amino acids
Biochemical analysis
Metabolism
Peptides
Proteins
Receptor (biochemistry)
Biodiversity
Biogeography
Bioelectric phenomena
Electric shock
Biological cells
Cell signaling
Cells (biology)
Chromosome mapping
Endothelial cells
Fibroblasts
RNA
Stem cells
Biological information theory
Biological processes
Biological interactions
Chronobiology
Circadian rhythm
Coagulation
Molecular biology
Symbiosis
Synaptic communication
Biological system modeling
Biological systems
Anatomy
Molecular communication
Organisms
Biology computing
Biophotonics
Biophysics
Aerospace biophysics
Biomagnetics
Cellular biophysics
Molecular biophysics
Botany
Cryobiology
Evolution (biology)
Memetics
Phylogeny
Genetics
DNA
Epigenetics
Gene therapy
Genetic communication
Genetic expression
Genetic programming
Genomics
Optogenetics
Homeostasis
Mechanobiology
Microbiology
Electroporation
Virology
Microinjection
Nanobiotechnology
Phenology
Physiology
Action potentials
External stimuli
Metabolism
Neuromodulation
Somatosensory
Predator prey systems
Synthetic biology
Systematics
Systems biology
Vegetation
Crops
Marine vegetation
Zoology
Animals
Entomology
Biomedical communication
Biomedical telemetry
Telemmedicine
Biomedical computing
Bioinformatics
Neuroinformatics
Medical expert systems
Medical information systems
Electronic medical records
Biomedical engineering
Biomechanics
Biological techniques
Biomedical applications of radiation
Radiation therapy
Biomedical electronics
Biomedical signal processing
Biomedical image processing
Bioprinting
Biotechnology
Cloning
Drug delivery
Targeted drug delivery
Neural engineering
Neural circuits
Neural microtechnology
Neural nanotechnology
Neural prosthesis
Protein engineering
Tissue engineering
Regeneration engineering
Translational research
Biomedical equipment
Assistive technologies
Assistive devices
Assistive robots
Closed captioning
Video description
Wheelchairs
Biomedical electrodes
Biomedical telemetry
Biomedical transducers
Catheters
Endoscopes
Endomicroscopy
Gerontechnology
Hypodermic needles
Implants
Auditory implants
Brainstem implants
Cochlear implants
Microelectronic implants
Neural implants
Intracranial pressure sensors
Lithotriptors
Medical devices
Medical instruments
Pacemakers
Pulse oximeter
Stethoscope
Surgical instruments
Laparoscopes
Ventilators
Biomedical imaging
Angiography
Biomedical optical imaging
Cardiology
Echocardiography
Electrocardiography
Phonocardiography
DICOM
Elastography
Encephalography
Mammography
Medical diagnostic imaging
Anatomical structure
Radionuclide imaging
Molecular imaging
Phantoms
Photoacoustic imaging
Bionanotechnology
Bioterrorism
Computational biology
Computational biochemistry
Computational biophysics
Computational systems biology
Genetic engineering
Medical services
Assisted living
Ambient assisted living
Catheterization
Clinical diagnosis
Clinical neuroscience
Cybercare
Electronic healthcare
Health information management
Hospitals
In vitro
In vitro fertilization
In vivo
Internet of Medical Things
Medical conditions
Acute respiratory distress syndrome
Addiction
...Vaccines
...X-rays
...X-ray applications
...X-ray astronomy
...X-ray detection
...X-ray scattering
...X-ray telescopes
...X-ray tomography
...Medical specialties
...Anesthesiology
...Cardiology
...Cardiac tissue
...Dermatology
...Endocrinology
...Gastroenterology
...Gerontology
...Gerontechnology
...Gynecology
...Immunology
...Antigens
...Immunofluorescence
...Neonatology
...Nephrology
...Neurology
...Dyslexia
...Neurorehabilitation
...Obstetrics
...Oncology
...Radiation therapy
...Ophthalmology
...Pathology
...Histopathology
...Neuropathology
...Pathological processes
...Pediatrics
...Pharmacology
...Pharmacodynamics
...Pharmacokinetics
...Psychiatry
...Mental disorders
...Pulmonology
...Spirometry
...Radiology
...Neuroradiology
...Urology
...Nuclear medicine
...Synthetic biology

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

Security management

Storage management

Supply management

Supply chain management

Technical management

Technology management

Operations research

Inventory control

Virtual enterprises

Organizations

BNSC

Companies

Decentralized autonomous organization

European Space Agency

Government

Non-governmental organizations

Sociotechnical systems

United Kingdom Space Agency

Commercialization

Consortia

Economics

Access charges

Costs

Cost benefit analysis

Developing countries

Econometrics

Economic forecasting

Economic indicators

Share prices

Electronic commerce

Environmental economics

Carbon tax

Emissions trading

Exchange rates

Free economic zones

Freeports

Fuel economy

International trade

Macroeconomics

Privatization

Microeconomics

Economies of scale

Industrial economics

Monopoly

Oligopoly

Power generation economics

Electricity supply industry
deregulation

Profitability

Sharing economy

Shared transport

Stock markets

Supply and demand

Trade agreements

Venture capital

Virtual enterprises

Innovation management

Creativity

Legal factors

Copyright protection

Intellectual property

Software protection

Law

Censorship

Commercial law

Consumer protection

Contract law

Criminal law

Employment law

Forensics

Fraud

Law enforcement

Patent law

Trademarks

Patents

Product liability

Warranties

Software protection

Trademarks

Market research

Planning

Meeting planning

Schedules

Strategic planning

Roadmaps (technology planning)

Technical planning

Technology planning

Product development

Graphical user interfaces

Avatars

Product customization

Product lifecycle management

Prognostics and health management

Software product lines

Time to market

Project engineering

Scheduling

Adaptive scheduling

Dynamic scheduling

Job shop scheduling
Single machine scheduling
Turnkey project
Research and development management
Innovation management
Creativity
Research initiatives
Software development management
Agile project management
Agile software development
Scrum (Software development)
DevOps
Model-driven development

Geoscience and remote sensing

Environmental factors
Biosphere
Climate change
Global warming
Ecology
Habitats
Ecosystems
Aquatic ecosystems
Estuaries
Grasslands
Rainforests
Tundra
Wetlands
Environmental economics
Carbon tax
Emissions trading
Environmental monitoring
Global warming
Green manufacturing
Green products
Green buildings
Green cleaning
Green transportation
Habitat loss
Pollution
Air pollution
Emissions trading
Industrial pollution
Land pollution
Oil pollution
Radioactive pollution
Thermal pollution
Urban pollution
Water pollution
Geographic information systems

Geospatial analysis
Gunshot detection systems
Geophysical measurement techniques
Geophysical image processing
Geophysical measurements
Geodesy
Level measurement
Sea measurements
Geoacoustic inversion
Seismic measurements
Geophysical signal processing
Geoscience
Antarctica
South Pole
Arctic
North Pole
Atmosphere
Air quality
Atmospheric modeling
Atmospheric waves
Biosphere
Continents
Africa
Asia
Australia
Europe
North America
South America
Cyclones
Hurricanes
Tropical cyclones
Earth
Earthquakes
Earthquake engineering
Equator
Estuaries
Forestry
Deforestation
Geochemistry
Geoengineering
Geography
Rural areas
Urban areas
Geology
Biogeochemistry
Continental crust
Erosion
Geological processes
Landslides
Minerals
Oceanic crust
January 2024 IEEE Taxonomy

- Rocks
- Stratigraphy
- Tectonics
- Geophysics
- EMTDC
- Extraterrestrial phenomena
- Geodynamics
- Geophysics computing
- Meteorology
- Moisture
- Seismology
- Surface waves
- Well logging
- Glaciology
- Glaciers
- Hydrography
- Ice
- Glaciers
- Ice shelf
- Ice surface
- Ice thickness
- Icebergs
- Sea ice
- Lakes
- Land surface
- Watersheds
- Levee
- Meteorological factors
- Natural resources
- Oceanography
- Ocean circulation
- Ocean dynamics
- Oceans
- Antarctic Ocean
- Arctic Ocean
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- Birefringence
- Brightness
- Brightness temperature
- Color
- Color gamut
- Color temperature
- Pigmentation
- Electron optics
- Extinction coefficients
- Extinction ratio
- Fiber optics
- Fiber nonlinear optics
- Optical fibers
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- Immunofluorescence
- Four-wave mixing
- Geometrical optics
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- Stray light
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- Electroluminescence
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- Phosphorescence
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- Thermoluminescence
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- Optical retarders
- Optical saturation
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...........Integrated optoelectronics
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...........Organic light emitting diodes
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...........Photoconductive devices
...........Electrophotography
...........Photodetectors
...........Photodiodes
...........Phototransistors
...........Superconducting photodetectors
...........Superluminescent diodes
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...........Nanophotonics
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...........Radiative recombination

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...........Magnetization
...........Magnetic anisotropy
...........Magnetic domain walls
...........Magnetic domains
...........Magnetic moments
...........Perpendicular magnetic anisotropy
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...........Ferrite devices
...........Circulators
...........Magnetic cores
...........Transformer cores
...........Magnetic gears
...........Magnetic heads
...........Magnetic memory

...........Floppy disks
...........Hard disks
...........Magnetic modulators
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...........Magnetoresistive devices
...........Magnetostrictive devices
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...........Ferrimagnetic films
...........Ferrite films
...........Ferrites
...........Garnet films
...........Garnets
...........Ferrite films
...........Ferrites
...........Ferrite films
...........Ferrofluid
...........Ferromagnetic materials
...........Garnet films
...........Garnets
...........Garnet films
...........Ferrimagnetic films
...........Ferrite films
...........Ferrite films
...........Garnet films
...........Magnetic liquids

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Materials, elements, and compounds

Atoms

Ultracold atoms

Chemical elements

Aluminum

Aluminum alloys

Aluminum compounds

Americium

Antimony

Arsenic

Arsenic compounds

Beryllium

Boron

Boron alloys

Bromine

Bromine compounds

Californium

Carbon

Carbon cycle

Carbon nanotubes

Diamonds

Fullerenes

Graphene

Graphite

Cerium

Cesium

Chlorine

Chlorine compounds

Dysprosium

Europium

Fluorine

Fluorine compounds

Gadolinium

Gadolinium oxide

Hafnium

Hafnium compounds

Helium

Holmium

Hydrogen

Deuterium

Green hydrogen

Iodine

Iodine compounds

Iridium

Isotopes

Krypton

Lutetium

Mercury (metals)

Molybdenum

Neon
.............Neptunium
.............Nitrogen
...............Denitrification
...............Nitrogen compounds
...............Silicon nitride
...............Osmium
...............Oxygen
...............Phosphorus
...............Plutonium
...............Polonium
...............Potassium
...............Praseodymium
...............Promethium
...............Protactinium
...............Radium
...............Radon
...............Rhenium
...............Rhodium
...............Roentgenium
...............Rubidium
...............Ruthenium
...............Scandium
...............Selenium
...............Sodium
...............Sulfur
...............Sulfur compounds
...............Tantalum
...............Technetium
...............Tellurium
...............Terbium
...............Thallium
...............Thorium
...............Thulium
...............Titanium
...............Titanium alloys
...............Titanium compounds
...............Titanium dioxide
...............Titanium nitride
...............Uranium
...............Vanadium
...............Ytterbium
...............Yttrium
...............Yttrium compounds
...............Zirconium
.............Compounds
...............Bismuth compounds
...............Gallium compounds
...............Aluminum gallium nitride
...............Gallium arsenide
...............Gallium nitride
...............Indium gallium arsenide
...............Indium gallium nitride
...............Indium compounds
...............Indium gallium arsenide
...............Indium tin oxide
...............Inorganic compounds
...............Transition metal compounds
...............Lead compounds
...............Organic compounds
...............Carbon compounds
...............Organic semiconductors
...............Volatile organic compounds
...............Silicon compounds
...............Silicides
...............Silicon carbide
...............Silicon nitride
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...............Bulk storage
...............Containers
...............Freight containers
...............Fuel storage
...............Secure storage
...............Stacking
...............Storage automation
...............Warehousing
...............Water storage
...............Dams
...............Reservoirs
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...............Acoustic materials
...............Additives
...............Aggregates
...............Amorphous materials
...............Diamond-like carbon
...............Glass
...............Auxetic materials
...............Bio-inspired materials
...............Self-assembly
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...............Bioceramics
...............Biofilms
...............Biomedical materials
...............Bioceramics
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Directed acyclic graph
Directed graphs
Graph neural networks
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Reachability analysis
Shortest path problem
Tree graphs
Steiner trees
Computational efficiency
Conformal mapping
Convergence
Convex functions
Semidefinite programming
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Directed graphs
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Graph neural networks
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Piecewise linear approximation
Predator prey systems
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Naive Bayes methods
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Demand forecasting
Economic forecasting
Forecast uncertainty
Technology forecasting
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Beam steering
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Circulators
Masers
Gyrotrons
Microwave bands
C-band
K-band
L-band
Microwave circuits
Microwave communication
Rectennas
Microwave devices
Masers
Microwave amplifiers
Microwave filters

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

Nanotechnology

Bionanotechnology
Casimir effect
Molecular computing
Molecular electronics
Nanobiotechnology
Nanobiophotonics
Nanocommunication
Nanoelectromechanical systems
Nanoelectronics
Junctionless nanowire transistors
Nanofabrication
Nanofluids
Nanolithography
Nanomagnetics
Nanomaterials
Nanocarriers
Nanopackaging
Nanopatterning
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Nanoscale technology
Nanopores
January 2024 IEEE Taxonomy

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

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

Mesons
   Neutrino sources
   Neutrons
   Particle beams
   Atomic beams
   Electron beams
   Ion beams
   Particle collisions
   Phonons
   Positrons
   Protons
   Fusion power generation
   Fusion reactors
   Fusion reactor design
   Tokamaks
   Gamma-rays
   Gamma-ray bursts
   Gamma-ray detection
   Gamma-ray effects
   Gas discharge devices
   Glow discharge devices
   Helioseismology
   High energy physics instrumentation computing

Linear particle accelerator
   Ion beam applications
   Ion implantation
   Plasma immersion ion implantation
   Nuclear electronics
   Nuclear imaging
   Energy resolution
   Ion emission
   Nuclear medicine
   Nuclear physics
   Alpha particles
   Beta rays
   Ignition
   Ion sources
   Isotopes
   Nuclear phase transformations
   Nuclear thermodynamics
   Relativistic effects
   Optical flow
   Particle accelerators
   Accelerator magnets
   Colliding beam accelerators
   Cyclotrons
   Electron accelerators
   Ion accelerators
........Linear accelerators
........Photon collider
........Plasma accelerators
........Proton accelerators
........Storage rings
........Synchrocyclotrons
........Synchrotrons
............Synchrotron radiation
........Undulators
....Particle beam handling
....Particle beam injection
........Plasmas
............Atmospheric-pressure plasmas
............Low-temperature plasmas
........Microwave plasmas
........Plasma applications
........Plasma devices
........Plasma immersion ion implantation
........Plasma welding
........Tokamaks
........Plasma confinement
............Inertial confinement
............Magnetic confinement
........Plasma diagnostics
........Plasma properties
........Dusty plasmas
........Plasma chemistry
........Plasma density
........Plasma sheaths
........Plasma stability
........Plasma temperature
........Plasmons
........Plasma simulation
........Plasma sources
........Plasma transport processes
........Plasma-assisted combustion
....Radiation effects
............Biological effects of radiation
............Gamma-ray effects
........Ion radiation effects
........Neutron radiation effects
........Scintillators
........Single event latchup
........Space radiation
........Terahertz radiation
........Total ionizing dose
....Radiation hardening (electronics)
....Radiation monitoring
....Radiation dosage
....Radiation safety
........Radiation protection
............Radiofrequency safety
............Reactor instrumentation
............Scintillation counters
.............Solid scintillation detectors
............Thermionic emission

Oceanic engineering and marine Technology

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

Power electronics

....Converters
............AC-AC converters
............DC-AC power converters
............Digital-to-frequency converters
............Frequency conversion
.............Mixers
............Optical frequency conversion
............Multilevel converters
............Power conversion
............AC-AC converters
............AC-DC power converters
............DC-AC power converters
............DC-DC power converters
............Matrix converters
............Power conversion harmonics
............Voltage-source converters
............Pulse width modulation converters
Resonant converters
Static power converters
Voltage-source converters
Wavelength converters
Current limiters
Fault current limiters
Gate drivers
Inverters
Multilevel inverters
Pulse inverters
Resonant inverters
Voltage source inverters
Phase control
Power conditioning
Power smoothing
Power semiconductor devices
Power transistors
Power semiconductor switches
Bipolar transistors
Insulated gate bipolar transistors
Kirk field collapse effect
Thyristors
Photothyristors
Snubbers
Three-phase electric power

Power engineering and energy

Electric variables control
Current control
Electric current control
Electrical ballasts
Gain control
Power control
Power system control
Bidirectional power flow
Load flow control
SCADA systems
Reactive power control
Voltage control
Automatic voltage control
Energy
Energy barrier
Energy capture
Energy consumption
Energy conversion
Atomic batteries
Batteries
Fuel cells
Motors
Photovoltaic cells
Potential well
Solar heating
Thermoelectricity
Waste heat
Wave energy conversion
Wind energy conversion
Energy dissipation
Energy exchange
Inductive charging
Energy harvesting
Nanogenerators
Energy management
Demand side management
Energy conservation
Energy efficiency
Energy informatics
Energy management systems
Load management
Transactive energy
Energy resources
Fuels
Geothermal energy
Nuclear energy
Solar energy
Wave power
Wind energy
Wind farms
Energy states
Band structures
Effective mass
Fermi level
Orbital calculations
Polaritons
Quasi-Fermi level
Surface states
Energy storage
Batteries
Battery energy storage system
Battery storage plants
Flywheels
Fuel cells
Hydrogen storage
Supercapacitors
Superconducting magnetic energy storage
Power engineering
Ferroresonance
High-voltage techniques
Power engineering computing
Power system simulation
Power generation
<table>
<thead>
<tr>
<th>Topic</th>
<th>Sub-Topic</th>
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<td>Automatic generation control</td>
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<td>Cogeneration</td>
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<td>Distributed power generation</td>
<td>Charging stations</td>
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<td>Virtual power plants</td>
<td>Current supplies</td>
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<td>Islanding</td>
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<td>Microhydro power</td>
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<td>Picohydro power</td>
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<td>Wave energy conversion</td>
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<td>Magnetohydrodynamic power generation</td>
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<td>Power grids</td>
<td>Substations</td>
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<td>Microgrids</td>
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Product safety engineering

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

Professional communication

- Collaboration
- Collaborative tools
- Call conference
- Collaborative software
- Videoconferences
- Discussion forums
- Teamwork
- Virtual groups
- Communication aids
- Closed captioning
- Communication effectiveness
- Communication symbols
- Semiotics
- Pragmatics
- Semantics
- Syntactics
- Context
- Databases
- Database systems
- Audio databases
- Deductive databases
- Image databases
- Indexes
- Multimedia databases
- NoSQL databases
- Object oriented databases
- Query processing
- Sharding
- Deductive databases
- Distributed databases
- Blockchains
- Image databases
.................Image retrieval
.............Multimedia databases
............Object oriented databases
...........Relational databases
............Spatial databases
.............Transaction databases
................Itemsets
...........Visual databases
.............Point cloud compression
.........Global communication
.........Cross-cultural communication
.........Geographic information systems
..........Geospatial analysis
..........Gunshot detection systems
...........Grammar
...........Information analysis
...........Decision analysis
...........Indexing
...........Information integrity
..........Information resources
..........Information retrieval
.........Blogs
.........Content-based retrieval
.........Dimensionality reduction
........Manifold learning
.........Hypertext systems
.........Information filtering
...........Information filters
.........Recommender systems
.........Information rates
.........Music information retrieval
.........Online services
...........Mobility as a service
...........Online banking
.........Web conferencing
.........Search engines
.........Search methods
.........Keyword search
.........Metasearch
.........Search problems
.........Semantic search
.........Web search
.........Social networking (online)
.........Community networks
.........Computer mediated communication
.........Cyberbullying
.........Information diffusion
.........Second Life
.........Tagging
.........Tag clouds
..........Taxonomy
..........Terminology
.............Dictionaries
...........Visual information retrieval
..........Vocabulary
..........Web sites
...........Uniform resource locators
..........Web design
..........Information science
............Quantum information science
...........Quantum channels
...........Quantum circuit
..........Information services
.............Dictionaries
...........Document delivery
..........Encyclopedias
.........Libraries
...........Software libraries
..........Teletext
.........Videotex
..........Information systems
.............Data systems
...........Buffer storage
.........Data acquisition
.........Data centers
.........Data compression
.........Data conversion
.........Data engineering
.........Data handling
.........Data processing
.........Data warehouses
..........Database systems
.........Audio databases
.........Deductive databases
.........Image databases
.........Indexes
.........Multimedia databases
.........NoSQL databases
.........Object oriented databases
.........Query processing
..........Sharding
.........Decision support systems
.........Distributed information systems
.........Distributed management
.........Publish-subscribe
.........Identity management systems
.........Federated identity
..........Informatics
.........Bioinformatics
.........Cognitive informatics
..........Energy informatics
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Tectonics
Geophysics
EMTDC
Extraterrestrial phenomena
Geodynamics
Geophysics computing
Meteorology
Moisture
Seismology
Surface waves
Well logging
Glaciology
Glaciers
Hydrography
Ice
Glaciers
Ice shelf
Ice surface
Ice thickness
Icebergs
Sea ice
Lakes
Land surface
Watersheds
Levee
Meteorological factors
Natural resources
Oceanography
Ocean circulation
Ocean dynamics
Oceans
Antarctic Ocean
Arctic Ocean
Atlantic Ocean
Indian Ocean
Ocean salinity
Ocean temperature
Pacific Ocean
Sea coast
Sea floor
Sea level
Sea surface
Tides
Rivers
Sediments
Soil
Peat
Permafrost
Soil moisture
Soil properties
Soil texture
Tornadoes
Tsunami
Volcanoes
Lava
Volcanic activity
Volcanic ash
Wetlands
Life sciences
Metrology
Optical metrology
Neuroscience
Clinical neuroscience
Cognitive neuroscience
Computational neuroscience
Neuroinformatics
Neuromarketing
Neuroprostheses
Systems neuroscience
Transcranial direct current stimulation
Transcranial magnetic stimulation
Paleontology
Physics
Acoustics
Acoustic applications
Acoustic devices
Acoustic emission
Acoustic field
Acoustic noise
Acoustic phonetics
Acoustic propagation
Acoustic pulses
Acoustic waves
Acoustooptic effects
Biomedical acoustics
Cepstral analysis
Nonlinear acoustics
Psychoacoustics
Reverberation
Spectral shape
Underwater acoustics
Astrophysics
Asteroseismology
Dark matter
Orbits
Stellar dynamics
Beams
Acoustic beams
Laser beams
Molecular beams
Optical beams
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<tr>
<th>Category</th>
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<tbody>
<tr>
<td>Biophysics</td>
<td>Aerospace biophysics, Biomagnetics, Cellular biophysics, Molecular biophysics</td>
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January 2024 IEEE Taxonomy

Propagation
Reflectivity
Seismic waves
Shock waves
Solitons
Surface acoustic waves
Wave functions
...Social sciences
...Behavioral sciences
...Animal behavior
Cognition
Consumer behavior
Psychology
Psychology
Social intelligence
Psychology
Active perception
Emotional responses
Industrial psychology
Mental health
Mood
Neuropsychology
Psychometric testing
Sociology
Digital divide
Social groups
...Social intelligence
...Thermodynamics
...Adiabatic processes
Enthalpy
Fermi level
...Isobaric processes
...Isothermal processes
...Quasi-Fermi level

Sensors

Acoustic sensors
Chemical and biological sensors
Biosensors
...Gas detectors
Amperometric sensors
Electromechanical sensors
Microsensors
Force sensors
Glucose sensors
...Inertial sensors
Infrared sensors
Intelligent sensors
Intracranial pressure sensors
...Ionizing radiation sensors
...Position sensitive particle detectors
Radiation detectors
...Bolometers
Gamma-ray detectors
Infrared detectors
...Photodetectors
...Semiconductor radiation detectors
...Silicon radiation detectors
X-ray detectors
Magnetic sensors
Spin valves
Mechanical sensors
Capacitive sensors
Multimodal sensors
Nanosensors
Optical sensors
...Optical detectors
...Bar codes
...Optical fiber sensors
...Optoelectronic and photonic sensors
Pressure sensors
Quantum sensing
...Sensor phenomena and characterization
...Sensor placement
...Sensor systems and applications
Detectors
...Envelope detectors
...Semiconductor detectors
...Electric sensing devices
Leak detection
...Radiofrequency identification
...RFID tags
...Robot sensing systems
Proprioception
...Robot vision systems
...Simultaneous localization and mapping
...Stereognosis
...Tactile sensors
...Sensor arrays
...Sensor fusion
...Sensor systems
...Activity recognition
...Gunshot detection systems
...Soft sensors
...Thermal sensors
...Electrothermal actuators
...Temperature sensors
...Thermocouples
Thermometers
Thick film sensors
Thin film sensors
Vision sensors
Wearable sensors

Signal processing

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

Acoustic distortion
Four-wave mixing
Jitter
Timing jitter
Nonlinear distortion
Harmonic distortion
Intermodulation distortion
Phase distortion
Error correction
Forward error correction
Fading channels
Frequency-selective fading channels
Rayleigh channels
Weibull fading channels
Filters
Active filters
Band-pass filters
Anisotropic
Bragg gratings
Fiber gratings
Channel bank filters
Comb filters
Digital filters
Finite impulse response filters
Equalizers
Adaptive equalizers
Blind equalizers
Decision feedback equalizers
Filtering theory
Collaborative filtering
Image filtering
Gabor filters
Harmonic filters
IIR filters
Kalman filters
Low-pass filters
Matched filters
Microstrip filters
Nonlinear filters
Notch filters
Particle filters
Power filters
Spurline
Resonator filters
Spatial filters
Superconducting filters
Transversal filters
Frequency locked loops
Geophysical signal processing
Limiting
Local field potentials
Judd-Ofelt theory
Spectroradiometers
Signal design
Signal detection
Acoustic signal detection
Sonar detection
Motion detection
Odometry
Multiuser detection
Optical signal detection
Phase detection
Phase frequency detectors
Radar detection
Signal generators
Noise generators
Pulse generation
Optical pulse generation
Signal integrity
Signal reconstruction
Signal denoising
Signal resolution
Diversity reception
Signal restoration
Signal sampling
Signal synthesis
Source separation
Blind source separation
Spectrogram
Tracking loops
Social implications of technology
Cultural aspects
Cultural differences
Cultural differences
Environmental factors
Biosphere
Climate change
Global warming
Ecology
Habitats
Ecosystems
Aquatic ecosystems
Estuaries
Grasslands
Rainforests
Tundra
Wetlands
Environmental economics
Carbon tax
Emissions trading
Environmental monitoring
Global warming
Green manufacturing
Green products
Green buildings
Green cleaning
Habitat loss
Pollution
Air pollution
Emissions trading
Industrial pollution
Land pollution
Oil pollution
Radioactive pollution
Thermal pollution
Urban pollution
Water pollution
Ethical aspects
Ethics
Cyberethics
Machine ethics
Globalization
International relations
Peace technology
Philosophical considerations
Social factors
Demography
Population density
Developing countries
Technology social factors
Privacy
Sustainable development
Technology
Appropriate technology
Disruptive technologies
Machine ethics
Neurotechnology
Technological innovation
Technology social factors
Privacy
Technology transfer
Small business technology transfer
Telepresence
Telexistence
Solid state circuits
Circuit subsystems
Circuit theory
Inductive coupling
FET circuits
Superconductivity

..Bean model
..Critical current density
..Flux pinning
..Superconducting devices
..Josephson junctions
..SQUIDs
..Superconducting coils
..Superconducting magnets
..Superconducting microwave devices
..Superconducting photodetectors
..Superconducting films

Superconducting thin films
Superconducting integrated circuits
Superconducting magnetic energy storage
Superconducting materials
Granular superconductors
High-temperature superconductors
Yttrium barium copper oxide
Multifilamentary superconductors
Niobium-tin
Superconducting filaments
Superconducting wires
Multifilamentary superconductors
Type II superconductors
Superconducting transition temperature
Superconductive tunneling

Systems engineering and theory

..Adaptive systems
..Adaptive control
..Cognitive radar
..Line enhancers
..Multi-agent systems
..Collaborative intelligence
..Variable structure systems
Capability engineering
Complex systems
Configuration management
Failure state
Hierarchical systems
..Multilevel systems
..Integrated design
..Interface management
..Military systems
..Military control
..Military robotics
Modeling
..Analytical models
..Common Information Model (computing)
Atmospheric modeling
Brain modeling
Building information management
Computational modeling
Agent-based modeling
Computational cultural modeling
Computational materials science
Reversible computing
Context modeling
Data models
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....System improvement
....System integration
....System of systems
.........Cyber-physical systems
.........Digital twins
....System realization
....System validation
....System testing
.........Model checking
....System verification
.........System testing
.........Model checking
....Systems architecture
.........Deep architecture
............Deep learning
....Systems engineering education
...Systems operation
...Systems simulation
...Systems support
...Systems thinking
....Task analysis
...Technical management
.........Maintenance management
.........Technical planning
Systems, man, and cybernetics
....Behavioral sciences
.........Animal behavior
.........Cognition
.........Activity recognition
.........Cognitive load
.........Cognitive neuroscience
.........Cognitive processes
.........Commonsense reasoning
.........Metacognition
.........Self-aware
.........Consumer behavior
.........Neuromarketing
.........Self-service
.........Psychiatry
.........Mental disorders
.........Psychology
.........Active perception
.........Emotional responses
.........Industrial psychology
.........Mental health
.........Mood
.........Neuropsychology
.........Psychometric testing
.........Social intelligence
...Biological control systems
.........Biomarkers
............Molecular biomarkers
....Computational linguistics
.........Machine translation
.........Sentiment analysis
.........Cybernetics
.........Adaptive systems
.........Adaptive control
.........Cognitive radar
.........Line enhancers
.........Multi-agent systems
.........Variable structure systems
.........Cognitive informatics
.........Cognitive science
.........Human intelligence
.........Problem-solving
.........Control theory
.........Control nonlinearities
.........Iterative learning control
.........Observability
.........Econophysics
.........Emergent phenomena
.........Intelligent control
.........Feedforward systems
.........Neurocontrollers
.........Linear feedback control systems
.........Frequency locked loops
.........Phase locked loops
.........State feedback
.........Tracking loops
.........Ergonomics
.........Job design
.........Smart spaces
.........User experience
.........Cyberbullying
.........Human factors
.........Anthropomorphism
.........Human augmentation
.........Human image synthesis
.........Human intelligence
.........Digital intelligence
.........Hyper-intelligence
.........Mental health
.........Pedestrians
.........Technology acceptance model
.........Human-machine systems
.........Digital intelligence
.........Extended reality
.........Interactive systems
.........External stimuli
.........Identification of persons
.........Biometrics (access control)
### Face recognition
- Fingerprint recognition
- Gait recognition
- Iris recognition
- Keystroke dynamics
- Palmprint recognition
- Face recognition
- Fingerprint recognition
- Handwriting recognition
- Forgery
- Speaker recognition
- Speech recognition
- Automatic speech recognition
- Personal voice assistants
- Speech analysis
- Pervasive computing
- Ubiquitous computing
- Context-aware services
- Wearable computers
- Smart glasses
- Wearable antennas
- Wearable Health Monitoring Systems

### Vehicular and wireless technologies
- Posthuman
- Remote working
- Transhuman
- User interfaces
- Audio user interfaces
- Brain-computer interfaces
- Data visualization
- Graph drawing
- Heat maps
- Isosurfaces
- Emotion recognition
- Exoskeletons
- Graphical user interfaces
- Avatars
- Human computer interaction
- Affective computing
- Chatbots
- Extended reality
- Gaze tracking
- Head-mounted displays
- Head-up displays
- Human in the loop
- Immersive experience
- Telepresence
- Telexistence
- Human-robot interaction
- Social robots
- Human-vehicle systems

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

- Automotive engineering
- Automotive applications
- Automotive control
- Automotive electronics
- Power steering
- Vehicle crash testing
- Vehicle detection
- License plate recognition
- Vehicle driving
- Autonomous driving
- Vehicle dynamics
- Rollover
- Vehicle safety
- Advanced driver assistance systems
- Lane departure warning systems
- Lane detection
- Land mobile radio equipment
- Mobile antennas
- Navigation
- Aircraft navigation
- Course correction
- Dead reckoning
Indoor navigation
Inertial navigation
Marine navigation
Radio navigation
Satellite navigation systems
Global navigation satellite system
Global Positioning System
Satellite constellations
Sonar navigation
Underwater navigation
Propulsion
Aerospace propulsion
Aircraft propulsion
Propellers
Electromagnetic launching
Coilguns
Railguns
Electrothermal launching
Rockets
Vehicles
Connected vehicles
Hydrogen powered vehicles
Hypersonic vehicles
Intelligent vehicles
Autonomous vehicles
Vehicle-to-everything
Internet of Vehicles
Land vehicles
Bicycles
Electric vehicles
Road vehicles
Military vehicles
Remotely guided vehicles
Drones
Remotely guided underwater vehicles
Remotely piloted aircraft
Space vehicles
Space shuttles
Wireless sensor networks
Body sensor networks
Event detection