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# 2014 IEEE Taxonomy

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**Version  
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of Electrical  
and  
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## IEEE Taxonomy: A Subset Hierarchical Display of IEEE Thesaurus Terms

The IEEE Taxonomy comprises the first three hierarchical 'levels' under each term-family (or branch) that is formed from the top-most terms of the IEEE Thesaurus. In this document these term-families are arranged alphabetically and denoted by **boldface** type. Each term family's hierarchy goes to no more than three sublevels, denoted by indents (in groups of four dots) preceding the next level terms. A term can appear in more than one hierarchical branch and can appear more than once in any particular hierarchy. The 2014 IEEE Taxonomy is defined in this way so that it is always a subset of the 2014 IEEE Thesaurus.

### **Aerospace and electronic systems**

....Aerospace control	.....Airborne radar
.....Air traffic control	.....Bistatic radar
.....Attitude control	.....Doppler radar
.....Ground support	.....Ground penetrating radar
....Aerospace engineering	.....Laser radar
.....Aerospace biophysics	.....Meteorological radar
.....Aerospace electronics	.....Millimeter wave radar
.....Aerospace safety	.....Multistatic radar
.....Air safety	.....MIMO radar
.....Aerospace simulation	.....Passive radar
.....Aerospace testing	.....Radar applications
.....Satellites	.....Radar countermeasures
.....Artificial satellites	.....Radar detection
.....Earth Observing System	.....Radar imaging
.....Low earth orbit satellites	.....Radar measurements
.....Moon	.....Radar polarimetry
.....Space stations	.....Radar remote sensing
.....Space technology	.....Radar tracking
.....Space exploration	.....Radar clutter
....Aerospace materials	.....Radar cross-sections
.....Aerospace components	.....Radar equipment
....Aircraft manufacture	.....Radar theory
....Aircraft navigation	.....Spaceborne radar
....Aircraft propulsion	.....Spread spectrum radar
.....Propellers	.....Synthetic aperture radar
....Command and control systems	.....Inverse synthetic aperture radar
....Electronic warfare	.....Polarimetric synthetic aperture radar
.....Electronic countermeasures	.....Ultra wideband radar
.....Jamming	....Sensor systems
.....Radar countermeasures	.....Gunshot detection systems
....Military equipment	....Sonar
.....Military aircraft	.....Sonar applications
.....Payloads	.....Sonar detection
.....Military satellites	.....Sonar measurements
.....Weapons	.....Sonar equipment
.....Guns	.....Synthetic aperture sonar
.....Missiles	....Telemetry
.....Nuclear weapons	.....Biomedical telemetry
.....Projectiles	
....Radar	



**Antennas and propagation**

- ....Antennas
  - .....Antenna accessories
  - .....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
  - .....Apertures
    - .....Aperture antennas
    - .....Aperture coupled antennas
  - .....Broadband antennas
    - .....Ultra wideband antennas
  - .....Vivaldi antennas
  - .....Dielectric resonator antennas
  - .....Dipole antennas
  - .....Directional antennas
  - .....Directive antennas
  - .....Feeds
    - .....Antenna feeds
  - .....Fractal antennas
  - .....Helical antennas
  - .....Horn antennas
  - .....Leaky wave antennas
  - .....Loaded antennas
  - .....Log-periodic dipole antennas
  - .....Microstrip antennas
  - .....Microwave antennas
  - .....Mobile antennas
  - .....Multifrequency antennas
  - .....Omnidirectional antennas
  - .....Patch antennas
  - .....Radar antennas
  - .....Receiving antennas
  - .....Rectennas
  - .....Reflector antennas
  - .....Satellite antennas
  - .....Slot antennas
  - .....Transmission line antennas
  - .....Transmitting antennas
  - .....UHF 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
- .....Submillimeter wave propagation
- .....UHF propagation
- ....Radio astronomy

**Broadcast technology**

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

**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 integrated circuits
  - .....BiCMOS integrated circuits



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



.....Millimeter wave integrated circuits	.....Thin film circuits
.....MIMICs	.....Thyristor circuits
.....Monolithic integrated circuits	.....Time varying circuits
.....MIMICs	.....Trigger circuits
.....MMICs	.....UHF circuits
.....MOSFET circuits	.....UHF integrated circuits
.....CMOSFET circuits	.....UHF integrated circuits
.....MOS integrated circuits	.....Ultra large scale integration
.....Power MOSFET	.....Very large scale integration
.....Multiplying circuits	.....Neuromorphics
.....Nonlinear circuits	.....Wafer scale integration
.....Nonlinear network analysis	.....VHF circuits
.....Passive circuits	.....Wafer scale integration
.....Phase shifters	...Contacts
.....Phase transformers	.....Brushes
.....Power dissipation	.....Contact resistance
.....Power integrated circuits	.....Ohmic contacts
.....Printed circuits	...Filtering
.....Flexible printed circuits	.....Filters
.....Programmable circuits	.....Active filters
.....Field programmable analog arrays	.....Anisotropic
.....Programmable logic arrays	.....Bragg gratings
.....Programmable logic devices	.....Channel bank filters
.....Programmable logic arrays	.....Digital filters
.....Programmable logic devices	.....Equalizers
.....Pulse circuits	.....Filtering theory
.....Flip-flops	.....Gabor filters
.....Radiation detector circuits	.....Harmonic filters
.....Rail to rail operation	.....IIR filters
.....Rail to rail amplifiers	.....Kalman filters
.....Rail to rail inputs	.....Low-pass filters
.....Rail to rail outputs	.....Matched filters
.....Rectifiers	.....Microstrip filters
.....RLC circuits	.....Nonlinear filters
.....Sampled data circuits	.....Particle filters
.....Sequential circuits	.....Power filters
.....Silicon-on-insulator	.....Resonator filters
.....Silicon on sapphire	.....Spatial filters
.....Submillimeter wave circuits	.....Superconducting filters
.....Submillimeter wave integrated circuits	.....Transversal filters
.....Summing circuits	.....Information filtering
.....Switched circuits	.....Information filters
.....Switched capacitor circuits	.....Recommender systems
.....Switching circuits	...Integrated circuit technology
.....Choppers (circuits)	.....CMOS technology
.....Logic circuits	.....CMOS process
.....Switching converters	.....Silicon on sapphire
.....Zero current switching	.....Moore's Law
.....Zero voltage switching	...Logic devices
.....Thick film circuits	.....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
  - .....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
    - .....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
  - .....Video codecs
- .....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
    - .....Relay networks (telecommunications)
    - .....Software defined networking
  - .....Communication system control
    - .....Telecommunication control
  - .....Communication system security
    - .....Radio communication countermeasures
  - .....Communication system signaling
  - .....Communication system software
    - .....Streaming media
  - .....Communication system traffic
    - .....Communication system traffic control
  - .....Computer networks
    - .....Ad hoc networks
    - .....Computer network management
    - .....Content distribution networks
    - .....Cyberspace
    - .....Diffserv networks
    - .....Domain Name System



.....Ethernet networks	.....Internet topology
.....Google	.....Middleboxes
.....Internet	.....Semantic Web
.....Intserv networks	.....Social computing
.....IP networks	.....Web 2.0
.....Metropolitan area networks	.....Web services
.....Multiprocessor interconnection networks	.....IP networks
.....Network servers	.....TCPIP
.....Next generation networking	.....ISDN
.....Overlay networks	.....B-ISDN
.....Peer-to-peer computing	.....Land mobile radio cellular systems
.....Software defined networking	.....Cellular networks
.....Storage area networks	.....Paging strategies
.....Token networks	.....Local area networks
.....Unicast	.....Wireless LAN
.....Virtual private networks	.....Machine-to-machine communications
.....Wide area networks	.....Metropolitan area networks
.....Cross layer design	.....Microwave communication
.....Data buses	.....Rectennas
.....Backplanes	.....Military communication
.....Data communication	.....Reconnaissance
.....Asynchronous communication	.....Millimeter wave communication
.....Asynchronous transfer mode	.....MIMO
.....Data buses	.....Rician channels
.....Data transfer	.....Mobile communication
.....Telecommunication buffers	.....3G mobile communication
.....Telemetry	.....4G mobile communication
.....Teleprinting	.....Ambient networks
.....Digital communication	.....Dual band
.....Baseband	.....Land mobile radio
.....DICOM	.....Land mobile radio cellular systems
.....Digital audio broadcasting	.....Mobile nodes
.....Digital images	.....Mobile radio mobility management
.....Digital multimedia broadcasting	.....Software radio
.....Digital video broadcasting	.....Molecular communication
.....DSL	.....Multiaccess communication
.....ISDN	.....Direct-sequence code-division multiple access
.....Passband	.....Frequency division multiaccess
.....Portable media players	.....Multicarrier code division multiple access
.....SONET	.....Subscriber loops
.....Spread spectrum communication	.....Time division multiple access
.....Facsimile	.....Time division synchronous code division multiple access
.....FDDI	.....Multicast communication
.....Indoor communication	.....Multicast VPN
.....Indoor environments	.....Multimedia communication
.....Internet	.....Narrowband
.....Crowdsourcing	.....Optical fiber communication
.....Instant messaging	.....FDDI
.....Internet of Things	
.....Internet telephony	



.....Optical buffering  
 .....Optical fiber networks  
 .....Optical fiber subscriber loops  
 .....Optical interconnections  
 .....Optical packet switching  
 .....Optical wavelength conversion  
 .....Scheduling algorithms  
 .....SONET  
 .....Personal communication networks  
 .....Protocols  
 .....Access protocols  
 .....Asynchronous transfer mode  
 .....Cryptographic protocols  
 .....Master-slave  
 .....Multicast protocols  
 .....Multiprotocol label switching  
 .....Routing protocols  
 .....Transport protocols  
 .....Wireless application protocol  
 .....Quality of service  
 .....Admission control  
 .....Radio communication  
 .....Baseband  
 .....Bluetooth  
 .....Indoor radio communication  
 .....Land mobile radio  
 .....Land mobile radio cellular systems  
 .....Packet radio networks  
 .....Passband  
 .....Personal area networks  
 .....Radio broadcasting  
 .....Radio communication  
 countermeasures  
 .....Radio frequency  
 .....Radio link  
 .....Radio spectrum management  
 .....Satellite communication  
 .....Satellite ground stations  
 .....Software radio  
 .....Zigbee  
 .....Routing  
 .....Wavelength routing  
 .....Satellite communication  
 .....Downlink  
 .....Satellite broadcasting  
 .....Satellite ground stations  
 .....Uplink  
 .....Satellite ground stations  
 .....SIMO  
 .....SISO  
 .....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  
 .....Telecommunication computing  
 .....Telecommunication network  
 topology  
 .....Telecommunication services  
 .....Telematics  
 .....Teleconferencing  
 .....Telegraphy  
 .....Telephony  
 .....Teleprinting  
 .....Teletext  
 .....Token networks  
 .....UHF communication  
 .....Underwater communication  
 .....Videophone systems  
 .....Videotex  
 .....Visual communication  
 .....Wide area networks  
 .....Wideband  
 .....Wireless communication  
 .....Cognitive radio  
 .....Cooperative communication  
 .....GSM  
 .....Open wireless architecture  
 .....Roaming  
 .....Spatial diversity  
 .....WiMAX  
 .....Wireless application protocol  
 .....Wireless networks  
 .....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
- ....Message systems
- .....Electronic mail
- .....Unified messaging
- .....Unsolicited electronic 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
- .....Electrooptic modulators
- .....Intensity modulation
- .....Phase modulation
- .....Continuous 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
- .....Multiplexing equipment
- .....Add-drop multiplexers
- .....OFDM
- .....Multiple access interference
- .....OFDM modulation
- .....Partial transmit sequences
- .....Peak to average power ratio
- .....Time division multiplexing
- .....Wavelength division multiplexing
- .....WDM networks
- ....Network topology
- .....Complex networks
- .....Computer network reliability
- ....Presence network agents
- ....TV
- .....Cable TV
- .....Digital TV
- .....Analog TV
- .....HDTV
- .....IPTV
- .....Mobile TV
- .....Three-dimensional television
- ....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
- .....Power capacitors
- .....Varactors
- .....Coils
- .....Superconducting coils
- .....Connectors
- .....Plugs
- .....Sockets
- .....Diodes
- .....Diode lasers
- .....Electrodes
- .....Anodes
- .....Cathodes
- .....Microelectrodes
- .....Fuses
- .....Inductors
- .....Active inductors



.....Thick film inductors	.....Decision support systems
.....Thin film inductors	.....Intelligent systems
.....Resistors	.....Intelligent robots
.....Memristors	.....Knowledge based systems
.....Switched capacitor networks	.....Expert systems
.....Varistors	.....Mobile agents
.....Structural plates	.....Knowledge engineering
.....Switches	.....Inference mechanisms
.....Contactors	.....Knowledge acquisition
.....Microswitches	.....Knowledge discovery
.....Optical switches	.....Knowledge representation
.....Transducers	.....Learning (artificial intelligence)
.....Acoustic transducers	.....Distance learning
.....Biomedical transducers	.....Electronic learning
.....Chemical transducers	.....Learning systems
.....Piezoelectric transducers	.....Backpropagation
.....Ultrasonic transducer arrays	.....Learning automata
....Electronic equipment manufacture	.....Semisupervised learning
.....Damascene integration	.....Supervised learning
.....Micromachining	.....Unsupervised learning
.....Radiation hardening (electronics)	.....Machine learning
.....Semiconductor device manufacture	.....Boosting
.....Diffusion processes	.....Statistical learning
.....Flip-chip devices	.....Prediction methods
.....High-K gate dielectrics	.....Linear predictive coding
.....Quasi-doping	.....Predictive coding
.....Semiconductor device doping	.....Predictive encoding
.....Semiconductor epitaxial layers	.....Predictive models
.....Semiconductor growth	....Autonomous mental development
.....Silicidation	....Computational intelligence
.....Wafer bonding	.....Computation theory
....Electronics packaging	.....Computational complexity
.....Chip scale packaging	.....Concurrent computing
....Environmentally friendly manufacturing techniques	.....Greedy algorithms
....Integrated circuit manufacture	.....Support vector machines
.....Surface-mount technology	.....Evolutionary computation
....Integrated circuit packaging	.....Particle swarm optimization
.....Multichip modules	.....Fuzzy systems
.....Plastic integrated circuit packaging	.....Fuzzy control
....Semiconductor device packaging	.....Fuzzy neural networks
....Thermal management of electronics	.....Hybrid intelligent systems
.....Electronic packaging thermal management	.....Genetic algorithms
.....Electronics cooling	....Logic
	.....Fuzzy logic
	.....Fuzzy cognitive maps
	.....Takagi-Sugeno model
	.....Multivalued logic
	.....Probabilistic logic
	.....Sufficient conditions
	....Machine intelligence
	.....Pattern analysis
<b>Computational and artificial intelligence</b>	
....Artificial intelligence	
.....Context awareness	
.....Cooperative systems	



- ....Neural networks
  - .....Artificial neural networks
    - .....Hebbian theory
    - .....Self-organizing feature maps
  - .....Biological neural networks
  - .....Cellular neural networks
  - .....Feedforward neural networks
    - .....Multilayer perceptrons
    - .....Multi-layer neural network
  - .....Neural network hardware
  - .....Radial basis function networks
  - .....Recurrent neural networks
    - .....Hopfield neural networks

### Computers and information processing

- ....Computer applications
  - .....Affective computing
  - .....Application virtualization
  - .....Computer aided analysis
  - .....Computer aided engineering
  - .....Computer aided instruction
  - .....Computer generated music
  - .....Computer integrated manufacturing
  - .....Control engineering computing
  - .....Green computing
  - .....High energy physics instrumentation computing
    - .....Linear particle accelerator
  - .....Knowledge management
    - .....Knowledge transfer
  - .....Medical information systems
    - .....Electronic medical records
  - .....Military computing
  - .....Physics computing
  - .....Power engineering computing
  - .....Power system analysis computing
  - .....Publishing
    - .....Bibliometrics
    - .....Company reports
    - .....Desktop publishing
    - .....Electronic publishing
    - .....Open Access
    - .....Scientific publishing
    - .....Scientific computing
  - .....Telecommunication computing
    - .....Internetworking
    - .....Soft switching
  - .....Virtual enterprises
  - .....Virtual manufacturing
    - .....Virtual machining

- .....Web sites
  - .....Facebook
  - .....MySpace
  - .....Uniform resource locators
  - .....Web design
  - .....YouTube
  - .....World Wide Web
    - .....Mashups
- ....Computer architecture
  - .....Accelerator architectures
  - .....Data structures
    - .....Arrays
      - .....Binary decision diagrams
      - .....Null value
      - .....Octrees
      - .....Table lookup
      - .....Tree data structures
  - .....Dynamic voltage scaling
  - .....Memory architecture
  - .....Memory management
  - .....Multiprocessor interconnection
    - .....Hypercubes
  - .....Parallel architectures
    - .....Multicore processing
  - .....Reconfigurable architectures
- ....Computer interfaces
  - .....Application programming interfaces
    - .....WebRTC
  - .....Browsers
  - .....Field buses
  - .....Firewire
  - .....Haptic interfaces
    - .....Data gloves
    - .....Force feedback
      - .....Grasping
    - .....Hypertext systems
  - .....Interface phenomena
    - .....Network interfaces
    - .....Interface states
  - .....Musical instrument digital interfaces
  - .....Ports (Computers)
  - .....System buses
- ....Computer networks
  - .....Ad hoc networks
    - .....AODV
    - .....Mesh networks
      - .....Mobile ad hoc networks
      - .....Vehicular ad hoc networks
  - .....Computer network management
    - .....Computer network reliability
    - .....Disruption tolerant networking



.....Management information base	.....Difference engines
.....Middleboxes	.....Microcomputers
.....Network address translation	.....Portable computers
.....Network synthesis	.....Workstations
.....Content distribution networks	.....Parallel machines
.....Cyberspace	.....Supercomputers
.....Diffserv networks	.....Tablet computers
.....Domain Name System	.....Wearable computers
.....Ethernet networks	...Computer science
.....EPON	.....Formal languages
.....Google	.....Computer languages
.....Internet	.....Runtime library
.....Crowdsourcing	.....Network theory (graphs)
.....Instant messaging	.....Programming
.....Internet of Things	.....Augmented reality
.....Internet telephony	.....Automatic programming
.....Internet topology	.....Concatenated codes
.....Middleboxes	.....Functional programming
.....Semantic Web	.....Granular computing
.....Social computing	.....Integer linear programming
.....Web 2.0	.....Logic programming
.....Web services	.....Microprogramming
.....Intserv networks	.....Object oriented methods
.....IP networks	.....Object oriented programming
.....TCPIP	.....Opportunistic software systems
.....Metropolitan area networks	development
.....Multiprocessor interconnection	.....Parallel programming
networks	.....Performance analysis
.....Network servers	.....Programming profession
.....Next generation networking	.....Robot programming
.....Overlay networks	...Concurrency control
.....Peer-to-peer computing	.....Processor scheduling
.....Software defined networking	.....Scheduling algorithms
.....Storage area networks	...Database machines
.....Token networks	...Data systems
.....Unicast	.....Data acquisition
.....Virtual private networks	.....Fastbus
.....Extranets	.....User-generated content
.....Wide area networks	.....Data compression
...Computer performance	.....Adaptive coding
.....Computer errors	.....Audio compression
.....Computer crashes	.....Huffman coding
.....Performance loss	.....Source coding
...Computer peripherals	.....Test data compression
.....Disk drives	.....Transform coding
.....Keyboards	.....Data conversion
.....Modems	.....Analog-digital conversion
.....Printers	.....Digital-analog conversion
...Computers	.....Data engineering
.....Analog computers	.....Data handling
.....Calculators	.....Data assimilation



.....Data encapsulation	.....Internet of Things
.....Document handling	.....Internet telephony
.....Merging	.....Internet topology
.....Sorting	.....Middleboxes
.....Data processing	.....Semantic Web
.....Associative processing	.....Social computing
.....Business data processing	.....Web 2.0
.....Data analysis	.....Web services
.....Data collection	.....Metacomputing
.....Data integration	.....Grid computing
.....Data preprocessing	.....Peer-to-peer computing
.....Data transfer	...DNA computing
.....Information exchange	...File servers
.....Spreadsheet programs	...Hardware
.....Text processing	.....Open source hardware
.....Virtual enterprises	...High performance computing
.....Data storage systems	...Image processing
.....Data warehouses	.....Active shape model
...Digital systems	.....Feature extraction
.....Internet	.....Geophysical image processing
.....Crowdsourcing	.....Gray-scale
.....Instant messaging	.....Image analysis
.....Internet of Things	.....Image classification
.....Internet telephony	.....Image motion analysis
.....Internet topology	.....Image quality
.....Middleboxes	.....Image sequence analysis
.....Semantic Web	.....Image texture analysis
.....Social computing	.....Object detection
.....Web 2.0	.....Subtraction techniques
.....Web services	.....Image coding
.....ISDN	.....Image color analysis
.....B-ISDN	.....Image decomposition
.....Local area networks	.....Image denoising
.....Wireless LAN	.....Image enhancement
.....Metropolitan area networks	.....Image fusion
.....Token networks	.....Image generation
...Distributed computing	.....Plasma displays
.....Client-server systems	.....Visual effects
.....Middleware	.....Image recognition
.....Servers	.....Image edge detection
.....Collaborative work	.....Image reconstruction
.....Cooperative communication	.....Image registration
.....Crowdsourcing	.....Image representation
.....Social computing	.....Image resolution
.....Diffserv networks	.....High-resolution imaging
.....Distributed databases	.....Spatial resolution
.....Distributed information systems	.....Image restoration
.....Publish-subscribe	.....Image sampling
.....Internet	.....Image segmentation
.....Crowdsourcing	.....Image sequences
.....Instant messaging	.....Image texture



- .....Machine vision
  - .....Object recognition
  - .....Object segmentation
  - .....Morphological operations
  - .....Optical feedback
  - .....Smart pixels
  - .....Spatial coherence
  - .....Table lookup
- ....Memory
  - .....Analog memory
  - .....Associative memory
  - .....Buffer storage
    - .....Computer buffers
    - .....Cache memory
    - .....Cache storage
    - .....Content addressable storage
    - .....Flash memories
      - .....Flash memory cells
    - .....Magnetic memory
      - .....Floppy disks
      - .....Hard disks
    - .....Memory management
    - .....Nonvolatile memory
      - .....Nonvolatile single electron memory
    - .....Phase change memory
      - .....Phase change random access memory
    - .....Random access memory
      - .....DRAM chips
      - .....Phase change random access memory
    - .....SDRAM
    - .....SRAM cells
    - .....SRAM chips
    - .....Read only memory
      - .....PROM
    - .....Read-write memory
    - .....Registers
      - .....Shift registers
    - .....Scanning probe data storage
    - .....Semiconductor memory
  - ....Mobile computing
  - ....Molecular computing
  - ....Multitasking
    - .....Parametric study
  - ....Open systems
    - .....Open Access
      - .....Public domain software
  - ....Physical layer
  - ....Optical computing
    - .....Parallel processing
  - .....Multiprocessing systems
    - .....Data flow computing
    - .....Processor scheduling
    - .....Systolic arrays
  - .....Multithreading
  - .....Parallel algorithms
  - .....Pipeline processing
  - ....Pattern recognition
    - .....Active shape model
    - .....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
    - .....Pattern matching
      - .....Image matching
    - .....Speech recognition
      - .....Automatic speech recognition
      - .....Speech analysis
    - .....Text recognition
  - ....Pervasive computing
    - .....Ubiquitous computing
      - .....Context-aware services
    - .....Wearable computers
  - ....Petascale computing
  - ....Platform virtualization
  - ....Quantum computing
    - .....Quantum cellular automata
  - ....Real-time systems
    - .....WebRTC
  - ....Software
    - .....Application software
    - .....Embedded software
    - .....Middleware
      - .....Mediation
        - .....Message-oriented middleware
      - .....Web services
    - .....Open source software
    - .....Optical character recognition software
    - .....Public domain software
    - .....Software agents



- .....Autonomous agents
- .....Intelligent agents
- .....Software as a service
- .....Software debugging
- .....Software design
- .....Software maintenance
- .....Software packages
  - .....EMTDC
  - .....MATLAB
  - .....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
  - .....Programming environments
  - .....Reasoning about programs
  - .....Runtime
    - .....Dynamic compiler
    - .....Runtime environment
  - .....Software architecture
    - .....Client-server systems
    - .....Microarchitecture
    - .....Representational state transfer
  - .....Software libraries
- ....System recovery
  - .....Checkpointing
  - .....Core dumps
  - .....Debugging
- ....Time sharing computer systems
- ....Virtual machine monitors

### Consumer electronics

- ....Ambient intelligence
- ....Audio systems
  - .....Audio-visual systems
  - .....Auditory displays
  - .....Headphones

- .....Loudspeakers
- .....Microphones
  - .....Microphone arrays
- .....Portable media players
- .....Sonification
  - ....Home automation
    - .....Portable media players
    - .....Refrigerators
    - .....Smart homes
    - .....Washing machines
  - ....Home computing
    - ....Low-power electronics
      - ....Microwave ovens
    - ....Multimedia systems
      - .....Multimedia communication
      - .....Multimedia computing
      - .....Multimedia databases

### Control systems

- ....Automatic control
  - .....Power generation control
    - ....Automatic generation control
    - ....Bidirectional control
    - ....CAMAC
    - ....Centralized control
    - ....Closed loop systems
    - ....Control design
    - ....Control engineering
    - ....Control equipment
      - .....Actuators
        - .....Electrostatic actuators
        - .....Hydraulic actuators
        - .....Intelligent actuators
        - .....Microactuators
        - .....Piezoelectric actuators
        - .....Pneumatic actuators
      - .....Fasteners
      - .....Microcontrollers
      - .....Regulators
      - .....Servosystems
        - .....Servomotors
      - .....Switches
        - .....Contactors
        - .....Microswitches
        - .....Optical switches
      - .....Switchgear
        - .....Circuit breakers
        - .....Interrupters
        - .....Relays
      - .....Telecontrol equipment



- .....Thermostats
- ....Controllability
- ....Control system synthesis
- ....Decentralized control
- .....Distributed parameter systems
- ....Delay systems
- .....Added delay
- .....Delay lines
- ....Digital control
- .....Programmable control
- .....Flow graphs
- ....Feedback
- .....Feedback circuits
- .....Output feedback
- .....Negative feedback
- .....Neurofeedback
- ....Fluid flow control
- ....Fluidics
- .....Microfluidics
- .....Nanofluidics
- ....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
- .....Kinetic theory
- .....Motion planning
- .....Path planning
- .....Visual servoing
- .....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
- ....Moisture control
- .....Humidity control
- ....Motion compensation
- ....Networked control systems
- ....Nonlinear control systems
- ....Open loop systems
- ....Optical control
- .....Lighting control
- .....Optical variables control
- ....Optimal control
- .....Bang-bang control
- .....Infinite horizon
- ....PD control
- ....Pi control
- ....Pneumatic systems
- ....Pressure control
- ....Proportional control
- ....Radio control
- ....Robot control
- .....Robot motion
- ....SCADA systems
- ....Sensorless control
- ....Sliding mode control
- ....Supervisory control
- .....SCADA systems
- ....Thermal variables control
- .....Temperature control
- .....Cooling
- .....Heating
- .....Thermal analysis
- .....Thermomechanical processes
- ....Traffic control
- .....Queueing analysis
- .....Vehicle routing

### **Dielectrics and electrical insulation**

- ....Dielectrics
- .....Dielectric constant
- .....High-K gate dielectrics
- .....Dielectric devices
- .....Capacitors
- .....Ferroelectric devices
- .....Piezoelectric devices
- .....Pyroelectric devices
- .....Dielectric losses
- .....Dielectric substrates
- .....Dielectrophoresis
- .....Electrohydrodynamics
- .....Electrokinetics
- .....Electrostriction





- ....Electric breakdown
  - .....Avalanche breakdown
  - .....Corona
  - .....Dielectric breakdown
    - .....Arc discharges
    - .....Discharges (electric)
    - .....Electrostatic discharges
    - .....Flashover
    - .....Glow discharges
    - .....Partial discharges
    - .....Surface discharges
    - .....Vacuum breakdown
  - .....Sparks
- ....Insulation
  - .....Cable insulation
    - .....Power cable insulation
  - .....Ceramics
    - .....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

- ....Computer science education
- ....Continuing education
  - .....Education courses
- ....Educational institutions
- ....Educational technology
  - .....Computer aided instruction
  - .....Courseware
  - .....Electronic learning
- ....Engineering education
  - .....Biomedical engineering education
  - .....Communication engineering education
  - .....Control engineering education
  - .....Electrical engineering education
    - .....Electronics engineering education
  - .....Engineering students
  - .....Power engineering education
  - .....Student experiments
  - .....Systems engineering education

- ....Physics education
- ....Power engineering education
- ....Qualifications
- ....Training
  - .....Industrial training
  - .....Management training
  - .....On the job training
  - .....Vocational training

### Electromagnetic compatibility and interference

- ...Electromagnetic compatibility
  - .....Immunity testing
  - .....Reverberation chambers
- ...Electromagnetics
  - .....Electromagnetic analysis
    - .....Air gaps
      - .....Computational electromagnetics
      - .....Delay effects
      - .....Electromagnetic fields
      - .....Electromagnetic forces
      - .....Electromagnetic refraction
      - .....Permeability
      - .....Spark gaps
      - .....Time-domain analysis
  - .....Electromagnetic coupling
    - .....Mutual coupling
    - .....Optical coupling
  - .....Electromagnetic devices
  - .....Electromagnetic induction
    - .....Eddy currents
      - .....Inductive power transmission
  - .....Electromagnetic metamaterials
  - .....Electromagnetic radiation
    - .....Correlators
    - .....Electromagnetic wave absorption
    - .....Frequency
    - .....Gamma-rays
    - .....Line-of-sight propagation
  - .....Electromagnetic shielding
    - .....Cable shielding
    - .....Magnetic shielding
  - .....Electromagnetic transients
    - .....EMP radiation effects
      - .....EMTDC
      - .....EMTP
    - .....Power system transients
    - .....Surges
  - .....Proximity effects
- ...Interference



- .....Clutter
  - .....Crosstalk
  - .....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
- Electron devices**
- ....Cathode ray tubes
  - ....Electron guns
  - ....Electron multipliers
  - ....Electron tubes
    - .....Field emitter arrays
    - .....Klystrons
    - .....Magnetrons
    - .....Thyratrons
  - ....Mechatronics
    - .....Biomechatronics
  - ....Microelectromechanical systems
    - .....Microelectromechanical devices
      - .....Microactuators
      - .....Micromotors
      - .....Micropumps
      - .....Microvalves
    - .....Radiofrequency microelectromechanical systems
  - ....Microfluidics
  - ....Micromechanical devices
    - .....Biomedical microelectromechanical systems
    - .....Fluidic microsystems
    - .....Microfabrication
  - ....Photoelectricity
    - .....Photovoltaic effects
      - .....Shunts (electrical)
      - .....Photovoltaic cells
  - .....Light trapping
  - ....Quantum computing
    - .....Quantum cellular automata
    - ....Quantum well devices
      - .....Quantum well lasers
        - .....Quantum cascade lasers
      - .....Quantum wells
        - .....Two dimensional hole gas
    - ....Semiconductivity
      - ....Semiconductor devices
        - .....Flip-chip devices
        - .....Gunn devices
        - .....Hall effect devices
        - .....Junctions
          - .....Heterojunctions
          - .....Hybrid junctions
          - .....P-n junctions
          - .....Waveguide junctions
        - .....MIS devices
          - .....Charge coupled devices
          - .....MOS devices
          - .....MONOS devices
          - .....Piezoresistive devices
          - .....P-i-n diodes
        - .....Power semiconductor devices
          - .....Power transistors
          - .....Power semiconductor switches
            - .....Bipolar transistors
            - .....Thyristors
        - .....Quantum dots
        - .....Quantum well lasers
          - .....Quantum cascade lasers
        - .....Schottky diodes
        - .....Semiconductor counters
        - .....Semiconductor detectors
        - .....Semiconductor device modeling
        - .....Semiconductor device noise
        - .....Semiconductor diodes
          - .....P-i-n diodes
          - .....Schottky diodes
        - .....Semiconductor-metal interfaces
        - .....Superluminescent diodes
        - .....Varactors
        - .....Semiconductor-insulator interfaces
        - .....Semiconductor lasers
          - .....Laser tuning
            - .....Quantum dot lasers
            - .....Quantum well lasers
          - .....Semiconductor laser arrays
          - .....Semiconductor optical amplifiers
          - .....Surface emitting lasers



- .....Semiconductor waveguides
- .....Silicon devices
- .....SONOS devices
- .....Superluminescent diodes
- .....Surface emitting lasers
- .....Vertical cavity surface emitting lasers
- .....Thermistors
- .....Transistors
  - .....Field effect transistors
  - .....Heterojunction bipolar transistors
  - .....Millimeter wave transistors
  - .....Phototransistors
- ....Single electron devices
- .....Single electron memory
  - .....Hetero-nanocrystal memory
- .....Single electron transistors
- ....Thick film devices
- .....Thick film inductors
- ....Thin film devices
  - .....Film bulk acoustic resonators
  - .....Thin film inductors
  - .....Thin film transistors
    - .....Organic thin film transistors
- ....Tunneling
  - .....Gate leakage
  - .....Josephson effect
  - .....Magnetic tunneling
  - .....Resonant tunneling devices
  - .....Tunneling magnetoresistance
- ....Vacuum technology
  - .....Photomultipliers
  - .....Vacuum systems
    - .....Gettering

### **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
    - .....Graphics
      - .....Animation

- .....Art
  - .....Character generation
  - .....Computer graphics
  - .....Engineering drawings
  - .....Layout
  - .....Shape
  - .....Symbols
  - .....Virtual reality
  - .....Visualization
- .....Green design
  - .....Ecodesign
  - .....Green computing
- .....Process design
  - .....Pattern formation
  - .....Product design
  - .....Prototypes
- .....Technical drawing
- .....Time to market
- .....User centered design
- .....Virtual prototyping

### **Engineering - general**

- ....Acoustical engineering
- ....Agricultural engineering
- ....Chemical engineering
- ....Civil engineering
  - .....Railway engineering
  - .....Railway safety
- ....Structural engineering
  - .....Offshore installations
- ....Concurrent engineering
- ....Design engineering
- ....Electrical engineering
  - .....Electrical engineering computing
  - .....Engineering profession
  - .....Maintenance engineering
    - .....Predictive maintenance
    - .....Preventive maintenance
      - .....Condition monitoring
- ....Mechanical engineering
  - .....Mechanical power transmission
    - .....Torque converters
  - .....Mechanical systems
    - .....Mechanical energy
      - .....Micromechanical devices
- ....Precision engineering
- ....Production engineering
  - .....Production planning
    - .....Capacity planning
    - .....Materials requirements planning



- .....Process planning
- ....Research and development
- ....Reverse engineering
- ....Sanitary engineering
- ....Standardization
- .....Formal specifications
- .....Guidelines
- .....Standards
- .....ANSI standards
- .....Code standards
- .....Communication standards
- .....IEC standards
- .....IEEE standards
- .....ISO standards
- .....Measurement standards
- .....Military standards
- .....Software standards
- .....Standards activities board
- .....Standards organizations
- .....Telecommunication standards
- .....Universal Serial Bus
- ....Thermal engineering

**Engineering in medicine and biology**

- ....Bioinformatics
- ....Biology
- .....Biochemistry
- .....Amino acids
- .....Biochemical analysis
- .....Peptides
- .....Proteins
- .....Biodiversity
- .....Biogeography
- .....Bioelectric phenomena
- .....Electric shock
- .....Biological cells
- .....Cells (biology)
- .....Chromosome mapping
- .....Fibroblasts
- .....RNA
- .....Stem cells
- .....Biological information theory
- .....Biological processes
- .....Biological interactions
- .....Chronobiology
- .....Circadian rhythm
- .....Coagulation
- .....Symbiosis
- .....Biological system modeling
- .....Biological systems

- .....Anatomy
- .....Molecular communication
- .....Organisms
- .....Biology computing
- .....Biophotonics
- .....Biophysics
- .....Aerospace biophysics
- .....Biomagnetics
- .....Cellular biophysics
- .....Molecular biophysics
- .....Evolution (biology)
- .....Memetics
- .....Phylogeny
- .....Genetics
- .....DNA
- .....Gene therapy
- .....Genetic communication
- .....Genetic expression
- .....Genetic programming
- .....Genomics
- .....Microinjection
- .....Nanobioscience
- .....DNA computing
- .....Nanobiotechnology
- .....Physiology
- .....Predator prey systems
- .....Synthetic biology
- .....Systematics
- .....Systems biology
- .....Vegetation
- .....Crops
- .....Marine vegetation
- .....Zoology
- .....Animals
- ....Biomedical communication
- .....Biomedical telemetry
- .....Telemedicine
- ....Biomedical computing
- .....Biomedical informatics
- .....Medical expert systems
- .....Medical information systems
- .....Electronic medical records
- ....Biomedical engineering
- .....Bioimpedance
- .....Biological techniques
- .....Biomedical applications of radiation
- .....Biomedical electronics
- .....Biomedical signal processing
- .....Biomedical image processing
- .....Biotechnology
- .....Cloning



.....Drug delivery	.....Computational biochemistry
.....Targeted drug delivery	.....Computational biophysics
.....Neural engineering	.....Computational systems biology
.....Neural microtechnology	...Genetic engineering
.....Neural nanotechnology	...Medical services
.....Neural prosthesis	.....Assisted living
.....Protein engineering	.....Catheterization
.....Tissue engineering	.....Clinical diagnosis
.....Regeneration engineering	.....Cybercare
...Biomedical equipment	.....Health information management
.....Assistive technology	.....Hospitals
.....Assistive devices	.....In vitro
.....Wheelchairs	.....In vitro fertilization
.....Biomedical electrodes	.....In vivo
.....Biomedical telemetry	.....Medical conditions
.....Biomedical transducers	.....Aneurysm
.....Catheters	.....Arteriosclerosis
.....Cybercare	.....Arthritis
.....Endoscopes	.....Atrophy
.....Gerontechnology	.....Blindness
.....Hypodermic needles	.....Cancer
.....Implantable biomedical devices	.....Deafness
.....Implants	.....Diabetes
.....Auditory implants	.....Diseases
.....Brainstem implants	.....Epilepsy
.....Cochlear implants	.....Hemorrhaging
.....Microelectronic implants	.....Hypertension
.....Intracranial pressure sensors	.....Hyperthermia
.....Lithotriptors	.....Influenza
.....Pacemakers	.....Injuries
.....Stethoscope	.....Pregnancy
.....Surgical instruments	.....Retinopathy
.....Laparoscopes	.....Sleep apnea
...Biomedical imaging	.....Thrombosis
.....Angiocardiology	.....Tumors
.....Angiography	.....Medical diagnosis
.....Biomedical optical imaging	.....Autopsy
.....Cardiology	.....Bronchoscopy
.....Echocardiography	.....Colonography
.....Electrocardiography	.....Computer aided diagnosis
.....Phonocardiography	.....Medical signal detection
.....DICOM	.....Nanomedicine
.....Encephalography	.....Plethysmography
.....Mammography	.....Sensitivity and specificity
.....Medical diagnostic imaging	.....Medical tests
.....Anatomical structure	.....Amniocentesis
.....Molecular imaging	.....Biopsy
.....Phantoms	.....Cancer detection
...Bionanotechnology	.....Colonoscopy
...Bioterrorism	.....Pregnancy test
...Computational biology	.....Medical treatment



.....Anesthesia  
 .....Angioplasty  
 .....Brachytherapy  
 .....Brain stimulation  
 .....Cardiology  
 .....Chemotherapy  
 .....Clinical trials  
 .....Defibrillation  
 .....Dentistry  
 .....Electrical stimulation  
 .....Electronic medical prescriptions  
 .....Embolization  
 .....Fibrillation  
 .....Gastroenterology  
 .....Gerontology  
 .....Gynecology  
 .....Hepatectomy  
 .....Hospitals  
 .....Hyperthermia  
 .....Lithotripsy  
 .....Magnetic stimulation  
 .....Neonatology  
 .....Neuromuscular stimulation  
 .....Neutron capture therapy  
 .....Noninvasive treatment  
 .....Oncology  
 .....Orthopedic procedures  
 .....Orthotics  
 .....Pathology  
 .....Patient rehabilitation  
 .....Pediatrics  
 .....Pharmaceuticals  
 .....Surgery  
 .....Occupational medicine  
 .....Prosthetics  
 .....Artificial biological organs  
 .....Artificial limbs  
 .....Prosthetic hand  
 .....Prosthetic limbs  
 .....Visual prosthesis  
 .....Public healthcare  
 .....Sensory aids  
 .....Hearing aids  
 .....Vaccines  
 .....X-rays  
 .....X-ray applications  
 .....X-ray detection  
 .....X-ray scattering  
 .....X-ray tomography  
 .....Nuclear medicine  
 .....Synthetic biology

## Engineering management

....Business  
 .....Business data processing  
 .....Industrial relations  
 .....Management  
 .....Asset management  
 .....Best practices  
 .....Business continuity  
 .....Business process re-engineering  
 .....Communication system operations  
 and management  
 .....Content management  
 .....Contingency management  
 .....Contracts  
 .....Customer relationship management  
 .....Decision making  
 .....Enterprise resource planning  
 .....Facilities management  
 .....Financial management  
 .....Governmental factors  
 .....Human resource management  
 .....Information management  
 .....International collaboration  
 .....Knowledge management  
 .....Marketing management  
 .....Organizational aspects  
 .....Outsourcing  
 .....Process planning  
 .....Production management  
 .....Project management  
 .....Public relations  
 .....Quality management  
 .....Research and development  
 management  
 .....Resource management  
 .....Risk analysis  
 .....Storage management  
 .....Supply chain management  
 .....Operations research  
 .....Inventory control  
 .....Virtual enterprises  
 .....Organizations  
 .....BNSC  
 .....Companies  
 .....Government  
 .....Sociotechnical systems  
 ....Commercialization  
 ....Economics  
 .....Costs  
 .....Cost benefit analysis  
 .....Econometrics



- .....Economic forecasting
  - .....Economic indicators
  - .....Share prices
  - .....Electronic commerce
  - .....Environmental economics
  - .....Carbon tax
  - .....Exchange rates
  - .....Fuel economy
  - .....International trade
  - .....Macroeconomics
  - .....Privatization
  - .....Microeconomics
  - .....Economies of scale
  - .....Industrial economics
  - .....Monopoly
  - .....Oligopoly
  - .....Power generation economics
  - .....Electricity supply industry deregulation
  - .....Profitability
  - .....Stock markets
  - .....Supply and demand
  - .....Trade agreements
  - .....Venture capital
  - .....Virtual enterprises
  - .....Innovation management
  - .....Legal factors
  - .....Copyright protection
  - .....Software protection
  - .....Law
  - .....Censorship
  - .....Commercial law
  - .....Consumer protection
  - .....Contract law
  - .....Criminal law
  - .....Employment law
  - .....Forensics
  - .....Law enforcement
  - .....Patent law
  - .....Trademarks
  - .....Law enforcement
  - .....Patents
  - .....Product liability
  - .....Warranties
  - .....Software protection
  - .....Trademarks
  - .....Market research
  - .....Product development
  - .....Graphical user interfaces
  - .....Avatars
  - .....Product customization
  - .....Product life cycle management
  - .....Prognostics and health management
  - .....Time to market
  - .....Project engineering
  - .....Scheduling
  - .....Adaptive scheduling
  - .....Dynamic scheduling
  - .....Job shop scheduling
  - .....Single machine scheduling
  - .....Research and development management
  - .....Innovation management
  - .....Research initiatives
  - .....Software development management
  - .....Agile software development
  - .....Scrum (Software development)
  - .....Technology management
- Geoscience and remote sensing**
- ....Environmental factors
  - .....Biosphere
  - .....Ecosystems
  - .....Environmental economics
  - .....Carbon tax
  - .....Environmental monitoring
  - .....Global warming
  - .....Green products
  - .....Green buildings
  - .....Green cleaning
  - .....Pollution
  - .....Air pollution
  - .....Industrial pollution
  - .....Land pollution
  - .....Oil pollution
  - .....Radioactive pollution
  - .....Thermal pollution
  - .....Urban pollution
  - .....Water pollution
  - ....Geographic information systems
  - .....Geospatial analysis
  - .....Gunshot detection systems
  - ....Geophysical measurements
  - .....Geodesy
  - .....Level measurement
  - .....Sea measurements
  - .....Geoacoustic inversion
  - .....Seismic measurements
  - ....Geophysical measurement techniques
  - ....Geophysical signal processing



....Geoscience	.....Ocean salinity
.....Antarctica	.....Ocean temperature
.....South Pole	.....Sea coast
.....Arctic	.....Sea floor
.....North Pole	.....Sea level
.....Atmosphere	.....Sea surface
.....Atmospheric modeling	.....Tides
.....Atmospheric waves	.....Rivers
.....Biosphere	.....Sediments
.....Continents	.....Soil
.....Africa	.....Soil moisture
.....Asia	.....Soil properties
.....Australia	.....Soil texture
.....Europe	.....Tornadoes
.....North America	.....Tsunami
.....South America	.....Volcanoes
.....Cyclones	.....Planetary volcanoes
.....Hurricanes	.....Volcanic activity
.....Tropical cyclones	.....Volcanic ash
.....Earth	...Land surface temperature
.....Earthquakes	...Photometry
.....Earthquake engineering	...Radar
.....Forestry	.....Airborne radar
.....Geoengineering	.....Bistatic radar
.....Geography	.....Doppler radar
.....Cities and towns	.....Ground penetrating radar
.....Rural areas	.....Laser radar
.....Urban areas	.....Meteorological radar
.....Geology	.....Millimeter wave radar
.....Minerals	.....Multistatic radar
.....Rocks	.....MIMO radar
.....Geophysics	.....Passive radar
.....EMTDC	.....Radar applications
.....Extraterrestrial phenomena	.....Radar countermeasures
.....Geodynamics	.....Radar detection
.....Geophysics computing	.....Radar imaging
.....Meteorology	.....Radar measurements
.....Moisture	.....Radar polarimetry
.....Seismology	.....Radar remote sensing
.....Surface waves	.....Radar tracking
.....Well logging	.....Radar clutter
.....Ice	.....Radar cross-sections
.....Ice shelf	.....Radar equipment
.....Ice surface	.....Radar theory
.....Ice thickness	.....Spaceborne radar
.....Sea ice	.....Spread spectrum radar
.....Lakes	.....Synthetic aperture radar
.....Land surface	.....Inverse synthetic aperture radar
.....Levee	.....Polarimetric synthetic aperture radar
.....Meteorological factors	.....Ultra wideband radar
.....Oceans	





- ....Radiometry
  - .....Microwave radiometry
  - .....Radiometers
    - .....Spectroradiometers
- ....Remote sensing
  - .....Hyperspectral sensors
  - .....Hyperspectral imaging
  - .....Passive microwave remote sensing
- ....Remote monitoring
- ....Terrain mapping
  - .....Digital elevation models
- ....Terrestrial atmosphere
  - .....Clouds
  - .....Global warming
  - .....Ionosphere
  - .....Magnetosphere
  - .....Vegetation mapping

**IEEE organizational topics**

- ....IEEE activities
  - .....Awards activities
    - .....Corporate recognition awards
    - .....External awards
    - .....Honorary membership
    - .....Medals
    - .....Prize paper awards
    - .....Scholarships
    - .....Service awards
    - .....Student awards
    - .....Technical field awards
  - .....Conferences
  - .....Corporate activities
    - .....Calendars
    - .....Ethics
    - .....Finance
    - .....Legislation
    - .....Meetings
    - .....Member relations
    - .....Membership development
    - .....Motion-planning
    - .....Planning
    - .....Public relations
    - .....Strategic planning
    - .....Technology planning
  - .....Educational activities
    - .....Accreditation
    - .....Career development
    - .....Continuing education
    - .....Curriculum development
    - .....Educational programs

- .....Scholarships
- .....Intersociety activities
- .....Local activities
- .....Member and Geographic Activities
  - .....Conferences
  - .....Meetings
  - .....Nominations and elections
  - .....Organizing
  - .....Professional activities
    - .....Career development
    - .....Certification
    - .....Consortia
    - .....Continuing education
    - .....Employment
    - .....Ethics
    - .....Intellectual property
    - .....Legislation
    - .....Meetings
    - .....Professional aspects
    - .....Public policy
  - .....Publishing activities
    - .....Books
    - .....CD-ROMs
    - .....Conference proceedings
    - .....Indexes
    - .....Standards publication
      - .....Standards activities
      - .....Standards development
      - .....Standards publication
    - .....Student activities
    - .....Technical activities
      - .....Conferences
      - .....Meetings
  - .....Technical Activities Guide - TAG
  - .....United States activities
    - .....Career development
    - .....Continuing education
    - .....Employment
    - .....Ethics
    - .....Intellectual property
    - .....Legislation
    - .....PACE network
    - .....Public policy
    - .....Volunteer activities
  - .....Audit Committee
  - .....Board of Directors Awards Board Committee
    - .....Credentials Committee
    - .....Ethics Committee
    - .....Executive Committee
    - .....Fellow Committee



- .....Life Members Committee
- .....Member Conduct Committee
- .....Nominations and elections
- .....Strategic Planning Committee
- .....Tellers Committee
- .....Women in Engineering Committee
- ....IEEE entities
- .....Boards
- .....Board of Directors
- .....Educational Activities Board
- .....IEEE Press Editorial Board
- .....IEEE Spectrum Editorial Board
- .....Member and Geographic Activities Board
- .....Proceedings Editorial Board
- .....Publications Board
- .....Standards Board
- .....Technical Activities Board
- .....The Institute Editorial Board
- .....United States Activities Board
- .....Center for the History of Electrical Engineering
- .....History
- .....Chapters
- .....Student Chapters
- .....Committees
- .....Awards committees
- .....Board committees
- .....Communities
- .....New Technology Connections Portal
- .....Online Communities/Technical Collaboration
- .....Standards Working Groups
- .....Councils
- .....Accreditation Policy Council
- .....Career Policy Council
- .....Geographic Councils
- .....IEEE Biometrics Council
- .....IEEE Council on Electronic Design Automation
- .....IEEE Council on Superconductivity
- .....IEEE Nanotechnology Council
- .....IEEE Sensors Council
- .....IEEE Systems Council
- .....IEEE Technology Management Council
- .....Lifelong Learning Council
- .....Member Activities Council
- .....Metropolitan Councils
- .....Nanotechnology Council
- .....Operations Council
- .....Outreach Council
- .....Professional Activities Council
- .....Systems Council
- .....Technical Councils
- .....Technical Field Awards Council
- .....Technology Policy Council
- .....IEEE Computer Society Press
- .....IEEE Foundation
- .....IEEE Press
- .....Regions
- .....Chapters
- .....Region 1
- .....Region 10
- .....Region 2
- .....Region 3
- .....Region 4
- .....Region 5
- .....Region 6
- .....Region 7
- .....Region 8
- .....Region 9
- .....Sections
- .....Student Chapters
- .....Sections
- .....Chapters
- .....Student Chapters
- .....Societies
- .....IEEE Aerospace and Electronic Systems Society
- .....IEEE Antennas and Propagation Society
- .....IEEE Broadcast Technology Society
- .....IEEE Circuits and Systems Society
- .....IEEE Communications Society
- .....IEEE Components, Packaging, and Manufacturing Technology Society
- .....IEEE Computational Intelligence Society
- .....IEEE Computer Society
- .....IEEE Consumer Electronics Society
- .....IEEE Control Systems Society
- .....IEEE Dielectrics and Electrical Insulation Society
- .....IEEE Education Society
- .....IEEE Electromagnetic Compatibility Society
- .....IEEE Electron Devices Society
- .....IEEE Engineering in Medicine and Biology Society



.....IEEE Engineering Management Society	.....Student members
.....IEEE Geoscience and Remote Sensing Society	...IEEE news
.....IEEE Industrial Electronics Society	.....Chapter news
.....IEEE Industry Applications Society	.....Region news
.....IEEE Information Theory Society	.....Section news
.....IEEE Instrumentation and Measurement Society	.....Society news
.....IEEE Intelligent Transportation Systems Society	...IEEE products
.....IEEE Lasers and Electro-Optics Society	.....Audio tapes
.....IEEE Magnetics Society	.....Catalogs
.....IEEE Microwave Theory and Techniques Society	.....Educational Activities Product Catalog
.....IEEE Nuclear and Plasma Sciences Society	.....IEEE catalog
.....IEEE Oceanic Engineering Society	.....IEEE Electronic catalog
.....IEEE Photonics Society	.....IEEE standards catalog
.....IEEE Power Electronics Society	.....New products catalog
.....IEEE Power & Energy Society	.....Conference proceedings
.....IEEE Reliability Society	.....Educational products
.....IEEE Robotics and Automation Society	.....Reading series
.....IEEE Signal Processing Society	.....Self-study courses
.....IEEE Society on Social Implications of Technology	.....Videos
.....IEEE Solid-State Circuits Society	.....IEEE standards
.....IEEE Systems, Man, and Cybernetics Society	.....IEEE 1394 Standard
.....IEEE Technology Management Council	.....IEEE 802.11 Standards
.....IEEE Ultrasonics, Ferroelectrics, and Frequency Control Society	.....IEEE 802.15 Standards
.....IEEE Vehicular Technology Society	.....IEEE 802.16 Standards
.....Student Chapters	.....IEEE 802.3 Standards
...IEEE governance	.....IEEE Xplore
.....Bylaws	.....IEL
.....Constitution	.....Merchandise
.....IEEE Policy and Procedures	.....Reading series
.....IEEE Staff	.....Self-study courses
.....Mission and Vision	.....Videos
.....Organization Charts	...IEEE publications
...IEEE members	.....IEEE conference proceedings
.....Associate members	.....IEEE directories
.....Fellows	.....IEEE Membership Directory
.....Joining IEEE	.....IEEE Staff Directory
.....Signup web site	.....IEEE indexing
.....Life members	.....Awards
.....Senior members	.....Book reviews
	.....CD-ROM reviews
	.....Editorials
	.....Interviews
	.....Obituaries
	.....Software reviews
	.....Special issues and sections
	.....Tutorials
	.....Video reviews
	.....IEEE journals
	.....IEEE Canadian Journal of Electrical and Computer Engineering



.....IEEE Communications Letters	.....IEEE Annals of the History of Computing
.....IEEE Communications Surveys & Tutorials	.....IEEE Antennas and Propagation Magazine
.....IEEE Computer Architecture Letters	.....IEEE Circuits and Devices
.....IEEE Electrochemical and Solid-State Letters	.....IEEE Communications Magazine
.....IEEE Electron Device Letters	.....IEEE Computational Intelligence
.....IEEE Embedded Systems Letters	.....IEEE Computational Science and Engineering
.....IEEE Journal of Microelectromechanical Systems	.....IEEE Computer Applications in Power
.....IEEE Journal of Oceanic Engineering	.....IEEE Computer Graphics and Applications
.....IEEE Journal of Quantum Electronics	.....IEEE Computer Magazine
.....IEEE Journal of Robotics and Automation	.....IEEE Concurrency
.....IEEE Journal of Selected Topics in Applied Earth Observation and Remote Sensing	.....IEEE Control Systems
.....IEEE Journal of Selected Topics in Quantum Electronics	.....IEEE Design and Test of Computers
.....IEEE Journal of Selected Topics in Signal Processing	.....IEEE Electrical Insulation Magazine
.....IEEE Journal of Solid-State Circuits	.....IEEE Engineering in Medicine and Biology Magazine
.....IEEE Journal of Technology	.....IEEE Engineering Management Review
.....IEEE Journal of Technology Computer Aided Design	.....IEEE Industrial Electronics Magazine
.....IEEE Journal on Selected Areas in Communications	.....IEEE Industry Applications Magazine
.....IEEE Latin America Learning Technologies Journal [IEEE-RITA]	.....IEEE Instrumentation and Measurement Magazine
.....IEEE Learning Technology	.....IEEE Intelligent Systems and their Applications
.....IEEE Magnetics Letters	.....IEEE Intelligent Transportation Systems Magazine
.....IEEE Microwave and Guided Wave Letters	.....IEEE Internet Computing
.....IEEE/OSA Journal of Display Technology	.....IEEE Micro
.....IEEE/OSA Journal of Lightwave Technology	.....IEEE Multidisciplinary Engineering Education Magazine
.....IEEE/OSA Journal of Optical Communications and Networking	.....IEEE Multimedia
.....IEEE Photonics Journal	.....IEEE Nanotechnology Magazine
.....IEEE Photonics Technology Letters	.....IEEE Network
.....IEEE Reviews in Biomedical Engineering	.....IEEE Personal Communications
.....IEEE Signal Processing Letters	.....IEEE Potentials
.....IEEE Systems Journal	.....IEEE Power Engineering Review
.....Proceedings of the IEEE	.....IEEE Robotics and Automation Magazine
.....IEEE magazines	.....IEEE Signal Processing Magazine
.....IEEE Aerospace and Electronics Society Magazine	.....IEEE Software
	.....IEEE Solid-State Circuits Magazine
	.....IEEE Spectrum
	.....IEEE Technology and Society Magazine



.....IEEE-USA Today's Engineer  
 .....IEEE newsletters  
 .....Broadcast Technology Society  
 Newsletter  
 .....Center for the History of Electrical  
 Engineering Newsletter  
 .....Circuits and Systems Society  
 Newsletter  
 .....Components, Packaging, and  
 Manufacturing Technology Society  
 Newsletter  
 .....Consumer Electronics Society  
 Newsletter  
 .....Education Society Newsletter  
 .....Electromagnetic Compatibility  
 Society Newsletter  
 .....Electron Devices Society  
 Newsletter  
 .....Electronics and the Environment  
 Newsletter  
 .....Engineering Management Society  
 Newsletter  
 .....Geoscience and Remote Sensing  
 Society Newsletter  
 .....IEEE Circuitboard  
 .....IEEE Looking Forward  
 .....IEEE Publications Bulletin  
 .....Industrial Electronics Society  
 Newsletter  
 .....Information Theory Society  
 Newsletter  
 .....Instrumentation and Measurement  
 Society Newsletter  
 .....Lasers and Electro-Optics Society  
 Newsletter  
 .....Magnetics Society Newsletter  
 .....Microwave Theory and Techniques  
 Society Newsletter  
 .....Nuclear and Plasma Sciences  
 Society Newsletter  
 .....Oceanic Engineering Society  
 Newsletter  
 .....Power Electronics Society  
 Newsletter  
 .....Professional Communication  
 Society Newsletter  
 .....Reliability Society Newsletter  
 .....Systems, Man and Cybernetics  
 Society Newsletter  
 .....The Institute  
 .....The Staff Circuit  
 .....Ultrasonics, Ferroelectrics, and  
 Frequency Control Society Newsletter  
 .....Vehicular Technology Society  
 Newsletter  
 .....IEEE online publications  
 .....IEEE Bibliographies On-line  
 .....IEEE Circuitboard  
 .....IEEE Communications Interactive  
 .....IEEE Communications Surveys &  
 Tutorials  
 .....IEEE Distributed Systems Online  
 .....IEEE Electrochemical and Solid-  
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 Computer Aided Design  
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 .....IEEE Latin America Transactions  
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 .....IEEE Learning Technology  
 .....IEEE Looking Forward  
 .....IEEE Multidisciplinary Engineering  
 Education Magazine  
 .....IEEE Network Interactive  
 .....IEEE Personal Communications  
 Interactive  
 .....IEEE Photonics Journal  
 .....IEEE Transactions on  
 Computational Intelligence and AI in  
 Games  
 .....IEEE Transactions on Learning  
 Technologies  
 .....IEEE Transactions on Network and  
 Service Management  
 .....IEEE Transactions on Services  
 Computing  
 .....IEEE standard glossaries  
 .....IEEE transactions  
 .....IEEE/ACM Transactions on  
 Networking  
 .....IEEE Biometrics Compendium  
 .....IEEE Latin America Transactions  
 [Revista IEEE America Latina]  
 .....IEEE Transactions on Aerospace  
 and Electronic Systems  
 .....IEEE Transactions on Affective  
 Computing



.....IEEE Transactions on Antennas and Propagation  
 .....IEEE Transactions on Applied Superconductivity  
 .....IEEE Transactions on Audio, Speech, and Language Processing  
 .....IEEE Transactions on Automatic Control  
 .....IEEE Transactions on Automation Science and Engineering  
 .....IEEE Transactions on Autonomous Mental Development  
 .....IEEE Transactions on Biomedical Circuits and Systems  
 .....IEEE Transactions on Biomedical Engineering  
 .....IEEE Transactions on Broadcasting  
 .....IEEE Transactions on Circuits and Systems for Video Technology  
 .....IEEE Transactions on Circuits and Systems I: Fundamental Theory and Applications  
 .....IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing  
 .....IEEE Transactions on Communications  
 .....IEEE Transactions on Components, Packaging, and Manufacturing Technology Part A  
 .....IEEE Transactions on Components, Packaging, and Manufacturing Technology Part B  
 .....IEEE Transactions on Components, Packaging, and Manufacturing Technology Part C  
 .....IEEE Transactions on Computational Intelligence and AI in Games  
 .....IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems  
 .....IEEE Transactions on Computers  
 .....IEEE Transactions on Consumer Electronics  
 .....IEEE Transactions on Control Systems Technology  
 .....IEEE Transactions on Dielectrics and Electrical Insulation  
 .....IEEE Transactions on Education  
 .....IEEE Transactions on Electromagnetic Compatibility  
 .....IEEE Transactions on Electron Devices  
 .....IEEE Transactions on Energy Conversion  
 .....IEEE Transactions on Engineering Management  
 .....IEEE Transactions on Evolutionary Computation  
 .....IEEE Transactions on Fuzzy Systems  
 .....IEEE Transactions on Geoscience and Remote Sensing  
 .....IEEE Transactions on Haptics  
 .....IEEE Transactions on Image Processing  
 .....IEEE Transactions on Industrial Electronics  
 .....IEEE Transactions on Industry Applications  
 .....IEEE Transactions on Information Forensics and Security  
 .....IEEE Transactions on Information Technology in Biomedicine  
 .....IEEE Transactions on Information Theory  
 .....IEEE Transactions on Instrumentation and Measurement  
 .....IEEE Transactions on Knowledge and Data Engineering  
 .....IEEE Transactions on Learning Technologies  
 .....IEEE Transactions on Magnetics  
 .....IEEE Transactions on Mechatronics  
 .....IEEE Transactions on Medical Imaging  
 .....IEEE Transactions on Microwave Theory and Techniques  
 .....IEEE Transactions on Nanotechnology  
 .....IEEE Transactions on Network and Service Management  
 .....IEEE Transactions on Neural Networks  
 .....IEEE Transactions on Nuclear Science  
 .....IEEE Transactions on Pattern Analysis and Machine Intelligence  
 .....IEEE Transactions on Plasma Science



.....IEEE Transactions on Power Delivery	.....Electronic mail
.....IEEE Transactions on Power Electronics	.....Financial advantage program
.....IEEE Transactions on Power Systems	.....IEEE Bibliographies On-line
.....IEEE Transactions on Professional Communication	.....IEEE Electronic catalog
.....IEEE Transactions on Rehabilitation Engineering	.....Job listing service
.....IEEE Transactions on Reliability	.....Membership renewal
.....IEEE Transactions on Robotics	.....Travel services
.....IEEE Transactions on Robotics and Automation	.....Web and internet services
.....IEEE Transactions on Semiconductor Manufacturing	.....Subscriptions
.....IEEE Transactions on Services Computing	.....Web and internet services
.....IEEE Transactions on Signal Processing	.....Electronic mail
.....IEEE Transactions on Smart Grid	.....IEEE Electronic catalog
.....IEEE Transactions on Software Engineering	.....IEEE Journals and Transactions On-LINE - OpeRA
.....IEEE Transactions on Speech and Audio Processing	.....Online banking
.....IEEE Transactions on Sustainable Energy	.....IEEE web sites
.....IEEE Transactions on Systems, Man, and Cybernetics Part A: Systems and Humans	.....Society home pages
.....IEEE Transactions on Systems, Man, and Cybernetics Part B: Cybernetics	.....Web page design
.....IEEE Transactions on Systems, Man, and Cybernetics Part C: Applications and Reviews	
.....IEEE Transactions on Ultrasonics, Ferroelectrics and Frequency Control	<b>Imaging</b>
.....IEEE Transactions on Vehicular Technology	....Biomedical imaging
.....IEEE Transactions on Very Large Scale Integration - VLSI	.....Angiocardiology
.....IEEE Transactions on Visualization and Computer Graphics	.....Angiography
.....IEEE Women in Engineering	.....Biomedical optical imaging
.....Notice of Violation	.....Cardiology
.....IEEE services	.....Echocardiography
.....Ask IEEE	.....Electrocardiography
.....Conference management	.....Phonocardiography
.....Meeting services	.....DICOM
.....Member services	.....Encephalography
.....Career development	.....Mammography
	.....Medical diagnostic imaging
	.....Anatomical structure
	.....Molecular imaging
	.....Phantoms
	....Cameras
	.....Digital cameras
	.....Webcams
	....Focusing
	....Ground penetrating radar
	....Holography
	....Image converters
	.....Image intensifiers
	....Image sensors
	.....Active pixel sensors
	.....CCD image sensors
	.....Charge-coupled image sensors
	.....CMOS image sensors
	.....Infrared image sensors
	....Image storage



- ....Infrared imaging
  - .....Night vision
- ....Magnetic resonance imaging
  - .....Diffusion tensor imaging
- ....Magneto electrical resistivity imaging technique
- ....Microscopy
  - .....Atomic force microscopy
  - .....Electron microscopy
    - .....Photoelectron microscopy
    - .....Scanning electron microscopy
    - .....Transmission electron microscopy
  - .....Scanning probe microscopy
- ....Microwave imaging
- ....Motion pictures
- ....Multispectral imaging
- ....Nuclear imaging
  - .....Energy resolution
- ....Optical imaging
  - .....Talbot effect
  - .....Thermoreflectance imaging
- ....Photography
  - .....Cinematography
  - .....Digital photography
  - .....Image forensics
  - .....Photomicrography
- ....Radiation imaging
- ....Radiography
  - .....Diagnostic radiography
- ....Stereo vision
  - .....Stereo image processing
- ....Tomography
  - .....Computed tomography
  - .....Electrical capacitance tomography
  - .....Positron emission tomography
    - .....Whole-body PET
  - .....Reconstruction algorithms
  - .....Single photon emission computed tomography
  
- Industrial electronics**
  - ....Assembly systems
    - .....Flexible electronics
    - .....Robotic assembly
  - ....Computer aided manufacturing
    - .....CADCAM
    - .....Silicon compiler
  - ....Cryogenic electronics
  - ....Industrial control
    - .....Process control
  
- .....Predictive control
  - .....Three-term control
  - .....Two-term control
- .....Production control
  - .....Continuous production
  - .....Lot sizing
  - .....Optimized production technology
  - .....Scheduling
- ....Integrated manufacturing systems
- ....Machine control
  - .....Machine vector control
- ....Manufacturing automation
  - .....Computer aided manufacturing
  - .....CADCAM
  - .....Silicon compiler
  - .....Computer integrated manufacturing
  - .....Computer numerical control
  - .....Flexible manufacturing systems
- ....Testing
  - .....Aerospace testing
  - .....Automatic testing
    - .....Automatic test pattern generation
  - .....Ring generators
  - .....Benchmark testing
  - .....Built-in self-test
  - .....Circuit testing
    - .....Integrated circuit measurements
  - .....Electronic equipment testing
  - .....Immunity testing
  - .....Error analysis
    - .....Bit error rate
  - .....Finite wordlength effects
  - .....Error-free operations
  - .....Failure analysis
    - .....Equipment failure
    - .....Semiconductor device breakdown
  - .....Frequency response
  - .....Impulse testing
  - .....Insulator testing
    - .....Insulation testing
  - .....Integrated circuit testing
    - .....Integrated circuit yield
  - .....Logic testing
  - .....Life testing
  - .....Materials testing
    - .....Accelerated aging
    - .....Acoustic testing
    - .....Adhesive strength
    - .....Bonding forces
    - .....Delamination
    - .....Elastic recovery





- .....Nondestructive testing
- .....Optical fiber testing
- .....Remaining life assessment
- .....Ring generators
- .....Semiconductor device testing
- .....Software testing
- .....System testing
- .....Model checking
- .....Test equipment
- .....Automatic test equipment
- .....Test facilities
- .....Anechoic chambers
- .....Laboratories
- .....Large Hadron Collider
- .....Open area test sites
- .....TEM cells

### Industry applications

- ....Accident prevention
- .....Accidents
  - .....Aerospace accidents
  - .....Electrical accidents
  - .....Industrial accidents
  - .....Marine accidents
  - .....Railway accidents
  - .....Road accidents
- ....Chemical technology
- .....Chemical reactors
  - .....Bioreactors
  - .....Continuous-stirred tank reactor
  - .....Ignition
- .....Chemical sensors
- .....Crystallizers
- .....Distillation equipment
- .....Fluidization
- .....Pharmaceutical technology
- .....Vitrification
- ....Cryogenics
- ....Electrochemical devices
  - .....Amperometric sensors
  - .....Batteries
    - .....Lithium batteries
  - .....Battery management systems
  - .....Fuel cells
  - .....Supercapacitors
- ....Electrochemical processes
- ....Electromechanical systems
  - .....Electromechanical devices
    - .....Armature
    - .....SAW filters

- ....Electrostatic devices
  - .....Electrostatic precipitators
  - .....Electrostatic processes
    - .....Aerosols
    - .....Electrophotography
    - .....Electrostatic analysis
    - .....Electrostatic induction
    - .....Electrostatics
      - .....Electrostatic levitation
    - .....Particle charging
    - .....Particle production
    - .....Space charge
    - .....Surface charging
      - .....Triboelectricity
    - .....Triboelectricity
  - ....Engines
    - .....Heat engines
      - .....Steam engines
      - .....Stirling engines
    - .....Internal combustion engines
      - .....Diesel engines
      - .....Ignition
      - .....Jet engines
  - ....Environmental management
    - .....Biodegradation
      - .....Biodegradable materials
    - .....Land use planning
    - .....Pest control
    - .....Pollution control
    - .....Recycling
    - .....Renewable energy sources
      - .....Biomass
      - .....Sustainable development
    - .....Waste management
      - .....Waste disposal
      - .....Waste handling
      - .....Waste recovery
      - .....Waste reduction
    - .....Water conservation
      - .....Desalination
      - .....Water resources
        - .....Desalination
        - .....Reservoirs
  - ....Food technology
    - .....Food preservation
      - .....High-temperature techniques
      - .....Rapid thermal processing
  - ....Industrial engineering
    - .....Industrial communication
  - ....Industries
    - .....Agriculture



.....Agricultural products	.....Electricity supply industry
.....Aquaculture	.....Nuclear facility regulation
.....Fertilizers	.....Power system interconnection
.....Greenhouses	.....Sugar industry
.....Irrigation	.....Sugar refining
.....Architecture	.....Textile technology
.....Banking	.....Spinning
.....Beverage industry	.....Weaving
.....Chemical industry	.....Toy industry
.....Coal industry	.....Wood industry
.....Communication industry	...Inspection
.....Computer industry	.....Automatic optical inspection
.....Construction	...Machinery
.....Buildings	.....Agricultural machinery
.....Green buildings	.....Ball bearings
.....Modular construction	.....Belts
.....Prefabricated construction	.....Drives
.....Construction industry	.....Hydraulic drives
.....Prefabricated construction	.....Motor drives
.....Defense industry	.....Variable speed drives
.....Entertainment industry	.....Electric machines
.....Gas industry	.....AC machines
.....Manufacturing industries	.....Alternators
.....Aerospace industry	.....Brushless machines
.....Cement industry	.....Compressors
.....Ceramics industry	.....Conductors
.....Clothing industry	.....DC machines
.....Electrical products industry	.....Electric fences
.....Electronics industry	.....Generators
.....Food industry	.....Permanent magnet machines
.....Footwear industry	.....Rotating machines
.....Fuel processing industries	.....Rotors
.....Glass industry	.....Stators
.....Machinery production industries	.....Washing machines
.....Metal product industries	.....Fans
.....Plastics industry	.....Furnaces
.....Pulp and paper industry	.....Blast furnaces
.....Rubber industry	.....Kilns
.....Shipbuilding industry	.....Gears
.....Textile industry	.....Hydraulic systems
.....Toy manufacturing industry	.....Electrohydraulics
.....Metals industry	.....Hydraulic equipment
.....Mining industry	.....Hydraulic fluids
.....Coal mining	.....Machine components
.....Natural gas industry	.....Air cleaners
.....Petroleum industry	.....Belts
.....Oil drilling	.....Cams
.....Oil refineries	.....Engine cylinders
.....Well logging	.....Exhaust systems
.....Power industry	.....Impellers
.....Electrical equipment industry	.....Intake systems



.....Manifolds	.....Chemical products
.....Mechanical splines	.....Consumer products
.....Pistons	.....Electrical products
.....Rotors	.....Food products
.....Shafts	.....Fuels
.....Valves	.....Glass products
.....Motors	.....Mechanical products
.....AC motors	.....Metal products
.....Brushless motors	.....Paper products
.....Commutation	.....Paper pulp
.....DC motors	.....Plastic products
.....Electric motors	.....Rubber products
.....Hysteresis motors	.....Sports equipment
.....Induction motors	.....Textile products
.....Micromotors	.....Windows
.....Permanent magnet motors	.....Manufacturing systems
.....Servomotors	.....Agile manufacturing
.....Traction motors	.....Automobile manufacture
.....Universal motors	.....Batch production systems
.....Printing machinery	.....Blanking
.....Pumps	.....Cellular manufacturing
.....Fuel pumps	.....Flow production systems
.....Heat pumps	.....Food manufacturing
.....Micropumps	.....Forging
.....Textile machinery	.....Glass manufacturing
.....Spinning machines	.....Integrated manufacturing systems
.....Manufacturing	.....Intelligent manufacturing systems
.....Assembly	.....Job production systems
.....Fitting	.....Joining processes
.....Microassembly	.....Layered manufacturing
.....Preforms	.....Lean production
.....Soldering	.....Manufacturing processes
.....Assembly systems	.....Mass production
.....Flexible electronics	.....Melt processing
.....Robotic assembly	.....Pulp manufacturing
.....Embossing	.....Sheet metal processing
.....Fabrication	.....Thermoforming
.....Bonding processes	.....Mass customization
.....Microfabrication	.....Tolerance analysis
.....Optical device fabrication	.....Packaging
.....Soldering	.....Bagging
.....Welding	.....Bottling
.....Lithography	.....Canning
.....Colloidal lithography	.....Encapsulation
.....Interferometric lithography	.....Labeling
.....Nanolithography	.....Multichip modules
.....Soft lithography	.....Plastic packaging
.....Stereolithography	.....Wrapping
.....X-ray lithography	.....Paper technology
.....Manufactured products	.....Production
.....Ceramic products	.....Ball milling



.....Compression molding	.....Process planning
.....Embossing	.....Cause effect analysis
.....Food products	.....Production control
.....Dairy products	.....Continuous production
.....Fats	.....Lot sizing
.....Sugar	.....Optimized production technology
.....Group technology	.....Scheduling
.....Injection molding	.....Production engineering
.....Materials processing	.....Production planning
.....Annealing	.....Production equipment
.....Bleaching	.....Applicators
.....Casting	.....Clamps
.....Coatings	.....Cutting tools
.....Curing	.....Fixtures
.....Etching	.....Machine tools
.....Heat treatment	.....Mining equipment
.....Joining processes	.....Molding equipment
.....Lamination	.....Packaging machines
.....Machining	.....Paper making machines
.....Melt processing	.....Polishing machines
.....Plasma materials processing	.....Soldering equipment
.....Pressing	.....Production facilities
.....Punching	.....Foundries
.....Refining	.....Greenhouses
.....Shearing	.....Industrial plants
.....Smelting	.....Machine shops
.....Softening	.....Paper mills
.....Swaging	.....Production management
.....Mechanical products	.....Control charts
.....Automotive components	.....Inventory management
.....Axles	.....Lead time reduction
.....Bellows	.....Logistics
.....Blades	.....Process planning
.....Couplings	.....Production planning
.....Fasteners	.....Production materials
.....Flanges	.....Abrasives
.....Gears	.....Aerospace materials
.....Hoses	.....Automotive materials
.....Machine components	.....Inhibitors
.....Mechanical guides	.....Ink
.....Needles	.....Joining materials
.....Orifices	.....Lubricants
.....Pistons	.....Retardants
.....Seals	.....Production systems
.....Springs	.....Assembly systems
.....Steering systems	.....Exhaust systems
.....Structural shapes	.....Intelligent manufacturing systems
.....Suspensions	.....Lean production
.....Tires	.....Manufacturing systems
.....Vents	.....Steering systems
.....Wheels	.....Productivity



.....Shafts	.....Public key
.....Camshafts	.....Random number generation
.....Springs	.....Data security
.....Suspensions	.....Cryptography
.....Shock absorbers	.....Message authentication
.....Transfer molding	.....Digital signatures
....Safety	.....Information security
.....Aerospace safety	.....Intrusion detection
.....Air safety	.....Power system security
.....Domestic safety	.....Reconnaissance
.....Emergency services	.....Terrorism
.....Explosion protection	.....Bioterrorism
.....Hazards	.....National security
.....Biohazards	.....Watermarking
.....Chemical hazards	...Wine industry
.....Explosions	.....Wineries
.....Fires	
.....Flammability	
.....Floods	
.....Hazardous areas	
.....Hazardous materials	
.....Toxicology	
.....Health and safety	
.....Occupational health	
.....Occupational safety	
.....Marine safety	
.....Product safety	
.....Protection	
.....Explosion protection	
.....Lightning protection	
.....Radiation safety	
.....Safety devices	
.....Eye protection	
.....Protective clothing	
.....Vehicle safety	
....Security	
.....Access control	
.....Authorization	
.....Alarm systems	
.....Smoke detectors	
.....Computer security	
.....Authentication	
.....Computer crime	
.....Computer hacking	
.....Firewalls (computing)	
.....Identity management systems	
.....Invasive software	
.....Permission	
.....Cryptography	
.....Ciphers	
.....Encryption	
	<b>Information theory</b>
	...Audio coding
	...Biological information theory
	...Channel coding
	.....Block codes
	.....Linear codes
	.....Combined source-channel coding
	.....Turbo codes
	...Codes
	.....Binary codes
	.....Reflective binary codes
	.....Convolutional codes
	.....Cyclic redundancy check codes
	.....Error correction codes
	.....Reed-Solomon codes
	.....Parity check codes
	.....Iterative decoding
	.....Product codes
	.....Bar codes
	.....Space-time codes
	...Communication channels
	.....Channel allocation
	.....Channel capacity
	.....Channel estimation
	.....Channel models
	.....Channel spacing
	.....Channel state information
	.....Gaussian channels
	.....AWGN channels
	.....Multipath channels
	.....Multiuser channels
	.....Partial response channels
	.....Throughput



- .....Time-varying channels
  - ....Decoding
    - .....Maximum likelihood decoding
  - ....Encoding
    - .....Audio coding
    - .....Channel coding
      - .....Block codes
      - .....Combined source-channel coding
      - .....Turbo codes
    - .....Entropy coding
      - .....Huffman coding
    - .....Source coding
    - .....Speech coding
    - .....Transcoding
  - ....Error compensation
  - ....Genetic communication
  - ....Hamming distance
  - ....Hamming weight
  - ....Information entropy
  - ....Mutual information
  - ....Network coding
  - ....Rate-distortion
  - ....Rate distortion theory
    - .....Channel rate control
  - ....Source coding
  - ....Speech coding
- Instrumentation and measurement**
- ....Computerized instrumentation
  - ....Electric variables
    - .....Admittance
    - .....Capacitance
      - .....Parasitic capacitance
      - .....Quantum capacitance
    - .....Capacitance-voltage characteristics
    - .....Conductivity
      - .....Photoconductivity
      - .....Semiconductivity
      - .....Transconductance
    - .....Current
      - .....Bioimpedance
      - .....Current slump
      - .....Dark current
      - .....Fault currents
      - .....Leakage currents
      - .....Persistent currents
      - .....Short-circuit currents
      - .....Threshold current
    - .....Current-voltage characteristics
    - .....Electric potential
  - .....Gain
  - .....Impedance
    - .....Impedance matching
  - .....Inductance
  - .....Permittivity
  - .....Piezoresistance
  - .....Q-factor
  - .....Resistance
    - .....Electric resistance
    - .....Piezoresistance
    - .....Surface resistance
    - .....Thermal resistance
    - .....Viscosity
  - .....Voltage
    - .....Breakdown voltage
    - .....Dynamic voltage scaling
    - .....Threshold voltage
    - .....Voltage fluctuations
  - .....Wiring
  - ....High energy physics instrumentation
  - ....computing
    - .....Linear particle accelerator
  - ....Instruments
    - .....Compass
    - .....Goniometers
    - .....Microscopy
      - .....Atomic force microscopy
      - .....Electron microscopy
      - .....Scanning probe microscopy
    - .....Oscilloscopes
    - .....Potentiometers
    - .....Pressure gauges
    - .....Probes
    - .....Radiometers
      - .....Spectroradiometers
    - .....Telescopes
    - .....Theodolites
    - .....Tuners
    - .....Vibrometers
    - .....Voltmeters
    - .....Watthour meters
    - .....Wattmeters
  - ....Measurement
    - .....Accelerometers
    - .....Acoustic measurements
    - .....Antenna measurements
    - .....Anthropometry
    - .....Area measurement
    - .....Atmospheric measurements
    - .....Atomic measurements
    - .....Biomedical measurement



.....Biomarkers	.....Frequency-domain analysis
.....Biomedical monitoring	.....Frequency estimation
.....Electroencephalography	.....Gain measurement
.....Electromyography	.....Gas chromatography
.....Electrooculography	.....Geologic measurements
.....Electrophysiology	.....Geophysical image processing
.....Photoplethysmography	.....Geophysical measurements
.....Reproducibility of results	.....Geodesy
.....Sensitivity and specificity	.....Sea measurements
.....Calorimetry	.....Seismic measurements
.....Coordinate measuring machines	.....Interferometry
.....Density measurement	.....Fabry-Perot
.....Hydrometers	.....Interferometers
.....Distance measurement	.....Optical interferometry
.....Euclidean distance	.....Phase shifting interferometry
.....Distortion measurement	.....Radar interferometry
.....Total harmonic distortion	.....Radio interferometry
.....Doppler measurement	.....Sagnac interferometers
.....Dosimetry	.....Length measurement
.....Dynamic range	.....Lifetime estimation
.....Electric variables measurement	.....Loss measurement
.....Admittance measurement	.....Packet loss
.....Ammeters	.....Magnetic variables measurement
.....Attenuation measurement	.....Magnetic field measurement
.....Capacitance measurement	.....Magnetometers
.....Conductivity measurement	.....Permeability measurement
.....Current measurement	.....Measurement by laser beam
.....Dielectric measurement	.....Laser velocimetry
.....Electrical resistance measurement	.....Measurement techniques
.....Electrostatic measurements	.....Calibration
.....Energy measurement	.....Dynamic equilibrium
.....Impedance measurement	.....Measurement uncertainty
.....Inductance measurement	.....Measurement units
.....Partial discharge measurement	.....Nanometers
.....Phasor measurement units	.....Mechanical variables measurement
.....Power measurement	.....Angular velocity
.....Q measurement	.....Displacement measurement
.....Transmission line measurements	.....Force measurement
.....Voltage measurement	.....Motion measurement
.....Electromagnetic measurements	.....Position measurement
.....Electromagnetic modeling	.....Rotation measurement
.....Linearity	.....Strain measurement
.....Microwave measurement	.....Stress measurement
.....Millimeter wave measurements	.....Thickness measurement
.....Parameter extraction	.....Torque measurement
.....Polarimetry	.....Velocity measurement
.....Radiometry	.....Vibration measurement
.....Submillimeter wave measurements	.....Volume measurement
.....Extraterrestrial measurements	.....Weight measurement
.....Fluid flow measurement	.....Moisture measurement
.....Frequency measurement	.....Humidity measurement



.....Noise measurement  
 .....Multiple signal classification  
 .....Noise figure  
 .....Noise shaping  
 .....Nuclear measurements  
 .....Particle tracking  
 .....Optical variables measurement  
 .....Ellipsometry  
 .....Photometry  
 .....Reflection coefficient  
 .....Refractive index  
 .....Particle beam measurements  
 .....Particle measurements  
 .....Performance evaluation  
 .....Phase measurement  
 .....pH measurement  
 .....Plasma measurements  
 .....Plethysmography  
 .....Pollution measurement  
 .....Pressure measurement  
 .....Altimetry  
 .....Tire pressure  
 .....Pulse measurements  
 .....Reflectometry  
 .....Reproducibility of results  
 .....Scintillation counters  
 .....Solid scintillation detectors  
 .....Sea state  
 .....Semiconductor device measurement  
 .....Sensitivity  
 .....Sensitivity analysis  
 .....Shape measurement  
 .....Size measurement  
 .....Software measurement  
 .....Software metrics  
 .....Soil measurements  
 .....Spectroscopy  
 .....Electrochemical impedance spectroscopy  
 .....Kirchhoff's Law  
 .....Mass spectroscopy  
 .....MERIS  
 .....Neutron spin echo  
 .....Photoacoustic effects  
 .....Resonance light scattering  
 .....Thermal variables measurement  
 .....Temperature measurement  
 .....Time measurement  
 .....Clocks  
 .....Time dissemination  
 .....Timing  
 .....UHF measurements  
 .....Ultrasonic variables measurement  
 .....Viscosity  
 .....Wavelength measurement  
 .....Wide area measurements  
 .....Monitoring  
 .....Computerized monitoring  
 .....Environmental monitoring  
 .....Patient monitoring  
 .....Radiation monitoring  
 .....Radiation dosage  
 .....Remote monitoring  
 .....Surveillance  
 .....Infrared surveillance  
 .....Video surveillance  
 .....Testing  
 .....Aerospace testing  
 .....Automatic testing  
 .....Automatic test pattern generation  
 .....Ring generators  
 .....Benchmark testing  
 .....Built-in self-test  
 .....Circuit testing  
 .....Integrated circuit measurements  
 .....Electronic equipment testing  
 .....Immunity testing  
 .....Error analysis  
 .....Bit error rate  
 .....Finite wordlength effects  
 .....Error-free operations  
 .....Failure analysis  
 .....Equipment failure  
 .....Semiconductor device breakdown  
 .....Frequency response  
 .....Impulse testing  
 .....Insulator testing  
 .....Insulation testing  
 .....Integrated circuit testing  
 .....Integrated circuit yield  
 .....Logic testing  
 .....Life testing  
 .....Materials testing  
 .....Accelerated aging  
 .....Acoustic testing  
 .....Adhesive strength  
 .....Bonding forces  
 .....Delamination  
 .....Elastic recovery  
 .....Nondestructive testing  
 .....Optical fiber testing  
 .....Remaining life assessment





- .....Ring generators
- .....Semiconductor device testing
- .....Software testing
- .....System testing
- .....Model checking
- .....Test equipment
  - .....Automatic test equipment
- .....Test facilities
  - .....Anechoic chambers
  - .....Laboratories
  - .....Large Hadron Collider
  - .....Open area test sites
  - .....TEM cells

### **Intelligent transportation systems**

- ....Automated highways
- ....Geographic information systems
  - .....Geospatial analysis
  - .....Gunshot detection systems
- ....Intelligent vehicles
  - .....Vehicle routing
- ....Navigation
  - .....Aircraft navigation
  - .....Course correction
  - .....Dead reckoning
  - .....Inertial navigation
  - .....Marine navigation
  - .....Radio navigation
  - .....Satellite navigation systems
    - .....Global Positioning System
    - .....Satellite constellations
  - .....Sonar navigation
- ....Transportation
  - .....Air transportation
    - .....Aircraft
    - .....Airports
  - .....Land transportation
    - .....Rail transportation
    - .....Road transportation
  - .....Vehicles
    - .....Land vehicles
    - .....Remotely operated vehicles
    - .....Space vehicles

### **Lasers and electrooptics**

- ....Electrooptic devices
  - .....Electrochromic devices
  - .....Electrooptic deflectors
  - .....Electrooptic modulators

- ....Electrooptic effects
  - .....Electrochromism
  - .....Kerr effect
  - .....Optical bistability
  - .....Stark effect
- ....Lasers
  - .....Atom lasers
  - .....Chemical lasers
  - .....Diode lasers
  - .....Free electron lasers
  - .....Gas lasers
  - .....Laser applications
    - .....Dark states
    - .....Distributed feedback devices
    - .....Laser ablation
    - .....Laser beam cutting
    - .....Laser fusion
    - .....Laser theory
    - .....Magneto optic recording
    - .....Laser excitation
      - .....Optical pumping
    - .....Laser modes
      - .....Laser mode locking
      - .....Laser stability
      - .....Laser transitions
    - .....Power lasers
      - .....Pump lasers
      - .....Quantum well lasers
        - .....Quantum cascade lasers
      - .....Ring lasers
        - .....Fiber lasers
      - .....Semiconductor lasers
        - .....Laser tuning
          - .....Quantum dot lasers
          - .....Quantum well lasers
        - .....Semiconductor laser arrays
        - .....Semiconductor optical amplifiers
        - .....Surface emitting lasers
      - .....Solid lasers
        - .....Microchip lasers
          - .....Quantum well lasers
          - .....Semiconductor lasers
            - .....Surface emitting lasers
          - .....Surface emitting lasers
            - .....Vertical cavity surface emitting lasers
      - .....X-ray lasers
  - ....Optics
    - .....Adaptive optics
    - .....Birefringence
    - .....Brightness



.....Brightness temperature	.....Holographic optical components
.....Color	.....Lenses
.....Pigmentation	.....Light deflectors
.....Electron optics	.....Lighting
.....Extinction coefficients	.....Luminescent devices
.....Extinction ratio	.....Mirrors
.....Fiber optics	.....Optical arrays
.....Fiber nonlinear optics	.....Optical attenuators
.....Optical fibers	.....Optical collimators
.....Fluorescence	.....Optical device fabrication
.....Four-wave mixing	.....Optical filters
.....Geometrical optics	.....Optical resonators
.....Ray tracing	.....Optical sensors
.....Integrated optics	.....Thermooptical devices
.....Light sources	.....Optical distortion
.....Electroluminescent devices	.....Optical fiber applications
.....Fast light	.....Optical fiber devices
.....Luminescent devices	.....Optical harmonic generation
.....Phosphors	.....Optical losses
.....Slow light	.....Optical microscopy
.....Stray light	.....Optical mixing
.....Superluminescent diodes	.....Multiwave mixing
.....Ultraviolet sources	.....Optical polarization
.....Luminescence	.....Polarization shift keying
.....Bioluminescence	.....Stokes parameters
.....Electroluminescence	.....Optical pulses
.....Fluorescence	.....Optical retarders
.....Phosphorescence	.....Optical saturation
.....Photoluminescence	.....Optical solitons
.....Thermoluminescence	.....Optical tuning
.....Microoptics	.....Particle beam optics
.....Micromirrors	.....Atom optics
.....Nonlinear optics	.....Electron optics
.....Fiber nonlinear optics	.....Stimulated emission
.....Nonlinear optical devices	.....Photoluminescence
.....Optical mixing	.....Physical optics
.....Optical saturation	.....Optical refraction
.....Photorefractive effect	.....Optical vortices
.....Raman scattering	.....Ray tracing
.....Supercontinuum generation	.....Stray light
.....Optical amplifiers	.....Ultrafast optics
.....Doped fiber amplifiers	.....Whispering gallery modes
.....Erbium-doped fiber amplifiers	.....Optoelectronic devices
.....Semiconductor optical amplifiers	.....Charge-coupled image sensors
.....Optical crosstalk	.....Integrated optoelectronics
.....Optical design	.....Light emitting diodes
.....Optical design techniques	.....Inorganic light emitting diodes
.....Optical devices	.....LED lamps
.....Bragg gratings	.....Organic light emitting diodes
.....Collimators	.....Superluminescent diodes
.....Displays	.....Photoconducting devices



- .....Electrophotography
- .....Photodetectors
- .....Photodiodes
- .....Phototransistors
- .....Superconducting photodetectors
- .....Superluminescent diodes
- ....Photonics
- .....Biophotonics
- .....Microwave photonics
- .....Nanophotonics
- .....Photochromism
- .....Photothermal effects
- .....Silicon photonics
- .....Spontaneous emission
- .....Radiative recombination

### **Magnetics**

- ....Biomagnetics
- .....Magnetoencephalography
- ....Demagnetization
- ....Gyromagnetism
- ....Magnetic analysis
- .....Magnetization
- ....Magnetic anisotropy
- .....Magnetic domains
- .....Magnetic domain walls
- .....Magnetic moments
- .....Perpendicular magnetic anisotropy
- ....Magnetic devices
- .....Accelerator magnets
- .....Ferrite devices
- .....Circulators
- .....Magnetic cores
- .....Transformer cores
- .....Magnetic heads
- .....Magnetic memory
- .....Floppy disks
- .....Hard disks
- .....Magnetic modulators
- .....Magneto optic devices
- .....Magnetoresistive devices
- .....Magnetostriuctive devices
- .....Solenoids
- .....Transformer cores
- .....Undulators
- ....Magnetic fields
- .....Geomagnetism
- .....Magnetic reconnection
- .....Magnetic separation
- .....Magnetostatics

- .....Toroidal magnetic fields
- ....Magnetic flux
- .....Flux pinning
- .....Magnetic flux density
- .....Magnetic flux leakage
- ....Magnetic force microscopy
- ....Magnetic forces
- .....Coercive force
- ....Magnetic hysteresis
- ....Magnetic levitation
- ....Magnetic losses
- ....Magnetic materials
- .....Amorphous magnetic materials
- .....Antiferromagnetic materials
- .....Diamagnetic materials
- .....Ferrimagnetic films
- .....Ferrite films
- .....Garnet films
- .....Ferrimagnetic materials
- .....Ferrimagnetic films
- .....Ferrite films
- .....Ferrites
- .....Garnet films
- .....Garnets
- .....Ferrite films
- .....Ferrites
- .....Ferrite films
- .....Garnet films
- .....Garnets
- .....Garnet films
- .....Magnetic films
- .....Ferrimagnetic films
- .....Ferrite films
- .....Garnet films
- .....Magnetic liquids
- .....Magnetic semiconductors
- .....Magnetic superlattices
- .....Paramagnetic materials
- .....Soft magnetic materials
- ....Magnetic multilayers
- ....Magnetic particles
- ....Magnetic properties
- ....Magnetic sensors
- .....Spin valves
- ....Magnetic susceptibility
- ....Magnetic switching
- ....Magnetization processes
- .....Magnetization reversal
- .....Saturation magnetization
- ....Magnetoacoustic effects
- ....Magnetolectric effects



- .....Hall effect
  - .....Magnetic tunneling
  - .....Magnetoelectronics
    - .....Spin polarized transport
  - .....Magnetoresistance
    - .....Anisotropic magnetoresistance
    - .....Ballistic magnetoresistance
    - .....Colossal magnetoresistance
    - .....Enhanced magnetoresistance
    - .....Extraordinary magnetoresistance
    - .....Giant magnetoresistance
    - .....Ordinary magnetoresistance
    - .....Tunneling magnetoresistance
  - ....Magnetomechanical effects
    - .....Magnetic field induced strain
    - .....Magnetoelasticity
      - .....Magnetostriction
  - ....Magneto-optic effects
    - .....Faraday effect
    - .....Gyrotropism
  - ....Magnets
    - .....Electromagnets
      - .....Superconducting magnets
    - .....Micromagnetics
    - .....Permanent magnets
    - .....Microwave magnetics
    - .....Nonlinear magnetics
    - .....Remanence
- Materials, elements, and compounds**
- ....Chemical elements
    - .....Boron
      - .....Boron alloys
    - .....Carbon
    - .....Cerium
    - .....Darmstadtium
    - .....Helium
    - .....Hydrogen
      - .....Deuterium
    - .....Isotopes
    - .....Lutetium
    - .....Nitrogen
      - .....Silicon nitride
    - .....Oxygen
    - .....Roentgenium
    - .....Tellurium
    - .....Titanium
      - .....Titanium alloys
      - .....Titanium compounds
  - .....Ytterbium
  - .....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
        - .....Lead compounds
      - .....Organic compounds
        - .....Carbon compounds
          - .....Organic semiconductors
          - .....Volatile organic compounds
      - .....Silicon compounds
        - .....Silicides
          - .....Silicon carbide
          - .....Silicon nitride
    - ....Materials
      - .....Acoustic materials
      - .....Additives
        - .....Aggregates
      - .....Amorphous materials
        - .....Diamond-like carbon
        - .....Glass
          - .....Auxetic materials
      - .....Biological materials
      - .....Biomedical materials
        - .....Bioceramics
        - .....Biomembranes
      - .....Building materials
        - .....Asphalt
        - .....Concrete
          - .....Floors
          - .....Mortar
          - .....Tiles
          - .....Windows
        - .....Ceramics
          - .....Porcelain
        - .....Composite materials
        - .....Conducting materials
        - .....Corrosion inhibitors
        - .....Crystalline materials
          - .....Nanocrystals
          - .....Superlattices
        - .....Crystals



.....Colloidal crystals	.....Magnetic superlattices
.....Crystallography	.....Paramagnetic materials
.....Crystal microstructure	.....Soft magnetic materials
.....Grain boundaries	.....Material properties
.....Grain size	.....Creep
.....Liquid crystals	.....Elasticity
.....Dielectric materials	.....Resilience
.....Dielectric films	.....Media
.....Dielectric liquids	.....Nonhomogeneous media
.....Electrets	.....Random media
.....Epoxy resins	.....Mesoporous materials
.....High K dielectric materials	.....Metal foam
.....Piezoelectric materials	.....Metamaterials
.....Films	.....Electromagnetic metamaterials
.....Conductive films	.....Optical cloaking
.....Dielectric films	.....Optical metamaterials
.....Epitaxial layers	.....Nanostructured materials
.....Ferrimagnetic films	.....Nanocomposites
.....Ferrite films	.....Nanoporous materials
.....Garnet films	.....Oils
.....Magnetic films	.....Lubricating oils
.....Optical films	.....Vegetable oils
.....Piezoelectric films	.....Optical materials
.....Plastic films	.....Optical cloaking
.....Polymer films	.....Optical polymers
.....Semiconductor films	.....Optical retarders
.....Thick films	.....Optical superlattices
.....Thin films	.....Photorefractive materials
.....Fluids	.....Organic inorganic hybrid materials
.....Fluid dynamics	.....Organic materials
.....Gases	.....Paints
.....Hydraulic fluids	.....Paper pulp
.....Liquids	.....Petrochemicals
.....Viscosity	.....Phase change materials
.....Hazardous materials	.....Photoconducting materials
.....Inorganic materials	.....Plastics
.....Lacquers	.....Epoxy resins
.....Laminates	.....Fiber reinforced plastics
.....Magnetic materials	.....Plastic films
.....Amorphous magnetic materials	.....Plastic optical fiber
.....Antiferromagnetic materials	.....Polymer foams
.....Diamagnetic materials	.....Polymer gels
.....Ferrimagnetic films	.....Polymers
.....Ferrimagnetic materials	.....Liquid crystal polymers
.....Ferrite films	.....Optical polymers
.....Ferrites	.....Polyethylene
.....Garnet films	.....Polyimides
.....Garnets	.....Production materials
.....Magnetic films	.....Abrasives
.....Magnetic liquids	.....Aerospace materials
.....Magnetic semiconductors	.....Automotive materials



.....Inhibitors	.....Wire
.....Ink	...Materials science and technology
.....Joining materials	.....Absorption
.....Lubricants	.....Aging
.....Retardants	.....Accelerated aging
.....Radioactive materials	.....Chemical analysis
.....Nuclear fuels	.....Activation analysis
.....Radioactive decay	.....Chemical processes
.....Radioactive waste	.....Chemicals
.....Raw materials	.....Electronic noses
.....Resins	.....pH measurement
.....Epoxy resins	.....Contamination
.....Resists	.....Surface contamination
.....Semiconductor materials	.....Degradation
.....Amorphous semiconductors	.....Filtration
.....Elemental semiconductors	.....Microfiltration
.....Gallium	.....Hysteresis
.....Gallium arsenide	.....Impurities
.....Germanium	.....Semiconductor impurities
.....III-V semiconductor materials	.....Materials handling
.....II-VI semiconductor materials	.....Cleaning
.....Indium gallium arsenide	.....Decontamination
.....Indium phosphide	.....Freight handling
.....Magnetic semiconductors	.....Materials handling equipment
.....Organic semiconductors	.....Remote handling
.....Semiconductor superlattices	.....Materials preparation
.....Silicon	.....Doping
.....Silicon germanium	.....Firing
.....Substrates	.....Ion implantation
.....Wide band gap semiconductors	.....Laser sintering
.....Sheet materials	.....Sputtering
.....Solids	.....Materials reliability
.....Young's modulus	.....Materials testing
.....Superconducting materials	.....Accelerated aging
.....Granular superconductors	.....Acoustic testing
.....High-temperature superconductors	.....Adhesive strength
.....Multifilamentary superconductors	.....Bonding forces
.....Niobium-tin	.....Delamination
.....Type II superconductors	.....Elastic recovery
.....Textiles	.....Nondestructive testing
.....Cotton	.....Microstructure
.....Fabrics	.....Periodic structures
.....Textile fibers	.....Gratings
.....Wool	.....Photonic crystals
.....Waste materials	.....Pigmentation
.....Effluents	.....Pigments
.....Electronic waste	.....Separation processes
.....Industrial waste	.....Fractionation
.....Radioactive waste	.....Particle separators
.....Slurries	.....Surface engineering
.....Wastewater	.....Surfaces



.....Corrosion	.....Germanium
.....Corrugated surfaces	.....Germanium alloys
.....Rough surfaces	.....Gold
.....Surface impedance	.....Gold alloys
.....Surface morphology	.....Hafnium
.....Surface resistance	.....Hafnium compounds
.....Surface roughness	.....Indium
.....Surface soil	.....Iron
.....Surface structures	.....Cast iron
.....Surface tension	.....Iron alloys
.....Surface texture	.....Lanthanum
.....Surface topography	.....Lanthanum compounds
.....Surface treatment	.....Lead
...Material storage	.....Lead isotopes
.....Bulk storage	.....Lithium
.....Containers	.....Lithium compounds
.....Freight containers	.....Magnesium
.....Fuel storage	.....Magnesium compounds
.....Secure storage	.....Manganese
.....Stacking	.....Manganese alloys
.....Storage automation	.....Mercury (metals)
.....Warehousing	.....Metallization
.....Water storage	.....Integrated circuit metallization
.....Reservoirs	.....Neodymium
...Metals	.....Neodymium alloys
.....Alloying	.....Neodymium compounds
.....Intermetallic	.....Nickel
.....Shape memory alloys	.....Nickel alloys
.....Aluminum	.....Niobium
.....Aluminum alloys	.....Niobium alloys
.....Aluminum compounds	.....Niobium compounds
.....Barium	.....Palladium
.....Barium compounds	.....Platinum
.....Bismuth	.....Platinum alloys
.....Boron	.....Rare earth metals
.....Boron alloys	.....Samarium
.....Cadmium	.....Samarium alloys
.....Cadmium compounds	.....Silver
.....Calcium	.....Steel
.....Calcium compounds	.....Strontium
.....Chromium	.....Strontium compounds
.....Chromium alloys	.....Tin
.....Cobalt	.....Tin alloys
.....Cobalt alloys	.....Tin compounds
.....Copper	.....Titanium
.....Copper alloys	.....Titanium alloys
.....Copper compounds	.....Titanium compounds
.....Digital alloys	.....Tungsten
.....Erbium	.....Yttrium
.....Gallium	.....Yttrium compounds
.....Gallium alloys	.....Zinc



.....Zinc compounds

## Mathematics

....Accuracy

....Algebra

.....Abstract algebra

.....Galois fields

.....Modules (abstract algebra)

.....Boolean algebra

.....Boolean functions

.....Linear algebra

.....Linear programming

.....Matrices

.....Vectors

.....Set theory

.....Fuzzy sets

.....Fuzzy set theory

.....Rough sets

....Algorithms

.....Adaptive algorithms

.....Adaptation models

.....Algorithm design and analysis

.....Approximation algorithms

.....Backpropagation algorithms

.....Basis algorithms

.....Change detection algorithms

.....Classification algorithms

.....Clustering algorithms

.....Compression algorithms

.....Density estimation robust algorithm

.....Detection algorithms

.....Distributed algorithms

.....Dynamic programming

.....Filtering algorithms

.....Genetic algorithms

.....Heuristic algorithms

.....Inference algorithms

.....Least mean square algorithms

.....Machine learning algorithms

.....Matching pursuit algorithms

.....Maximum likelihood detection

.....MLFMA

.....Multicast algorithms

.....Parallel algorithms

.....Partitioning algorithms

.....Prediction algorithms

.....Projection algorithms

.....Pursuit algorithms

.....Signal processing algorithms

.....Software algorithms

.....Viterbi algorithm

....Arithmetic

.....Digital arithmetic

.....Fixed-point arithmetic

.....Floating-point arithmetic

....Azimuth

.....Azimuthal angle

.....Azimuthal component

.....Azimuthal current

.....Azimuthal harmonics

.....Azimuthal plane

....Boundary value problems

.....Boundary conditions

.....Upper bound

....Calculus

.....Differential equations

.....Differential algebraic equations

.....Navier-Stokes equations

.....Partial differential equations

.....Transfer functions

.....Integral equations

.....Probability density function

.....Level set

....Closed-form solutions

....Combinatorial mathematics

.....Graph theory

.....Bipartite graph

.....Optimal matching

.....Reachability analysis

.....Shortest path problem

.....Tree graphs

.....Steiner trees

....Computational efficiency

....Conformal mapping

....Convergence

....Convex functions

....Cyclic redundancy check

.....Cyclic redundancy check codes

....Eigenvalues and eigenfunctions

....Equations

.....Boltzmann equation

.....Difference equations

.....Integrodifferential equations

.....Maxwell equations

.....Nonlinear equations

.....Bifurcation

.....Polynomials

.....Riccati equations

....Estimation

.....Estimation error

.....Estimation theory





- .....Cramer-Rao bounds
- .....Maximum a posteriori estimation
- .....Life estimation
- .....Maximum likelihood estimation
- .....State estimation
- .....Observers
- .....Yield estimation
- ....Euclidean distance
- .....Hilbert space
- ....Finite difference methods
- ....Finite element analysis
- ....Fourier series
- ....Functional analysis
- ....Geometry
- .....Computational geometry
- .....Fractals
- .....Elliptic curves
- .....Elliptic design
- .....Ellipsoids
- .....Information geometry
- .....Surface topography
- .....Nanotopography
- ....Gradient methods
- ....Graph theory
- .....Bipartite graph
- .....Optimal matching
- .....Reachability analysis
- .....Shortest path problem
- .....Tree graphs
- ....Harmonic analysis
- ....Iterative methods
- .....Expectation-maximization algorithms
- .....Iterative algorithms
- .....Belief propagation
- .....Iterative closest point algorithm
- .....Sum product algorithm
- ....Kernel
- .....Null space
- ....Laplace equations
- ....Lattices
- .....Lattice Boltzmann methods
- ....Limit-cycles
- ....Linearization techniques
- ....Linear matrix inequalities
- ....Linear systems
- ....Mathematical model
- .....Mathematical analysis
- .....Formal concept analysis
- .....Fractional calculus
- .....Modal analysis
- ....Mathematical programming
- ....Method of moments
- ....Minimization
- .....Minimization methods
- ....Mode matching methods
- ....Network theory (graphs)
- ....Nonlinear equations
- .....Bifurcation
- ....Nonlinear systems
- .....Chaos
- .....Chaotic communication
- .....Complexity theory
- .....Spatiotemporal phenomena
- .....Nonlinear dynamical systems
- ....Numerical analysis
- .....Adaptive mesh refinement
- .....Approximation methods
- .....Approximation error
- .....Chebyshev approximation
- .....Curve fitting
- .....Extrapolation
- .....Function approximation
- .....Interpolation
- .....Least squares approximations
- .....Linear approximation
- .....Perturbation methods
- ....Convergence of numerical methods
- ....Finite difference methods
- ....Finite element analysis
- ....Finite volume methods
- ....Gradient methods
- ....Independent component analysis
- ....Iterative methods
- .....Expectation-maximization algorithms
- .....Iterative algorithms
- ....Method of moments
- ....Mode matching methods
- ....Multigrid methods
- ....Newton method
- ....Numerical simulation
- ....Numerical stability
- ....Relaxation methods
- ....Sparse matrices
- ....Splines (mathematics)
- ....Surface fitting
- .....Response surface methodology
- ....Symmetric matrices
- ....Transmission line matrix methods
- ....Optimization
- ....Cost function
- ....Optimal scheduling



- .....Optimization methods
- .....Circuit optimization
- .....Design optimization
- .....Gradient methods
- .....H infinity control
- .....Mathematical programming
- .....Optimized production technology
- .....Pareto optimization
- .....Quadratic programming
- .....Simulated annealing
- ....Piecewise linear techniques
- .....Piecewise linear approximation
- ....Predator prey systems
- ....Probability
- .....Ant colony optimization
- .....Bayes methods
- .....Recursive estimation
- .....Error probability
- .....Forecasting
- .....Demand forecasting
- .....Economic forecasting
- .....Forecast uncertainty
- .....Technology forecasting
- .....Memoryless systems
- .....Pairwise error probability
- .....Possibility theory
- .....Probability distribution
- .....Exponential distribution
- .....Log-normal distribution
- .....Maxwell-Boltzmann distribution
- .....Nakagami distribution
- .....Random variables
- .....Statistical distributions
- .....Distribution functions
- .....Gaussian distribution
- .....Weibull distribution
- .....Uncertainty
- .....Forecast uncertainty
- ....Quaternions
- ....Random processes
- .....Brownian motion
- ....Root mean square
- ....Sequences
- .....Binary sequences
- .....Random sequences
- ....Set theory
- .....Fuzzy sets
- .....Fuzzy set theory
- .....Rough sets
- ....Simulated annealing
- ....Smoothing methods
- ....Spirals
- ....Statistics
- .....Adaptive estimation
- .....Autoregressive processes
- .....Boltzmann distribution
- .....Lattice Boltzmann methods
- .....Correlation
- .....Autocorrelation
- .....Correlation coefficient
- .....Covariance matrices
- .....Gaussian mixture model
- .....Higher order statistics
- .....Histograms
- .....Least squares methods
- .....Least mean squares methods
- .....Least squares approximations
- .....Linear discriminant analysis
- .....Maximum likelihood estimation
- .....Mean square error methods
- .....Minimax techniques
- .....Parametric statistics
- .....Prediction theory
- .....Ranking (statistics)
- .....Root mean square
- .....Sampling methods
- .....Compressed sensing
- .....Nonuniform sampling
- .....Statistical analysis
- .....Analysis of variance
- .....Mode matching methods
- .....Monte Carlo methods
- .....Parameter estimation
- .....Pareto analysis
- .....Principal component analysis
- .....Regression analysis
- .....Time series analysis
- ....Stochastic processes
- .....Gaussian processes
- .....Gaussian mixture model
- .....Markov processes
- .....Markov random fields
- ....Taylor series
- ....Topology
- ....Transforms
- .....Discrete transforms
- .....Discrete cosine transforms
- .....Empirical mode decomposition
- .....Fourier transforms
- .....Discrete Fourier transforms
- .....Fast Fourier transforms
- .....Karhunen-Loeve transforms



- .....Poincare invariance
- .....Wavelet transforms
  - .....Biorthogonal modulation
  - .....Continuous wavelet transforms
  - .....Discrete wavelet transforms
  - .....Wavelet coefficients
  - .....Wavelet packets
- ....Transmission line matrix methods
- ....Uncertain systems
- ....Utility theory

### **Microwave theory and techniques**

- ....Microwave technology
  - .....Beam steering
  - .....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 communication
  - .....Millimeter wave devices
    - .....Millimeter wave transistors
  - .....Millimeter wave integrated circuits
    - .....MIMICs
  - .....Millimeter wave radar
- ....Submillimeter wave technology
  - .....Submillimeter wave circuits
    - .....Submillimeter wave integrated circuits
  - .....Submillimeter wave communication
  - .....Submillimeter wave devices
    - .....Submillimeter wave filters
  - .....Submillimeter wave integrated circuits

### **Nanotechnology**

- ....Bionanotechnology
- ....Casimir effect
- ....Molecular computing
- ....Molecular electronics
- ....Nanobioscience
  - .....DNA computing
  - .....Nanobiotechnology
- ....Nanoelectromechanical systems
- ....Nanoelectronics
- ....Nanofabrication
- ....Nanofluidics
- ....Nanolithography
- ....Nanomaterials
  - .....Nanopatterning
    - .....Colloidal lithography
  - .....Nanophotonics
  - .....Nanopositioning
- ....Nanoscale devices
  - .....Nanocontacts
  - .....Nanotube devices
- ....Nanosensors
- ....Nanostructured materials
  - .....Nanocomposites
  - .....Nanoporous materials
- ....Nanostructures
  - .....Nanoparticles
    - .....Nanocrystals
  - .....Nanotubes
    - .....Carbon nanotubes
    - .....Semiconductor nanotubes
- ....Nanowires
  - .....Semiconductor nanostructures
- ....Self-assembly
  - .....Electrostatic self-assembly
  - .....Self-replicating machines

### **Nuclear and plasma sciences**

- ....Biomedical applications of radiation
- ....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	.....Nuclear phase transformations
.....Hot carriers	.....Nuclear thermodynamics
.....Electrons	.....Relativistic effects
.....Electron sources	...Particle accelerators
.....Quantum wells	.....Accelerator magnets
.....Trions	.....Colliding beam accelerators
.....Elementary particle exchange interactions	.....Cyclotrons
.....Elementary particle vacuum	.....Electron accelerators
.....Ions	.....Ion accelerators
.....Ionization	.....Linear accelerators
.....Ion sources	.....Photon collider
.....Mesons	.....Plasma accelerators
.....Neutrino sources	.....Proton accelerators
.....Neutrons	.....Storage rings
.....Particle beams	.....Synchrocyclotrons
.....Atomic beams	.....Synchrotrons
.....Electron beams	.....Synchrotron radiation
.....Ion beams	.....Undulators
.....Particle collisions	...Particle beam handling
.....Phonons	...Particle beam injection
.....Positrons	...Plasmas
.....Protons	.....Atmospheric-pressure plasmas
...Fusion power generation	.....Plasma applications
...Fusion reactors	.....Plasma devices
.....Fusion reactor design	.....Plasma immersion ion implantation
.....Tokamaks	.....Plasma welding
.....Tokamak devices	.....Tokamaks
...Gamma-rays	.....Plasma confinement
.....Gamma-ray bursts	.....Inertial confinement
.....Gamma-ray detection	.....Magnetic confinement
.....Gamma-ray effects	.....Plasma diagnostics
...Gas discharge devices	.....Plasma properties
.....Glow discharge devices	.....Dusty plasmas
...High energy physics instrumentation computing	.....Plasma chemistry
.....Linear particle accelerator	.....Plasma density
...Ion beam applications	.....Plasma sheaths
.....Ion implantation	.....Plasma stability
.....Plasma immersion ion implantation	.....Plasma temperature
...Ion emission	.....Plasmons
.....Nuclear electronics	.....Plasma simulation
.....Nuclear imaging	.....Plasma sources
.....Energy resolution	.....Plasma transport processes
.....Nuclear medicine	...Radiation effects
.....Nuclear physics	.....Biological effects of radiation
.....Alpha particles	.....Gamma-ray effects
.....Beta rays	.....Ion radiation effects
.....Ignition	.....Neutron radiation effects
.....Ion sources	...Radiation hardening (electronics)
.....Isotopes	...Radiation monitoring
	.....Radiation dosage
	...Radiation 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
- .....Underwater communication
- .....Underwater equipment
- .....Underwater structures
- ....Oceanographic techniques
- ....Ocean temperature
- ....Water pollution
- .....Marine pollution

### **Power electronics**

- ....Converters
- .....AC-AC converters
- .....DC-AC power converters
- .....Digital-to-frequency converters
- .....Frequency conversion
- .....Mixers
- .....Optical frequency conversion
- .....Power conversion
- .....AC-AC converters
- .....AC-DC power converters
- .....DC-AC power converters
- .....DC-DC power converters
- .....Matrix converters
- .....Power conversion harmonics
- .....Pulse width modulation converters
- .....Static power converters
- .....Wavelength converters
- ....Current limiters
- .....Fault current limiters
- ....Inverters
- .....Pulse inverters
- .....Resonant 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
- .....Electrical ballasts
- .....Electric current control
- .....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
- .....Batteries
- .....Fuel cells
- .....Motors
- .....Photovoltaic cells
- .....Potential well
- .....Solar heating
- .....Thermoelectricity
- .....Waste heat
- .....Energy dissipation
- .....Energy exchange
- .....Inductive charging
- .....Energy harvesting
- .....Energy management
- .....Energy conservation
- .....Energy efficiency
- .....Load management
- .....Energy resources



.....Fuels	....Power systems
.....Geothermal energy	.....Hybrid power systems
.....Nuclear fuels	.....Industrial power systems
.....Solar energy	.....Power distribution
.....Wave power	.....Power distribution faults
.....Wind energy	.....Power distribution lines
.....Wind farms	.....Power grids
.....Energy states	.....Microgrids
.....Effective mass	.....Smart grids
.....Orbital calculations	.....Power supplies
.....Energy storage	.....Battery chargers
.....Batteries	.....Charging stations
.....Flywheels	.....Current supplies
.....Fuel cells	.....Emergency power supplies
.....Hydrogen storage	.....Inductive charging
.....Supercapacitors	.....Islanding
.....Superconducting magnetic energy storage	.....Power demand
....Power engineering	.....Power quality
.....Ferroresonance	.....Power system restoration
.....High-voltage techniques	.....Switched-mode power supply
.....Power engineering computing	.....Traction power supplies
.....Power system simulation	.....Umbilical cable
....Power generation	.....Power system analysis computing
.....Automatic generation control	.....Power system dynamics
.....Cogeneration	.....Power system economics
.....Distributed power generation	.....Power system faults
.....Geothermal power generation	.....Power system harmonics
.....Hydroelectric power generation	.....Power harmonic filters
.....Hydroelectric-thermal power generation	.....Power system management
.....Microhydro power	.....Load flow
.....Picohydro power	.....Power system measurements
.....Magnetohydrodynamic power generation	.....Meter reading
.....Nuclear power generation	.....Power system planning
.....Fission reactors	.....Power demand
.....Fusion power generation	.....Power system protection
.....Power generation control	.....Electrical safety
.....Power generation dispatch	.....Substation protection
.....Power generation planning	.....Surge protection
.....Solar power generation	.....Power system reliability
.....Maximum power point trackers	.....Power system stability
.....Photovoltaic systems	.....Power transmission
.....Trigeneration	.....Flexible AC transmission systems
.....Turbomachinery	.....HVDC transmission
.....Turbines	.....Inductive power transmission
.....Turbogenerators	.....Static VAr compensators
.....Wind energy generation	.....Transmission lines
.....Wind energy integration	.....PSCAD
.....Wind power generation	.....Pulse power systems
	.....Pulsed power supplies
	.....Reactive power
	.....Substations



- .....Substation automation
- .....Substation protection
- .....Transformers
  - .....Current transformers
  - .....Flyback transformers
  - .....Instrument transformers
  - .....Phase transformers
  - .....Power transformers
  - .....Pulse transformers
- .....Uninterruptible power systems
- .....Wind energy integration

### **Product safety engineering**

- ....Consumer protection
- ....Power system protection
  - .....Electrical safety
    - .....Fault protection
    - .....Grounding
    - .....Substation protection
    - .....Surge protection
    - .....Arresters
- ....Safety
  - .....Aerospace safety
    - .....Air safety
    - .....Domestic safety
    - .....Emergency services
    - .....Explosion protection
    - .....Hazards
      - .....Biohazards
      - .....Chemical hazards
      - .....Explosions
      - .....Fires
      - .....Flammability
      - .....Floods
      - .....Hazardous areas
      - .....Hazardous materials
      - .....Toxicology
    - .....Health and safety
      - .....Occupational health
      - .....Occupational safety
    - .....Marine safety
    - .....Product safety
    - .....Protection
      - .....Explosion protection
      - .....Lightning protection
      - .....Radiation safety
      - .....Safety devices
        - .....Eye protection
        - .....Protective clothing
      - .....Vehicle safety

- ....Vehicle crash testing

### **Professional communication**

- ....Collaboration
  - .....Collaborative tools
    - .....Call conference
    - .....Collaborative software
    - .....Videoconferences
  - .....Discussion forums
  - .....Teamwork
  - .....Virtual groups
- ...Communication aids
  - ....Communication effectiveness
  - ....Communication symbols
    - .....Semiotics
      - .....Pragmatics
      - .....Semantics
      - .....Syntactics
- ...Context
  - ....Databases
    - .....Database systems
      - .....Audio databases
      - .....Deductive databases
      - .....Image databases
      - .....Indexes
      - .....Multimedia databases
      - .....Object oriented databases
      - .....Query processing
    - .....Deductive databases
    - .....Distributed databases
    - .....Image databases
    - .....Image retrieval
    - .....Multimedia databases
    - .....Object oriented databases
    - .....Relational databases
    - .....Spatial databases
    - .....Transaction databases
    - .....Itemsets
    - .....Visual databases
  - ...Global communication
    - .....Cross-cultural communication
    - .....Geographic information systems
    - .....Geospatial analysis
    - .....Gunshot detection systems
  - ....Grammar
    - ....Information analysis
    - .....Indexing
    - ....Information resources
    - ....Information retrieval
    - .....Blogs



- .....Content-based retrieval
- .....Hypertext systems
- .....Information filtering
- .....Information filters
- .....Recommender systems
- .....Information rates
- .....Music information retrieval
- .....Online services
- .....Search engines
- .....Search methods
- .....Keyword search
- .....Metasearch
- .....Nearest neighbor searches
- .....Search problems
- .....Web search
- .....Social network services
- .....Computer mediated communication
- .....Facebook
- .....LinkedIn
- .....MySpace
- .....Second Life
- .....Twitter
- .....YouTube
- .....Tagging
- .....Tag clouds
- .....Taxonomy
- .....Terminology
- .....Dictionaries
- .....Video sharing
- .....Facebook
- .....MySpace
- .....YouTube
- .....Vocabulary
- .....Web sites
- .....Facebook
- .....MySpace
- .....Uniform resource locators
- .....Web design
- .....YouTube
- ....Information science
- ....Information services
- .....Ask IEEE
- .....Dictionaries
- .....Document delivery
- .....Ask IEEE
- .....Encyclopedias
- .....Libraries
- .....Software libraries
- .....Teletext
- .....Videotex
- .....Wikipedia
- ....Information systems
- .....Database systems
- .....Audio databases
- .....Deductive databases
- .....Image databases
- .....Indexes
- .....Multimedia databases
- .....Object oriented databases
- .....Query processing
- .....Data systems
- .....Data acquisition
- .....Data compression
- .....Data conversion
- .....Data engineering
- .....Data handling
- .....Data processing
- .....Data storage systems
- .....Data warehouses
- .....Distributed information systems
- .....Publish-subscribe
- .....Identity management systems
- .....Informatics
- .....Biomedical informatics
- .....Cognitive informatics
- .....Information architecture
- .....Information management
- .....Competitive intelligence
- .....Document handling
- .....Information security
- .....Information sharing
- .....Knowledge transfer
- .....Information processing
- .....Informatics
- .....Information exchange
- .....Sonification
- .....Management information systems
- .....Portals
- .....Medical information systems
- .....Electronic medical records
- ....Information technology
- .....Information representation
- .....Printing
- .....Digital printing
- .....Teleprinting
- .....Service computing
- .....Telematics
- .....Universal Serial Bus
- ....Manuals
- ....Oral communication
- .....Public speaking
- .....Speech





- ....Plagiarism
- ....Portfolios
- ....Professional societies
- ....Public speaking
- ....Rhetoric
- ....Writing
  - .....Abstracts
  - .....Bibliographies
  - .....Biographies
  - .....Autobiographies
  - .....Dictionaries
  - .....Documentation
  - .....Grammar
  - .....Readability metrics
  - .....Resumes
  - .....Reviews
  - .....Thesauri

### Reliability

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

### Resonance

- ....Ferroresonance
- ....Magnetic resonance
  - .....Nuclear magnetic resonance
  - .....Paramagnetic resonance
- ....Resonance light scattering

- ....Stochastic resonance

### Robotics and automation

- ....Animatronics
- ....Automation
  - .....Automated highways
  - .....Automatic generation control
  - .....Automatic testing
  - .....Automatic test pattern generation
  - .....Ring generators
- ....Building automation
  - .....Manufacturing automation
    - .....Computer aided manufacturing
    - .....Computer integrated manufacturing
    - .....Computer numerical control
    - .....Flexible manufacturing systems
  - .....Office automation
    - .....Workflow management software
  - .....Storage automation
- ....Multi-robot systems
- ....Robots
  - .....Androids
  - .....Aquatic robots
  - .....Automata
    - .....Turing machines
  - .....Cognitive robotics
  - .....Computer vision
    - .....Active appearance model
    - .....Face detection
    - .....Smart cameras
  - .....Educational robots
  - .....Humanoid robots
  - .....Intelligent robots
  - .....Manipulators
    - .....End effectors
    - .....Manipulator dynamics
    - .....Micromanipulators
  - .....Medical robotics
    - .....Rehabilitation robotics
  - .....Mobile robots
    - .....Climbing robots
    - .....Legged locomotion
  - .....Orbital robotics
  - .....Parallel robots
  - .....Robot control
    - .....Robot motion
    - .....Robot kinematics
      - .....Motion analysis
    - .....Robot programming
    - .....Robot sensing systems
    - .....Robot vision systems



- .....Simultaneous localization and mapping
- .....Tactile sensors
- .....Service robots
- .....Telerobotics
- .....Teleoperators

### Science - general

- ....Astronomy
  - .....Astrophysics
  - .....Observatories
  - .....Orbits (stellar)
  - .....Planets
    - .....Earth
    - .....Extrasolar planets
    - .....Jupiter
    - .....Mars
    - .....Mercury (planets)
    - .....Pluto
    - .....Saturn
    - .....Sun
    - .....Venus
  - .....Radio astronomy
  - .....Solar system
    - .....Kuiper belt
    - .....Stellar dynamics
    - .....Stellar motion
- ....Biology
  - .....Biochemistry
    - .....Amino acids
    - .....Biochemical analysis
    - .....Peptides
    - .....Proteins
  - .....Biodiversity
  - .....Biogeography
  - .....Bioelectric phenomena
    - .....Electric shock
  - .....Biological cells
    - .....Cells (biology)
    - .....Chromosome mapping
    - .....Fibroblasts
    - .....RNA
    - .....Stem cells
  - .....Biological information theory
  - .....Biological processes
  - .....Biological interactions
  - .....Chronobiology
  - .....Circadian rhythm
  - .....Coagulation
  - .....Symbiosis

- .....Biological system modeling
- .....Biological systems
  - .....Anatomy
  - .....Molecular communication
  - .....Organisms
- .....Biology computing
- .....Biophotonics
- .....Biophysics
  - .....Aerospace biophysics
  - .....Biomagnetics
  - .....Cellular biophysics
  - .....Molecular biophysics
- .....Evolution (biology)
- .....Memetics
- .....Phylogeny
- .....Genetics
  - .....DNA
  - .....Gene therapy
  - .....Genetic communication
  - .....Genetic expression
  - .....Genetic programming
  - .....Genomics
- .....Microinjection
- .....Nanobioscience
  - .....DNA computing
  - .....Nanobiotechnology
- .....Physiology
- .....Predator prey systems
- .....Synthetic biology
- .....Systematics
- .....Systems biology
- .....Vegetation
  - .....Crops
  - .....Marine vegetation
- .....Zoology
  - .....Animals
- ....Chemistry
  - .....Astrochemistry
  - .....Biochemistry
    - .....Amino acids
    - .....Biochemical analysis
    - .....Peptides
    - .....Proteins
  - .....Chemical analysis
    - .....Activation analysis
    - .....Chemical processes
  - .....Chemicals
    - .....Electronic noses
    - .....pH measurement
  - .....Chemical compounds
  - .....Anti-freeze



.....Ethanol	.....EMTDC
.....Methanol	.....Extraterrestrial phenomena
.....Inorganic chemicals	.....Geodynamics
.....Interstellar chemistry	.....Geophysics computing
.....Organic chemicals	.....Meteorology
.....Hydrocarbons	.....Moisture
.....Photochemistry	.....Seismology
.....Photobleaching	.....Surface waves
....Electricity	.....Well logging
.....Photoelectricity	.....Ice
.....Photovoltaic effects	.....Ice shelf
.....Piezoelectricity	.....Ice surface
.....Piezoelectric effect	.....Ice thickness
.....Piezoelectric polarization	.....Sea ice
.....Pyroelectricity	.....Lakes
.....Thermoelectricity	.....Land surface
.....Electrothermal effects	.....Levee
.....Thermoelectric devices	.....Meteorological factors
.....Triboelectricity	.....Oceans
...Geoscience	.....Ocean salinity
.....Antarctica	.....Ocean temperature
.....South Pole	.....Sea coast
.....Arctic	.....Sea floor
.....North Pole	.....Sea level
.....Atmosphere	.....Sea surface
.....Atmospheric modeling	.....Tides
.....Atmospheric waves	.....Rivers
.....Biosphere	.....Sediments
.....Continents	.....Soil
.....Africa	.....Soil moisture
.....Asia	.....Soil properties
.....Australia	.....Soil texture
.....Europe	.....Tornadoes
.....North America	.....Tsunami
.....South America	.....Volcanoes
.....Cyclones	.....Planetary volcanoes
.....Hurricanes	.....Volcanic activity
.....Tropical cyclones	.....Volcanic ash
.....Earth	...Metrology
.....Earthquakes	...Physics
.....Earthquake engineering	.....Acoustics
.....Forestry	.....Acoustic applications
.....Geoengineering	.....Acoustic devices
.....Geography	.....Acoustic emission
.....Cities and towns	.....Acoustic noise
.....Rural areas	.....Acoustic propagation
.....Urban areas	.....Acoustic pulses
.....Geology	.....Acoustic waves
.....Minerals	.....Acoustooptic effects
.....Rocks	.....Biomedical acoustics
.....Geophysics	.....Cepstral analysis



.....Music	.....Hydrodynamics
.....Nonlinear acoustics	.....Kinematics
.....Psychoacoustics	.....Lubrication
.....Reverberation	.....Magnetohydrodynamics
.....Spectral shape	.....Photoelasticity
.....Underwater acoustics	.....Pressure effects
.....Astrophysics	.....Shock (mechanics)
.....Beams	.....Strain
.....Acoustic beams	.....Stress
.....Laser beams	.....Surface cracks
.....Molecular beams	.....Torque
.....Optical beams	.....Vibrations
.....Particle beams	.....Volume relaxation
.....Biophysics	.....Workability
.....Aerospace biophysics	.....Network theory (graphs)
.....Biomagnetics	.....Orbits
.....Cellular biophysics	.....Physics education
.....Molecular biophysics	.....Quantum mechanics
.....Dark energy	.....Density functional theory
.....Entropy	.....Lagrangian functions
.....Fluid flow	.....Proton effects
.....Fluid dynamics	.....Quantum capacitance
.....Hydraulic diameter	.....Quantum entanglement
.....Hydrology	.....Relativistic quantum mechanics
.....Pipelines	.....Schrodinger equation
.....Valves	.....Stationary state
.....Geophysics	.....Teleportation
.....EMTDC	.....Tunneling
.....Extraterrestrial phenomena	.....String theory
.....Geodynamics	.....Thermal factors
.....Geophysics computing	.....Temperature
.....Meteorology	.....Temperature dependence
.....Moisture	.....Thermal conductivity
.....Seismology	.....Thermal expansion
.....Surface waves	.....Thermal management
.....Well logging	.....Thermal stresses
.....Kinetic theory	.....Thermoelasticity
.....Kinetic energy	.....Thermoelectricity
.....Levitation	.....Thermolysis
.....Electrostatic levitation	.....Thermooptic effects
.....Magnetic levitation	.....Thermoresistivity
.....Lorentz covariance	.....Waves
.....Mechanical factors	.....Atmospheric waves
.....Acceleration	.....Berry phase
.....Aerodynamics	.....Doppler effect
.....Biomechanics	.....Electrodynamics
.....Damping	.....Magnetostatic waves
.....Dynamics	.....Matter waves
.....Fatigue	.....Plasma waves
.....Force	.....Propagation
.....Friction	.....Reflectivity



- .....Seismic waves
- .....Shock waves
- .....Solitons
- .....Surface acoustic waves
- .....Wave functions
- ....Sociology
- .....Digital divide
- ....Thermodynamics
- .....Isobaric
- .....Isothermal processes

### Sensors

- ....Acoustic sensors
- ....Chemical and biological sensors
  - .....Biosensors
  - .....Gas detectors
    - .....Amperometric sensors
- ....Electromechanical sensors
  - .....Microsensors
- ....Force 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
- ....Sensor phenomena and characterization
- ....Sensor systems and applications
  - .....Detectors
    - .....Envelope detectors
    - .....Semiconductor detectors
    - .....Electric sensing devices

- .....Leak detection
- .....Radiofrequency identification
  - .....RFID tags
- .....Robot sensing systems
- .....Robot vision systems
- .....Simultaneous localization and mapping
- .....Tactile sensors
  - .....Sensor arrays
  - .....Sensor fusion
  - .....Sensor systems
  - .....Gunshot detection systems
- ....Thermal sensors
  - .....Temperature sensors
- ....Thick film sensors
- ....Thin film sensors
- ....Wearable sensors

### Signal processing

- ....Acoustic signal processing
  - .....Active noise reduction
    - .....Echo cancellers
    - .....Speech processing
      - .....Human voice
      - .....Speech enhancement
      - .....Speech synthesis
  - .....Adaptive signal processing
    - .....Adaptive filters
    - .....Adaptive signal detection
- ....Amplifiers
  - .....Broadband amplifiers
  - .....Cavity resonators
    - .....Laser cavity resonators
  - .....Differential amplifiers
  - .....Distributed amplifiers
  - .....Low-noise amplifiers
  - .....Operational amplifiers
    - .....Feedback amplifier
  - .....Power amplifiers
    - .....High power amplifiers
    - .....Predistortion
  - .....Preamplifiers
  - .....Pulse amplifiers
  - .....Radiofrequency amplifiers
- ....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
  - .....Frequency-selective fading channels
  - .....Rayleigh channels
  - .....Weibull fading channels
- ....Filters
  - .....Active filters
    - .....Band-pass filters
    - .....Anisotropic
    - .....Bragg gratings
    - .....Fiber gratings
    - .....Channel bank filters
    - .....Digital filters
      - .....Finite impulse response filters
    - .....Equalizers
      - .....Adaptive equalizers
      - .....Blind equalizers
      - .....Decision feedback equalizers
    - .....Filtering theory
    - .....Gabor filters
    - .....Harmonic filters
    - .....IIR filters
    - .....Kalman filters
    - .....Low-pass filters
    - .....Matched filters
    - .....Microstrip filters
    - .....Nonlinear filters
    - .....Particle filters
    - .....Power filters
      - .....Spurline
    - .....Resonator filters
    - .....Spatial filters
  - .....Superconducting filters
  - .....Transversal filters
- ....Frequency locked loops
- ....Geophysical signal processing
- ....Limiting
- ....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
    - .....Electrooptic modulators
    - .....Intensity modulation
    - .....Phase modulation
      - .....Continuous phase modulation
      - .....Differential phase shift keying
      - .....Phase shift keying
    - .....Pulse modulation
      - .....Pulse width modulation
        - .....Pulse width modulation inverters
        - .....Space vector pulse width modulation
  - .....Multidimensional signal processing
  - .....Video signal processing
    - .....Video coding
    - .....Video compression
- ....Noise
  - .....1f noise
  - .....Additive noise
    - .....Additive white noise
    - .....AWGN
  - .....Colored noise
  - .....Gaussian noise
    - .....AWGN
  - .....Laser noise
    - .....Laser feedback
  - .....Low-frequency noise
  - .....Noise cancellation
  - .....Phase noise
  - .....Signal to noise ratio
  - .....PSNR
  - .....Superconducting device noise



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

- .....Motion detection
- .....Multiuser detection
- .....Optical signal detection
- .....Phase detection
  - .....Phase frequency detector
- .....Radar detection
- ....Signal generators
  - .....Noise generators
  - .....Pulse generation
    - .....Optical pulse generation
- ....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 differences
- ....Environmental factors
  - .....Biosphere
  - .....Ecosystems
  - .....Environmental economics
    - .....Carbon tax
  - .....Environmental monitoring
  - .....Global warming
  - .....Green products
    - .....Green buildings
    - .....Green cleaning
  - .....Pollution
    - .....Air pollution
    - .....Industrial pollution
    - .....Land pollution
    - .....Oil pollution
    - .....Radioactive pollution
    - .....Thermal pollution
    - .....Urban pollution
    - .....Water pollution
- ....Ethical aspects
- ....Globalization
- ....International relations
- ....Peace technology
- ....Philosophical considerations
- ....Social factors
  - .....Demography



- .....Technology social factors
  - .....Privacy
- ....Sustainable development
- ....Technology
  - .....Appropriate technology
  - .....Technological innovation
  - .....Technology social factors
    - .....Privacy
  - .....Technology transfer
    - .....Small business technology transfer

### **Solid state circuits**

- ....Circuit subsystems
- ....Circuit theory
- ....FET circuits
  - .....FET integrated circuits
    - .....Field effect MMIC
    - .....MESFET integrated circuits
  - .....JFET circuits
    - .....JFET integrated circuits
  - .....MESFET circuits
    - .....MESFET integrated circuits
  - .....MODFET circuits
    - .....MODFET integrated circuits
  - .....MOSFET circuits
    - .....CMOSFET circuits
    - .....MOS integrated circuits
    - .....Power MOSFET
- ....Gate leakage
- ....Solid state circuit design
- ....Transistors
  - .....Field effect transistors
    - .....CNTFETs
    - .....Double-gate FETs
    - .....HEMTs
    - .....JFETs
    - .....MESFETs
    - .....MISFETs
    - .....MODFETs
    - .....MOSFET
    - .....MOSHFETs
    - .....OFETs
    - .....Schottky gate field effect transistors
    - .....Thin film transistors
  - .....Heterojunction bipolar transistors
    - .....Double heterojunction bipolar transistors
  - .....Millimeter wave transistors
  - .....Phototransistors

### **Superconductivity**

- ....Bean model
- ....Critical current density (superconductivity)
  - .....Critical current density
  - ....Flux pinning
  - ....Superconducting devices
    - .....Josephson junctions
    - .....SQUIDs
    - .....Superconducting coils
    - .....Superconducting magnets
    - .....Superconducting microwave devices
    - .....Superconducting photodetectors
  - ....Superconducting filaments and wires
  - ....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
      - .....Type II superconductors
    - ....Superconducting transition temperature
- Systems engineering and theory
  - ....Adaptive systems
    - .....Adaptive control
    - .....Line enhancers
    - .....Multi-agent systems
    - .....Variable structure systems
  - ....Hierarchical systems
    - .....Multilevel systems
  - ....Modeling
    - .....Analytical models
    - .....Atmospheric modeling
    - .....Brain modeling
    - .....Computational modeling
      - .....Computational cultural modeling
    - .....Context modeling
    - .....Data models
    - .....Deformable models
    - .....Digital elevation models
    - .....Emulation
    - .....Graphical models
    - .....Green's function methods
    - .....Hidden Markov models
    - .....Input variables
    - .....Integrated circuit modeling





.....Cutoff frequency	.....Time-varying systems
.....Inverse problems	....Systems engineering education
.....Deconvolution	
.....Load modeling	
.....Metamodeling	<b>Systems, man, and cybernetics</b>
.....Numerical models	....Behavioral science
.....Object oriented modeling	.....Animal behavior
.....Power system modeling	.....Cognition
.....Load modeling	.....Consumer behavior
.....Semiconductor device modeling	.....Psychiatry
.....Semiconductor process modeling	.....Mental disorders
.....Signal representation	.....Psychology
.....Simulation	.....Industrial psychology
.....Computer simulation	.....Mood
.....Digital simulation	.....Psychometric testing
.....Medical simulation	....Biological control systems
.....Solid modeling	.....Biomarkers
.....System identification	.....Molecular biomarkers
....Multidimensional systems	....Computational linguistics
....Reduced order systems	.....Sentiment analysis
....Stochastic systems	....Cybernetics
....System analysis and design	.....Adaptive systems
.....Asymptotic stability	.....Adaptive control
.....Control system analysis	.....Line enhancers
.....State-space methods	.....Multi-agent systems
.....Diakoptics	.....Variable structure systems
.....Distributed processing	.....Cognitive informatics
.....Message passing	.....Cognitive science
.....Distributed vision networks	.....Problem-solving
.....Fault detection	.....Control theory
.....Fault tolerant systems	.....Control nonlinearities
.....Interconnected systems	.....Observability
.....Large-scale systems	.....Decision theory
.....Lyapunov methods	.....Decision trees
.....Open systems	.....Econophysics
.....Open Access	.....Emergent phenomena
.....Physical layer	.....Intelligent control
.....Petri nets	.....Feedforward systems
.....Robust control	.....Neurocontrollers
.....Scalability	.....Linear feedback control systems
.....Scattering parameters	.....Frequency locked loops
.....Sequential analysis	.....Phase locked loops
.....Sequential diagnosis	.....State feedback
.....Software prototyping	.....Tracking loops
.....System-level design	....Ergonomics
.....System performance	.....Job design
.....Cooperative caching	....Human factors
.....Time factors	.....Affective computing
.....Continuous time systems	.....Anthropomorphism
.....Discrete-time systems	....Identification of persons
.....Time invariant systems	.....Biometrics (access control)



- .....Gait recognition
- .....Iris recognition
- .....Face recognition
- .....Fingerprint recognition
- .....Handwriting recognition
- .....Forgery
- .....Speaker recognition
- .....Speech recognition
- .....Automatic speech recognition
- .....Speech analysis
- ....Man machine systems
- .....Interactive systems
- ....Natural languages
- .....Natural language processing
- .....Morphology
- .....Sentiment analysis
- ....Pervasive computing
- .....Ubiquitous computing
- .....Context-aware services
- .....Wearable computers
- ....Posthuman
- ....Teleworking
- ....Transhuman
- ....User interfaces
- .....Audio user interfaces
- .....Brain-computer interfaces
- .....Data visualization
- .....Isosurfaces
- .....Emotion recognition
- .....Exoskeletons
- .....Graphical user interfaces
- .....Avatars
- .....Human computer interaction
- .....Human-robot interaction
- .....Smart cards

### **Ultrasonics, ferroelectrics, and frequency control**

- ....Ferroelectric materials
- .....Ferroelectric films
- .....Relaxor ferroelectrics
- ....Frequency control
- .....Automatic frequency control
- .....Tunable circuits and devices
- .....RLC circuits
- .....Tuned circuits
- .....Tuning
- .....Laser tuning
- .....Optical tuning
- .....Tuners

- ....Piezoelectricity
- .....Piezoelectric effect
- .....Piezoelectric polarization
- ....Pyroelectricity
- ....Ultrasonic imaging
- .....Ultrasonography
- .....Sonogram
- ....Ultrasonic transducers

### **Vehicular and wireless technologies**

- ....Automotive engineering
- .....Automotive applications
- .....Automotive electronics
- .....Power steering
- .....Vehicle crash testing
- .....Vehicle detection
- .....Vehicle driving
- .....Vehicle dynamics
- .....Vehicle safety
- ....Land mobile radio equipment
- .....Mobile antennas
- ....Navigation
- .....Aircraft navigation
- .....Course correction
- .....Dead reckoning
- .....Inertial navigation
- .....Marine navigation
- .....Radio navigation
- .....Satellite navigation systems
- .....Global Positioning System
- .....Satellite constellations
- .....Sonar navigation
- ....Propulsion
- .....Aircraft propulsion
- .....Propellers
- .....Electromagnetic launching
- .....Coilguns
- .....Railguns
- .....Electrothermal launching
- .....Rockets
- ....Vehicles
- .....Land vehicles
- .....Bicycles
- .....Electric vehicles
- .....Road vehicles
- .....Remotely operated vehicles
- .....Unmanned aerial vehicles
- .....Space vehicles
- .....Space shuttles
- ....Wireless sensor networks



.....Body sensor networks  
.....Event detection

