computer science & engineering
DEPARTMENT REPORT 2012-2013
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CS&E AT A GLANCE

Associate Professor Chad Myers with students.

Professor Maria Gini speaking at the 2013 Open House and Tech Forum.

Attendees at the 2013 Open House and Tech Forum poster session.

December 2013

Computer Science faculty: 39
Graduate Students (full- and part-time):
   M.S. 168
   Ph.D. 228
Graduate Assistantships 202
Number of degrees awarded January 2012-December 2013:
   Bachelor of Arts in Computer Science 49
   Bachelor of Science
      Computer Science 278
      Computer Engineering 69
   Master of Science
      Computer Science 168
      Software Engineering 78
   Ph.D. in Computer Science 56
The past two years have seen an unprecedented level of activity in the department that is reflected in numerous awards and honors for the department’s faculty and students, as well as requests for keynote talks and leadership roles at major scientific conferences and science policy forums for our faculty and students.

We are pleased to be able to share these successes and achievements over the past two years through this report. As you can see in these pages, you will find ample evidence that our work continues to sow the seeds of excellence in undergraduate and graduate education, research and discovery, service and outreach to industry and community.

Excellence in Undergraduate and Graduate Education

Computer science departments around the country are experiencing huge enrollment increases. At Minnesota, our enrollments rose 27% over the past two years, continuing a trend of enrollment increases in the department each of the preceding six years. The department continues to grow to meet this demand for local and national workforce. Two new instructors, Amy Larson and Dan Challou joined our award-winning team. We also recruited four outstanding young researchers as assistant professors: Stephen Guy, Brent Hecht, Dan Knights and Stephen McCamant. Their research spans the areas of graphics, social computing, bioinformatics and computer security.

Despite the challenges arising from sustained year by year enrollment increases, we are happy to report that the quality of training received by our students continues to be outstanding. Over 55 undergraduate students participated in research over the past two years and many of them co-authored papers in top international conferences. We graduated a record number of students over the past two years. These graduates have been in high demand locally and nationally by top companies like Google, Amazon, Microsoft, Apple, IBM and Yahoo as well as academic institutions around the world. In addition, a number of our recent Ph.D. graduates have been recruited as faculty by top Medical Schools.

We have many exceptional students, and we are proud to be able to share their accomplishments with you, among them is the Barry M. Goldwater scholarship for Chung-Yun (George) Chao, the President’s Student Leadership and Service Award for James Faghmous, the IBM fellowship awards for Puja Das and Dimitri Jevremovic, and a CRA Outstanding Undergraduate Award (honorable mention) for Muhammed Uluyol. A record 17 graduate students were awarded a Doctoral Dissertation Fellowship by the University of Minnesota Graduate School and additional three students received an Interdisciplinary Doctoral Fellowship. Twenty-one papers co-authored by our students and faculty received best paper awards at various national and international forums.

Our alumni continue to receive high recognition on the national and international stage. Senior Google Fellow Jeff Dean received the 2012 ACM - Infosys Foundation Award “for his leadership in the science and engineering of internet-scale distributed systems.” Dean was also honored with a 2013 Outstanding Alumni Award from the University of Minnesota. Suzanne Shontz, an assistant professor at Mississippi State University, received a highly prestigious NSF Presidential Early Career Awards for Scientists and Engineers for her project on parallel dynamic meshing algorithms, theory, and software for simulation-assisted medical interventions. Ananth Grama, a professor at Purdue University, was elected Fellow of AAAS. Gang Fang, an assistant professor at the Mt. Sinai School of Medicine, received the "Best Dissertation Award" from the University of Minnesota for his Ph.D. dissertation “Discovering Combinatorial Disease Biomarkers.”

Ranked among the top 20 universities in the nation in Artificial Intelligence, Distributed & Parallel Computing, Networking, Human-Computer Interaction, and the World Wide Web, and 4th worldwide in Data Mining.

-Microsoft Academic Search Engine, January 2014
Research and Discovery

As the reach of computer science grows into virtually every aspect of our modern lives, from lifesaving medical research in cancer patients to understanding how social media impacts e-commerce, our faculty are playing leading role in advancing these frontiers with numerous projects with collaborators across the University, the country and the world.

As an example, in 2013, Loren Terveen released the first-ever study of Pinterest, providing insight into the activity on the popular social networking site. Chad Myers and his collaborators at the Mayo Clinic and the University of Toronto successfully showed that a new method for targeting mutated cells could create a major breakthrough in a personalized medicine approach to treat cancer.

Dan Knights’ collaboration with researchers at the Mayo Clinic was awarded a grant for nearly $1M to understand the roles of gut microbes in irritable bowel syndrome, and to develop approaches for shifting the gut microbiome of patients toward a healthier state. My work with Arindam Banerjee and Shashi Shekhar, “Understanding Climate Change: Data Driven Approach,” was showcased at NSF in a day long review. This five-year, $10M project is funded by NSF’s Expeditions in Computing program with the goal of pushing the boundaries of computer science research.

Our faculty is playing a major role in several new initiatives at the University. As a part of a college wide Minnesota’s Discovery, Research and InnovaVation Economy initiative in the area of robotics, sensors and advanced manufacturing, 15 new faculty positions have been made available that will help us increase our leadership and visibility in this area of national importance. Associate Department Head Joe Konstan has taken a major role in the University’s new Social Media and Business Analytics Collaborative, where researchers and industry leaders are collaborating to advance understanding of today’s data-rich, socially-networked world.

Professor Dan Boley is leading the establishment of a new master’s degree program in the area of Data Sciences involving faculty from four departments, designed to provide students with a rigorous treatment of the statistics, algorithmics, and infrastructure underlying today’s advanced data driven society.

Service and Outreach

We continue to look for ways to support local, state and national computing initiatives by hosting and participating in events to promote the field of computer science. As the importance of, and dependence on, computing technology on our daily life grows, we seek new ways to communicate how vital our work is to the success of the local and state economy and how it benefits the public. These range from participation in advisory groups such as Computing Community Consortium and World Economic Forum, to expanding our student base through massively open online courses, to local small-group tech camps on robotics for kids. We also host specialized computing events like the launch of the Minnesota chapter of the Geekettes, SQL Saturday and Twin Cities Code Camp.

Professor Maria Gini was the local co-chair of the 2013 Grace Hopper Celebration of Women in Computing, which had a record attendance of 4,750 people. The University of Minnesota had more attendees than any other academic institution with more than 60 students and faculty present.
Our faculty are taking a leading role in the development of massively open online courses (MOOC). Associate Department Head Joe Konstan taught the department’s first MOOC in the fall of 2013. “Introduction to Recommender Systems” introduced the concepts, applications, algorithms, programming, and design of recommender systems and had 23,000 registered students. Professors Shekhar and Hecht are planning a second MOOC offering on the topic of spatial computing in Fall 2014.

We are helping fuel the local and national workforce. To better team with industry leader, the department formed a new advisory group, the Industry Affiliates Council (IAC). Our IAC members are involved in recruitment events, research, networking, and finding ways to incorporate more industry collaboration in the undergraduate classroom.

We continue to be supported by the Computer Science Associates (CSA) in seeking more active outreach in promoting computer science. CSA is currently collaborating with CS&E alumnus and Distinguished Alumni Awardee Rebecca Schatz. Her group CodeSaavy is a not-for-profit organization that inspires kids and teens to understand the kind of creative thinking that goes into coding, and to try out programming computers and devices.

We held our ninth biennial Open House and Tech Forum in 2013 at the McNamara Alumni Center, with a keynote provided by Roni Kohavi of Microsoft. Nearly 275 people attended the Open House and participated in our popular poster session featuring the work our faculty, students and industry friends, and a panel discussion by CS&E faculty.

Looking Forward
Our faculty and students give us so many reasons to be proud of the work that we are doing here in Minnesota, and I encourage you to see the many more examples of that excellence in this report. This excellence is being recognized by various measures. For example, a ranking of academic programs by Microsoft Research places our department in top-20 in several research areas including HCI, scientific computing, artificial intelligence, and networking. In the area of data mining, the department is ranked fourth world-wide amongst academic institutions.

We would like to acknowledge and thank Yongdae Kim for his contributions to the department. Kim joined the faculty of the Korea Advanced Institute of Science and Technology in 2012. In 2013 we lost a gifted friend and researcher, John Riedl. We would like to thank all of our alumni and friends who contributed to the department in his memory.

There are so many reasons to celebrate the work that we are doing here in Minnesota. My colleagues and I appreciate the commitment that we receive form our alumni and friends. Your support of the department’s goals make this level of excellence possible.

— Vipin Kumar
William Norris Professor and
CS&E Department Head
A reflection of accomplishments in Keller Hall

CS&E and Electrical and Computer Engineering collaborated in creating a permanent art display commemorating the impact the departments have made in the fields of supercomputing, medical devices, and the Internet. The display honors the world-renowned achievements of the departments and their alumni: the pioneering work in computing by Seymour Cray, the lifesaving pacemaker work of Medtronic co-founder Earl Bakken and the continued record of medical innovation in the state of Minnesota, and the pioneering work at the University of Minnesota in starting the Internet and recommender systems.

Dovolis Receives University Undergraduate Teaching Award

Instructor Chris Dovolis was selected to receive the 2013 Morse-Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education. He is the second faculty in the Department who has received this award, and the first P&A instructor selected for this distinction.

Kumar Wins ACM SIGKDD Innovation Award

Department Head Vipin Kumar has received the ACM SIGKDD 2012 Innovation Award, the highest award for technical excellence in the field of Knowledge Discovery and Data Mining. Kumar was honored for his contributions to foundational research in data mining and its applications to mining scientific data.

Professor Joe Konstan selected for 2013 SIGCHI Lifetime Service Award

Professor Joe Konstan received the 2013 SIGCHI Lifetime Service Award which goes to individuals who have contributed to the growth of SIGCHI in a variety of capacities, and honors individuals who have provided extended services to the community at large over a number of years.

10-Year ICDM Highest Impact Paper award for Professor George Karypis and alumnus Michihiro Kuramochi

Professor George Karypis and Michihiro Kuramochi (Ph.D. 2005) were awarded the 10-year Highest Impact Paper Award at the 10th IEEE International Conference on Data Mining for their paper “Frequent Subgraph Discovery.” Kuramochi is a software engineer at Google.

2012 INFORMS ISS Design Science Award for Ketter, Collins, Gini, Schrater

Alumnus Wolfgang Ketter of Erasmus University together with Professors John Collins, Maria Gini, Alok Gupta, and Paul Schrater have received the 2012 INFORMS ISS Design Science Award for their work on design of automated agents capable of recognizing and forecasting the economic environment. The award recognizes research centered on design and realization of innovative information technology artifacts.
New Medical Devices Center runs on CS&E research and technology

A new state-of-the-art Medical Devices Center celebrated its grand opening on June 4, 2013. The new 8,000-square-foot center expands upon the previous center space in Shepherd Labs. Facilities include a 3D Virtual Design Lab, Imaging Lab, SimPortal/Anatomy and Physiology Lab, Mechanical and Electronic Fabrication Labs, Wet Lab and Brainstorming Rooms. The research and technology of Assistant Professor Dan Keefe’s lab, the 3D Virtual Reality Touch Table, and novel interfaces to drive it are the highlight of the center’s tours.

Two McKnight Professorships awarded to CS&E faculty members Keefe and Zhang.

Professor Zhi-Li Zhang was named a recipient of a 2013 Distinguished McKnight University Professorship for his work in computer networking and Internet development. He is the fifth CS&E faculty to receive this prestigious award. Assistant Professor Dan Keefe was awarded the McKnight Land-Grant Professorship. Keefe’s research integrates 3D computer graphics, human-computer interfaces, and real-world applications. He is the 15th faculty from the Department to receive this recognition.

Saad awarded SIAM outstanding paper

Professor Yousef Saad won a 2013 Society for Industrial and Applied Mathematics (SIAM) Outstanding Paper Prize for his paper “The trace ratio optimization problem for dimensionality reduction” written with Thanh Ngo and Mohammed Bellalij. The award is given for outstanding papers published in SIAM journals during the past three years. Saad and his co-authors were selected for the journal *SIAM Journal on Matrix Analysis and Applications* for the year 2012.

CS&E offers its first MOOC - Introduction to Recommender Systems

CS&E offered its first MOOC course in 2013 via Coursera. “Introduction to Recommender Systems,” taught by Joe Konstan and Michael Ekstrand. The for-credit course introduces the concepts, applications, algorithms, programming, and design of recommender systems—software systems that recommend products or information, often based on extensive personalization. Students learned how Web merchants such as Amazon.com personalize product suggestions.

Undergraduate Chun-Yun (George) Chao named Goldwater Scholar

CS&E student Chung-Yun (George) Chao was one of three University of Minnesota undergraduates to have been named a 2012 Barry M. Goldwater Scholar. The prestigious Goldwater Scholarship is awarded annually to outstanding sophomores and juniors in mathematics, science and engineering who intend to pursue research-oriented careers in mathematics, the natural sciences and engineering.

$3.5M grant awarded to Roumeliotis’ team

A team led by Professor Stergios Roumeliotis has been awarded a $3.5 million grant from the National Science Foundation. The award is part of the National Robotics Initiative and will fund research in collaborative robotics, particularly humanoid robots that are designed to assist humans with carrying and manipulating large and heavy objects. Collaborators include Aerospace Engineering and Mechanics Associate Professor Demoz Gebre-Egziabher and faculty from the University of Delaware, Drexel University, the University of Pennsylvania, and the University of Illinois at Urbana - Champaign.

Fast Company Magazine names ReconRobotics one of the 50 most innovative companies in the world

CS&E startup ReconRobotics was recognized as one of the “World’s Most Innovative Companies” by Fast Company magazine in 2012. Inventor of the tactical micro-robot and a major supplier of robotic technologies to military units and law enforcement agencies worldwide ReconRobotics was ranked 44th on the list of honorees.
**FACULTY Awards**

We are especially proud of the achievements of our faculty, who have been lauded with an impressive list of awards.

**ENDOWED CHAIRS**
- William Norris Land Grant Chair in Large-Scale Computing: Kumar, Saad, Sameh*, Yew
- Qwest Land Grant Chair in Telecommunications: Du, Zhang
- ERA Land Grant Chair in the History of Technology: Norberg (retired)

**COLLEGE AWARDS**
- **College of Science and Engineering**
  - Distinguished Professorship: Gini, Saad
  - Taylor Award: Konstan, Riedl, Zhang
  - Charles E. Bowers Teaching Award: Hsu*, Konstan
  - Guillermo Borja Award: Roumeliotis
- **College of Continuing Education**
  - Distinguished Teaching Award: Gini

**UNIVERSITY-WIDE AWARDS**
- Ada Comstock Distinguished Women Scholars Lecture: Gini
- Award for Outstanding Contributions to Postbaccalaureate, Graduate, and Professional Education: Heimdahl, Konstan
- Distinguished McKnight University Professorship: Konstan, Papanikolopoulos, Riedl, Shekhar, Zhang
- Distinguished Women Scholar: Gini
- Institute on the Environment Resident Fellow: Banerjee, Isler, Shekhar
- McKnight Land-Grant Professorship: Banerjee, Chen*, He, Heimdahl, Hopper, Interrante, Isler, Keefe, Kim*, Myers, Papanikolopoulos, Roumeliotis, Schuler, Van Wyk, Zhang
- Morse-Minnesota Alumni Association Award for Outstanding Contributions to Undergraduate Education: Dovolis, Gini
- Mullen-Spector-Traux Women’s Leadership Award: Gini
- Richard P. Braun Distinguished Service Award: Papanikolopoulos

**NATIONAL AWARDS**
- AAAI Fellow: Gini
- AAAS Fellow: Konstan, Kumar, Saad, Shekhar
- ACM Distinguished Scientist: Gini, Konstan, Riedl, Terveen
- ACM Fellow: Konstan, Kumar, Riedl
- ACM SIGKDD Innovation Award: Kumar
- ACM Software Systems Award: Konstan, Riedl
- IBM Faculty Award: Chandra, Srivastava, Zhai, Zhang
- IEEE Fellow: Du, Konstan, Kumar, Papanikolopoulos, Riedl, Shekhar, Srivastava, Tripathi, Yew, Zhang
- IEEE Technical Achievement Award: Kumar, Shekhar
- INFORMS ISS Design Science Award: Gini, Schrater
- NSF PECASE Award: Interrante, Roumeliotis, Schuler*
- PAKDD Distinguished Contributions Award: Srivastava
- SIAM Fellow: Saad
- SIGCHI Lifetime Service Award: Konstan
- UMUAI James Chen Award: Konstan, Riedl

*No longer with the CS&E department

**DEPARTURES**

**Yongdae Kim**
In 2012 Yongdae Kim joined the Department of Electrical Engineering at the Korea Advanced Institute of Science and Technology where he is continuing his work in the security of emerging and current systems after 10 years of service in the department. His research involves design and implementation of attacks, design and implementation and analysis of secure systems.
Arvind (M.S. 1977, Ph.D. 1973), Massachusetts Institute of Technology professor, was awarded the IEEE Computer Society's 2012 Harry H. Goode Award. Arvind was recognized “for fundamental contributions to research in dataflow computing, memory models, and cache coherence protocols.” Arvind was also recently elected Fellow of the American Academy of Arts and Sciences.

Gang Fang, (Ph.D. 2013) was awarded the University of Minnesota Graduate School’s “Best Dissertation Award” in the Physical Sciences & Engineering for 2013 for “Discovering Combinatorial Disease Biomarkers.” Fang is currently an Assistant Professor at Mount Sinai School of Medicine.

Steve Goddard, (B.A. 1985) was appointed interim dean of the University of Nebraska - Lincoln College of Arts and Sciences.

Ananth Grama, (Ph.D. 1996) was elected Fellow by the American Association for the Advancement of Science (AAAS). Grama is currently a Professor at Purdue University.

Anjali Joshi (M.S. 2003, Ph.D. 2008) was been promoted to senior team lead at The MathWorks where she is managing the core Simulink Design Verifier team.

Costas Bekas and his team at IBM were awarded the prestigious Gordon Bell Prize, among the highest honors for high-performance computing. Bekas's team has been researching bubbles, or more specifically, bursting bubbles and their implications in medical treatments. Before working at IBM, Bekas was a postdoctoral assistant for Professor Yousef Saad from 2003 to 2005.

Scott Brandt (M.S. 1993) was appointed Vice Chancellor for Research at the University of California, Santa Cruz, where he has been a faculty member in the Computer Science Department since 1999.

Kelsey Bruso (Ph.D. 2007) was named a Distinguished Engineer for Unisys Corporation.

Dan Cosley (Ph.D. 2006) was appointed General Co-Chair of the 18th ACM on Computer Supported Cooperative Work and Social Computing (CSCW 2015). Cosley is an Assistant Professor at Cornell University.

Jeff Dean (B.S. 1990) received the 2012 ACM - Infosys Foundation Award “for his leadership in the science and engineering of internet-scale distributed systems.” He also received a 2013 Outstanding Alumni Award from the University of Minnesota. Dean is a Senior Fellow at Google.

Wolf Ketter (Ph.D. 2006) was promoted to full professor at the Rotterdam School of Management, Erasmus University, in the Department of Decision and Information Sciences. Ketter is the founder and director of the Erasmus Center for Future Energy Business. He is also the leader of the Power TAC project.

Ajitha Rajan (Ph.D. 2007) was appointed Chancellor's Fellow/Lecturer at the School of Informatics in the University of Edinburgh, Scotland.

Suzanne Shontz, who completed a post-doc position with Professor Yousef Saad at the CS&E department from 2004-2006, received a 2011 NSF Presidential Early Career Awards for Scientists and Engineers for her project on parallel dynamic meshing algorithms, theory, and software for simulation-assisted medical interventions.

Eugene Vasserman (M.S. 2008, Ph.D. 2010) received an NSF CAREER award on “Safety and security for next-generation world-scale real-time medical systems.” Vasserman is an assistant professor at Kansas State University.

Richard Weinberg (M.S. Ph.D. 1982), CS&E Distinguished Alumnus Award recipient, was installed as the Charles S. Swartz Chair in Entertainment Technology at the University of Southern California (USC) School of Cinematic Arts (SCA).
**BEST PAPERS 2012**
2012 IEEE ICIP, Anoop Cherian, Vassilios Morellas and Nikolaos Papanikolopoulos
2012 IEEE ICDM, Ze Tian and Huanan Zhang
2012 IEEE International Conference on Data Mining, Ph.D. Student Forum, Vanja Pauníc, Michael Steinbach, Martin Maiers and Vipin Kumar

**ACM SIGSPATIAL International Conference on Advances, Abbeldawab Hendawi, Mohamed Mokbel**
**ACM SIGSPATIAL International Conference on Advances, Saladi Rahul, Ravi Janandian**
**COLING 2012**, Luuan Nguyen, Marten Van Schijndel and William Schuler
**MinneWIC 2012**, Jaya Kawale, Vipin Kumar, Stefan Liess and Michael Steinbach
**2012 SIAM SDM**, Soumyadeep Chatterjee, Karsten Steinhaeuser, Arindam Banerjee, Snigdhasnu Chatterjee and Auroop Ganguly

**BEST PAPERS 2013**
16th International Symposium on Research in Attacks, Intrusions and Defenses, Nan Jiang, Yu Jin and Ann Skudlar
2013 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, Shuo (Steven) Chang and Aditya Pal
2013 SIAM, Yousef Saad, Thanh Ngo and Mohammed Bellalij
2013 SIAM SDM13 Arindam Banerjee and Karthik Subbian
2013 SIAM Outstanding Paper Prize, Yousef Saad
**ACM HILT13** Sanjai Rayadurgam, Anitha Murugesan, Michael Whalen and Mats Heimdahl
**ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data**, Xun Zhou, Shashi Shekhar and Dev Oliver
**ACM Symposium on Cloud Computing**, Benjamin Heintz, Abhishek Chandra and Ramesh K. Sitaraman
**BigMine’13 workshop at KDD**, Arindam Banerjee and students Huahua Wang and Qiang Fu
**User Modeling and User-Adapted Interaction, the Journal of Personalization Research**, Joe Konstan and John Riedl
**U-Spatial Symposium 2013**, Abdeltawab Hendawi

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**STUDENT SCHOLARSHIPS, FELLOWSHIPS, and AWARDS**

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<th>2012 Barry M. Goldwater Scholar</th>
<th>Konstantina Christokopolou</th>
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<td>Chung-Yun (George) Chao</td>
<td>Michael Tetzlaff</td>
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<td>2012 Mary A. McEvoy Award for Public Engagement and Leadership</td>
<td>Departmental Fellowship</td>
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<td>James Faghmous</td>
<td>Karen Guo</td>
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<td>2012 President’s Student Leadership and Service Award</td>
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<td>James Faghmous</td>
<td>Gowtham Atturi</td>
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<td>3M Fellowship</td>
<td>Raamesh Deshpande</td>
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<td>Sanjoy Dey</td>
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<td>Hung Tuan Pham</td>
<td>Michael Evans</td>
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<td>Loren Fiore</td>
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<td>ADC Telecommunications Fellowship</td>
<td>Bret Jackson</td>
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<td>Ahmed Medhat Ahmed</td>
<td>Nan Jiang</td>
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<td>Ziqi Fan</td>
<td>Jaya Kawale</td>
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<td>ARCS Scholar Award</td>
<td>Mikhail Masli</td>
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<td>Joshua Vander Hook</td>
<td>Varun Mithal</td>
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<td>Best Graduate Student Research Award in the ACM Student Research Competition (SRC) at the Grace Hopper Conference</td>
<td>Avery Musbach</td>
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<td>Jaya Kawale</td>
<td>Esha Nerurkar</td>
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<td>College of Science and Engineering Fellowship</td>
<td>Dev Oliver</td>
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<td>IBM Ph.D. Fellowship</td>
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<td>Interdisciplinary Doctoral Fellowships</td>
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<td>Lando Scholarship</td>
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**BEST PAPERS 2013**
16th International Symposium on Research in Attacks, Intrusions and Defenses, Nan Jiang, Yu Jin and Ann Skudlar
2013 IEEE/ACM International Conference on Advances in Social Networks Analysis and Mining, Shuo (Steven) Chang and Aditya Pal
2013 SIAM, Yousef Saad, Thanh Ngo and Mohammed Bellalij
2013 SIAM SDM13 Arindam Banerjee and Karthik Subbian
2013 SIAM Outstanding Paper Prize, Yousef Saad
**ACM HILT13** Sanjai Rayadurgam, Anitha Murugesan, Michael Whalen and Mats Heimdahl
**ACM SIGSPATIAL International Workshop on Analytics for Big Geospatial Data**, Xun Zhou, Shashi Shekhar and Dev Oliver
**ACM Symposium on Cloud Computing**, Benjamin Heintz, Abhishek Chandra and Ramesh K. Sitaraman
**BigMine’13 workshop at KDD**, Arindam Banerjee and students Huahua Wang and Qiang Fu
**User Modeling and User-Adapted Interaction, the Journal of Personalization Research**, Joe Konstan and John Riedl
**U-Spatial Symposium 2013**, Abdeltawab Hendawi
Distinguished Lectures, Keynotes, and PLENARY TALKS

Winter/Spring 2012
Mount Sinai IRB Education Retreat. (Konstan)
Workshop on Broadening Participation in Data Mining, BPDM. (Kumar)
Analytical Virtual Integration of Cyber-Physical Systems (AVICPS) Workshop (Whalen)

Summer/Fall 2012
Distinguished Lecturer, Aalto University (Shekhar)
ACM Symposium on High-Performance Parallel and Distributed Computing 2012 (Weissman)
Fourth CSL Symposium on Emerging Topics in Control and Modeling at UIUC (Isler)
Plenary Panel Presentation on Recommender Systems: Achievements and Future Directions (Konstan)
RecSys 2012 Workshop on Human Decision Making in Recommender Systems (Konstan)
LBSN 2012 Workshop (Mokbel)

Winter/Spring 2013
Midwest Instruction and Computing Symposium 2013 (Keefe)
AAMAS 2013 Human-Agent Interaction Design and Models Workshop (Konstan)
Distinguished lecturer, University of California, Davis (Kumar)
Plenary Panel, International Parallel and Distributed Processing Symposium (Kumar)
Keynote Speaker, COSYNE (Schrater)
Keynote Speaker, ESCONS (Schrater)
Distinguished Speaker, National Cancer Institute (Shekhar)
Distinguished Lecture, Arizona State University (Shekhar)
Workshop on Big Data and Demography at the Institute of Population Research at Ohio State University (Shekhar)
NSF Workshop on Big Data and Urban Informatics at the University of Illinois at Chicago (Shekhar)
Keynote Speaker, Collaboration Technologies and Systems 2013 (Terveen)
Modeling in Software Engineering Workshop (MISE) at ICSE 2013 (Whalen)

Summer/Fall 2013
15th IEEE International Conference on Communication Technology (Du)
IEEE 2nd International Conference on Cloud Computing and Intelligence (Du)
Recent Development in Storage Research (Du)
IEEE International Symposium on Safety, Security, and Rescue Robotics (Gini)
ACM SIGGRAPH Conference on Motion in Games (Guy)
3M Computational Intelligence Colloquium (Guy)
Distinguished lecturer, Computer Science Department, George Mason University (Kumar)
Distinguished Lecture, Aalto University (Shekhar)

Distinguished Lecture, Korean Advanced Institute for Science and Technology National Institute of Health Workshop on Geospatial Frontiers in Health and Social Environments (Shekhar)
Business Application of Social Network Analysis (Srivastava)
High Integrity Languages and Tools Conference (Whalen)
WikiSym 2012: 8th International Symposium on Wikis and Open Collaboration (Hecht)
IEEE Workshop on Big Data Mining Techniques for Online Sales and Customer Service (Srivastava)

Editorships

Editors-in-Chief
• John Riedl, Founding Editor-in-Chief, ACM Transactions on Interactive Intelligent Systems
• Shashi Shekhar, Co-Editor-in-Chief, GeoInformatica: An Intl. Journal on Advances in Computer Sciences for Geographic Information Systems

Editors, Associate Editors, Editorial Board Members
ACM TAP (Interrante), ACM TISSEC (Hopper), ACM TOCHI (Terveen), ACM TISSEC (Hopper) ACM TOSN (He), ACM TWEB (Konstan), ARII (Kumar), Artificial Intelligence (Gini), Autonomous Agents and Multi-Agent Systems (Gini), BSP (Janardan), Cluster Computing (Weissman), Computers & Graphics (Interrante), Current Bioinformatics (Janardan), DAPD (Mokbel), Data Mining and Knowledge Discovery (Kumar), Data Mining and Knowledge Discovery Series (Kumar), ECRA (Collins), ETNA (Saad), Integrated Computer-Aided Engineering (Gini), IEEE Real-Time (He), IEEE TC (Weissman), IEEE TKDE (Kumar), IEEE TPDS (Weissman), IEEE Transactions on Automation Science and Engineering (Isler), IEEE Transactions on ITS (Papanikolopoulos), IEEE/ACM Trans on Networking (Zhang), IEEE Transactions on Robotics (Isler), IJ Cluster Computing (Du), IJCSA (Du), IJDMB (Kumar), IJHCI (Konstan), IJSC (Srivastava), IJSNet (He), ISRN-Geometry (Janardan), J. of Intelligent and Robotic Systems (Papanikolopoulos), ICM (He), JDA (Janardan), JCSS (Zhang), JISE (Du, Janardan, Yew), JOSIS (Mokbel), JPDC (Kumar), J. of Statistical Analysis and Data Mining (Srivastava), Knowledge and Information Systems (Kumar), Numerical Linear Algebra (Saad), PMC (He), Robotics and Autonomous Systems (Gini), RAS Conference (Papanikolopoulos), Requirements Engineering (Heimdahl), SCPE (Du), SDM (Srivastava), SIAM J. on Matrix Analysis (Boley), TCDE Data Engineering Bulletin (Mokbel), TOAI (Janardan), UMLAI (Konstan), W3J (Srivastava), Web Intelligence and Agent Systems (Gini).
Architectures & Compilers

P. Yew, A. Zhai

Computer architecture and compiler research targets on future generations of high-performance low-power many-core systems. Areas of focus include architectural and compiler support for such many-core systems, dynamic binary translation and system virtualization for cloud computing, and debugging tools for parallel programs.

Bioinformatics & Computational Biology

D. Boley, J. Carlis, R. Janardan, G. Karypis, D. Knights, R. Kuang, V. Kumar, C. Myers

Bioinformatics and computational biology research focuses on building predictive models for effective disease diagnoses, algorithms for sequence and structure analysis, protein structure and function prediction, virtual screening and lead discovery, data modeling, database management systems extensions in support of brain image and proteomics analyses, and analysis and inference of genetic and protein-protein interaction networks. This group has growing collaborations with the University’s College of Biological Sciences, the Medical School and the May Clinic.

Data Mining, Databases, Health Informatics & Geographical Information Systems

A. Banerjee, D. Boley, J. Carlis, G. Karypis, V. Kumar, M. Mokbel, S. Shekhar, J. Srivastava

This research group focuses on the development of novel algorithms for anomaly and pattern detection, predictive modeling, query processing, and spatial data analysis. This research is conducted across a variety of domains, including bioinformatics, cyber security, global climate data analysis, sensor networks, social computing, transportation, and the Web. This group has extensive connections with industry and national labs, providing a rich source of problems, data sets, and experiences for students.

Graphics & Visualization

S. Guy, V. Interrante, D. Keefe, G. Meyer

Graphics and visualization research specializes in communicating information to users through images. This research group works in immersive virtual environments, 3-D user interaction, computer animation, non-photorealistic rendering, color appearance simulation, and color reproduction techniques. Research focuses on interdisciplinary scientific visualization with applications in 3-D medical imaging, perceptual issues in virtual environments, pedestrian traffic simulations, design of color surface coatings, and biomechanical analysis.

High Performance Computing

D. Boley, G. Karypis, V. Kumar, Y. Saad, J. Weissman

Research areas being pursued by this group include grid computing, parallel algorithm design, performance analysis, and sparse matrix algorithms for large-scale scientific and engineering simulations. Software libraries developed by the group are used extensively world-wide in industry, academia and research labs.
Human Computer Interaction (HCI)
B. Hecht, J. Konstan, L. Terveen
The HCI group specializes in collaborative and social systems - computing systems that help people interact and work together. They explore the way computer tools enhance collective intelligence in groups as small as two users to as large as all of Wikipedia. They draw upon and conduct studies of individual and collective behavior to guide the creation of novel algorithms, interaction techniques, and user experiences. The HCI group is particularly well known for its experimental research, including the deployment of systems to reach hundreds, thousands, and even hundreds of thousands of users. The group's current projects include recommender system work (including the MovieLens and BookLens recommenders, and the LensKit toolkit), explorations of online systems for producing digital community artifacts (including explorations of wiki sites, tagging, crowdsourcing, quality control mechanisms, and incentive systems), and systems at the intersection of collaborative computing and geography (including the Cyclopath system and geographic and intercultural analyses of big data).

Networks, Systems & Security
A. Chandra, D. Du, T. He, N. Hopper, S. Roumeliotis, J. Srivastava, A. Tripathi, J. Weissman, Z. Zhang
Research thrusts in this group include the development of innovative theories and techniques, efficient and scalable mechanisms and protocols, and novel network and system architectures and services for enhancing a variety of networked systems and applications. These enhancements affect: availability, reliability, quality-of-service, mobility, manageability, power, performance, and privacy/security of current and future Internet, emerging wireless/mobile, sensor, cloud computing, peer-to-peer systems, large-scale storage systems, high performance distributed systems/network computing systems and networked multimedia systems and applications.

Robotics, Machine Learning, and Artificial Intelligence
A. Banerjee, M. Gini, S. Guy, V. Isler, N. Papanikolopoulos, S. Roumeliotis, P. Schrater
Research in this area addresses recent challenges in perception, cognition, and control with special emphasis on computer vision and image understanding, detection and estimation theory, algorithms, optimization, multi-agent decision making, and distributed task allocation. Embodiments of this research include: aerial, ground, and surface robots endowed with novel sensing and mobility mechanisms; humanoid robots; portable devices; and wearable computers. Applications include reconnaissance, search and rescue, environmental monitoring, agricultural robotics, human-robot interaction, augmented reality, and normal-form games. Machine learning research focuses on probabilistic graphical models, large scale optimization and inference, decision making under uncertainty, high-dimensional sparse models, and applications to a wide array of complex real-world problems including text analysis, social media and social networks analysis, bioinformatics, climate sciences, ecology and finance.

Software Engineering, Programming Languages and Compilers
M. Heimdahl, S. McCamant, G. Nadathur, E. Van Wyk
Research in software engineering and programming languages focuses on two main thrusts: developing tools and techniques to enhance programmer productivity and ensure safe and secure software deployment; and designing and implementing new formalisms and frameworks for expressing solutions to computational problems. These two focus areas are synergistic, as new languages are usually oriented towards improving productivity and software quality. Many faculty members in the software engineering research area are part of the University of Minnesota Software Engineering Center (UMSEC), which integrates software engineering research, education, and outreach. The center promotes dissemination of state-of-the-art software engineering methodologies among practitioners in industry and encourages industry involvement in the center's research.

Theoretical Foundations
A. Banerjee, D. Boley, N. Hopper, R. Janardan, G. Karypis, V. Kumar, G. Nadathur, Y. Saad, E. Van Wyk
Theoretical foundations research encompasses a broad range of foundational topics in computer science, including computational learning theory, complexity theory, algorithm and data structure design, geometric computing, cryptography, computational logic, and programming languages theory. Several group members are also actively engaged in leveraging their research into other research application areas.

Graphics used by Assistant Professor Stephen Guy.
Arindam Banerjee

Arindam Banerjee is an Associate Professor in the department and a Resident Fellow at the Institute on the Environment at the University of Minnesota, Twin Cities. His research interests are in machine learning, data mining, convex analysis and optimization, and their applications in complex real-world problems including text analysis, climate sciences, ecology, finance, bioinformatics, and social network analysis. He has won several awards, including the IBM Faculty Award (2013), the Yahoo Faculty Research Engagement Program Award (2013), the NSF CAREER award (2010), the McKnight Land-Grant Professorship at the University of Minnesota, Twin Cities (2009–2011), the IBM Ph.D. fellowship (2003–05), and five Best Paper awards in top-tier conferences.

Selected Publications


Q. Fu, H. Wang, and A. Banerjee, "Bethe-ADMM for Tree Decomposition based Parallel MAP inference," Conference on Uncertainty in Artificial Intelligence (UAI), 2013.


Daniel Boley

Professor Boley specializes in numerical analysis, linear algebra and control, computational methods in statistical machine learning, unsupervised document categorization, in data-mining and bioinformatics. He is an IEEE senior member and a fellow in the Minnesota Supercomputer Institute. Boley has served on numerous professional panels and committees. He is a member of SIAM, IEEE, ACM and the ACM special interest group on Numerical Mathematics. Boley is an associate editor for the SIAM Journal of Matrix Analysis and has chaired several technical symposia at major conferences. In addition to his work as a professor, Boley has had extended visiting positions at the Los Alamos Scientific Laboratory, the IBM Research Center in Zurich (Switzerland), the Australian National University in Canberra, Stanford University, the University of Salerno (Italy), and the Delft University of Technology (the Netherlands). His research interests include large sparse linear algebra problems arising from many engineering applications, the integration of numerical techniques in new technologies in a robust and fault tolerant manner, and the application of similar techniques to specific applications. Applications include control theory, bioinformatics, machine learning, data mining, and high performance computing.

Selected Publications


John Carlis
Professor John Carlis specializes in the practice of and extensions to Database Management Systems, focusing on interdisciplinary bio-medical applications such as microbiology (HIV), neuroscience (Alzheimer’s disease), and proteomics (oral cancer) and in visualization techniques driven by those applications. His academic record includes one book, several dozen refereed journals articles and conference papers, two of which were honored with best paper awards. Carlis’s professional service has included numerous conference program committee memberships and both program and general chair positions. He has served on institutional review boards and on Oracle’s life sciences advisory board. He serves on National Institutes of Health (NIH) review panels. He is Associate Director of Graduate Studies for the Biomedical Informatics and Computational Biology major. Carlis’s main research interest is database management systems (DBMS). Within DBMS he is interested in data modeling, language extensions, and scientific applications. Successful scientific database projects drive database research, forcing the invention of new ways to analyze and to visualize data. He is working with biologists and other computer scientists on proteomics, genome, brain and other databases. He also conducts workshops on research writing and on giving professional talks.

Selected Publications

Abhishek Chandra
Associate Professor Chandra’s research focuses on Operating Systems and Distributed Systems, with emphasis on performance and resource management in large-scale systems such as clouds, grids, and data centers. He is a recipient of the NSF CAREER Award and IBM Faculty Award. His Ph.D. dissertation titled “Resource Allocation for Self-Managing Servers” was nominated for the ACM Dissertation Award, and he is co-author on two papers winning Best Paper Student Paper Awards. He is a member of ACM and IEEE, and serves on several conference program committees and in leadership roles. Within the disciplines of operating and distributed systems, Chandra works in the areas of resource management, scheduling, and performance analysis. His research has focused on achieving reliability, scalability, and energy-efficiency in a variety of distributed systems: clouds, data centers, mobile computing platforms and grids. The key focus of his work has been to provide system support for data- and compute-intensive applications, while making large-scale systems self-managing and reliable. His research methodology includes a combination of modeling, system implementation, and experimental evaluation. Some of his recent work has examined issues in energy-efficient computing, virtualization, data-intensive computing, and fault tolerance.

Selected Publications
David Hung-Chang Du
Dr. David Du is currently the Qwest Chair Professor of computer science and engineering. He is also the director of a National Science Foundation Industrial/University Collaboration Research Center in intelligent storage. This center is currently have 16 industrial sponsorships and is supported by the following companies: Seagate, Symantec, Xyratex, HP, Dell, SGI, HGST, NEC Labs, LSI and FedCentric. The mission of the center is to investigate new storage technologies and to design new storage systems architecture to address the “big data” problem. He has served as a program director at the NSF CISE/CNS Division from March 2006 to September 2008. At NSF, he was responsible for the NeTS (networking research cluster) NOSS (Networks of Sensor Systems) Program and the Cyber Trust Program. Du received a Ph.D. from the University of Washington (Seattle) in 1981. Du has a wide range of research expertise including multimedia computing, mass storage systems, high-speed networking, sensor networks, cyber security, high-performance file systems and I/O, database design, and CAD for VLSI circuits. He has authored and co-authored over 250 technical papers including 120 refereed journal publications in these research areas. He has graduated 54 Ph.D. and more than 80 M.S. students in the last 30 years. His research in multimedia computing and storage systems include video-on-demand server architecture, video and audio synchronization techniques, multimedia storage systems, intelligent storage devices and future storage systems. His research in CAD includes physical layout, timing verification and delay fault testing for high-speed circuits. His research in high-speed networking includes heterogeneous high-performance computing over high-speed networks, quality of service, parallel data archive for high-performance computing, optical networks and sensor networks. He is also working on the security and privacy aspects of vehicle-to-vehicle networks.

Selected Publications

Maria Gini
Professor Gini specializes in artificial intelligence, multi-agent systems, and robotics. She studies decision making for autonomous agents in a variety of applications and contexts, ranging from distributed methods for allocation of tasks that have both a temporal and a spatial component, to decision methods for robots that disperse to explore an unknown environment, teamwork for search and rescue, and shared mental models for agents to collaborate with humans. She also worked on agent-based economic predictions for supply-chain management, for which she won the INFORMS Design Science Award for her work with Wolf Ketter and other colleagues. She is a Fellow of the Association for the Advancement of Artificial Intelligence, a Distinguished Scientist of the Association for Computing Machinery, a Distinguished Professor of the College of Science and Engineering at the University of Minnesota, and the winner of numerous University awards, including the Distinguished Women Scholars Award, and the Morse-Alumni Award for Outstanding Contributions to Undergraduate Education. She co-chairs the Distributed Research Experiences for Undergraduates program from CRA-W/CDC, which aims at increasing the number of women and students from underrepresented groups in computer science. She is on the editorial board of numerous journals, including Artificial Intelligence, Autonomous Agents & Multi-Agent Systems, Robotics and Autonomous Systems, Web Intelligence and Agent Systems, and Integrated Computer Aided Engineering. She has coauthored over 300 technical papers in journals, books, and conference proceedings.

Selected Publications
Stephen Guy

Stephen J. Guy is an assistant professor and the director of the Applied Motion Lab. His group’s research covers topics in the areas of interactive computer graphics, human motion analysis, and multi-robot coordination. This work has led to methods for high-fidelity crowd simulation and online approaches to collision avoidance that are widely used in both industry and academia. His work on motion planning has been licensed for use in the digital entertainment industry by companies such as Relic Entertainment and EA; his work in crowd simulation has been recognized with best paper awards at international conferences.

Selected Publications


Tian He

Dr. Tian He is currently an associate professor. He received his Ph.D. under Professor John A. Stankovic from the University of Virginia in 2004. Dr. He is the author and co-author of over 150 papers in premier network journals and conferences with over 12,000 citations (H-Index 44). Dr. He has received a number of research awards in the area of networking, including five best paper awards. Dr. He is also the recipient of the NSF CAREER Award 2009, McKnight Land-Grant Professorship and K. C. Wong Award. Dr. He has served in program chair positions in international conferences and on many program committees, and currently serves as an editorial board member for seven international journals including ACM Transactions on Sensor Networks. His research includes wireless sensor networks, cyber-physical systems, intelligent transportation systems, real-time embedded systems and distributed systems.

Selected Publications

Mats Heimdahl
Professor Mats Heimdahl specializes in software engineering and safety critical systems. He is the director of the University of Minnesota Software Engineering Center (UMSEC). Heimdahl is the recipient of the National Science Foundation’s CAREER award, a McKnight Land-Grant Professorship and the McKnight Presidential Fellow award at the University of Minnesota, as well as the University of Minnesota Award for Outstanding Contributions to Post-Baccalaureate, Graduate, and Professional Education. Heimdahl’s research group, the Critical Systems Research Group (CriSys), is conducting research in software engineering and is investigating methods and tools to help develop software with predictable behavior free from critical defects. Research in this area spans all aspects of system development ranging from concept formation and requirements specification, through design and implementation, to testing and maintenance. Currently, his group is investigating issues in automated software engineering techniques; how they can effectively leverage tool support to reduce cost, shorten cycle time, and improve software quality. Specifically, he focuses on software requirements engineering, model-based software development, software validation, static verification, code generation from models, software verification, software test automation, assurance cases, and certification.

Selected Publications

Brent Hecht
Brent Hecht is an assistant professor. His interests lie at the intersection of human–computer interaction, geography, and big data, his research centers on the relationship between big data and human factors such as culture. A major focus of his work involves volunteered geographic information and its application in location-aware technologies. Dr. Hecht received a Ph.D. in computer science from Northwestern University, a Master’s degree in geography from University of California Santa Barbara, and dual Bachelor’s degrees in computer science and geography from Macalester College. He was a keynote speaker at WikiSym – the premiere conference on wikis and open collaboration – and has received awards for his research at top-tier publication venues in human–computer interaction and geography (e.g. ACM CHI, COSIT). He has collaborated with Google Research, Xerox PARC, and Microsoft Research, and his work has been featured in the MIT Technology Review, New Scientist, AllThingsDigital, and various international TV, radio, and Internet outlets.

Selected Publications
Nicholas Hopper

Professor Hopper’s research focuses on computer security and privacy. Broadly, the field of computer security studies the behavior of computing systems in the presence of an adversary, seeking to understand the methods of attack and mechanisms that can be used to mitigate attacks. Hopper’s work in this area has focused on protocols and algorithms for censorship resistant Internet publishing, secure and efficient peer-to-peer file sharing, anonymous networking, and steganography. Hopper and his group have published papers on these topics in highly selective venues such as STOC, Crypto, Eurocrypt, TCC, CCS, NDSS, ICDCS, PETS, ACM TISSEC and IEEE Transactions on Computers. Professor Hopper completed his Ph.D. at Carnegie Mellon University in 2004. He received the NSF CAREER award in 2006, the IT Student Board’s “CSE professor of the year” award in 2007, and was a 2008-2010 McKnight Land-Grant Professor. Hopper is a member of the International Association for Cryptologic Research and serves on the advisory board of the Privacy Enhancing Technologies Symposium, and the editorial board for ACM Transactions on Information and System Security (TISSEC).

Selected Publications


Victoria Interrante

Professor Interrante specializes in the fields of virtual environments, visualization and computer graphics. Broadly speaking, her research focuses on the application of insights from visual perception to the design, implementation, and evaluation of novel methods for effectively communicating scientific data and information through computer-generated images. Interrante has enjoyed numerous interdisciplinary collaborations with colleagues across the University on a variety of projects ranging from the investigation of spatial perception and presence in immersive virtual environments to the development of methods for more effectively visualizing multivariate turbulent flow data. Interrante received the Presidential Early Career Award for Scientists and Engineers in 1999 and was a 2001–2003 McKnight Land Grant Professor. She is a senior member of ACM and IEEE and an associate editor of the ACM Transactions on Applied Perception and on the editorial board of Computers & Graphics. She is also serving as general co-chair of IEEE Virtual Reality 2014, the premiere international conference on virtual environments research.

Selected Publications


I. Volkan Isler
Volkan Isler is an Associate Professor of Computer Science and Engineering. He is also a resident fellow at the Institute on Environment and 2010-12 McKnight Land-Grant Professor. In 2008, he received the National Science Foundation’s Young Investigator Award (CAREER). He is currently co-chairing the IEEE Society of Robotics and Automation’s Technical Committee on Networked Robots. He is also serving as an Associate Editor for IEEE Transactions on Robotics and IEEE Transactions on Automation Science and Engineering. His research interests are primarily in robotics, sensor networks and geometric algorithms. His group seeks to develop algorithms with provable performance guarantees (often using geometric techniques) and to validate them with real-life deployments. In recent years, his lab has been focusing on environmental applications such as tracking invasive fish, agricultural automation, and using robots as data mules for harvesting sensor data.

Selected Publications

Ravi Janardan
Professor Janardan specializes in geometric computing and its applications. Broadly speaking, geometric computing is concerned with the design of efficient computational techniques for representing, reasoning with, and manipulating geometric entities. Janardan’s work in this area encompasses combinatorial analysis, algorithm and data structure design, and software development, as well as the application of these techniques to problems in spatial query-retrieval, medical simulation, and computer-aided design and manufacture. He is a Senior Member of IEEE and a member of the IEEE Computer Society.

Selected Publications
George Karypis

Professor George Karypis’ research interests span the areas of data mining, bio-informatics, parallel processing, CAD, and scientific computing. His research in data mining is focused on developing innovative new algorithms for a variety of data mining problems including clustering, classification, pattern discovery, and deviation detection, with an emphasis on business applications and information retrieval. Karypis' work in bio-informatics is focused on developing algorithms for understanding the function of genes and proteins in different species using data arising from genome-wide expression profiles. In this work, he uses data mining techniques to analyze expression profiles of genes and find groups of genes that behave similarly, and determine the underlying genetic regulatory network. Karypis' research in parallel processing is focused on developing scalable parallel algorithms for emerging applications and architectures. This includes research on data intensive applications, scientific computing, architectures with deep memory hierarchies, and architectures with heterogeneous interconnection networks. His recent research has led to the development of a number of highly efficient and scalable software packages and algorithms such as METIS (a serial sparse graph partitioning software), ParMETIS (an MPI-based parallel graph partitioning software), hMETIS (a circuit partitioning software), PSPASES (a parallel direct solver), and CHAMELEON (a spatial clustering algorithm).

Selected Publications

Dan Keefe

Assistant Professor Keefe’s research centers on data visualization (visualization of time-varying multidimensional data, visualization at scale, perceptually optimized visualization), interactive computer graphics (3D interfaces, haptics, pen and multi-touch input), and computational creativity (design and creativity support tools, synergies between art and science). His research is applied to exciting problems in science, engineering, art, and the humanities. Current projects include applications to virtual prototyping for medical device design, improving training for laparoscopic and robot-assisted surgery, analyzing the biomechanics of the human spine, reconstructing ancient Greek sites in virtual environments, real-time visualization of second-harmonic generation microscopy data, and more. In 2011 Keefe received the NSF CAREER Award. He has received best paper and best panel awards at international conferences for his research and teaching, and he regularly serves on program committees for the leading conferences in his field and on national and international review panels. In addition to his work in computer science, Keefe is also an accomplished artist and has published and exhibited work in top international venues for digital art. His research is supported by the National Science Foundation, the National Academies Keck Futures Initiative, the Digital Technology Center and Office of the Vice President for Research at the University of Minnesota, and industry. Before joining the University of Minnesota, Keefe did post-doctoral work at Brown University jointly with the departments of Computer Science and Ecology and Evolutionary Biology and with the Rhode Island School of Design. He received the Ph.D. in 2007 from Brown University’s Department of Computer Science, which nominated his work for the ACM Dissertation Prize, and the B.S. in Computer Engineering summa cum laude from Tufts University in 1999.

Selected Publications
Joseph Konstan

Professor Konstan specializes in Human-Computer Interaction and specifically in Social Computing, with research projects spanning application areas from recommender systems to the design of community information repositories to public health and medical records systems. He has been elected as an ACM Fellow, and IEEE Fellow, and a AAAS Fellow in recognition of his contributions to human-computer interaction; he is also a recipient of the ACM Software Systems Award for his work on recommender systems and the ACM SIGCHI Lifetime Service Award. He is a Distinguished McKnight University Professor and also a Distinguished University Teaching Professor in recognition of his contributions to graduate education. Highlights of Professor Konstan’s work include: foundational work on recommender systems algorithms, interfaces, and metrics (a topic on which he recently taught an open online course to more than 20,000 students); experimental studies and new algorithms for improving performance of online question-and-answer websites; developing and testing new ways of approaching crowdsourcing; and the development of new techniques to help users find relevant information in contexts ranging from libraries to medical records. His work spans over 100 peer-reviewed articles. He has also been active in the commercialization of technology and in collaboration with industry on research. Dr. Konstan received an A.B. from Harvard University (1987) and M.S. (1990) and Ph.D. (1993) degrees from the University of California, Berkeley. He served as President of ACM SIGCHI, the 4500 member Special Interest Group on Human-Computer Interaction, and has served in various leadership positions in the profession, including twice on the ACM Council and Executive Committee and as chair of both ACM’s SIG Governing Board and ACM’s Publications Board. He was founding general chair of ACM’s Recommender Systems conference, was general chair of the ACM CHI 2012 conference, and will be Papers co-Chair for ACM CSCW 2016. Dr. Konstan is an active consultant, and has traveled and lectured extensively, giving over 250 talks in more than 25 countries.

Selected Publications


Dan Knights

Dan Knights is an Assistant Professor in the Department of Computer Science and Engineering and the BioTechnology Institute at the University of Minnesota. His research includes linking host genetics with host-associated microbiome function in inflammatory diseases, developing theory and tools for modeling genome-scale host-microbe interactions, and predictive modeling of microbial community dynamics and genome variation. He has co-authored over 30 articles in top peer-reviewed journals. His projects have received international media attention and selected runner-up for the Science “Breakthrough of the Year.” He has been the expert witness on National Public Radio’s “Wait Wait...Don’t Tell Me!” and was the official 2003 Rubik’s Cube World Champion. Knights received his B.A. in Computer Science from Middlebury College, and his M.S. and Ph.D. in Computer Science from the University of Colorado, with a certificate in Interdisciplinary Quantitative Biology from the BioFrontiers Institute. His Ph.D. thesis received the 2012 Outstanding Dissertation Award from the University of Colorado School of Engineering. Before joining the University of Minnesota, Knights completed a post-doctoral research fellowship at Harvard Medical School and the Broad Institute of MIT and Harvard.

Selected Publications


Rui Kuang
Associate Professor Kuang joined the department in 2006 and specializes in computational biology and machine learning. Kuang is interested in studying cancer genomics and phenotype-genome relation from a data-driven and network-based perspective. His lab develops machine learning algorithms and network analysis methods for understanding the molecular characteristics of disease phenotypes from high-throughput sequencing data and microarray expression data by integration with biological networks. His current projects center around cancer biomarker identification, disease phenotype-genome association analysis and protein remote homology detection. Dr. Kuang is a recipient of an NSF CAREER award. He received his Ph.D. from Columbia University in 2006, M.S. from Temple University in 2002 and B.S. from Nankai University in 1999, all in computer science. He also worked as a system analyst at Procter & Gamble (China) in Guangzhou from 1999-2000.

Selected Publications

Vipin Kumar
Professor Kumar’s current research interests include data mining, high-performance computing, and their applications in Climate / Ecosystems and Biomedical domains. He is the lead PI of a five-year, $10 million project “Understanding Climate Change - A Data Driven Approach,” funded by the NSF’s Expeditions in Computing program that is aimed at pushing the boundaries of computer science research. He also served as the Director of Army High Performance Computing Research Center from 1988 to 2005. His research has resulted in the development of the concept of isoefficiency metric for evaluating the scalability of parallel algorithms, as well as highly efficient parallel algorithms and software for sparse matrix factorization and graph partitioning (METIS, ParMetis, hMetis). He has authored over 300 research articles, and has coedited or coauthored 11 books including widely used text books “Introduction to Parallel Computing” and “Introduction to Data Mining,” that have been translated into many languages. Kumar is a Fellow of the ACM, IEEE, and AAAS. He is a recipient of Distinguished Alumnus Award from IIT Roorkee and from the Computer Science Department, University of Maryland College Parks. His research in high performance computing and data mining have been recognized by a number of professional awards including 2005 IEEE Computer Society’s Technical Achievement Award and ACM SIGKDD 2012 Innovation Award, which is the highest award for technical excellence in the field of Knowledge Discovery and Data Mining.

Selected Publications
I. Stephen McCamant

Stephen McCamant has been an Assistant Professor since the fall of 2012. He received his Ph.D. from the Massachusetts Institute of Technology in 2008, and from 2008-2012 was a postdoctoral fellow at the University of California, Berkeley. He has been named to the program committees of the 2014 USENIX Security Symposium and the 2015 International Conference on Software Engineering (ICSE). His main research area is program analysis for software security and correctness, particularly binary code analysis and transformation, hybrid dynamic/static techniques and symbolic execution, information flow/taint analysis, and applications of decision procedures. Much of his recent work has applied a tool for binary symbolic execution to test generation for program correctness and vulnerability detection.

Selected Publications


Gary Meyer

Associate Professor Gary Meyer’s computer graphics research emphasizes color appearance design techniques and color synthesis algorithms. He takes advantage of the human color vision system to develop computer aided design tools for color appearance professionals and to improve the efficiency and realism of synthetic image generation techniques. Meyer is developing software that lets industrial designers and color technologists have the same interactive control over color appearance that engineers and architects have had over geometry since the beginning of computer graphics almost 40 years ago. Computer aided color appearance design (CACAD) allows color appearance designers and scientists to examine how existing paints and coatings look on new products. More importantly, CACAD makes it possible to hypothesize and visualize new surface coatings with heretofore unseen reflection properties. Much of Meyer’s work in realistic image synthesis is centered on replacing the explicit simulation of a camera with an imaging technique that incorporates more of what is known about the human visual system. In this way he hopes to avoid some of the artifacts inherent in photographic techniques and to develop a more device independent representation for color. Professor Meyer is also advancing the state of the art in synthetic image generation by simulating the mechanisms in nature (such as refraction, scattering, and interference) that determine color.

Selected Publications


Mohamed Mokbel
Associate Professor Mohamed Mokbel’s current research interests include database systems, spatial computing, and GIS. His research work has been recognized by four Best Paper Awards at IEEE MASS 2008, IEEE MDM 2009, SSTD 2011, and ACM MobiGIS 2012, and by the NSF CAREER award in 2010. Mokbel has served as the general co-chair for SSTD 2011, program co-chair for ACM SIGSPATIAL GIS 2008-2010, MDM 2011, 2014, DMSN 2011, and LBSN 2011, and proceeding chair for ACM SIGMOD 2010. Mokbel is or has been on the editorial board of ACM Transactions on Spatial Algorithms and Systems, IEEE Data Engineering Bulletin, and Distributed and Parallel Databases Journal. He is a senior member of ACM and IEEE, a founding member and elected Treasurer of ACM SIGSPATIAL. Mokbel received his Ph.D. Purdue University in 2005 and his M.S. and B.S. from Alexandria University.

Selected Publications

Chad Myers
Associate Professor Chad Myers joined the department in January of 2008 and specializes in computational biology. Myers’s research focuses on developing computational approaches to enable mapping, mining, or inference of biological networks. Recent developments in experimental technology have produced enormous amounts of data, including thousands of sequenced genomes and millions of measurements capturing the cellular activity and interactions of genes or proteins. These data offer unprecedented ways to study molecular biology, evolution, and human disease, but making sense of them poses a number of nontrivial computational challenges. The Myers lab is working with biologists to develop solutions to these problems in a variety of organisms including yeast, plants (Arabidopsis and maize), worm and human. Myers has co-authored more than 50 refereed publications for various journals and conferences.

Selected Publications
Gopalan Nadathur
Professor Nadathur's research is at the interface of logic and programming languages: he uses ideas from logic to inform language structure and he exploits such structure in the task of reasoning about properties of computations. He also shows the practical viability of his ideas by designing good implementation techniques for the language features he proposes and by developing systems that can be used to establish rich properties of programs. He is well-known for his work on the higher-order specification and prototyping language λProlog and its implementation in the Teyjus system. In recent work, he has collaboratively developed a rich logic for reasoning about specifications written in λProlog. This work has led to an interactive theorem prover called Abella. Professor Nadathur moderates the Programming Languages and the Logic in Computer Science subareas of the ACM, NCSTRL and AAAI sponsored Computing Research Repository and is a member of the Advisory Board of the Theory and Practice of Logic Programming journal.

Selected Publications/Systems

Nikos Papanikolopoulos
Professor Papanikolopoulos specializes in robotics, computer vision, and sensors for transportation and homeland security uses. He is the Director of the Center for Distributed Robotics and the NSF/Industry Safety, Security and Rescue Research Center, and leads the Security in Transportation Technology Research and Applications program. He is credited with being the major driving force behind the UMN Scout, a small reconnaissance robot now used by the United States Army. Papanikolopoulos has more than 350 publications, including journal and conference papers and book chapters, and has graduated more than 60 masters and doctoral students. He has won numerous best paper awards, a best video award at the 2000 IEEE Robotics and Automation Conference, a Faculty Creativity award in 1999 and the National Science Foundation's CAREER Award in 1995. In addition, he was awarded the McKnight Land-Grant Professorship Award in 1995 and the Distinguished McKnight University Professorship in 2007. Papanikolopoulos was a member of the IEEE Robotics & Automation Society Administrative Committee for two consecutive terms and is an IEEE Fellow. Professor Papanikolopoulos's work is focused on robotics, computer vision, and sensors for transportation, medical, and surveillance applications. His work also emphasizes experimental verification of the theory that can be done in the Artificial Intelligence, Robotics and Vision Laboratory that has more than 60 robots of various sizes. In computer vision, he is interested in model-based tracking, camera placement, moving object segmentation, real-time vision, medical applications, shadow detection, periodic motion analysis, human activity monitoring, morphing, on-line and off-line handwriting recognition, and object recognition. In transportation and surveillance, he is interested in the use of computer vision techniques for pedestrian and vehicle detection and tracking, vision-based vehicle following, data collection, bicycle counting, monitoring driver fatigue, and monitoring safety in work zones.

Selected Publications
Stergios Roumeliotis

Professor Stergios I. Roumeliotis received the Diploma in Electrical Engineering from the National Technical University of Athens, Greece, in 1995, and the M.S. and Ph.D. degrees in Electrical Engineering from the University of Southern California in 1999 and 2000 respectively. From 2000 to 2002 he was a Postdoctoral Fellow at the California Institute of Technology. Since 2009, S.I. Roumeliotis is the Associate Director for Research of the Digital Technology Center. His research interests include distributed estimation under processing and communication constraints, active sensing for reconfigurable networks of sensors, and vision-aided inertial navigation for space, aerial, and ground vehicles, as well as mobile devices. Roumeliotis is the recipient of the Guillermo E. Borja Award (2009), the NSF Presidential Early Career Award for Scientists and Engineers (PECASE) (2008), the NSF CAREER award (2006), the McKnight Land-Grant Professorship award (2006-08), the ICRA Best Reviewer Award (2006), and he is the co-recipient of the One NASA Peer award (2006), and the One NASA Center Best award (2006). Papers he has co-authored have received the King-Sun Fu Best Paper Award of the IEEE Transactions on Robotics (2009), the Robotics Society of Japan Best Journal Paper award (2007), the ICASSP Best Student Paper award (2006), the NASA Tech Briefs award (2004), and four of them were Finalists for the IROS Best Student Paper Award (2013), the RSS Best Paper Award (2009), the ICRA Best Student Paper Award (2009), and the IROS Best Paper Award (2006). Roumeliotis served as Associate Editor for the IEEE Transactions on Robotics between 2006 and 2010.

Selected Publications


Yousef Saad

Professor Saad’s research interests include sparse matrix computations, numerical linear algebra techniques for data mining, parallel algorithms, and eigenvalue problems. He was named College of Science and Engineering Distinguished Professor in 2005. He is a Fellow of the AAAS and a Fellow of SIAM. Saad has authored or co-authored five books, 152 journal articles, and more than 50 papers and book chapters. He is an editor for the Electronic Transactions of Numerical Analysis, and the Journal of Numerical Linear Algebra with Applications. Professor Saad’s research interests also include applications to problems related to quantum mechanics. He has projects in Density Functional Theory methods for determining electronic structures and in Dynamical Mean Field Theory for highly correlated systems. These applications lead to large eigenvalue problems of complex sparse matrix equations. Saad has contributed numerical algorithms, for solving sparse linear systems of equations and eigenvalue problems, along with their theoretical analyses. He has developed several software packages for sparse matrix computations. In the early 1990s he developed SPARSKIT, a package for performing various basic tasks with sparse matrices, and for solving sparse linear systems of equations. His most recent software contributions include ITSOL, a sequential package which includes various preconditioners for solving linear systems, and pARMS, which can be viewed as the parallel version of ITSOL. PARSEC, another package which he co-developed with a multidisciplinary team over the span of over a decade, is a comprehensive code for performing electronic structure calculations.

Selected Publications


Paul Schrater
Associate Professor Paul Schrater’s research interests involve probabilistic models of perception, control and learning in man and machine. His work involves both developing models and empirically testing them, studying both humans and artificial agents, using psychophysics, computation and brain imaging as methods. Current research interests include the management of perceptual and motor uncertainty, active learning, optimal exploration behavior, and structure learning in sequential choice tasks. He has published over 50 journal and conference papers in these areas.

Selected Publications

Shashi Shekhar
Shashi Shekhar, a Distinguished McKnight University Professor, is a leading researcher in the area of geographic information systems (GIS), spatial databases, and spatial data mining. For outstanding contributions to these areas, he received the IEEE-CS Technical Achievement Award (2006) and was elected an IEEE Fellow (2003) as well as an AAAS Fellow (2008). He was also named a key difference-maker for the field of GIS by the most popular GIS textbook. He has a distinguished academic record that includes more than 250 refereed papers, a popular textbook on Spatial Databases and an authoritative Encyclopedia of GIS. In the early 1990s, his research developed core technologies behind in-vehicle navigation devices as well as web-based routing services, which revolutionized outdoor navigation in urban environments. His recent research results played a critical role in evacuation route planning for homeland security and received recognition from multiple sources, including the CTS Partnership Award for significant impact on transportation. He also pioneered the research area of spatial data mining via pattern families (e.g. collocation, mixed-drove co-occurrence, and cascade), keynote speeches, survey papers and workshop organization. Furthermore, he contributed significantly to design of the UMN map server software for publishing geographic data on the WWW and the Crime-Stat 3.0 software to identify spatial patterns in crime report datasets. Recently, he co-led a community report to identify compelling research challenges and opportunities in spatial computing.

Selected Publications
Jaideep Srivastava
Professor Jaideep Srivastava directs the DMRG laboratory, focusing on research in Web Mining, Social Network Analysis, and Health Analytics. He has authored over 285 papers, and supervised 29 Ph.D. dissertations and 58 M.S. theses. His research has been supported by government agencies, including NSF, NASA, ARDA, DARPA, IARPA, NIH, CDC, the U.S. Army, US Air Force, and MNDot; and industry, including IBM, United Technologies, Eaton, Honeywell, Cargill, and Huawei Telecom. He has an active collaboration with Allina’s Center for Healthcare Innovation, where he is a Distinguished Fellow. Dr. Srivastava has significant experience in the industry. He has led a data mining team at Amazon and built a data analytics department at Yodlee. He has provided technology and strategy advice to Cargill, United Technologies, IBM, Honeywell, KPMG, 3M, TCS, and Eaton, and has served as advisor to the State Government of Minnesota and the Government of India. He has held distinguished professorships at Heilongjiang University and Wuhan University, China. Srivastava has a B. Tech from the Indian Institute of Technology (IIT), Kanpur, India, and an M.S. and Ph.D. from the University of California, Berkeley. He is a Fellow of IEEE, and has been an IEEE Distinguished Visitor. He has given over 150 invited talks in over 30 countries, including more than a dozen keynote addresses at major conferences.

Selected Publications

Loren Terveen
Professor Terveen specializes in Human-Computer Interaction and Social Computing. He applies theories from the social sciences to create new interaction techniques and algorithms that elicit more positive participation in online communities. He also does work to bring online and physically-based communities together, creating mobile and web-based systems that let people share information about geographical places and areas. As part of this, he has led work to develop the first full-featured geographic wiki. Specific problems he is working on include analyzing contribution to Wikipedia and improving the Wikipedia user experience, developing frameworks and mechanisms to increase participation in online communities, and creating a mobile crowdsourcing system to facilitate citizen data collection and citizen science campaigns. Terveen is a member of ACM and ACM/SIGCHI and is an ACM Distinguished Scientist. He has led the major conferences in his field, including serving as general co-chair for CHI 2002 and IUI 1998 as well as program co-chair for CSCW 2004 and 2013. He also serves on the ACM SIGCHI Executive Committee. He has served on the editorial board for ACM Transactions on CHI and Knowledge-Based Systems. Other professional service includes membership on the SIGCHI Publications Board and Conference Management Committee, (2002-2004), and the ACM Special Interest Group on Artificial Intelligence Vice Chair for conferences (1995-1999). Terveen also has served on numerous National Science Foundations Panels.

Selected Publications
Anand Tripathi

Anand Tripathi received his M.S. (1978) and Ph.D. (1980) in electrical engineering from the University of Texas at Austin, and B.Tech (1972) from IIT Bombay. During 1981–84 he was a Senior Principal Research Scientist at Honeywell. He worked as a Program Director at NSF during 1995–97. His research interests are in highly available and scalable distributed systems, autonomic systems, cloud data management systems, fault-tolerant computing, pervasive computing, and system security. Professor Tripathi is an IEEE Fellow and a member of the ACM. He served as an at-large member of the IEEE Computer Society Publications Board. He also served on the editorial boards of IEEE Pervasive Computing, IEEE Transactions on Computers, IEEE Distributed Systems Online, and Elsevier Journal on Pervasive and Mobile Computing. He served as a Program Vice Chair for International Conference on Distributed Computing Systems (ICDCS'1997), and as the Program Chair for the IEEE Symposium on Reliable Distributed Systems (SRDS'2001) and for the Second IEEE International Conference on Pervasive Computing and Communications (PerCom'2004), and 2014 International Conference on Parallel Processing. He was one of the organizers of two workshops on exception handling at the European Conference on Object Oriented Programming, and co-editor for two Springer LNCS volumes on this subject, published in 2002 and 2006. He was the principal organizer of the ACM OOPSLA2000 Workshop on mobile agent systems and IEEE ICSE2007 Workshop on Software Engineering for Pervasive Computing Applications, Systems, and Environments. He served as a co-editor of two special issues of IEEE Transactions on Software Engineering (2000) on exception handling.

Selected Publications


Eric Van Wyk

Associate Professor Van Wyk's research is in programming languages, in particular extensible programming languages and compilers. His research focuses on high-level declarative specifications for programming language tools, such as compilers and optimizers, and the mechanisms for mapping these specifications into working tools. One area of interest is extensible programming languages and compiler designs that allow new language features to be imported into a language framework. These new features define their own syntax, semantics, and optimizations. In such an approach, programmers do not choose which language to use for a particular task, but instead choose which set of language features to use and import these features into their programming environment. This creates a new customized language specific to their current problem domain.

To support this work, Van Wyk and his students have developed various software tools including Silver, an extensible attribute grammar system, and Copper, a integrated parser and context-aware scanner generator. They have used these systems to build extensible specifications of Java 1.4, Lustre, Promela, and ANSI C along with various domain-specific language extensions for these “host” languages. He was awarded a McKnight Land-Grant Professorship in 2005 and the National Science Foundation’s CAREER award in 2004. Van Wyk has served on several program committees, is on the steering committee of the International Conference on Software Language Engineering, and was a PC co-chair for the first instance of that conference in 2008.

Selected Publications

Jon Weissman
Professor Weissman specializes in distributed systems and high performance computing. His specific interest is the development of techniques (algorithms, middleware, systems) to support applications running on distributed systems including Grids, peer-to-peer, mobile, and cloud infrastructures. His research is principally concerned with the development of scheduling techniques to meet the performance and reliability constraints of distributed applications. He is a Senior Member of IEEE.

Selected Publications

Pen-Chung Yew
Professor Yew’s main research effort is on the design of future generations of high-performance and low-power computer systems, which include both microprocessors and multiprocessors. He is interested in issues related to their machine architectures, programming models, compilation techniques and system software. In the design of future generations of microprocessors, he is focusing on multi-threaded, multi-core architectures that exploit both thread-level and instruction-level parallelism possibly with speculation support to achieve high performance with reduced power consumption. The targeted systems span from large-scale parallel machines to application-specific embedded systems. His compiler effort is focused on a profile-based approach that supports both medium-grained (loop iteration-level) and fine-grained (instruction-level) parallelism with speculation, low power and latency hiding schemes. His research is focused on both static (at compile time) and dynamic (at runtime) compilation techniques. He also focuses on binary translation techniques that support cross-platform execution. Another area of interest is new parallel programming models that support domain experts for their specific applications. System software research currently focuses on operating system support for multi-core embedded systems, and on supporting virtualization for various applications. He uses an experimental approach to those design issues with on-going development of compiler and architectural simulation infrastructure to support our research effort.

Selected Publications
Antonia Zhai
Associate Professor Antonia Zhai received her Ph.D. degree in computer science from Carnegie Mellon University in 2005 for her research on developing advanced compiler technologies to exploit the potential of thread-level speculation for general-purpose applications. Prior to that, she received her B.A.Sc. and M.A.Sc. degrees in Computer Engineering from the University of Toronto in 1996 and 1998 respectively. Her research focuses on developing novel compiler optimizations and architecture features for modern homogeneous and heterogeneous multicore systems. She is interested not only in improving the performance for such processors, but also to enhance non-performance features, such as programmability, security, testability and reliability.

Selected Publications

Zhi-Li Zhang
Professor Zhang received his B.S. degree in computer science from Nanjing University, China, and his M.S. and Ph.D. degrees in Computer Science from the University of Massachusetts, Amherst. He has held visiting positions at University of California, Berkeley, and Miller Institute of Basic Sciences; IMDEA Networks and Universidad Carlos III Madrid; AT&T Labs; Sprint Advanced Technology Labs; IBM T.J. Watson Research Center; Microsoft Research; Fujitsu Labs of America and INRIA, Sophia-Antipolis, France. Dr. Zhang’s research interests lie broadly in computer communication and networks, Internet technology, multimedia and emerging applications. His past research was centered on the analysis, design and development of scalable Internet QoS solutions to support performance-demanding multimedia applications. His current research focuses on building highly scalable, resilient and secure Internet infrastructure and mechanisms to enhance Internet service availability, reliability and security, and on developing next generation, service-oriented, manageable Internet architectures to provide better support for creation, deployment, operations and management of value-added Internet services and underlying networks, including mobile, cloud and content delivery services and networks. Dr. Zhang has served on the editorial board of IEEE/ACM Transactions on Networking, Elsevier’s Computer Networks, and Journal of Computer Science and Technology. He was Technical Program Co-chair of IEEE INFOCOM 2006, ACM/USENIX Internet Measurement Conference 2008 and IEEE/IFIP IWQoS Workshop. He received the National Science Foundation CAREER Award, the University of Minnesota Distinguished McKnight University Professorship, McKnight Land-Grant Professorship, the George Taylor Distinguished Research Award, and the Miller Visiting Professorship at Miller Institute for Basic Sciences, University of California, Berkeley. He is co-recipient of four Best Paper Awards (ACM SIGMETRICS’96, IEEE ICNP’02, IEEE INFOCOM’10 and RAID’13). He is a member of IEEE and ACM, and a Fellow of IEEE.

Selected Publications
The Department of Computer Science and Engineering mourned the untimely death of Professor John Riedl, who passed away on the evening of July 15, 2013, at the age of 51. Professor Riedl was known worldwide as a pioneer in the field of recommender systems—a field he was instrumental in creating and nurturing—and one of the leading figures in the broader field of interactive intelligent systems. He was successful in bringing technological advances into practice; he co-founded the company Net Perceptions in 1996 to commercialize his recommender systems research, successfully growing the company to over 300 employees and substantial influence in the field. He also worked with several industry and nonprofit organizations to transfer University research findings into practical advances. The impact of John's work is extensive, both in industry practice and among the research community. Software derived from his research is run by literally tens of thousands of businesses today. His work was highly recognized by the research community, and honored with awards such as the 2010 ACM Software System Award.

John's contributions did not end with his own research—he was an innovative teacher who created a practice-focused course where undergraduate students gain experience in designing and building interactive intelligent systems for the Web, releasing them into wide use, and supporting thousands of users. John was also a guide and mentor, and was honored with several teaching awards, including an Outstanding Teacher Award from the Department, the George Taylor Award for Exceptional Contributions to Teaching from the College of Science and Engineering and the University's McKnight Distinguished Professorship. He was greatly concerned about student welfare and was passionate about quality teaching. He was an oft-consulted mentor by our junior faculty, and a valuable resource for faculty seeking counsel on any aspect of teaching and managing students. John had a lasting, inspirational effect on so many undergraduates who, years later, comment on the formative and transformative effect John had on them.

John's influential research and his leadership in the field brought invaluable visibility to the department and the University. John is greatly mourned by his colleagues and students at the department and University, who extend their sympathy to his many friends in the broader research community. Most of all, we express our deepest sympathy to his family, especially his wife, Maureen, his sons Eric and Kevin, his daughter, Karen, and her husband, Anthony.
Phil Barry has been active in undergraduate education in the department, college, and university since 1989. He has served at times as the department’s Director of Undergraduate Studies, in the college undergraduate advising program, liaison to the College of Continuing Education’s Information Technology Infrastructure program, faculty writing consultant for the University’s writing program, and the department TA supervisor. He teaches a number of different computer science classes, and does research in the area of computer-aided geometric design.

Chris Dovolis’s background is in local area networks and high performance computing including several years in the supercomputing industry. Dovolis says that the early required courses for computer science majors are his favorites. Key topics include: program design and methodology, data representations, object oriented programming, and data structures—using functional as well as procedural approaches. Other courses include programming language courses and computer architecture. Dovolis is the recipient of many undergraduate teaching awards, and in 2013, he received the Morse Alumni Undergraduate Teaching Award which is the highest teaching award given by the University of Minnesota.

Dan Challou teaches programming design and implementation, Internet programming, and introductory programming & problem solving courses in various languages. He also supervises various independent study and undergraduate projects. Dan has over 20 years of industrial experience developing and delivering virtual/visual prototypes of military vehicles based discrete event simulation and implemented as distributed and parallel systems.

Jensen currently teaches the introductory C++ programming classes for engineers and scientists. His research involves the development of biologically plausible theories and computational models of learning and cognition. He is particularly interested in working on the computationally challenging problem of learning temporal sequences created by non-stationary stochastic processes. This research attempts to construct novel machine learning methods that learn rapidly while adapting appropriately to changes in the stochastic properties of the underlying (generative) processes.

Amy Larson teaches real-time embedded systems in the MSSE program and various undergraduate courses in the core curriculum of computer science. She taught in the Department for several years in an adjunct capacity, and has recently been hired as a full-time instructor. Outside of the University, Larson engages students of all ages in a variety of activities that promote computer science, specifically in the area of robotics.
Carl Sturtivant teaches discrete mathematics, algorithms & data structures, automata theory, computability, complexity theory at both undergraduate and graduate levels, and also internet & network programming as well as beginning programming in various languages. He also supervises some independent study and undergraduate projects and coaches the intercollegiate programming contest teams for the regional (and occasionally international final) contest. Sturtivant has been repeatedly voted Best Computer Science Professor by CSE students.

Carl Sturtivant

Baylor Wetzel works at the intersection of psychology and computer science. He studies how humans learn and make decisions and uses that data to build computer simulations of this behavior and improve existing artificial intelligence techniques. He also does research in non-psychological aspects of video game artificial intelligence. In addition to teaching artificial intelligence, he is the department’s writing consultant.

Baylor Wetzel

Michael Steinbach earned his B.S. degree in Mathematics, a M.S. degree in Statistics, an M.S. and Ph.D. degrees in Computer Science from the University of Minnesota. Previously, he held a variety of software engineering, analysis, and design positions in industry at Silicon Biology, Racotek, and NCR. His research interests are in the areas of data mining, bioinformatics, and statistics. He has authored over 30 research articles, and is a co-author of the data mining textbook, Introduction to Data Mining, published by Addison-Wesley.

Michael Steinbach

Shyam Boriah has research interests in data mining and machine learning, primarily in spatial, time series and spatio-temporal analysis. He has developed algorithms for global scale analysis in the earth science and environmental domains. His broader research interests are in developing data analysis techniques for issues in food supply, climate change and deforestation.

Shyam Boriah

Vassilios Morellas works in the areas of computer vision and robotics. He is interested in integrating sensors in general and video cameras in particular to various electromechanical systems in order to enhance their autonomy. The applications areas range from security and surveillance to access control to transportation to medical domains. In the areas of computer vision and image processing, he is interested in developing solutions that guarantee robust performance for long periods of time and under unpredictable and challenging realistic conditions for robots or flying drones.

Vassilios Morellas

Michael Whalen is the Program Director at the University of Minnesota Software Engineering Center. He has 15 years experience in software development and analysis, including 10 years experience in model-based development & safety-critical systems. Dr. Whalen has developed simulation, translation, testing, and formal analysis tools for model-based development languages including Simulink, Stateflow, Lustre, and RSML-e. He has led successful formal verification projects on large industrial avionics models, including displays (Rockwell-Collins ADGS-2100 Window Manager), redundancy management and control allocation (AFRL CerTA FCS program) and autoland (AFRL CerTA CPD program).

Michael Whalen
2012-2013
Doctorates Bestowed

Vijay Kumar Adhikari
Dissertation Title: Understanding and Improving Large-Scale Content Distribution. Employer: Microsoft

Muhammad Ahmad
Dissertation Title: Computational Trust in Multiplayer Online Games. Employer: Ninja Metrics

Seth Berrier
Dissertation Title: Digital Material Samples for Design. Employer: University of Wisconsin Stout

Vladimir Briskine
Dissertation Title: Computational Approaches for Analyzing Variation in the Transcriptome and Methylation of Zea Mays. Employer: University of Wisconsin Stout

Gang Fang
Dissertation Title: Discovering Combinatorial Disease Biomarkers. Employer: Mt. Sinai School of Medicine

Alexandre Fehr
Dissertation Title: Covariance Based Point Cloud Descriptors for Object Detection and Classification. Employer: Memorial Sloan Kettering Cancer Center

Denis Foo Kune
Dissertation Title: Towards Improving Security on the Wireless Medium. Employer: University of Michigan

George Devaraj
Dissertation Title: On the Effectiveness of Specification-Based Structural Test-Coverage Criteria as Test-Data Generators for Safety-Critical Systems. Employer: Rackspace

Aaron Halfaker
Dissertation Title: Maintaining the Efficiency of Open Production Systems at Scale: A Case Study of Wikipedia. Employer: Wikimedia Foundation

Guojin He
Dissertation Title: Efficient Dynamic Program Monitoring on Multi-core Platforms. Employer: Unisys

Guoquan Huang
Dissertation Title: Improving the Consistency of Nonlinear Estimator: Analysis, Algorithms and Applications. Employer: MIT

Gary Jansen
Dissertation Title: Privacy Preserving Performance Enhancements for Anonymous Communication Networks. Employer: U.S. Naval Research Lab

Jagan Jayaraj
Dissertation Title: A Strategy for High Performance in Computational Fluid Dynamics. Employer: Sandia National Labs

Dimitrije Jevremovic
Dissertation Title: Scalable Computation and Analysis of Elementary Flux Modes in Metabolic Networks. Employer: Microsoft

Zhonghua Jiang
Dissertation Title: A Novel Predictive Modeling Framework: Combining Association Rule Discovery With EM Algorithm. Employer: Goldman Sachs

Daniel Kaufman
Dissertation Title: Panel Conditioning in Longitudinal Social Science Surveys. Employer: George Mason University

Jaya Kawale
Dissertation Title: Mining Relationships in Spatio-temporal Datasets. Employer: Adobe Research

Yokesh Kumar
Dissertation Title: Automated Virtual Treatment Planning in Orthodontics: Modeling and Algorithms. Employer: Microsoft

Shyong Lam
Dissertation Title: Collaborative Curation in Social Production Communities. Employer: Google

Yanhu Li
Dissertation Title: Characterizing Diverse Link Patterns in Complex Networks: Theory and Applications. Employer: Noah’s Ark Lab

Pei-Hung Lin
Dissertation Title: Performance Portability Strategies for Computational Fluid Dynamics (CFD) Applications on HPC Systems. Employer: Lawrence Livermore National Lab

Zi Lin
Dissertation Title: Toward Building Practical Privacy Enhancing Technologies. Employer: Amazon Web Services

Guanlin Lu
Dissertation Title: An Efficient Data Reduplication Design with Flash-Memory Based Solid State Drive. Employer: EMC

Xiaobin Ma
Dissertation Title: Multi-Type Nearest and Reverse Nearest Neighbor Search: Concepts and Algorithms. Employer: Oracle

Amogh Mahapatra
Dissertation Title: A Computational Approach to Detection of Conceptual Incongruity In Text and Its Applications. Employer: Nuance

Krishnan Manjacheri
Dissertation Title: Composable Semantics Using Higher-Order Attribute Grammars. Employer: Coverity

Mikhil Masli
Dissertation Title: Understanding and Increasing Social Production Online. Employer: IBM

Ryan Michael McCabe
Dissertation Title: Validating A Computational Model Of Patient Illness: The Simcare Patient Model. Employer: Cancer Treatment Centers of America

Vineeth Mekkat
Dissertation Title: Performance- Correctness Challenges in Emerging Heterogeneous Multicore Processors. Employer: Intel

Hyueun Min
Dissertation Title: Multi-robot Formation and Cooperation Using Visual Tracking. Employer: University of Minnesota

Abedelaziz S. H. Mohaisen
Dissertation Title: Towards Trustworthy Computing on Social Networks: Measurements and New Applications. Employer: Verisign Labs

Faraz Mohammad-Mirzaei
Dissertation Title: Extrinsic and Intrinsic Sensor Calibration. Employer: Qualcomm

Pradeep Mohan
Dissertation Title: Spatio-Temporal Frequent Pattern Mining for Public Safety: Concepts and Techniques. Employer: SAS Corporation

Muthukumar Murugan
Dissertation Title: Towards a Flexible and Energy Adaptive Datacenter Infrastructure. Employer: Hewlett Packard

Joseph Myre
Dissertation Title: A Modular Environment for Geophysical Inversion and Run-time Autotuning Using Heterogeneous Computing Systems. Employer: University of Arkansas at Fayetteville

Xia Ning
Dissertation Title: Machine Learning and Data Mining Methods for Recommender Systems and Chemical Informatics. Employer: NEC Research

Aditya Pal
Dissertation Title: User Classification in Online Communities. Employer: IBM

Dongchul Park
Dissertation Title: Hot and Cold Data Identifications to Storage Devices and Systems. Employer: Samsung

Nishith Pathak
Dissertation Title: Analyzing Information Flow in Social Networks for Knowledge Discovery. Employer: Ninja Metrics

Gyan Ranjan
Dissertation Title: Understanding (Inter-) Dependencies and Vulnerabilities in Static and Dynamic Networks. Employer: Narus

Lane Schwartz
Dissertation Title: An Incremental Syntactic Language Model for Statistical Phrase-Based Translation. Employer: Air Force Research Lab

Hanhui Shan
Dissertation Title: Probabilistic Models for Multi-relational Data Analysis. Employer: Microsoft

Sarah Sharafkandi
Dissertation Title: Global Self-Similarity and Salience Measures Based on Sparse Representations for Classification of Objects and Spatio-Temporal Sequences. Employer: 3M

Nisheeth Srivastava
Dissertation Title: A Computational Investigation of Being in the World. Employer: University of California - San Diego

Ze Tian
Dissertation Title: Learning with Kernels and Graphs to Understand Cancer DNA Copy Number Variations. Employer: Microsoft

Jesse Samuel Vig

Xun Zhou
Dissertation Title: Motion Induced Robot-to-Robot Extrinsic Calibration. Employer: SRI International
<table>
<thead>
<tr>
<th>Researcher</th>
<th>Year</th>
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<td>Statistical Modeling of Dynamic Covariance Matrices</td>
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<td>HIMALAYAS: Hierarchical Machine Learning Stack for Fine-Grained Analysis of Malware Domain Groups</td>
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<td>2005</td>
<td>Effective Learning by Leveraging Supervised and Unsupervised Techniques</td>
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<td>Effective Convex Solvers for Machine Learning</td>
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<td>2011</td>
<td>Integrating Flash and Phase Change Memory into Memory/Storage Hierarchies for Enhancing High-End and Data-Intensive Computing</td>
<td>$199,427</td>
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<td>Data Deduplication with Special Consideration of Data Chunk Frequency</td>
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<td>Efficient FTL Buffer Management</td>
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<td>CSR Small Prediction-based Data Placement for New Memory and Storage Hierarchies</td>
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<td>Information Dissemination in Vehicular Networks</td>
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<td>Du, Chandra, Weissman, Zhang</td>
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<td>One Cloud Does Not Fit All: Minnesota Integrated Cloud Systems Research Testbed (MiST)</td>
<td>$350,000</td>
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<td>Extended Research Visits to European Robotics/AI Research</td>
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<td>Mixed Human-Robot Teams for Search &amp; Rescue</td>
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<td>Addressing Research Challenges in Low-Duty-Cycle Wireless Sensor Networks</td>
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<td>Autonomous Failure Detection &amp; Recovery</td>
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<td>CPS Synergy Collaborative Research Multiple-Level Predictive Control of Mobile Cyber Physical Systems with Correlated Context</td>
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<td>Assuring the Safety, Security and Reliability of Medical Device Cyber Physical Systems</td>
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<td>Measurement-Based Design and Analysis of Censorship Circumvention Schemes</td>
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<td>2007</td>
<td>Effectively Harnessing Virtual Environments Technology for Visualization and Design</td>
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<td>Virtual Reality Infrastructure and Technology Development to Support Architectural Education and Basic Research in Immersive Design, Embodied Interaction, Spatial Cognition</td>
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<td>CAREER: Mobility Control for Robotic Sensor Networks</td>
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<td>Game Theoretic Coverage and Connectivity Services</td>
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<td>A Robotic Network for Monitoring Carp</td>
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<td>Collaborative Research: Active Sensing for Robotic Cameramen</td>
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Listing reflects grants active during period of report.
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<td>BIGDATA: Big Tensor Mining, Theory, Scalable Algorithms and Applications</td>
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<td>BIGDATA: Coupling Data-Intensive Modeling, Simulation, and Visualization with Human Facilities for Design: Applications to Next-Generation Medical Device Prototyping</td>
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<td>Generalization of the Association Analysis</td>
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<td>Integrating Parallel and Distributed Data Mining Algorithms into the NASA Earth Exchange (NEX)</td>
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<td>EAGER: Building and Analyzing Dynamic Brain Functional Networks</td>
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<td>2009</td>
<td>Computer Aided Design of Nanostructured Optical Materials</td>
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<td>Towards Ubiquitous Location Services</td>
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<td>A Testing Methodology</td>
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<td>Mathematical Modeling of the Arabidopsis Defense Signaling Network</td>
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<td>GEPR Mineral Nutrient Gene Discovery and Gene X Environments</td>
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<td>Reasoning about Specifications of Computation</td>
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<td>Algorithms and Software/Hardware Infrastructure for Distributed Miniature Robots</td>
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<td>Papanikolopoulos, Heimdahl, and collaborators</td>
<td>2008</td>
<td>Development of a Vision-based Real-Time Body Motion Tracking Instrument for Advanced Radiation Treatment</td>
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<td>Development of a Video-Based Robotic Instrument</td>
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<td>A Software Framework for Controlling Multi-Robot Teams</td>
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<td>Detecting Cancer Using Advanced Computer Vision Techniques</td>
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<td>A New Miniature Ground/Water Robot</td>
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<td>Swarms of Robotic Aquapods to Assess Impact of Oil Spills on Marshlands</td>
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<td>Computational Tools for Behavioral Analysis, Diagnosis and Intervention of At-Risk Children</td>
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<td>MRI: Development of a Video-Based Robotic Instrument for Behavioral Analysis and Diagnosis of At-Risk Children</td>
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<td>Human-robot Coordinated Manipulation and Transportation of Large Objects</td>
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<td>Cyber Enhancement of Spatial Cognition for the Visually Impaired</td>
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<td>Numerical Linear Algebra and Approximation Theory Methods for Efficient Data Exploration</td>
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<td>Spatio-temporal Graph Databases for Transportation Science</td>
<td>$449,994</td>
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<td>Non-equilibrium Dynamics Across Space and Time</td>
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<td>Datanet: Terra Populus: A Global Population / Environment Data Network</td>
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<td>From GPS and Virtual Globes to Spatial Computing 2020</td>
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<td>Embedded Fault Detection for Low-Cost, Safety Critical Systems</td>
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<td>Some Assembly Required: Understanding the Emergence of Teams and Ecosystems of Teams</td>
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<td>Extensible Language and Library Frameworks for Scalable and Efficient Data-Intensive Applications</td>
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<td>Extensible Languages for Sustainable Development of High Performance Software in Materials Science</td>
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<td>One Thousand Points of Light: Accelerating Data-Intensive Applications by Proxy</td>
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<td>IAD Exploiting Multi-core Processor Technology for Interactive Supercomputing</td>
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<td>Dynamic Runtime Optimization and Adaptation for High Performance and Power Management on Multi-Core Processors</td>
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<td>Towards Versatile and Programmable Measurement Architecture for Future Networks</td>
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<td>VIRO Highly Scalable, Robust Namespace Independent Routing for Future Networks</td>
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<td>Spatio-Temporal Network Traffic Dynamics and Interactions of Social-Technical Networks</td>
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<td>Understanding, Managing and trouble-Shooting the Evolving Cellular Data Networks</td>
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<td>Enhanced Surveillance and Tacking Solution TWSG Task PS</td>
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<td>NIH</td>
<td>Carlis</td>
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<td>Characterizing Oral Cancer Progression via Saliva Proteomics</td>
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<td>Gene Regulatory Network Structure, Function and Evolution</td>
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<td>Sparse Structural Equation Models for Gene Networks and Chemical Genomics</td>
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<td>Cancer Drug Target Discovery from Genetic Interactions</td>
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<td>2012</td>
<td>Predictive Modeling for Ambulatory Care</td>
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<td>Power Optimized Hardware and Protocol Design</td>
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<td>Visualization Methods for Implantation of Cardiac Leads for Pacing and Defibrillation</td>
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New Challenges of Smart Cities
Lionel Ni, Hong Kong University of Science and Technology

Image Restoration from a Machine Learning Perspective
Dianne P. O’Leary, University of Maryland

Mining Billion-Node Graphs - Patterns and Algorithms
Christos Faloutsos, Carnegie Mellon University

A Walk in the Dark: Random Walks and Network Discovery
Don Towsley, University of Massachusetts

Seeing Through Augmented Reality
Steven Feiner, Columbia University

RAMCloud: Scalable High-Performance Storage Entirely in DRAM
John Ousterhout, Stanford University

Using Process Modeling and Analysis Techniques to Reduce Errors in Health Care
Lori A. Clarke, University of Massachusetts, Amherst

Geometric Network Optimization
Joseph Mitchell, State University of New York at Stony Brook

Geometric Computing over Uncertain Data
Subhash Suri, University of California

Program Logics for Certified Compilers
Andrew Appel, Princeton

Online Controlled Experiments: Introduction, Insights, Scaling, and Humbling Statistics
Ron Kohavi, Microsoft

Mining and Exploring Semi-Structured, Heterogeneous Social and Information Networks
Jiawei Han, University of Illinois at Urbana-Champaign

Taming Latency Variability and Scaling Deep Learning
Jeff Dean, Google

Convex Optimization: From Embedded Real-Time to Large-Scale Distributed
Stephen Boyd, Stanford

2012-2013
COLLOQUIUM SPEAKERS

Towards Reliable Storage Systems: From OS-Level File Systems to Cloud Storage
Haryadi Gunawi, University of California, Berkeley

Towards Scalable User-Agnostic Attack Defense
Zhichun Li, NEC Research Labs

Efficient Testing of Concurrent and Distributed Systems
Pallavi Joshi, University of California Berkeley

Modeling People from Billions of Photos
Ira Kemelmacher-Shlizerman, University of Washington

Testing Symmetric Properties of Massive Data
Elena Grigorescu, MIT

Linux File & Storage Systems: Moving Ideas into the Data Center
Ric Wheeler, Red Hat

Advancing Computer Vision by Leveraging Humans
Devi Parikh, Toyota Technological Institute at Chicago (TTIC)

Discover, Analyze, and Validate Attacks With Introspective Side Channels
Zhiyun Qian, University of Michigan

Algorithms for Scheduling and Large Data Analysis
Benjamin Moseley, University of Illinois Urbana-Champaign

Exploiting Sparsity and Low-Dimensional Structure: Techniques and Applications
Ewout van den Berg, Stanford University

No Free Lunch in Data Privacy
Ashwin Machanavajjhala, Yahoo! Research

Inference and Learning in Structured-Output Models for Computer Vision
Dhruv Batra, Toyota Technological Institute at Chicago

From Genotype to Phenotype: Finding Links and Bridging Gaps through eQTL-Centric Subnetworks
Teresa Przytycka, National Center for Biotechnology Information

Interactive Information Visualizations for Everyday Practices
Sheelagh Carpendale, University of Calgary

Collaborative Robot Tracking of Geophysical Flows: How Local Measurements Discover Global Structures
Ani Hsieh, Drexel University

A Latent Feature Diversification Algorithm to Reduce Choice Overload in Recommender Systems
Martijn Willemsen, Eindhoven University of Technology in the Netherlands

System Support for Managing Graph Data
Sameh Elnikety, Microsoft Research

Understanding and Enhancing Human Performance in Complex Domains
Anand Tharathanathan, Honeywell

No Requirements Engineering for Programmable, Self-Assembling Nanomachines
Robyn Lutz, Iowa State University

GENI - Global Environment for Network Innovations
Dr. Vicraj Thomas, BBN Technologies, Inc.

Autonomous Agents in Future Energy Markets: The Power Trading Agent Competition
Wolfgang Ketter, Rotterdam School of Management, Erasmus University

Interaction Models for Human and Autonomous Guidance
Bérénice Mettler, Aerospace Engineering and Mechanics

Human/Computer Vision: Visual Attention Modeling from Basic Research to Commercialization
Brian Stankiewicz, 3M

Systems Biology of Cellular Aging and Age-Related Degeneracies
Ananth Grama, Purdue University

Challenges in Software-Defined Storage Systems
Remzi H. Arpaci-Dusseau, University of Wisconsin, Madison

Hide-and-Seek on Networks
Steve Alpern, University of Warwick

Computing Dense Subgraphs from Theory to Practice
Barna Saha, AT&T Labs

Markov Chain Monte Carlo for Bayesian Statistics
Alicia Johnson, Macalester College
Computer Science Associates (CSA)
Since the 1970s, members of the Computer Science Associates have lent their expertise to the department. In 2013 CSA began a new era, one that will serve to build connections between alumni and the Department. CSA strives to be an engaging and rewarding contact point, a ready resource for CS&E alumni, corporate professionals, and friends interested in computers, education and technology. CSA’s mission is to get more of its members, alumni and friends of the Department involved helping and sharing with the students via specific programs (CS&E Mentors, coding contest volunteers, career advisors), organizations (ACM, IEEE, SWE, Grace Hopper, CodeSavvy) and events and activities (FIRST Robotic, Computer Science Education Week, Open House/Tech Forum). It aims to promote and facilitate one-to-one connections between students, the Department and faculty, computing people and computing enterprises.

Industry Affiliates Council (IAC)
The department launched the IAC in 2013. This new group is chartered to promote greater interaction between the department and our industry affiliates. The IAC meets twice each year, providing a forum to hear industry trends and to explore the opportunities that grow out of the department’s education and research activities. IAC members are invited to be active in promoting Computer Science through efforts to broaden the field, reach out to underrepresented groups, and promote and advance the economic impact of education and research.

All of our industry partners provide valuable input in the leadership and direction of the department, including suggestions regarding recruiting and retention of students, and reviewing and commenting on curriculum revision.

There are many ways corporations partner with CS&E, including: research collaboration with faculty, donation of equipment, scholarships for students and supporting student organization.

Past industry gifts, grants, and collaborative projects include:

- Distinguished Speaker Series: Cray, Unisys
- Endowed Chairs: CDC (Norris Chair), Qwest (Qwest Chair)
- Research Partnership Awards: IBM and Microsoft
- Joint Research Projects and student support:

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* Accenture
* Adventium Labs
* AGL Consulting
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Our alumni and friends provide generous financial support for our work. Their assistance is crucial in providing scholarships to students, support for our research, and in helping us recruit and retain top students and faculty.

We would like to use this page to express our gratitude to those supporters who have helped sustain the department the past two consecutive years.

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