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Computer Science (since January 1993)

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  * **Catch-up:** Categories: All Artificial Intelligence Hardware Architecture Computational Complexity Computational Engineering, Finance, and Science Computational Geometry

Computation and Language Cryptography and Security Computer Vision and Pattern Recognition Computers and Society Databases Distributed, Parallel, and Cluster Computing Digital Libraries Discrete Mathematics Data Structures and Algorithms Emerging Technologies Formal Languages and Automata Theory General Literature Graphics Computer Science and Game Theory Human-Computer Interaction Information Retrieval Information Theory Machine Learning Logic in Computer Science Multiagent Systems Multimedia Mathematical Software Numerical Analysis Neural and Evolutionary Computing Networking and Internet Architecture Other Computer Science Operating Systems Performance Programming Languages Robotics Symbolic Computation Sound Software Engineering Social and Information Networks Systems and Control

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Categories within Computer Science

* **cs.AI - Artificial Intelligence** ([new](/list/cs.AI/new), [recent](/list/cs.AI/recent), [current month](/list/cs.AI/current))

Covers all areas of AI except Vision, Robotics, Machine Learning, Multiagent Systems, and Computation and Language (Natural Language Processing), which have separate subject areas. In particular, includes Expert Systems, Theorem Proving (although this may overlap with Logic in Computer Science), Knowledge Representation, Planning, and Uncertainty in AI. Roughly includes material in ACM Subject Classes I.2.0, I.2.1, I.2.3, I.2.4, I.2.8, and I.2.11.

* **cs.AR - Hardware Architecture** ([new](/list/cs.AR/new), [recent](/list/cs.AR/recent), [current month](/list/cs.AR/current))

Covers systems organization and hardware architecture. Roughly includes material in ACM Subject Classes C.0, C.1, and C.5.

* **cs.CC - Computational Complexity** ([new](/list/cs.CC/new), [recent](/list/cs.CC/recent), [current month](/list/cs.CC/current))

Covers models of computation, complexity classes, structural complexity, complexity tradeoffs, upper and lower bounds. Roughly includes material in ACM Subject Classes F.1 (computation by abstract devices), F.2.3 (tradeoffs among complexity measures), and F.4.3 (formal languages), although some material in formal languages may be more appropriate for Logic in Computer Science. Some

material in F.2.1 and F.2.2, may also be appropriate here, but is more likely
to have Data Structures and Algorithms as the primary subject area.

* **cs.CE - Computational Engineering, Finance, and Science** ([new](/list/cs.CE/new), [recent](/list/cs.CE/recent), [current month](/list/cs.CE/current))

Covers applications of computer science to the mathematical modeling of
complex systems in the fields of science, engineering, and finance. Papers
here are interdisciplinary and applications-oriented, focusing on techniques
and tools that enable challenging computational simulations to be performed,
for which the use of supercomputers or distributed computing platforms is
often required. Includes material in ACM Subject Classes J.2, J.3, and J.4
(economics).

* **cs.CG - Computational Geometry** ([new](/list/cs.CG/new), [recent](/list/cs.CG/recent), [current month](/list/cs.CG/current))

Roughly includes material in ACM Subject Classes I.3.5 and F.2.2.

* **cs.CL - Computation and Language** ([new](/list/cs.CL/new), [recent](/list/cs.CL/recent), [current month](/list/cs.CL/current))

Covers natural language processing. Roughly includes material in ACM Subject
Class I.2.7. Note that work on artificial languages (programming languages,
logics, formal systems) that does not explicitly address natural-language
issues broadly construed (natural-language processing, computational
linguistics, speech, text retrieval, etc.) is not appropriate for this area.

* **cs.CR - Cryptography and Security** ([new](/list/cs.CR/new), [recent](/list/cs.CR/recent), [current month](/list/cs.CR/current))

Covers all areas of cryptography and security including authentication, public key cryptosytems, proof-carrying code, etc. Roughly includes material in ACM Subject Classes D.4.6 and E.3.

* **cs.CV - Computer Vision and Pattern Recognition** ([new](/list/cs.CV/new), [recent](/list/cs.CV/recent), [current month](/list/cs.CV/current))

Covers image processing, computer vision, pattern recognition, and scene understanding. Roughly includes material in ACM Subject Classes I.2.10, I.4, and I.5.

* **cs.CY - Computers and Society** ([new](/list/cs.CY/new), [recent](/list/cs.CY/recent), [current month](/list/cs.CY/current))

Covers impact of computers on society, computer ethics, information technology and public policy, legal aspects of computing, computers and education. Roughly includes material in ACM Subject Classes K.0, K.2, K.3, K.4, K.5, and K.7.

* **cs.DB - Databases** ([new](/list/cs.DB/new), [recent](/list/cs.DB/recent), [current month](/list/cs.DB/current))

Covers database management, datamining, and data processing. Roughly includes

material in ACM Subject Classes E.2, E.5, H.0, H.2, and J.1.

* **cs.DC - Distributed, Parallel, and Cluster Computing** ([new](/list/cs.DC/new), [recent](/list/cs.DC/recent), [current month](/list/cs.DC/current))

Covers fault-tolerance, distributed algorithms, stabilility, parallel computation, and cluster computing. Roughly includes material in ACM Subject Classes C.1.2, C.1.4, C.2.4, D.1.3, D.4.5, D.4.7, E.1.

* **cs.DL - Digital Libraries** ([new](/list/cs.DL/new), [recent](/list/cs.DL/recent), [current month](/list/cs.DL/current))

Covers all aspects of the digital library design and document and text creation. Note that there will be some overlap with Information Retrieval (which is a separate subject area). Roughly includes material in ACM Subject Classes H.3.5, H.3.6, H.3.7, I.7.

* **cs.DM - Discrete Mathematics** ([new](/list/cs.DM/new), [recent](/list/cs.DM/recent), [current month](/list/cs.DM/current))

Covers combinatorics, graph theory, applications of probability. Roughly includes material in ACM Subject Classes G.2 and G.3.

* **cs.DS - Data Structures and Algorithms** ([new](/list/cs.DS/new), [recent](/list/cs.DS/recent), [current month](/list/cs.DS/current))

Covers data structures and analysis of algorithms. Roughly includes material

in ACM Subject Classes E.1, E.2, F.2.1, and F.2.2.

* **cs.ET - Emerging Technologies** ([new](/list/cs.ET/new), [recent](/list/cs.ET/recent), [current month](/list/cs.ET/current))

Covers approaches to information processing (computing, communication, sensing) and bio-chemical analysis based on alternatives to silicon CMOS-based technologies, such as nanoscale electronic, photonic, spin-based, superconducting, mechanical, bio-chemical and quantum technologies (this list is not exclusive). Topics of interest include (1) building blocks for emerging technologies, their scalability and adoption in larger systems, including integration with traditional technologies, (2) modeling, design and optimization of novel devices and systems, (3) models of computation, algorithm design and programming for emerging technologies.

* **cs.FL - Formal Languages and Automata Theory** ([new](/list/cs.FL/new), [recent](/list/cs.FL/recent), [current month](/list/cs.FL/current))

Covers automata theory, formal language theory, grammars, and combinatorics on words. This roughly corresponds to ACM Subject Classes F.1.1, and F.4.3. Papers dealing with computational complexity should go to cs.CC; papers dealing with logic should go to cs.LO.

* **cs.GL - General Literature** ([new](/list/cs.GL/new), [recent](/list/cs.GL/recent), [current month](/list/cs.GL/current))

Covers introductory material, survey material, predictions of future trends,

biographies, and miscellaneous computer-science related material. Roughly includes all of ACM Subject Class A, except it does not include conference proceedings (which will be listed in the appropriate subject area).

* **cs.GR - Graphics** ([new](/list/cs.GR/new), [recent](/list/cs.GR/recent), [current month](/list/cs.GR/current))

Covers all aspects of computer graphics. Roughly includes material in all of ACM Subject Class I.3, except that I.3.5 is is likely to have Computational Geometry as the primary subject area.

* **cs.GT - Computer Science and Game Theory** ([new](/list/cs.GT/new), [recent](/list/cs.GT/recent), [current month](/list/cs.GT/current))

Covers all theoretical and applied aspects at the intersection of computer science and game theory, including work in mechanism design, learning in games (which may overlap with Learning), foundations of agent modeling in games (which may overlap with Multiagent systems), coordination, specification and formal methods for non-cooperative computational environments. The area also deals with applications of game theory to areas such as electronic commerce.

* **cs.HC - Human-Computer Interaction** ([new](/list/cs.HC/new), [recent](/list/cs.HC/recent), [current month](/list/cs.HC/current))

Covers human factors, user interfaces, and collaborative computing. Roughly includes material in ACM Subject Classes H.1.2 and all of H.5, except for H.5.1, which is more likely to have Multimedia as the primary subject area.

* **cs.IR - Information Retrieval** ([new](/list/cs.IR/new), [recent](/list/cs.IR/recent), [current month](/list/cs.IR/current))

Covers indexing, dictionaries, retrieval, content and analysis. Roughly
includes material in ACM Subject Classes H.3.0, H.3.1, H.3.2, H.3.3, and
H.3.4.

* **cs.IT - Information Theory** ([new](/list/cs.IT/new), [recent](/list/cs.IT/recent), [current month](/list/cs.IT/current))

Covers theoretical and experimental aspects of information theory and coding.
Includes material in ACM Subject Class E.4 and intersects with H.1.1.

* **cs.LG - Machine Learning** ([new](/list/cs.LG/new), [recent](/list/cs.LG/recent), [current month](/list/cs.LG/current))

Papers on all aspects of machine learning research (supervised, unsupervised,
reinforcement learning, bandit problems, and so on) including also robustness,
explanation, fairness, and methodology. cs.LG is also an appropriate primary
category for applications of machine learning methods.

* **cs.LO - Logic in Computer Science** ([new](/list/cs.LO/new), [recent](/list/cs.LO/recent), [current month](/list/cs.LO/current))

Covers all aspects of logic in computer science, including finite model
theory, logics of programs, modal logic, and program verification. Programming

language semantics should have Programming Languages as the primary subject area. Roughly includes material in ACM Subject Classes D.2.4, F.3.1, F.4.0, F.4.1, and F.4.2; some material in F.4.3 (formal languages) may also be appropriate here, although Computational Complexity is typically the more appropriate subject area.

* **cs.MA - Multiagent Systems** ([new](/list/cs.MA/new), [recent](/list/cs.MA/recent), [current month](/list/cs.MA/current))

Covers multiagent systems, distributed artificial intelligence, intelligent agents, coordinated interactions. and practical applications. Roughly covers ACM Subject Class I.2.11.

* **cs.MM - Multimedia** ([new](/list/cs.MM/new), [recent](/list/cs.MM/recent), [current month](/list/cs.MM/current))

Roughly includes material in ACM Subject Class H.5.1.

* **cs.MS - Mathematical Software** ([new](/list/cs.MS/new), [recent](/list/cs.MS/recent), [current month](/list/cs.MS/current))

Roughly includes material in ACM Subject Class G.4.

* **cs.NA - Numerical Analysis** ([new](/list/cs.NA/new), [recent](/list/cs.NA/recent), [current month](/list/cs.NA/current))

cs.NA is an alias for math.NA. Roughly includes material in ACM Subject Class

G.1.

* **cs.NE - Neural and Evolutionary Computing** ([new](/list/cs.NE/new), [recent](/list/cs.NE/recent), [current month](/list/cs.NE/current))

Covers neural networks, connectionism, genetic algorithms, artificial life,
adaptive behavior. Roughly includes some material in ACM Subject Class C.1.3,
I.2.6, I.5.

* **cs.NI - Networking and Internet Architecture** ([new](/list/cs.NI/new), [recent](/list/cs.NI/recent), [current month](/list/cs.NI/current))

Covers all aspects of computer communication networks, including network
architecture and design, network protocols, and internetwork standards (like
TCP/IP). Also includes topics, such as web caching, that are directly relevant
to Internet architecture and performance. Roughly includes all of ACM Subject
Class C.2 except C.2.4, which is more likely to have Distributed, Parallel,
and Cluster Computing as the primary subject area.

* **cs.OH - Other Computer Science** ([new](/list/cs.OH/new), [recent](/list/cs.OH/recent), [current month](/list/cs.OH/current))

This is the classification to use for documents that do not fit anywhere else.

* **cs.OS - Operating Systems** ([new](/list/cs.OS/new), [recent](/list/cs.OS/recent), [current month](/list/cs.OS/current))

Roughly includes material in ACM Subject Classes D.4.1, D.4.2., D.4.3, D.4.4, D.4.5, D.4.7, and D.4.9.

* **cs.PF - Performance** ([new](/list/cs.PF/new), [recent](/list/cs.PF/recent), [current month](/list/cs.PF/current))

Covers performance measurement and evaluation, queueing, and simulation. Roughly includes material in ACM Subject Classes D.4.8 and K.6.2.

* **cs.PL - Programming Languages** ([new](/list/cs.PL/new), [recent](/list/cs.PL/recent), [current month](/list/cs.PL/current))

Covers programming language semantics, language features, programming approaches (such as object-oriented programming, functional programming, logic programming). Also includes material on compilers oriented towards programming languages; other material on compilers may be more appropriate in Architecture (AR). Roughly includes material in ACM Subject Classes D.1 and D.3.

* **cs.RO - Robotics** ([new](/list/cs.RO/new), [recent](/list/cs.RO/recent), [current month](/list/cs.RO/current))

Roughly includes material in ACM Subject Class I.2.9.

* **cs.SC - Symbolic Computation** ([new](/list/cs.SC/new), [recent](/list/cs.SC/recent), [current month](/list/cs.SC/current))

Roughly includes material in ACM Subject Class I.1.

* **cs.SD - Sound** ([new](/list/cs.SD/new), [recent](/list/cs.SD/recent), [current month](/list/cs.SD/current))

Covers all aspects of computing with sound, and sound as an information channel. Includes models of sound, analysis and synthesis, audio user interfaces, sonification of data, computer music, and sound signal processing. Includes ACM Subject Class H.5.5, and intersects with H.1.2, H.5.1, H.5.2, I.2.7, I.5.4, I.6.3, J.5, K.4.2.

* **cs.SE - Software Engineering** ([new](/list/cs.SE/new), [recent](/list/cs.SE/recent), [current month](/list/cs.SE/current))

Covers design tools, software metrics, testing and debugging, programming environments, etc. Roughly includes material in all of ACM Subject Classes D.2, except that D.2.4 (program verification) should probably have Logics in Computer Science as the primary subject area.

* **cs.SI - Social and Information Networks** ([new](/list/cs.SI/new), [recent](/list/cs.SI/recent), [current month](/list/cs.SI/current))

Covers the design, analysis, and modeling of social and information networks, including their applications for on-line information access, communication, and interaction, and their roles as datasets in the exploration of questions in these and other domains, including connections to the social and biological sciences. Analysis and modeling of such networks includes topics in ACM Subject classes F.2, G.2, G.3, H.2, and I.2; applications in computing include

topics in H.3, H.4, and H.5; and applications at the interface of computing and other disciplines include topics in J.1--J.7. Papers on computer communication systems and network protocols (e.g. TCP/IP) are generally a closer fit to the Networking and Internet Architecture (cs.NI) category.

* **cs.SY - Systems and Control** ([new](/list/cs.SY/new), [recent](/list/cs.SY/recent), [current month](/list/cs.SY/current))

cs.SY is an alias for eess.SY. This section includes theoretical and experimental research covering all facets of automatic control systems. The section is focused on methods of control system analysis and design using tools of modeling, simulation and optimization. Specific areas of research include nonlinear, distributed, adaptive, stochastic and robust control in addition to hybrid and discrete event systems. Application areas include automotive and aerospace control systems, network control, biological systems, multiagent and cooperative control, robotics, reinforcement learning, sensor networks, control of cyber-physical and energy-related systems, and control of computing systems.

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