CATEGORIES ON THE ARXIV

COLTON GRAINGER

1. Mathematics

- math.AG - Algebraic Geometry Algebraic varieties, stacks, sheaves, schemes, moduli spaces, complex geometry, quantum cohomology (subsumes alg-geom)
- math.AT - Algebraic Topology Homotopy theory, homological algebra, algebraic treatments of manifolds
- math.CT - Category Theory Enriched categories, topoi, abelian categories, monoidal categories, homological algebra
- math.CA - Classical Analysis and ODEs Special functions, orthogonal polynomials, harmonic analysis, ODE's, differential relations, calculus of variations, approximations, expansions, asymptotics
- math.CO - Combinatorics Discrete mathematics, graph theory, enumeration, combinatorial optimization, Ramsey theory, combinatorial game theory
- math.AC - Commutative Algebra Commutative rings, modules, ideals, homological algebra, computational aspects, invariant theory, connections to algebraic geometry and combinatorics
- math.CV - Complex Variables Holomorphic functions, automorphic group actions and forms, pseudoconvexity, complex geometry, analytic spaces, analytic sheaves
- math.DG - Differential Geometry Complex, contact, Riemannian, pseudo-Riemannian and Finsler geometry, relativity, gauge theory, global analysis (subsumes dg-ga)
- math.DS - Dynamical Systems Dynamics of differential equations and flows, mechanics, classical few-body problems, iterations, complex dynamics, delayed differential equations
- math.FA - Functional Analysis Banach spaces, function spaces, real functions, integral transforms, theory of distributions, measure theory (subsumes funct-an)
- math.GM - General Mathematics mathematical material of general interest, topics not covered elsewhere
- math.GN - General Topology Continuum theory, point-set topology, spaces with algebraic structure, foundations, dimension theory, local and global properties
- math.GT - Geometric Topology Manifolds, orbifolds, polyhedra, cell complexes, foliations, geometric structures
- math.GR - Group Theory Finite groups, topological groups, representation theory, cohomology, classification and structure
- math.HO - History and Overview Biographies, philosophy of mathematics, mathematics education, recreational mathematics, communication of mathematics
- math.KT - K-Theory and Homology Algebraic and topological K-theory, relations with topology, commutative algebra, and operator algebras
- math.LO - Logic Logic, set theory, point-set topology, formal mathematics

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- math.MP - Mathematical Physics mathematical methods in quantum field theory, quantum mechanics, statistical mechanics, condensed matter, nuclear and atomic physics
- math.MG - Metric Geometry Euclidean, hyperbolic, discrete, convex, coarse geometry, comparisons in Riemannian geometry, symmetric spaces
- math.NT - Number Theory Prime numbers, diophantine equations, analytic number theory, algebraic number theory, arithmetic geometry, Galois theory
- math.NA - Numerical Analysis Numerical algorithms for problems in analysis and algebra, scientific computation
- math.OA - Operator Algebras Algebras of operators on Hilbert space, Cˆ*-algebras, von Neumann algebras, non-commutative geometry
- math.OC - Optimization and Control Operations research, linear programming, control theory, systems theory, optimal control, game theory
- math.PR - Probability Theory and applications of probability and stochastic processes: e.g. central limit theorems, large deviations, stochastic differential equations, models from statistical mechanics, queuing theory
- math.RT - Representation Theory Linear representations of algebras and groups, Lie theory, associative algebras, multilinear algebra
- math.RA - Rings and Algebras Non-commutative rings and algebras, non-associative algebras, universal algebra and lattice theory, linear algebra, semigroups
- math.SP - Spectral Theory Schrodinger operators, operators on manifolds, general differential operators, numerical studies, integral operators, discrete models, resonances, non-self-adjoint operators, random operators/matrices
- math.ST - Statistics Theory math.ST is an alias for stat.TH. Applied, computational and theoretical statistics: e.g. statistical inference, regression, time series, multivariate analysis, data analysis, Markov chain Monte Carlo, design of experiments, case studies
- math.SG - Symplectic Geometry Hamiltonian systems, symplectic flows, classical integrable systems

2. Computer Science

- cs.CC - Computational Complexity 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 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 Roughly includes material in ACM Subject Classes I.3.5 and F.2.2.
- cs.CR - Cryptography and Security 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.DS - Data Structures and Algorithms 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.DB - Databases 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.DM - Discrete Mathematics Covers combinatorics, graph theory, applications of probability. Roughly includes material in ACM Subject Classes G.2 and G.3.
- cs.FL - Formal Languages and Automata Theory 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 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.HC - Human-Computer Interaction 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.LO - Logic in Computer Science 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.LG - Machine Learning Covers machine learning and computational (PAC) learning. Roughly includes material in ACM Subject Class I.2.6.
- cs.MS - Mathematical Software Roughly includes material in ACM Subject Class G.4.
- cs.NA - Numerical Analysis Roughly includes material in ACM Subject Class G.1.
- cs.PL - Programming Languages 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.SI - Social and Information Networks 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.SE - Software Engineering 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.