The 30 tenure-line and research faculty members of the Department of Computer Science (CS) at CU-Boulder are engaged in research programs that address some of the most important challenges facing society today. From modeling the climate to understanding the role of social media, fundamental advances in computer science are changing the world around us.

Our diverse community of computer scientists is addressing basic computational challenges in the following areas:

- Artificial intelligence
- Programming systems and software engineering
- Numerical and scientific computing
- Systems and networking
- Human-centered computing
- Computational biology
- Theory of computing

Computer science at CU-Boulder is characterized by an unusual degree of deeply interdisciplinary research. Our faculty hold joint appointments in numerous departments across campus, and faculty members from linguistics to aerospace engineering sciences hold courtesy appointments in CS.

Our faculty and research staff are also integral members of industry and government funded research efforts with the Institute of Cognitive Science, the Interdisciplinary Telecommunications Program, the BioFrontiers Institute, and the School of Education, as well as having joint efforts with many of the other engineering departments.

Recent Highlights

- CS PhD candidate John Giacomoni and former CU professor Manish Vachharajani recently sold their startup LineRate Systems to F5 Networks for nearly $125 million. LineRate Systems emerged from research Giacomoni and Vachharajani initiated at CU. LineRate then licensed the technology from the university. F5 plans to maintain an office in Boulder to continue work on the LineRate product and technology.
- Aaron Clauset, along with colleagues Mark Newman at the University of Michigan and Cris Moore at the Santa Fe Institute, has been awarded a $3 million grant from the Defense Advanced Research Projects Agency (DARPA) and the Air Force Office of Scientific Research to develop network analysis techniques based on probabilistic generative models.
- Bor-Yuh Evan Chang received a $460K NSF CAREER Award for his research on “Cooperative Program Analysis: Bridging the Gap between User and Tool Reasoning.” He joins recent CS colleagues Sriram Sankaranarayanan and Katie Siek, who also received NSF CAREER Awards in 2009 and 2010, respectively.
- Nikolaus Correll was awarded a NASA Early Career Faculty Fellowship for his research aimed at facilitating the production of food in space to enable extended space missions.
- Xiao-Chuan Cai and Richard Byrd received a $752K DOE award to study “Scalable Optimization Algorithms for Systems Governed by Multi-Physics PDEs.” The project investigates parallel algorithms for numerical based control and stabilization of fluid instabilities.
- Douglas Sicker returned to CU after a two-year stint in Washington, D.C., where he served terms as the Chief Technical Officer for both the Federal Communication Commission and the National Telecommunications and Information Administration.

Department Facts

- The computer science department is home to Distinguished Professor Andrzej Ehrenfeucht and President’s Teaching Scholars Clayton Lewis and Mike Eisenberg.
- Research expenditures in the department reached $5.7M in 2013, for an average of $196K per faculty member.
- The department is home to an innovative five-year, $2.4 million NSF grant to fund 10 graduate student fellows each year to enrich traditional high school and middle school classes with computational thinking.
- CS is home to 99 PhD, 107 MS, 34 ME and 9 BS/MS students:
  - The average GPA for incoming students is 3.49/4.0.
  - The average quantitative GRE score for incoming graduate students is 163/166 on the new GRE scale.
Research Centers and Facilities

Center for Software and Society (CSS)
CSS, the department’s newest research center, carries out research that capitalizes on specialties of computing that cross boundaries in computer science and engineering disciplines. Its efforts derive from the philosophy that human-centered computing can serve to problematize important computing and engineering endeavors. Its current focus is on crisis informatics.

Computational Language and Education Research (CLEAR)
CLEAR is focused on research and education in all areas of human language technology, including parsing, computational semantics, speech recognition and, machine translation. Its mission is to advance the state of the art in speech and language processing and to apply this technology to education, health informatics, and social media.

Life-Long Learning and Design (L3D)
Established in 1993, the mission of L3D is to establish the scientific foundations for the envisionment, design, development, and assessment of socio-technical systems that serve as amplifiers of human capabilities and that will bring dramatic and transformative improvements in the ways people live, learn, work, and collaborate.

Faculty in Computer Science

Kenneth M. Anderson
Associate Professor. Software engineering, hypermedia and the WWW, human-computer interaction, computer-supported cooperative work.

John K. Bennett
Professor and Director of ATLAS Institute. Distributed information management, distributed robotic sensors, digital divide.

John R. Black
Associate Professor. Cryptography, network security; provable security, efficient implementations, probabilistic algorithms.

Elizabeth Bradley
Professor. Scientific computation and artificial intelligence, nonlinear dynamics and chaos.

Richard H. Byrd
Professor. Nonlinear optimization, linear programming, numerical linear algebra, nonlinear data fitting, global optimization in molecular chemistry, parallel computing.

Xiao-Chuan Cai
Professor. Scientific computing, parallel algorithms and software for partial differential equations.

Bor-Yuh Evan Chang
Assistant Professor. Tools and techniques for building, understanding, and ensuring reliable computational systems.

Aaron Clauset
Assistant Professor. Complex networks, statistical forecasting, stochastic processes, massive data sets, terrorism, war and societal dynamics, macroevolution, computational biology and biological computation.

Nikolaus J. Correll
Assistant Professor. Combinatorial algorithms, graph theory, computational molecular biology, genomic network analysis, analysis of noisy and error-prone data.

Dirk C. Grumwald
Professor. Computer architecture, object parallel languages and scalable runtime systems for distributed cache architectures.

Richard Y. Han
Associate Professor. Systems (Networks), Systems (Operating Systems), Ubiquitous computing/pervasive computing, distributed mobile applications, context-aware smart spaces and sensor networks.

Elizabeth R. Jessup
Professor. High-performance scientific computing, numerical linear algebra, design, analysis, and serial and parallel algorithms for matrix algebra.

Roger A. (Buzz) King
Professor. Databases, data integration, database-centric web apps, and multimedia and animation data management.

Clayton H. Lewis
Professor. User interface design, human-computer interaction, cognitive architectures, design of programming languages, end-user programming, computer supported negotiation.

Qin (Christine) Lv
Assistant Professor. Efficient systems design for massive data, search systems, data management, distributed systems, online social communities.

Michael G. Main
Professor. Theory of computation, introductory programming.

James H. Martin
Professor and Chair. Natural language processing, computational linguistics, information retrieval, machine learning.

Shivakant Mishra
Associate Professor. Dependable distributed systems, communication protocols, operating systems.

Michael C. Mozer
Professor. Cognitive science and cognitive neuroscience, computational modeling of human perception and cognition, machine learning, data mining.

Leyisia A. Palen
Associate Professor. Computer Supported Cooperative Work (CSCW), Human Computer Interaction (HCI), groupware studies, wireless computing adoption and practice.

Alexander Repenning
Research Associate Professor. Visual programming; interactive simulation, computers in education, agents.

Sriram Sankaranarayanan
Assistant Professor. Verification, specification and modeling of systems, embedded, real time, concurrent and hybrid systems, constraint solving, optimization and decision procedures, automata, programming language theory and logic.

Douglas C. Sicker
Professor. Cognitive and software defined radios, network performance, telecommunications policy.

Tamara R. Sumner
Associate Professor. Education and educational technology, interactive publishing, socio-technical design.

Henry M. Tufo
Professor. High-performance scientific computing, scalable multilevel solvers, lightweight software tools, immersive visualization.

Wayne H. Ward
Research Professor. Speech recognition, robust parsing of spoken input, integrating natural language processing with speech decoding, conversational voice interface.

Tom Yeh
Assistant Professor. Machine intelligence, human-computer interaction, computer vision, software engineering, human-center computing, intelligent user interfaces, and mobile computing.

More Information

James H. Martin
Chair, Department of Computer Science
University of Colorado Boulder
430 UCB, Boulder, CO 80309-0430
303-492-3552
james.martin@colorado.edu

Kurt Maute
Associate Dean for Research
Joseph Negler Endowed Professor
College of Engineering and Applied Science
University of Colorado Boulder
422 UCB, Boulder, CO 80309-0422
303-735-2103
maute@colorado.edu

Molly Riddell
Manager of Large Proposals
College of Engineering and Applied Science
University of Colorado Boulder
422 UCB, Boulder, CO 80309-0422
303-492-9103
molly.riddell@colorado.edu

www.colorado.edu/cs