



2013-2014

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ARIZONA STATE UNIVERSITY

school of
**computing, informatics,
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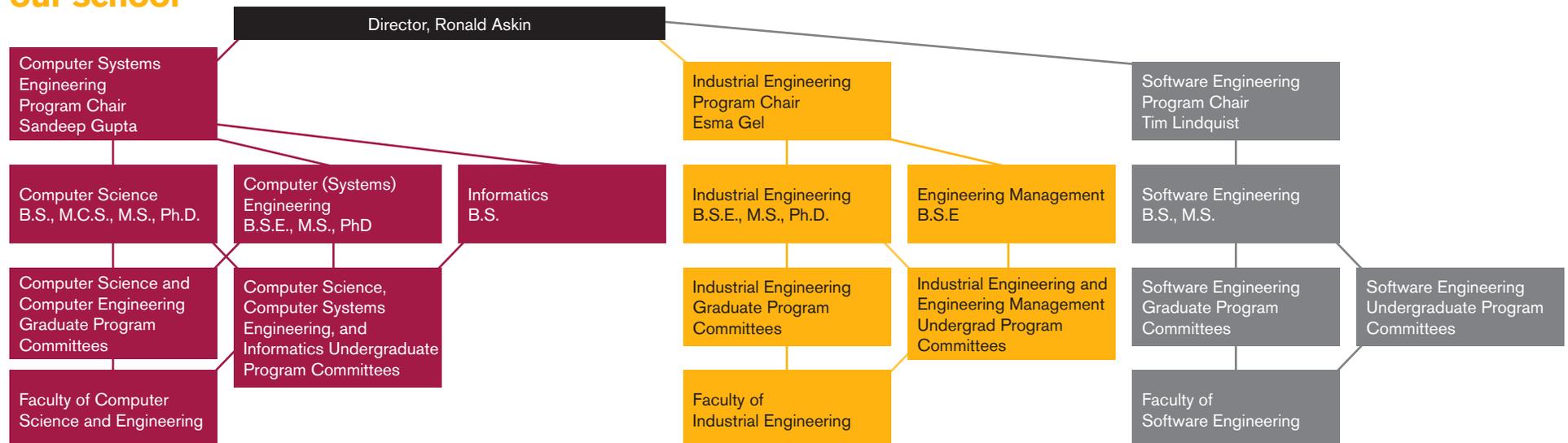
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our school



annual report contents

welcome	1
at a glance	2
research themes	4
faculty honors	12
new research awards	14
faculty news briefs	20
software engineering	24
new faculty	25
academic programs	26
undergraduate student research	28
doctoral degrees awarded 2014	29
student news	30
student news briefs	31
faculty directory	36
community outreach	48
acknowledgements	49

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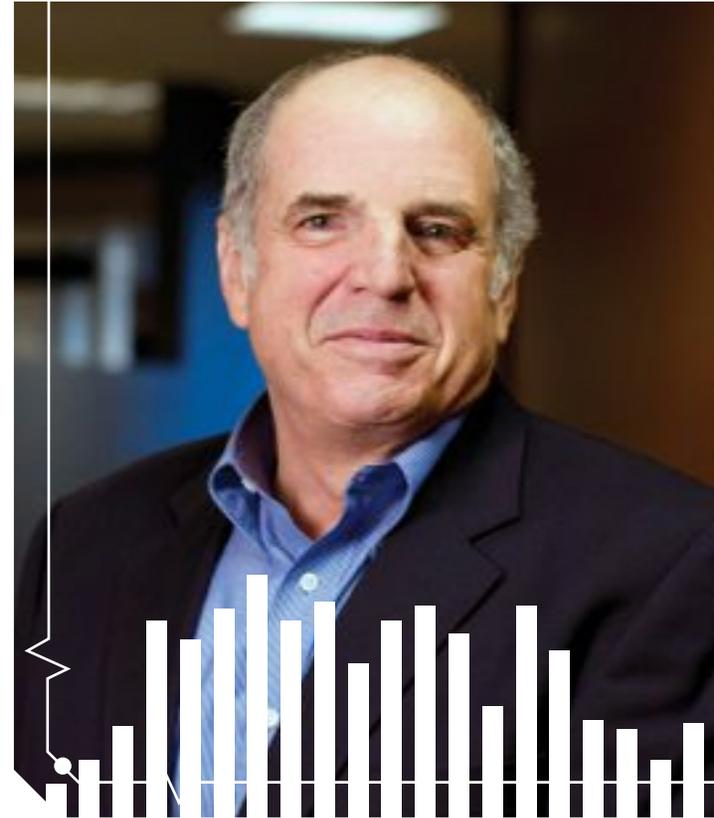
dear friends

Wow! We as a School and a profession must be doing something right because the demand for our programs continues to skyrocket. When we formed our School of Computing, Informatics, and Decision Systems Engineering (CIDSE) five years ago by linking Computer Science and Engineering with Industrial Engineering, we had just over 1,500 students. We grew steadily to 2,850 students in fall 2013 and then again grew by over 40 percent this past year to reach our current fall 2014 level of 4,395 students. Accommodating such rapid growth has been a challenge. But it's great to see the high demand for our academic programs and this has afforded us an opportunity to test out new methodologies including flipped classrooms and hybrid and online courses. For the most part this has been a resounding success. Students are pleased with the quality and variety of offerings and growth has allowed us to expand and diversify the faculty and support staff.

Our growth this past year was due in part to integrating the Software Engineering program at our Polytechnic campus into CIDSE. That program had the foresight to create an online B.S. degree program that has proved to be wildly attractive to place-bound students. Enrollment grew to over 400 new students this fall in only the program's second year of operation.

Evidence of excellence continues to mount. The Shanghai Jiao Tong University rankings recently placed us as 22nd in the U.S. and 33rd in the world for research impact in computer science based on citations, publications and awards. Our Industrial Engineering program continues to be ranked in the top 20 by USNWR. Two faculty members received National Science Foundation (NSF) CAREER Awards this year. Our students and faculty received a number of best paper awards at leading conferences such as KDD. Externally-funded research awards increased almost 10 percent to \$17.2 million. Additionally, our students performed very well in international competitions earning, for example, a first-place award at the Intel Cup competition in Shanghai this past summer.

We also had a very successful year in faculty recruiting, adding eight new tenure-track faculty to build upon our strengths in data mining, cyber security, personalized learning, cyberphysical systems and software engineering. You can learn more about these new faculty members from their individual profiles later in this report.



Please take a few minutes and read through this report. I'm sure you will agree that the present is exciting and the future is bright. And keep in mind that we're always looking for partners to collaborate with, so drop me a line and let me know your interest.

Now, back to carving out the future of computing, informing and deciding.

Ronald G. Askin, Director and Professor
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at a glance

degree programs

- computer engineering (M.S., Ph.D.)
- computer science (B.S., M.S., M.C.S., Ph.D.)
- computer systems engineering (B.S.E.)
- engineering management (B.S.E.)
- industrial engineering (B.S.E., M.S., Ph.D.)
- informatics (B.S.)
- software engineering (B.S., M.S.)

research impact

Computing data into information — secure and affordable, anytime, anywhere. It's an ambitious goal. To deliver on this vision, we rely on the energy, ingenuity and knowledge of our faculty and students. They're working to ensure that our data-hungry society gets what it demands: the information we live by, delivered as safe, as accurate, as fast, as cheap, and as accessible as possible.

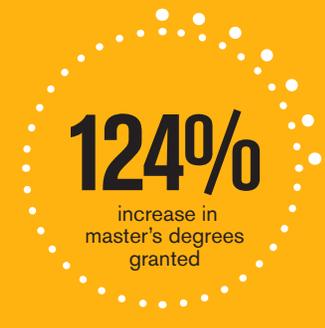
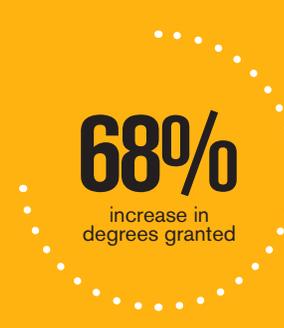
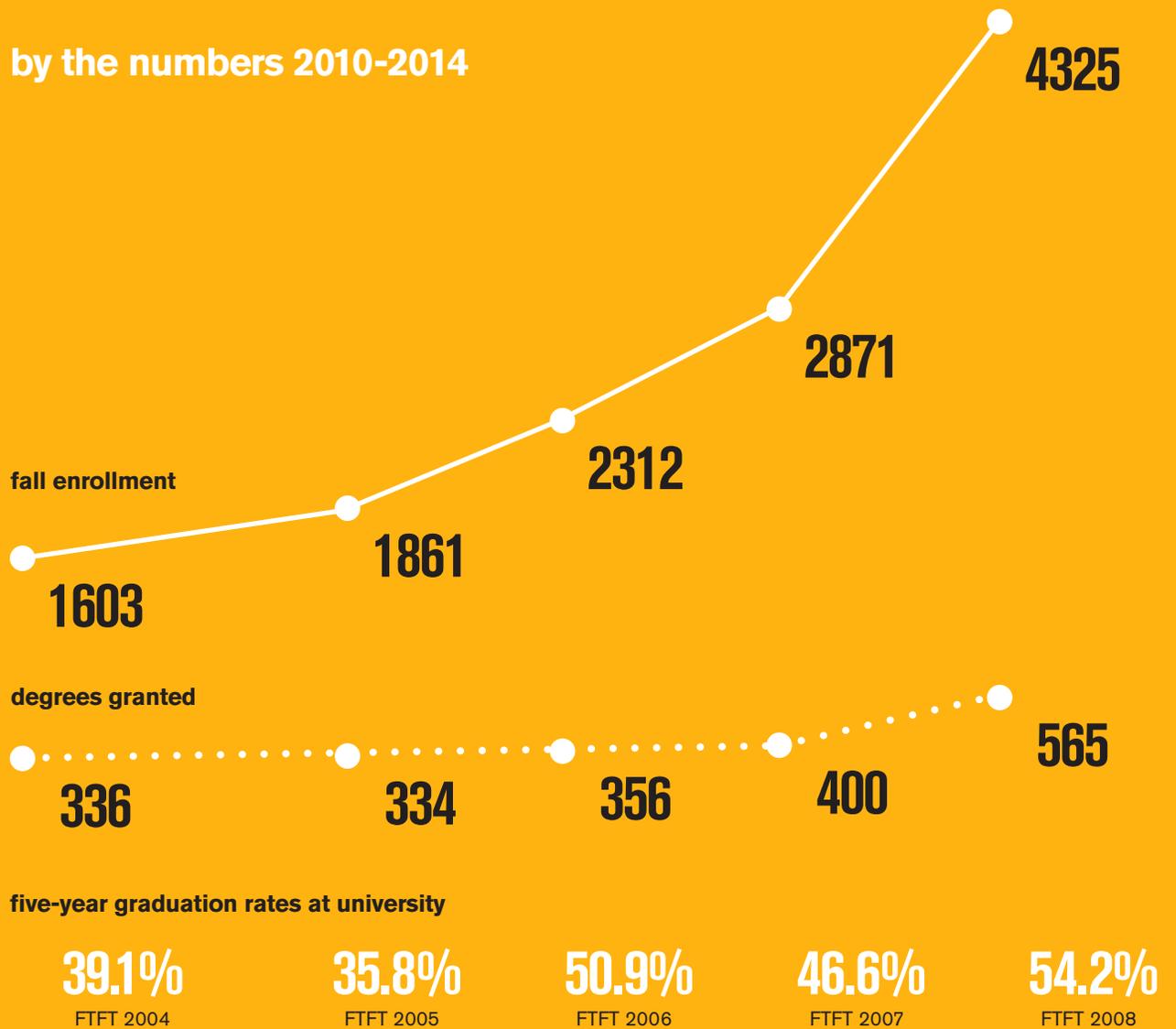
research impact areas

- computational intelligence and algorithms
- data management and information assurance
- network science and systems
- software and systems engineering

research centers

- Advanced Technology Innovation Center (ATIC)
- ASU-Mayo Clinic Imaging Informatics and Analytics Laboratory (AMIIAL)
- Center for Cognitive Ubiquitous Computing (CUBiC)
- Center for Embedded Systems (CES)
- Center for Engineering Logistics and Distribution (CELDi)
- Information Assurance Center (IAC)
- Partnership for Research in Spatial Modeling (PRISM)

by the numbers 2010-2014



degrees granted by program FY2014

bachelor's	master's	doctoral
computer (systems) engineering		
55	32	—
computer science		
129	182	8
engineering management		
3		
industrial engineering		
60	74	8
informatics		
7		
software engineering		
6	1	

enrollment by program fall 2014

bachelor's	master's	doctoral
computer (systems) engineering		
404	119	21
computer science		
1,339	591	162
engineering management		
275		
industrial engineering		
271	203	52
informatics		
48		
software engineering and computing studies		
770	70	

 Computer Engineering (Computer Systems), Engineering Management and Informatics were all established in FY2012. Engineering Management and Informatics do not offer graduate degrees. Software Engineering does not offer a doctoral degree.

computational intelligence and algorithms

Computational intelligence encompasses a collection of fundamental research areas dealing with the creation of knowledge from data, the development of algorithms for controlling computing decisions, and the effective approaches for interfacing computers and humans. The area focuses on enhancing human decision-making and learning and the automation of computing processes.

specialty areas

Artificial Intelligence

Our researchers are addressing problems in automated planning and scheduling, constraint satisfaction, knowledge representation and reasoning, natural language processing, multiagent systems, and the semantic web.

Theory and Algorithms

Understanding complexity and the theory of computation is critical for developing efficient algorithms. Research in this group focuses on both fundamental theory for analyzing algorithms and on developing specific deterministic and randomized algorithms for solving classic problem formulations relevant to the emerging problems in society and technology.

Data Mining and Machine Learning

As scientific and enterprise data sets grow with respect to data characteristics (volume, variety, velocity), it becomes imperative to develop new approaches to extract spatial and temporal relationships, correlation patterns and knowledge. The faculty is actively engaged in developing new scalable methods for learning with big data.

Imaging, Graphics and Visualization

Rendering clearer images of urban scenes for games and homeland security, geometric modeling of images for new approaches to detect biosignature disease indicators using volumetric and other measures, recovery and digitization of information content in physical media and dynamic movements are all being addressed by researchers.

Statistical Modeling

From universe to earth to nanoscale, random phenomena influence behavior. Models and methods are being developed to better understand and predict random behavior to allow for more efficient acquisition of knowledge (Design of Experiments), improved estimation of system reliability, better characterization of system capability and making more accurate and meaningful inferences from data.

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Tapping Twitter data for in-depth analysis of public opinion

Social scientists and others seeking insight into public opinion and behavior might benefit from Twitter-based research being conducted by two Arizona State University computer science doctoral students.

Yuheng Hu and Kartik Talamadupula are developing computer models for analytical systems that can harness massive amounts of data generated by Twitter and organize it in a rapid, reliable and efficient fashion.

Such a capability can help provide a sound basis for advanced statistical analysis of public opinion that develops in reaction to various events or to the emergence of social and political issues and controversies.

Hu and Talamadupula are doing the research under the supervision of **Subbarao (Rao) Kambhampati**, who said the students' research demonstrates how computer science can provide more sound information to help political scientists, social psychologists, linguists, journalists and others in similar fields gain more certainty in exploring societal attitudes and trends.

Gauging public reaction

Hu has created a computer model that performs a process he calls "sentiment analysis," using data from Twitter messages to determine public reaction to various events. He tested the model during the presidential candidates' debates before the 2012 national elections.

Hu's system enabled him, for instance, to quickly determine whether there was a more positive or negative public reaction on Twitter to various comments made by the candidates.

Closely watched events such as political debates and campaign speeches generate thousands of tweets that indicate how the public feels about various subjects. But usually an analysis of Twitter messages is done manually, which provides only a limited sample of tweets with which to determine trends in public opinion.

"Analysts might be able to manually sort through 300 tweets to study language or analyze public sentiment, but they lose out on a lot of information and the process is inefficient," Kambhampati explained.

Hu's model can quickly segment and align tweets according to the content of the messages and what they express about events and issues, thus providing a more accurate gauge of public attitudes.

Twitter-based linguistics

Hu teamed up with Talamadupula for a second project to do a computational linguistic analysis of the language used on Twitter. They were curious about whether the language of Twitter most resembles the way people communicate in text messages, e-mails, or in the more formal language of magazines.

"All forms of social media and written publications have their own linguistic expectation," Kambhampati said. Text messages contain language-shortening techniques, abbreviations and slang more frequently than e-mails, for instance.

"Linguists have been debating about the implications of the language of Twitter for some time, but Hu's and Talamadupula's research brings a needed large-scale analysis to the discussion," he said.

Hu and Talamadupula conducted a computational linguistic analysis that took a "snapshot" from a portion of the Twitter fire hose from June to August in 2011. In this snapshot of thousands of tweets they found that the language tends to resemble e-mail and magazine language more than the language used in text messages.

Hu said they found Twitter language "surprisingly formal," revealing that people resist word shortening and slang despite having to limit tweets to 140 characters.

New social science tool

Kambhampati said both projects exemplify the emergence of "computational social science," a powerful tool for those in social science fields to more accurately analyze large amounts of data and provide a more solid basis for identifying or predicting trends in societal attitudes and behavior.

"Human behavior is dynamic and often hard to understand, this research has been a great opportunity to know people better through social media," Hu said.

Kambhampati said the analysis of social media — something that is used millions of times each day — gives researchers a more vast trove of data than standard polls and surveys from which to derive empirical evidence of public sentiment.

The kind of large-scale data offered by the computational methods Hu and Talamadupula are developing "is just the beginning" of advanced analytics that can have far-reaching impacts on sociological research, Kambhampati said.

Hu and Talamadupula presented their research at the International Conference of Weblogs and Social Media in Boston in July 2013 and Kambhampati made a presentation at the International Joint Conference on Artificial Intelligence in August 2013 in Beijing, China.

Emerging research field

In addition, Kambhampati recently received a \$55,000 Google Research Award for to support work related to the Twitter Alignment project. It is Kambhampati's third Google Research Award.

He said the awards keep coming because Google respects the work ASU researchers are doing in this area, and the company has an interest in the emerging field of "computational journalism" tied to Twitter.

"Reporting on Twitter and analyzing what is said are new and emerging areas of journalism," said Kambhampati. "Our research clearly relates to that emerging field."

Kambhampati plans to use the Google grant to expand research in "ways that we haven't even fully realized yet."

In addition to presenting the research at conferences, Hu spent his summer doing a Microsoft Research Internship in Washington state. He performed similar research focused on using Twitter to predict users engagement in local events.

In collaboration with Srijith Ravikumar, who is pursuing a master's degree in computer science at ASU, Talamadupula began research on new algorithms to rank Twitter search results according to the interests of specific users. He reported on the research at the Annual Association for the Advancement of Artificial Intelligence (AAAI) conference in Washington state in July 2013.

Their paper has also been accepted for presentation at the Association for Computing Machinery (ACM) International Conference on Information and Knowledge Management conference in San Francisco in October.

data management and information assurance

While networks connect entities, it is the data transmitted across those networks that empowers objects and enriches life. With data being produced at high volume, variety and velocity, storage, processing and retrieval become key challenges. Knowing what, where, how and how long to store and index data for later use are major challenges. The secure and efficient functioning of this aspect of cyberinfrastructure is critical to supporting the needs of our modern information society.

specialty areas

Database Management and Information Retrieval

Query processing and extracting desired information from large, heterogeneous data bases represents a major challenge being addressed by our researchers. Designing platform and protocol solutions for data services and semantic web for structured and unstructured data are the foci of this group's activities.

Information Assurance and Security

As a certified National Center for Academic Excellence, the Information Assurance Center forms a focal point for research and education in information assurance and security. Ensuring privacy and protection from attack for personal mobile devices and corporate servers are challenges being addressed as well as developing schemes for supporting emerging technologies such as cloud computing.

Multimedia

Data comes in many forms with intended use for many purposes in many environments. Virtualization must accommodate text, video, audio, tactile and eventually taste, smell and emotional response for high-fidelity representation of the real-world experience. Models for integrating multimedia for enhanced educational experiences and new data fusion tools to aid physically impaired individuals are being developed.

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“Big data” advances could help solve health, energy challenges

Two teams of Arizona State University computer science researchers are working to develop the next generation of data-driven predictive systems to improve our ability to respond to epidemics and more effectively manage buildings and their energy systems.

Both teams are led by **K. Selçuk Candan**, a professor in the School of Computing, Informatics, and Decision Systems Engineering.

Candan has been awarded two National Science Foundation (NSF) grants to support the research, as well as a grant from Johnson Controls, Inc., a global company that provides products and services to optimize building operations, including energy systems.

His team is striving to devise better ways to analyze, integrate, and index large volumes of data that will be used to produce simulations. Researchers use the simulations to derive accurate information and predictions necessary to design more effective systems.

Candan's team for the building and energy management systems project includes **Maria Luisa Sapino**, an adjunct professor of computer science at ASU and a professor at the University of Torino, Italy, and Youngchoon Park, a technical fellow with Johnson Controls, Inc.

The epidemic management team includes Sapino and Gerardo Chowell-Puente, an associate professor in ASU's School of Human Evolution and Social Change, whose expertise includes epidemiology, mathematics, computer modeling and statistics.

Removing obstacles

According to the U.S. Energy Information Administration, buildings consume more energy than any other sector, accounting for 48.7 percent of overall energy consumption. In addition, building energy consumption is projected to grow faster than consumption by industry and transportation sectors.

Candan's team hopes to create a new building energy data management system (e-SDMS) that helps reduce energy dependency, consumption and costs. Accomplishing that goal will help remove major obstacles to environmentally sustainable development, particularly in developing countries, Candan said.

Computational models for the spatio-temporal dynamics of emerging infectious diseases, and data- and model-driven computer simulations of the spread of diseases, are increasingly critical in predicting the geo-temporal evolution of epidemics, Candan said. These models are used to effectively manage such health emergencies through a diverse set of pharmaceutical and nonpharmaceutical control measures.

The new data-driven epidemic simulation system (epiDMS) the team is developing will be part of a system to address the key data challenges underlying epidemic-spread simulations that hinder real-time analysis and decision-making during outbreaks of epidemics. Such problems slow reaction to fast-spreading epidemics such as Swine Flu and severe acute respiratory syndrome (SARS).

Complex dynamics

NSF grants provided \$500,000 for the two projects — the building/energy management system and the epidemic management system.

The Johnson Controls grant of \$50,000 to ASU's Center for Embedded Systems, an NSF Industry/University Cooperative Research Center, will also provide the Center and Candan with research data and building energy systems domain expertise, and help to deploy the project.

Candan's work focuses on solving the “big data” computational challenges that arise from the need to model, index, search, visualize and analyze — in a scalable manner — large volumes of data sets from observations and simulations.

While very powerful simulation software exists, Candan explained, the software presents two major challenges: creating models to support such simulations and analyzing simulation results are both extremely costly. Simulations involve hundreds of parameters, affected by complex dynamic processes operating at different spatial and temporal resolutions, he said. This means simulations and observations cover days to months of data and may be considered at different granularities of space and time.

New parameters, new contexts

For input, building energy simulations, for example, use building models — describing the building structure, materials used, cooling/heating units, heat-transfer characteristics and energy costs. A single building model may involve hundreds of parameters tracked for hundreds of thousands of time steps.

Multiple simulation results, with varying parameter settings, often need to be interpreted and possibly compared with real-world observations to make effective decisions, Candan said.

Candan's team is developing systems to support data-driven simulations that can potentially guide design decisions and management strategies and enable experts to explore and analyze models and simulations from diverse parameters and at multiple scales.

He said the data-management software will enable significant savings in modeling, execution, and analysis through modular re-use of existing simulation results in new settings — such as recontextualization of models and simulation results under new parameters and new contexts. The data encoding, partitioning and analysis algorithms will be efficiently computable and leverage massive parallelism to tackle scalability challenges.

Producing more “big data” experts

Candan is also helping to develop new graduate-level computer science courses for a concentration in “big data” systems. The program will help meet the growing need for data scientists and engineers who can design, build, implement and manage large data systems for industry and scientific discovery, he said.

The “big data” concentration will enable students to gain expertise in designing scalable (parallel, distributed, and real-time) systems for acquiring, storing, securing and accessing large-scale heterogeneous multi-source data over its life cycle, and to use analytical tools to mine information from the data.

Courses will include research, case studies and presentations from industry and government experts who can provide students diverse perspectives on the course topics.

The projects Candan's teams are working on with the support from the three new grants will also have an impact on the computer science concentration. The challenges his teams face and the outcomes of their research will be incorporated into the curricula.

These studies will introduce computer science students to “big data” management, indexing and analysis, and parallel data processing, as well as familiarize them with challenges in the areas of energy, sustainability and epidemic response management.

network science and systems

Networks permeate modern life. Open and virtual private networks support electronic data interchange within and between commercial enterprises. Wireless mobile networks enrich our personal lives by keeping us in contact with our friends and family. Sensor networks protect the homeland and enable scientific exploration. These network technologies support our existence and constitute the backbone of cyberinfrastructure. Protocols for ensuring safe, pervasive and ubiquitous access to information must constantly adapt to the changing environment, both in terms of scale and technology. Modeling interactions and ensuring resiliency for today's usage and preparing for tomorrow present significant research challenges being addressed at ASU.

specialty areas

Cloud and Distributed Computing

Maximizing the effective use of dispersed idle computing cycles while ensuring information reliability and security poses a major challenge being addressed by researchers. At the same time, growing calls for sustainable energy use dictate the need for careful design and management of large data centers and new strategies to support service oriented architectures. Along with these computing trends, the growing use of multimedia data presents the need for new data structures, application programming interfaces and encoding rules.

Computer Design and Architecture

Architectural design and parallelism issues are paramount in preparing for multithread and multicore processors. The integration of power management and heat dissipation issues into architectural design plays a paramount role in on-going research. Next-generation technologies that can sustain computational advances beyond CMOS are also being developed.

Cyber Physical and Embedded Systems

Most modern devices from automobiles to smart phones are defined by their integrated hardware/software systems for sensing, computing, controlling and communicating. Designing the network of interacting cyber-physical entities for efficiency, reliability, autonomy, sustainability and functionality is an ongoing challenge being addressed by the group as well as embedded systems issues such as partitioning functions between hardware and software for maximizing performance with minimal power and cost. The Center for Embedded Systems forms the core of this research and provides numerous opportunities for industrial collaboration as well as addressing fundamental challenges.

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Network Algorithms

Research spans problems in wireless, wireline, optical and transportation networks encompassing a broad range of problems from the design of resilient network architectures to operational routing to ensuring connectedness in mobile ad hoc networks. Location services, access control and scheduling, self-stabilizing protocols, coverage and connectivity, multipath and QoS routing and congestion modeling are among areas of active interest by the research group.

Social Computing

Social computing research seeks to understand social behavior and context based on computational systems. By integrating social, physical, psychological and governmental mechanisms with artificial intelligence knowledge representation and learning, this multidisciplinary collaboration develops novel theories, behavior models and pattern mining tools to predict and connect the actions and interactions of individuals, groups, communities and nation-states. The results have important applications for commercial sponsors, social scientists and security agencies alike.

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Pitu Mirchandani helps ASU transportation research team make an impact

Arizona State University's robust and expanding range of transportation research and studies was reflected in early 2014 in the contributions of faculty members and students to one of the major international gatherings of transportation experts.

An ASU contingent of more than 30 faculty members and students presented their research in more than 40 workshops and sessions at the Transportation Research Board (TRB) 93rd Annual Meeting in Washington, D.C., Jan. 12-16. The event attracted about 12,000 professionals from academia, research institutions, industry, and public and private policy groups from around the world.

The strength and variety of the faculty's combined endeavors was a factor in ASU's recent selection as a partner in two new multi-university national transportation research centers. They are the National Center for Strategic Transportation Policies, Investments and Decisions, and the Institute for Safety and Operations of Large-Area Rural-Urban International Systems (SOLARIS), both funded by the Research and Innovative Technology Administration of the U.S. Department of Transportation.

Professor **Pitu Mirchandani** is leading ASU's effort in the partnership with the SOLARIS Institute, contributing his expertise as a renowned authority on traffic-management algorithms, optimization methods and real-time adaptive control strategies for the design and management of transportation networks. Mirchandani is an associate director of the Institute.

The SOLARIS Institute, located on the campus of the University of Nevada, Reno, brings together five educational institutions from the tri-state area of Arizona, Nevada and New Mexico. The term "Large Area Rural/Urban" depicts the specific characteristics of this tri-state area and substantial parts of the U.S. where a sparse network connects smaller cities and towns and also connects the denser networks in large cities.

SOLARIS promotes intermodal transportation systems for efficient, safe and economical movement of goods and people. Additionally, the tri-states have abundant solar and other renewable energy resources which could potentially be used as alternative energy sources for the transportation industry.

ASU, NGA to address national security risks posed by climate change

Arizona State University was selected for a competitive five-year award of \$20 million by the National Geospatial-Intelligence Agency (NGA) to launch a research partnership effective June 1, 2014, to explore approaches for anticipating and mitigating national security risks associated with climate change.

Known as the Foresight Initiative, the cooperative agreement venture will explore how the effects of climate change on resources, such as water, food and energy, could contribute to political unrest and instability and gain insights to sustainability and resilience strategies for mitigating the effects.

Nadya Bliss is the principal investigator for the Foresight Initiative. Bliss is assistant vice president for research strategy with ASU's Office of Knowledge Enterprise Development, and a professor of practice in the School of Computing, Informatics, and Decision Systems Engineering.

Seven other Fulton Schools of Engineering faculty members are part of the Foresight Initiative team: professor Paul Westerhoff (School of Sustainable Engineering and the Built Environment); professor **Gail-Joon Ahn**, professor **Huan Liu**, associate professor **Hasan Davulcu** and assistant professor **Ross Maciejewski** (School of Computing, Informatics, and Decision Systems Engineering); associate professor Daniel Bliss (School of Electrical, Computer and Energy Engineering); and professor **Nancy Cooke** (program chair, Cognitive Science and Engineering, Polytechnic School).

Other key areas at ASU that will be integral to this work include the Julie Ann Wrigley Global Institute of Sustainability, College of Liberal Arts and Sciences, College of Public Programs, Decision Theater Network and Decision Center for a Desert City.

For example, Decision Theater provides advanced modeling and simulation that allows diverse groups of stakeholders to visualize large amounts of data, policy parameters and environmental uncertainties on panoramic high-definition displays. Scientists, analysts and decision makers can easily interact in real-time to tweak the rules and data sets to account for new insights and deeper understanding of relationships, providing a range of outcomes based on the changes. This allows for more effective decision-making among people from different backgrounds.

This initiative will play a key role in collaborative research efforts to accelerate the evolution of Activity-Based Intelligence addressing system level activities, dynamics and interdependent network effects in the context of global climate risks to water security. This multi-year research partnership leverages ASU expertise and thought leadership in visual analytics, complex modeling and transdisciplinary decision-making evolving from years of internal and external investments at ASU.

"NGA's investment and partnership with ASU is a game-changing relationship," said Michael Crow, ASU president. "This innovative research initiative will develop solutions and be a catalyst for the critical and creative thinking needed to address the complex challenges that come with climate change."

Leveraging computing and system modeling initiatives at ASU and partner organizations, the Foresight Initiative will apply ubiquitous cloud computing and storage technologies, advances in natural user interfaces, and machine learning to address unique geospatial data handling and visual analytic challenges driven by the volume and character of future persistent data flows. The resulting capabilities will allow analysts and decision makers to dynamically interact with diverse data sets in a real-time modeling and simulation environment. This will help them assess the effectiveness of plans, policies and decisions; discover second- and third-order causal relationships; and understand spatial and temporal patterns that reveal non-obvious underlying interconnections and dependencies.

"This is a tremendous partnership and opportunity for a real, tangible impact in addressing strategic security and humanitarian needs," Bliss said. "It is also pioneering how the academic and government research communities can leverage each other's strengths to seek solutions to these global-scale issues while advancing fundamental transdisciplinary research. ASU is the perfect place for this initiative because of the culture of use-inspired research and the exceptional quality of faculty working across traditional disciplinary boundaries."

"I am very proud to announce our partnership with ASU, a world class research university," said NGA Director, Letitia Long. "Our partnership is a prime example of the intelligence community working smartly with academia to address strategic global issues and to create capabilities that benefit everyone."

software and systems engineering

Software instantiates our intentions and controls modern devices. New computing paradigms and the growing complexity of many systems dictate the need for on-going development of flexible, reliable and usable tools and development practices. Those new software tools and practices are then applied to applications that integrate computational theory, data and networks. Within CIDSE, major efforts are advancing healthcare delivery, personalized learning, logistics and enterprise information systems.

specialty areas

Enterprise Systems

Collaborative design and decision-making in an environment with dynamically evolving and distributed collaborators and competitors motivates the development of new tools and information sharing protocols by the faculty. Methods for evaluating and improving systems engineering tools are also being developed.

Health Informatics

Our faculty is actively engaged in the development and application of data mining tools for diagnosing disease incidence from health records. Designing patient and workflow processes to improve system efficiency are also active initiatives. An additional thrust focuses on utilizing ubiquitous and pervasive computing to increase functionality and independence of physically-challenged individuals.

Personalized Learning and Educational Games

With a basic goal of understanding how we learn and a secondary goal of improving the attractiveness and effectiveness of STEM education, CIDSE faculty are developing intelligent virtual tutors and games that customize learning to the individual.

Production Logistics

Operations engineering of enterprises with an emphasis on the movement of people, information and goods constitutes a major application area for operational analysis and systems modeling. Faculty research develops algorithms to efficiently produce products to meet demand and ensure safe, efficient transport of goods.

Software Engineering

Improving the software development process and ensuring software reliability are ongoing challenges addressed by CIDSE. Research is ensuring effective functionality for middleware and application systems.

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Timothy Lindquist,
Wei-Tek Tsai, Stephen Yau



ASU, TNO to Lead Training of Renewable-Energy Workforce in Caribbean

The Caribbean Branch Office of TNO, in partnership with Arizona State University's Advanced Technology Innovation Center, has been awarded a three-year contract to train a renewable energy workforce in Trinidad and Tobago, Barbados and Jamaica.

The project is funded through the Inter-American Development Bank, the leading source of development financing for Latin America and the Caribbean.

The training is part of the program Building Capacity and Regional Integration for the Development of a Generation of Entrepreneurs (BRIDGE). The program develops human capital, while encouraging gender equality, to meet the demand for technicians, professionals and entrepreneurs in the sustainable energy and information and communication technology in the Caribbean.

The need for sustainable energy continues to increase in the Caribbean, driving demand for a trained workforce to design, operate and maintain these systems.

The Inter-American Development Bank and its partner organizations launched the BRIDGE program to bridge the gap between the current workforce's capacity and skill-level and the future workforce required to meet the demands of sustainable energy systems.

"The need for a sustainable energy workforce in the Caribbean is growing every day," said Anshuman Razdan, ASU professor of computer science and executive director of the Advanced Technology Innovation Center. "We can help prepare the region for that growing demand by sharing our expertise. We can teach direct skills, as well as help the region build its capacity to do its own training."

The project team will establish a baseline of the current technical and professional capacity and estimate future demand. Based on identified gaps, it will design training programs, working with the University of the West Indies and other technical and vocational training institutions.

The program will include a train-the-trainer initiative, as well as training for technicians and professionals. It also will implement an internship program and develop an online innovation platform.

"Development of sustainable energy resources and increasing energy efficiency creates opportunities for new jobs," said Ruurd Schoolderman, strategic advisor/energy of TNO's Caribbean branch office, Aruba, and BRIDGE project manager. "However, to capitalize on this you need a trained workforce in place," added Schoolderman.

"The BRIDGE program will help address this through an internship program and development of an entrepreneurship platform. This will help students gain real-life experience and strengthen the linkage between education and employers."

Using technology to advance learning

Brian Nelson says that learning in a typical classroom is nothing like learning in the real world. Nelson, an associate professor, is developing computer-based learning environments designed to immerse students in contextualized simulations of real-world activities to introduce them to scientific inquiry and content.

In a current study, funded by the National Science Foundation (NSF), SAVE Science (Situating Assessment in Virtual Environments for Science Content and Inquiry), Nelson is exploring ways to design and embed assessments into virtual worlds and find new ways to analyze the data.

Nelson's first game in the project, Sheep Trouble, tests students on their understanding of how organisms adapt over time to a specific physical environment. In Sheep Trouble, students help a farmer understand how new sheep — recently brought to the farm from a remote island — have physical characteristics that cause problems in their new environment.

As part of the study, Nelson and his colleagues at the University of Maryland and Temple University look for links between student results on standardized testing and the embedded assessments in SAVE Science.

"If there is little overlap, we want to know what that means," Nelson said. "Can we get more interesting data about learning from these kinds of embedded assessments? What patterns of interactions could serve as a substitute for regular testing?"

Now in the project's fourth year, Nelson has added virtual world-based tests and expanded work on assessments with researchers at the University of Maryland in data mining and analysis.

In the Sheep Trouble module the team found that some students who demonstrated an understanding that different physical attributes were impacting the health of the new sheep did not understand why. They also found that most students began the assessment by exploring the virtual farm randomly, but those who came into the test with an understanding of the concepts being tested narrowed their investigation to relevant information sources quickly.

Nelson has published and presented extensively on the viability of educational virtual environments for situated inquiry learning and assessment. He hopes that by better understanding how students learn we can design more effective teaching methods and immersive learning environments in the future.

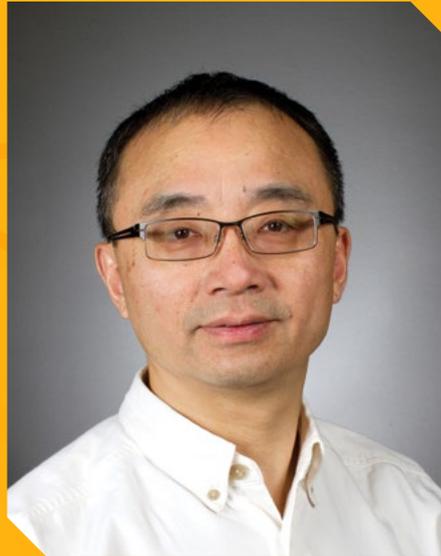


faculty honors



2013-2014 A. Alan B. Pritsker Outstanding IE Teacher Award

Linda Chattin



2013 Best Researcher Senior Faculty

Huan Liu



2013 Best Researcher Senior Faculty

Kurt VanLehn



2013 Best Researcher Junior Faculty

Georgios Fainekos

faculty awards

Sethuraman Panchanathan was selected as a 2013 Fellow of the National Academies of Inventors.

Greg Nielson received the Visualization Career Award from the IEEE Visualization and Graphics Technical Community.

Ross Maciejewski received a U.S. Coast Guard Meritorious Team Commendation for his work on the Port Resilience for Operational/Tactical Enforcement to Combat Terrorism Team (PROTECT); was awarded a NSF CAREER Award for "A Visual Analysis Approach to Space-Time Data Exploration."

Huan Liu, Fred Morstatter and Shamanth Kumar were awarded the ASU President's Award for Innovation for "Empowering Humanitarian Assistance and Disaster Relief with Social Media and Data Analytics."

Subbarao Kambhampati was elected President of AAAI, the leading professional organization in the field of Artificial Intelligence.

Georgios Fainekos was awarded a NSF CAREER Award for "Robustness Guided Testing and Verification for Cyber-Physical Systems."

faculty research productivity 2013

invention disclosures **27**

conference proceedings **167**

journal publications **166**

keynote speakers **12**



Engineering Best Teacher Award (Top 5%)

K. Selçuk Candan



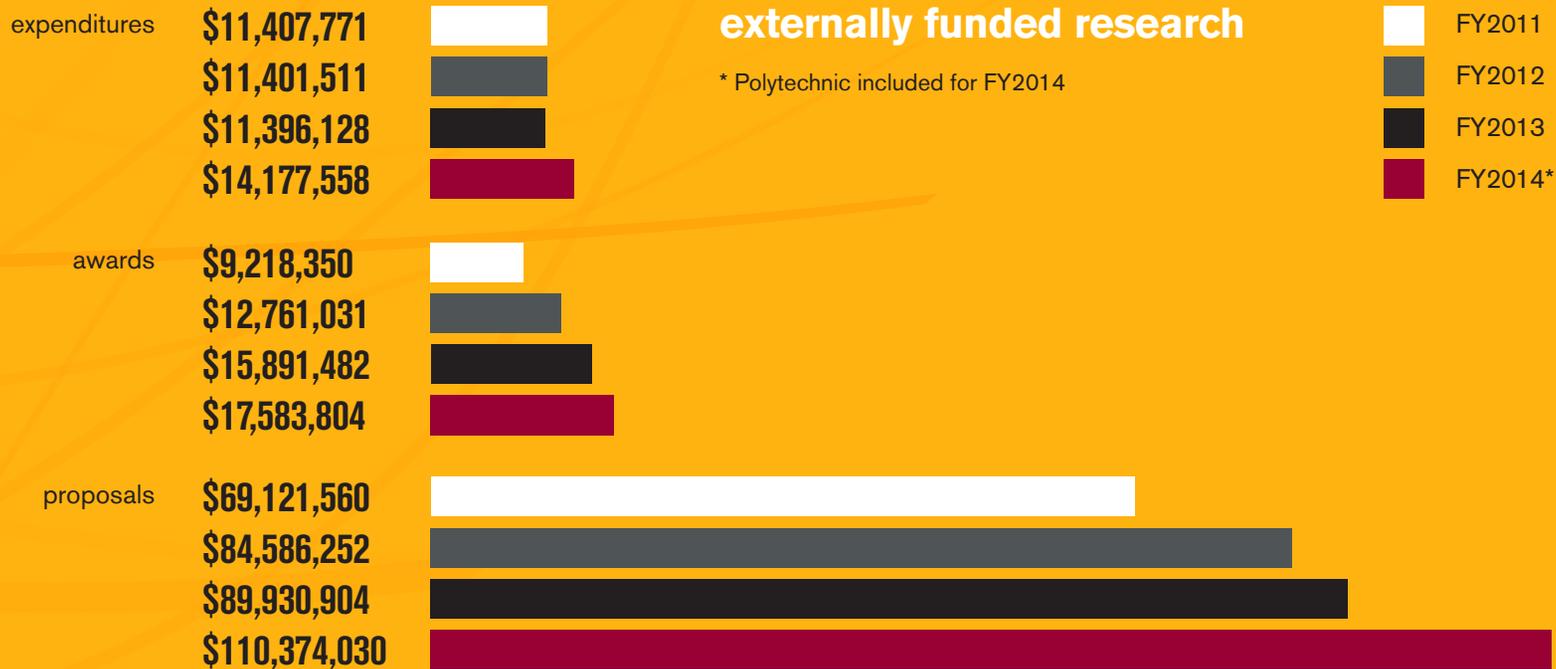
Engineering Best Teacher Award (Top 5%)

Yann-Hang Lee



Engineering Best Teacher Award (Top 5%)

Yoshiro Kobayashi



lead investigator	sponsor	award title	award \$
Ahn, Gail-Joon	National Security Agency	2014 ASU Application for DOD Information Assurance Scholarship Program	18,873
		DOD Information Assurance - Information Security Grant Program	14,805
	Cisco Systems, Inc.	Policy aware Secure Collaboration in Fog Computing	110,910
	NSF-Division of Undergraduate Education	SFS: An Information and Systems Assurance Scholarship Program	199,284
	DOD-Army Research Office	Socio metrics: Identifying Invisible Deviant Adversaries	50,000
	NSF-Directorate for Computer & Information Science & Engineering	Support for the Educational Activities at ACM CCS 2014	20,000
	DOD-National Geospatial-Intelligence Agency (NGA)	The Foresight Initiative	79,871
	Cisco Systems, Inc.	WebChameleons: Towards Secure and Trustworthy Web Browsing over HTTP 2.0	87,935
Atkinson, Robert	DOD-Office of Naval Research	Incorporating affective-based dynamic difficulty adjustment into personalized digital environments: A generalizable framework for closed-loop systems	135,067
	NCS Pearson Inc.	User Engagement Across Instructional Format	84,938
Baral, Chitta	Computing Research Association	A Foundational Model for Postdoctoral Programs in Computer Science at Large Universities (Dasgupta)	446,175
	HHS-NIH-NHGRI-National Human Genome Research Institute	Computational Analysis of Gene Expression Pattern Images	11,604
	University of North Carolina-Chapel Hill	DataNet Federation Consortium	32,800
	DOD-Office of Naval Research	Natural Language Interaction With Systems and Agents: Acquiring Knowledge Understanding Text Reasoning and Responding	107,510
	NSF-Division of Information Intelligent Systems (IIS)	Student Travel Grant: 2014 Principle of Knowledge Representation and Reasoning Conference and Doctoral Consortium	15,000
Bliss, Nadya	DOD-National Geospatial-Intelligence Agency (NGA)	The Foresight Initiative	1,517,553
Burleson, Winslow	Massachusetts General Hospital	Development of a Responsive Emotive Sensing System (DRESS)	86,526
	NSF-Directorate for Computer & Information Science & Engineering	DIP: Collaborative Research: Impact of Adaptive Interventions on Student Affect Performance and Learning	412,800
	NSF-Division of Undergraduate Science, Engineering & Mathematics	HCC: Small: Modeling and Supporting Creativity During Collaborative STEM Activities	335,399
Candan, K. Selçuk	NSF-Directorate for Education & Human Resources (EHR)	IGERT: Person-centered Technologies and Practices for Individuals with Disabilities	35,989
	NSF-Division of Molecular Biosciences	III: Small: Data Management for Real-Time Data Driven Epidemic Spread Simulations	94,777
	NSF-Directorate for Computer & Information Science & Engineering	SI2-SSE: E-SDMS: Energy Simulation Data Management System Software	474,714
Colbourn, Charles	Translational Genomics Research Institute (TGen)	Dell Powering the Possible Program	11,500
Collofello, James	Arizona Department of Transportation	2013 National Summer Transportation Institute	49,986
	Arizona State University Foundation	EPICS Intel-ospace for Social Change (ASUF 30006206)	25,000

lead investigator	sponsor	award title	award \$
Collofello, James	DOC-National Institute of Standards & Technology	NIST Summer Undergraduate Research Fellowship (SURF) Program-Boulder 2014	17,400
		NIST Summer Undergraduate Research Fellowship (SURF) Program-Gaithersburg 2014	17,220
Dasgupta, Partha	Computing Research Association	A Foundational Model for Postdoctoral Programs in Computer Science at Large Universities (Dasgupta)	446,175
Davulcu, Hasan	DOD-Office of Naval Research	Finding Allies for the War of Words: Mapping the Diffusion and Influence of Counter-Radical Muslim Discourse	163,836
		Identifying Terrorist Narratives and Counter-Narratives: Embedding Story Analysis in Expeditionary Unit	60,000
	DOD-National Geospatial-Intelligence Agency (NGA)	The Foresight Initiative	79,871
Fainekos, Georgios	NSF-Directorate for Computer & Information Science & Engineering	CAREER: Robustness Guided Testing and Verification for Cyber-Physical Systems	87,801
	NSF-Division of Electrical, Communications and Cyber Systems	CSR: Small: Collaborative Research: Gray box Testing of Complex Cyber-Physical Systems using Optimization and Optimal Control Techniques	249,998
Galluppi, Kenneth	University of North Carolina-Chapel Hill	DataNet Federation Consortium	49,199
	University of Arizona	Planning Development and Implementation of a State wide Research Initiative in Environmental informatics: Arizona Environmental Grid Infrastructure S	6,000
Goss, Jeffrey	STATE-US Agency for International Development	The Vocational University Leadership and Innovation Institute (VULII)	20,000
	Intel Products Vietnam Co., Ltd.	HEEAP 2.0 - Higher Engineering Education Excellence Alliance Program	763,593
Gupta, Sandeep	NSF-Directorate for Computer & Information Science & Engineering	CSR: Small: Understanding and modeling the trade-offs in data centers for next-generation sustainable management	11,200
	NSF-Directorate for Computer & Information Science & Engineering	SHB: Small: Toward Verifying Smart-Health Infrastructure Safety from their Impact on Human Physiology	16,000
	Intel Corporation	Open Stack Power Aware Scheduling	41,925
Huang, Dijiang	Duke University	Cyber Security Analysis and Assurance using Cloud-Based Security Measurement System	30,473
	DOD-Office of Naval Research	Establishing Research and Education Capacity for Mobile Cloud Computing	322,682
		MobiCloud: A Secure Mobile Cloud Framework for Mobile Computing And Communication	24,101
	NSF-Division of Undergraduate Education	SFS: An Information and Systems Assurance Scholarship Program	199,284
	China Mobile USA Research Center	STE: Secure Traffic Engineering for SDN Data Center Networking	35,000
DOD-Army Research Office	Traffic Analysis Models for Wireless Mobile Ad Hoc Devices	6,618	
Kambhampati, Subbarao	DOD-Office of Naval Research	Exploratory Research on RADAR: A User-Adaptive Bayesian Framework for Data-Based Decision Support	20,000
		Planning for Peer-to-Peer Human Robot Teaming in Open Worlds	87,294
		Robust Planning in the Presence of Partially Specified Domain Models and Objectives	119,065
	DOD-Army Research Office	Long-Term Continual Planning for Remote Human-Robot Teaming in Open Worlds	123,207
	Google Inc.	Listening To the Crowd: Automated Alignment, Aggregation and Analysis of Social Media Responses to Public Events	55,000

new research awards

lead investigator	sponsor	award title	award \$
Klein, Jay	NSF-Division of Industrial Innovation and Partnerships	I-Corps: Traumatic Brain Injury Detection and Reporting System	25,000
Lee, Joohyung	Electronics and Telecommunications Research Institute	Home Information Remote Aggregation and Context Inference Prediction Technology Development	84,179
	NSF-Directorate for Computer & Information Science & Engineering	RI: Small: Answer Set Programming Modulo Theories	315,000
	Electronics and Telecommunications Research Institute	Yr 1: Home Information Remote Aggregation and Context Inference Prediction Technology Development	9,147
Lee, Yann-Hang	Arizona State University Foundation	Curriculum Module Development - Firmware for Embedded Systems (ASUF 30006203)	10,000
	Electronics and Telecommunications Research Institute	Home Information Remote Aggregation and Context Inference Prediction Technology Development	84,179
		Yr 1: Home Information Remote Aggregation and Context Inference Prediction Technology Development	9,147
Li, Baoxin	NSF-Directorate for Education & Human Resources (EHR)	IGERT: Person-centered Technologies and Practices for Individuals with Disabilities	35,989
Li, Jing	Mayo Clinic Scottsdale	MRI-based mapping for identification of genomic diversity in glioblastoma	9,604
	ASURE	Phase II: Big Data in Large Communication Networks Mining Visualization	6,473
	University of Michigan	Sparse Structure Identification from High-Dimensional Epigenomic	67,920
Liu, Huan	DOD-Army Research Laboratory	Assessing Trustworthiness in Social Media: A Social Computing Approach	64,437
	DOD-Army Research Office	Computational Exploration of Noise in Social Media and Its Reduction	25,000
	FleishmanHillard	Content Analysis of Social Media Data	47,695
	DOD-Office of Naval Research	Developing Novel Auxiliary Technologies for Crisis Tracking	356,000
	HHS-NIH-NIGMS-National Institute of General Medical Sciences	International Conference on Social Computing Behavioral Modeling and Prediction	22,600
	University of Illinois-Champaign/Urbana	Modeling of Complex Systems: Mining Suspicious Tiny SubNetworks in a Massive Social Network	75,000
	Carnegie Mellon University	Multi-Source Assessment of State Stability	128,552
	National Security Innovations (NSI)	Social Media Characterization Study	70,000
	DOD-National Geospatial-Intelligence Agency (NGA)	The Foresight Initiative	79,871
Dynamics Research Corporation	Utilization of High Performance Computing for High Throughput Identification of Human Biosignatures Derived From Image Analytics of Chemical and Bio	30,000	
Maciejewski, Ross	Purdue University	Developing a spatial statistics framework in the visual analytics for law enforcement technology suite	172,472
	DOD-National Geospatial-Intelligence Agency (NGA)	The Foresight Initiative	798,712
McDaniel, Troy	Mayo Clinic Scottsdale	Golfers Cramp: Correlation of Wrist Movements and Surface EMG with Putter Movements	15,300
	NSF-Division of Industrial Innovation and Partnerships	I-Corps: Traumatic Brain Injury Detection and Reporting System	25,000

lead investigator	sponsor	award title	award \$
McDaniel, Troy	NSF-Directorate for Education & Human Resources (EHR)	IGERT: Person-centered Technologies and Practices for Individuals with Disabilities	107,967
Mirchandani, Pitu	University of Nevada-Reno	SOLARIS - Safety and Operations of Large Area Ruralurban Intermodal Systems	184,000
	DOT-Federal Highway Administration	2013 Eisenhower Graduate Fellowship-Jonathan Adler	11,500
	Booz-Allen Hamilton	Analysis Modeling and Simulation (AMS) Testbed Development and Evaluation to Support Dynamic Mobility Applications (DMA) and Active Transport	84,058
	University of Maryland	University Transportation Centers Program-National (2013)	37,500
		Congestion Mitigation Potential of Autonomous (Driverless) Vehicles: A Scenario-Based Approach	8,000
Montgomery, Douglas	DOD-Air Force Institute of Technology	Yr 4: The Science of Test: Advanced Test and Evaluation in Support of the DOD Test and Evaluation Enterprise	99,999
Montoya, Mitzi	STATE-US Agency for International Development	Pacific Islands Renewable Energy Technical and Vocational Education and Training Project	157,600
Muldner, Katarzyna	NSF-Directorate for Computer & Information Science & Engineering	DIP: Collaborative Research: Impact of Adaptive Interventions on Student Affect Performance and Learning	103,200
	NSF-Division of Undergraduate Science, Engineering & Mathematics	HCC: Small: Modeling and Supporting Creativity During Collaborative STEM Activities	77,400
Nelson, Brian	University of Maryland	RD: SAVE Science: Situated Assessment Using Virtual Environments for Science Content	80,000
Pan, Rong	NSF-Division of Civil, Mechanical & Mfg Innovation (CMMI)	Collaborative Research: Quantitative Reliability Prediction in Early Design Stages	240,191
Panchanathan, Sethuraman	NSF-Directorate for Education & Human Resources (EHR)	IGERT: Person-centered Technologies and Practices for Individuals with Disabilities	395,879
Razdan, Anshuman	IRENA - International Renewable Energy Agency	Guidance on Renewable Energy Curriculum Development through the IRENA Community	8,000
		Implementation of a Regional Program for Certification of Technicians in Renewable Energy Systems in Selected Regions	40,000
		Pacific Islands Delivery of Entrepreneurship Training and Supporting Certification Program for the Pacific Islands	18,000
	STATE-US Agency for International Development	Sustainable Energy Education Consortium (SEEC)	75,000
Richa, Andrea	NSF-CISE-Computing and Communication Foundations	EAGER: Self-organizing particle systems: Models and algorithms	16,000
		EAGER: Self-organizing particle systems: Models and algorithms	160,982
Runger, George	NSF-Division of Civil, Mechanical & Mfg Innovation (CMMI)	Collaborative Research: Leveraging Noncontact Dimensional Metrology to Understand Complex Part-to-Part Variation	167,400
	DOD-Office of Naval Research	Incorporating affective-based dynamic difficulty adjustment into personalized digital environments: A generalizable framework for closed-loop systems	90,044
	Semiconductor Research Corporation	Supply Chain Analysis	90,000
	Supply Chain Insights LLC	Supply Chain Metrics and Analysis	20,443
Saghafian, Soroush	Mayo Clinic Scottsdale	Bed-Block Phenomenon - A Significant Problem Affecting Patient Flow	95,000
Sapino, Maria	NSF-Directorate for Computer & Information Science & Engineering	SI2-SSE: E-SDMS: Energy Simulation Data Management System Software	24,985

new research awards

lead investigator	sponsor	award title	award \$
Sarjoughian, HESSAM	NSF-Division of Environmental Biology (DEB)	CNH: The Emergence of coupled Natural and Human Landscapes in the Western Mediterranean	260,000
Sen, Arunabha	DOD-Defense Threat Reduction Agency (DTRA)	A Network Planning and Management Tool for Design of Robust and Resilient Networks to withstand WMD Attacks IAW	379,393
Shrivastava, Aviral	NSF-CISE-Computing and Communication Foundations	CAREER: Compiler Techniques for Power-Efficient Protection Against Soft Errors	79,367
	DOE-U.S. Department of Energy Chicago	Compiling for Novel Scratch Pad Memory-based Multicore Architectures for Extreme Scale Computing	50,314
	NSF-Directorate for Computer & Information Science & Engineering	I-Corp Teams Compiler Technology for Modern Many-core Architectures	50,000
	University of California-Berkeley	Multicore Architecture Evaluation For Evaluation Systems	96,480
	NSF-Division of Industrial Innovation and Partnerships	PFI AIR Technology Translation Compiler Technology for Modern Manycore Architectures	150,000
Shunk, Dan	STATE-US Agency for International Development	The Vocational University Leadership and Innovation Institute (VULII)	50,000
	Centro De Enseñanza Técnica Y Superior	YRS 3-4: Visiting Scholar Proposal for the Assistance in the Creation of Centers of Excellence and Elevation of Operational Excellence Understanding	36,751
Tadayon-Navabi, Farideh	Stevens Institute of Technology	NCWIT Extension Services for Undergraduate Programs (ES-UP)	8,000
Tsai, Wei-Tek	Fujitsu Laboratories LTD	Project 3	15,000
VanLehn, Kurt	Gates (Bill and Melinda) Foundation	Adaptive General Education Program	82,500
	DOD-Office of Naval Research	An ITS authoring system for scientific and engineering modeling	1,025,305
Varsamopoulos, Georgios	NSF-Directorate for Computer & Information Science & Engineering	CSR: Small: Understanding and modeling the trade-offs in data centers for next-generation sustainable management	4,800
Vrudhula, Sarma	NSF-Division of Industrial Innovation and Partnerships	Collaborative Research: Consortium for Embedded Systems - Phase II	93,175
Walker, Erin	NSF-Division of Information, Robotics & Intelligent Systems	DIP: EMBRACEing English Language Learners with Technology	350,978
	Arizona State University Foundation	Future of the Book (ASUF 30005926)	10,250
Wang, Yalin	NSF-Division of Mathematical Sciences	Collaborative Research: Quantifying Human Retinotopic Mapping by Conformal Geometry	208,000
	HHS-NIH-NIA-National Institute on Aging	MRI Biomarker Discovery for Preclinical Alzheimer's disease with Geometry Methods	192,457
Wu, Carole-Jean	NSF-Division of Computer & Computation Research	EAGER: Characterization and Modeling for Architectural Thermal Energy Harvesting	200,000
	NSF-Directorate for Computer & Information Science & Engineering	Student Travel Support for the 2014 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS-2014)	5,000
	Science Foundation of Arizona	Yr 01: Bisgrove Post-Doctoral and Early Career Scholars	40,000
Wu, Teresa	University of Texas - El Paso	Development and Enhancement of Green Energy Learning for Effective Engineering Education to Foster the 21th Century Hispanic Sustainability Leaders	97,569
	Mayo Clinic Scottsdale	Dose Index Tracking System - Wu - William Pavlicek	121,262
		Extending Dose Index Tracking system	7,500
		MRI-based mapping for identification of genomic diversity in glioblastoma	9,604

lead investigator	sponsor	award title	award \$
Wu, Teresa	HHS-NIH-NIDDK-National Institute of Diabetes & Digestive & Kidney Diseases	MRI Techniques to Measure Whole-Kidney Nephron	35,603
	DOD-Air Force Institute of Technology	Phase II: Enterprise Requirements and Acquisition Model (ERAM) Analysis and Extension	44,000
		Phase II: Dynamic Multi Stage Modeling for Commercial Aircraft Contracting	45,000
Xue, Guoliang	DOD-Army Research Office	Computational Exploration of Noise in Social Media and Its Reduction	25,000
Yau, Sik-Sang	National Security Agency	2014 ASU Application for DoD Information Assurance Scholarship Program	18,873
		DOD Information Assurance - Information Security Grant Program	14,805
	NSF-Division of Undergraduate Education	SFS: An Information and Systems Assurance Scholarship Program	398,569
Ye, Jieping	NSF-Directorate for Computer & Information Science & Engineering	CAREER: Dimensionality Reduction for Multi-label Classification	84,253
	HHS-NIH-NHGRI-National Human Genome Research Institute	Computational Analysis of Gene Expression Pattern Images	116,044
	HHS-NIH-NLM-National Library of Medicine	Computational Methods for Expression Image Analysis	160,509
	University of California-Davis	SME: Guided Learning in Dynamic Environments (GLIDE)	45,000
	Semiconductor Research Corporation	Simultaneous Sparse Learning for Defect Classification	48,000
Yu, Shimeng	Stanford University	A Benchmark Study of Cognitive Computing From Synaptic Device to Neuromorphic Architecture	70,000
Zhang, Muhong	Mayo Clinic Scottsdale	Extending Dose Index Tracking system	7,500
	NSF-Division of Civil, Mechanical & Mfg Innovation (CMMI)	Mathematical Frameworks for Dynamic Reserve Policies	150,000

total

17,583,804

Montgomery honored for achieving elite stature in his field of engineering

Douglas Montgomery has attained one of the highest levels of recognition for exceptional achievement and leadership in his profession. The Arizona State University industrial engineer was recently elected as an Honorary Member of ASQ, the American Society for Quality, by a unanimous vote of its board. Already a fellow of ASQ this new honor places Montgomery at their highest level of distinction.

The organization's membership — almost 80,000 professionals from 150 countries — includes many of the modern pioneers and eminent figures in academia and industry in the fields of engineering, quality control and improvement, statistics, business management, technical process development and many other related areas of expertise.

Montgomery becomes only the 25th member elevated to Honorary Member status since the organization was founded in 1946.

Montgomery is an ASU Regents' Professor and an ASU Foundation Professor of industrial engineering in the School of Computing, Informatics, and Decision Systems Engineering.

His expertise is in statistical quality control, specifically "the mechanics of running complex experiments," he said, involving the design and development of tools, processes and methods necessary to provide "statistical integrity" in testing and experimentation.

"That means making sure you get reliable, accurate and valid conclusions" in performance analysis, testing and evaluation endeavors, Montgomery explained.

He has applied his knowledge in research for the Department of Defense and the National Science Foundation, and with many major corporations, including Intel, Motorola, AT&T, Procter and Gamble, Boeing, IBM, Dial Corp., Dow Chemicals, Alcoa, Eli Lilly and Union Carbide.

His Honorary Member designation by ASQ "once again acknowledges Doug as the international leader in quality engineering," said Ronald Askin, CIDSE director.

"His extensive list of research publications, textbooks and editorship service with the highest impact journals in the field constitute an unsurpassed record in creating and disseminating knowledge on the use of statistical methods to improve quality in both the design and operational phases of systems," Askin said.

Montgomery's contributions as a teacher are equally exceptional. "Our students are fortunate to have the opportunity to learn from Doug firsthand. He exudes a rare combination of enthusiasm for working with students, deep technical understanding and exceptional ability to convey difficult concepts in a clear manner that make him truly outstanding as a researcher, educator, mentor and colleague," Askin said.

Many former ASU engineering students credit professor Montgomery's teaching skills and mentorship with setting the stage for their career success.

William Woodall, a professor of statistics at the Virginia Polytechnic Institute and State University, led the nomination effort for Montgomery's ASQ honor.

In his nomination letter, Woodall wrote that Montgomery has made "an unusually large contribution to the development of the body of knowledge related to quality," and lauded Montgomery for a range of research pursuits that few others in the field could match.

Woodall further cites the influence of successful textbooks Montgomery has authored, primarily "Introduction to Statistical Quality and Control" and "Design and Analysis of Experiments."

He also notes Montgomery's contribution to development of the popular Six Sigma management and leadership training and certification program at ASU, as well as many short courses and tutorials Montgomery has taught for industry professionals.

ASU statistics professor Connie Borrer, who earned a doctoral degree in industrial engineering with Montgomery as her academic advisor, said he "has been a big draw for a long time for a lot of students. He's a foremost expert in five or six main areas, and that is unusual. People have purposely come to ASU because of him."

His impact as an educator is far-reaching. Those who have earned master's degrees and doctoral degrees under his guidance "are working all over the world," Borrer said.

"He's a fantastic mentor who builds up and brings out the best in his students," she said. "I owe my career to him, and a lot of other people can say that, too."



He got us started and headed on the right path. And just to say Doug Montgomery was your mentor or advisor opens doors for you because of the respect people have for him."

Among the dozens of honors and awards, he has been given the high status of Fellow in the American Statistical Association and the Institute of Industrial Engineers. He is an elected member of the International Statistical Institute and the United Kingdom-based Royal Statistical Society.

He has been editor of the *Quality & Reliability Engineering International* research journal since 2000, and was editor of the *Journal of Quality Technology* for three years. He has served as an associate editor and editorial board member for many other major research journals, and authored or co-authored numerous papers published in leading research journals.

Montgomery is in his 27th year at ASU. Previously he was on the faculties of the Georgia Institute of Technology and the University of Washington, and was an instructor at the Virginia Polytechnic Institute.

He was recognized for his career achievements in a formal tribute during ASQ's World Conference on Quality and Improvement in Dallas in May 2014.

President Obama appoints ASU's Panchanathan to National Science Board

Sethuraman “Panch” Panchanathan, Arizona State University's senior vice president of the Office of Knowledge Enterprise Development (OKED) and the leader of ASU's research, entrepreneurship and economic development efforts, has been appointed to the U.S. National Science Board (NSB) by President Barack Obama.

In addition to his work with OKED, Panchanathan is a professor in ASU's School of Computing, Informatics, and Decision Systems Engineering. He is also director of the Center for Cognitive Ubiquitous Computing (CUbic).

This marks the first time an American of Indian origin has been appointed to this preeminent board, which focuses on national science and technology policy.

In making the announcement of Panchanathan's and others' appointments, President Obama said, “Our nation will be greatly served by the talent and expertise these individuals bring to their new roles. I am grateful they have agreed to serve in this administration and I look forward to working with them in the months and years ahead.”

In addition to being an advisory body to the U.S. President and Congress on science and engineering issues, members of the 25-member board establish the policies of the National Science Foundation (NSF) within the framework set forth by the president and Congress. The NSF is a major science-funding agency with an annual budget of \$7.2 billion (FY2014) and the goal of promoting the progress of science; advancing national health, prosperity and welfare; and securing national defense.

“Panch has worked tirelessly in advancing ASU and its rapidly growing research enterprise, promoting our unique capabilities and what we offer businesses and government agencies, and leading the way to a greater public understanding of the benefits that scientific research and technology development have to offer,” said ASU President Michael Crow. “Panch exemplifies the spirit of innovation, entrepreneurship and social responsibility that ASU aims to cultivate. It is fitting that he be on this important board so that his influence can extend to the benefit of the nation.”



“This is a fantastic opportunity to help our nation be in the vanguard of global competitiveness through the rapid advancement of science, technology, entrepreneurship and innovation,” Panchanathan said. “It is truly an honor to serve our nation in this capacity.”

Drawn from industry and universities, and representing a variety of science and engineering disciplines and geographic areas, NSB members are selected for their eminence in research, education or public service, and records of distinguished service. NSB members are appointed for six-year terms.

Panchanathan was recently named a Fellow of the National Academy of Inventors. He led a team that received two Microsoft Imagine Cup awards, and he has been chosen for the Governor's Innovator of the Year for Academia award and the ASU Leadership Award.

Panchanathan has published or presented more than 400 papers in refereed journals and conferences, and is a Fellow of the Institute of Electrical and Electronics Engineers, the Society for Photo-Optical Instrumentation Engineers and the Canadian Academy of Engineering.

Fainekos' work on embedded cyber-physical systems earns NSF CAREER award

Highly complex automation and autonomously controlled machinery are certain to be ever more present in daily life. Transportation, energy, manufacturing and aerospace systems, healthcare equipment and household appliances are among increasingly self-operated technologies.

Such advances are made possible by intricate networks of interacting computing components embedded in the control systems of automobiles, aircraft, electric power grids, medical devices and more.

Such technology-controlling networks are known as cyber-physical systems — systems in which computing devices both send information to the larger systems in which they are integrated and receive information from the immediate environment that guide computers' reactions in response to varying external conditions.

Finding ways to ensure cyber-physical systems can be made to operate more safely, reliably and economically is among the research pursuits of Arizona State University computer scientist **Georgios Fainekos**, an assistant professor in the School of Computing, Informatics, and Decision Systems Engineering.

Fainekos is the director of the Cyber-Physical Systems Laboratory at ASU and is an affiliate with the university's Center for Embedded Systems.

Fainekos will expand his research with support from a prestigious National Science Foundation (NSF) CAREER Award he recently received. The awards are bestowed on younger faculty members considered to be emerging leaders in research and teaching in their fields. The award provides his project more than \$430,000 over the next five years.

He will seek to improve the software that drives embedded computing systems, enabling the software to better reveal and eliminate errors in the design, modeling and implementation of cyber-physical systems.

He wants to create the tools for more dependable testing of such systems, as well as better methodologies to verify the systems meet quality and regulatory standards.

"One big challenge," Fainekos said, "will be finding ways to update testing and analysis methodologies even as more complex software continues to be developed to improve the performance of embedded systems."



Solving the challenge will become more critical to helping prevent the kinds of design and testing errors that could eventually cost industry billions of dollars due to product defects.

Even more, Fainekos said, improvements in cyber-physical systems are essential "so that we can have confidence in the new technologies we are going to depend on for many things in our lives."

His project results will find their way into classrooms. One goal is to develop curriculum for teaching about cyber-physical systems advancements in online education programs for practicing engineers who need to update their training in the field.

Fainekos earned master's and doctoral degrees in computer and information science from the University of Pennsylvania. He earned bachelor's and master's degrees in mechanical engineering from the National Technical University of Athens, Greece.

Before joining ASU, he was a postdoctoral researcher at NEC Laboratories Inc., a U.S.-based global network of research laboratories.

Ross Maciejewski: Providing new ways to look at the world

Ross Maciejewski uses his curious mind and extraordinary computer skills to create new ways to see the world, from 3-D views of a traumatic spine injury to simulation of water in the desert, to new ways to visualize crime statistics or predict disease outbreaks.

Maciejewski, assistant professor of computer science in the School of Computing, Informatics, and Decision Systems Engineering, recently received the prestigious National Science Foundation Faculty Career Development, or CAREER Award, which provides \$450,000 for research and outreach efforts.

“Ross’ work is on the cutting edge of visual analytics, and he is contributing to significant advances,” said Dave White, associate professor in ASU’s School of Community Resources and Development. “The significance lies in the development of new methods and tools to link big-data analytics with meaningful and compelling visualizations to provide insights for decision-making.”

The CAREER Award is a vote of confidence from Maciejewski’s community and the greater engineering community, according to David Frakes, associate professor in the School of Biological and Health Systems Engineering, one of the Fulton Schools of Engineering.

“There are few awards that can mean more than the CAREER Award,” Frakes said. “It’s a clear message from his community that Ross’ work is greatly valued and that they see a strong likelihood that his contributions will continue to grow and be meaningful to society.”

Maciejewski earned three bachelor’s degrees from the University of Missouri, and master’s and doctoral degrees at Purdue University.

His dissertation was on “syndromic surveillance,” analyzing data from hospital emergency departments to help predict a disease outbreak. Maciejewski said his research is more applied than pure computer science.

“It deals with real-world problems,” Maciejewski said. “I want to help people make better decisions with data, to understand the input. It’s about knowledge acquisition.”

Maciejewski was a visiting associate professor at Purdue before coming to ASU in 2011. He teaches undergraduate research and runs ASU’s Visual Analytics and Data Exploration Research Lab.



He’s mapping crime reports to allow better allocation of resources or provide information to first responders, working with ASU’s Foresight Initiative to anticipate and mitigate national security risks associated with climate change, and refining a water simulation model for the National Science Foundation’s ASU Decision Center for a Desert City, which studies water management in climatic uncertainty.

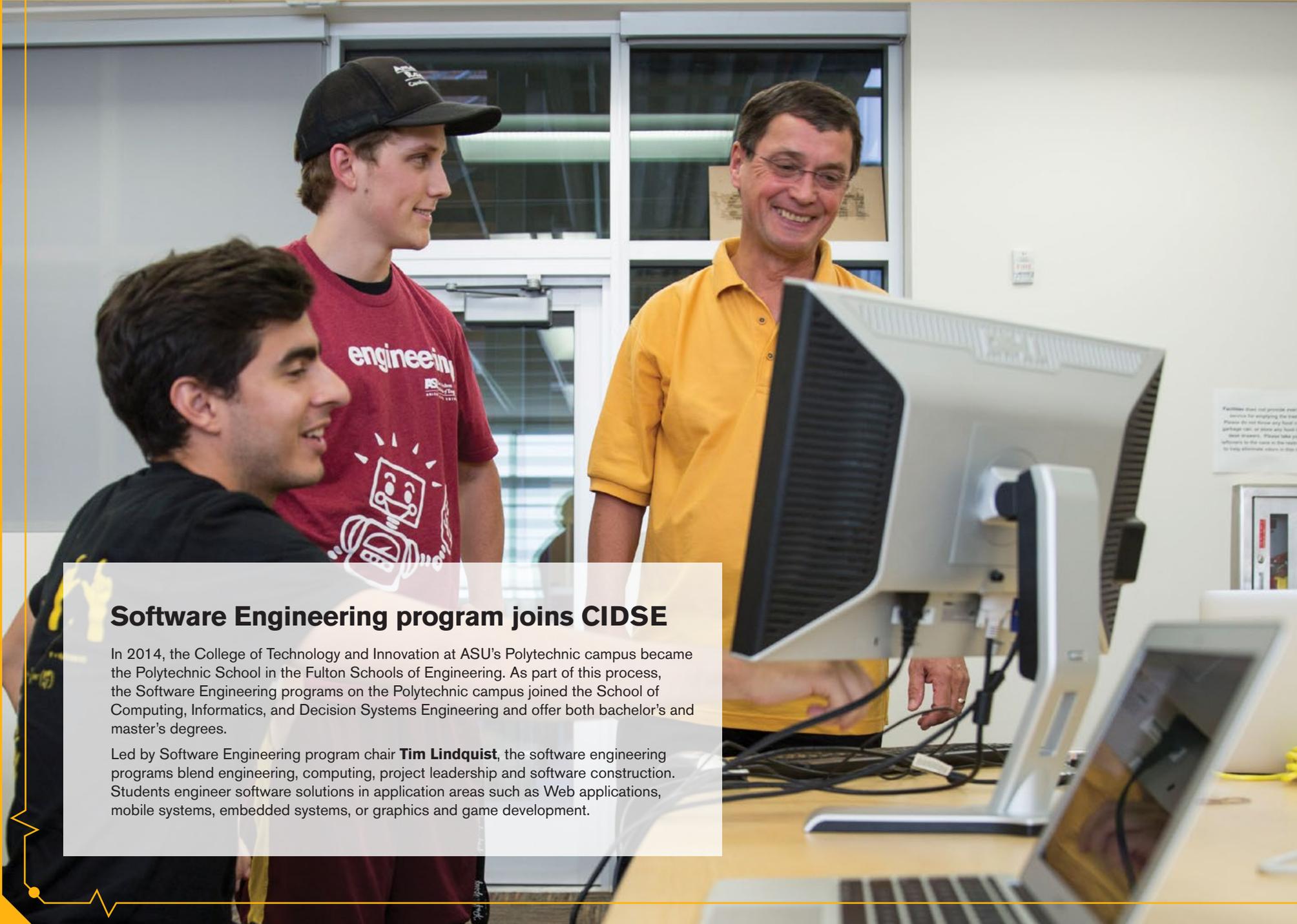
Frakes said he and Maciejewski work on medical imaging visualization projects.

“We combine imaging from different methods, like CT (Computed Tomography) or MRI (Magnetic Resonance Imaging),” Frakes said. “For example, when there is a

traumatic spinal injury, CT scanning will show the bones clearly, while the MRI will show the edema, or swelling of the damaged tissue. Putting those together helps the doctor see where the bones and swelling are at the same time.”

Frakes also said he appreciates Maciejewski’s commitment to students.

“It’s important to give undergraduates an opportunity to do research to find out if they like it and to develop independent thinking,” Maciejewski said.



Software Engineering program joins CIDSE

In 2014, the College of Technology and Innovation at ASU's Polytechnic campus became the Polytechnic School in the Fulton Schools of Engineering. As part of this process, the Software Engineering programs on the Polytechnic campus joined the School of Computing, Informatics, and Decision Systems Engineering and offer both bachelor's and master's degrees.

Led by Software Engineering program chair **Tim Lindquist**, the software engineering programs blend engineering, computing, project leadership and software construction. Students engineer software solutions in application areas such as Web applications, mobile systems, embedded systems, or graphics and game development.



Adam Doupé

Ph.D., University of California, Santa Barbara

Doupé, an assistant professor, focuses his research on cyber security for web applications. He developed the “Capture the Flag” live educational security competition that attracted over 1,300 individuals in 2013. In a previous project, he and a team developed an automated tool that found hundreds of vulnerable web applications, which allowed him to notify the owners so that they could fix the vulnerability. Discussing his work, Doupé said, “I love the practical applicability of security research. I am very excited about positively impacting and improving the safety of web applications and other computing areas.” Doupé chose ASU for the environment and energy of CIDSE. “During my interview, I could feel the excitement and enthusiasm from the faculty, students and staff. I also wanted to be a part of a dynamic and growing institution, and ASU certainly fits that bill,” he said. He hopes to make ASU a recognized leader in computer security research by 2020.



Mohamed Sarwat

Ph.D., University of Minnesota

Sarwat, an assistant professor, focuses primarily on developing highly effective, efficient and scalable systems, as well as establishing the theoretical foundation behind these systems. He developed a scalable personalized recommender system which has been downloaded over 4,000 times this year and has received an award. His work has been funded by the National Science Foundation, University of Minnesota Digital Technology Center and Microsoft Research.



Jingrui He

Ph.D., Carnegie Mellon University

He, an assistant professor, uses statistical machine learning and data mining techniques to analyze “big data.” Her research focuses on the following two major challenges of big data: rarity and heterogeneity. She has filed eight patents and was team leader of the second place team at the 1010 IEEE International Conference on Data Mining Contest on Traffic Prediction for Intelligent GPS Navigation. Prior to joining ASU, she was an assistant professor at the Stevens Institute of Technology. Describing ASU as “the most vibrant place [she’s] ever been,” she chose to teach at ASU because she believes it is where she can best make an impact on society. In her next few years at ASU, she hopes to advance state-of-the-art techniques in her field and make contributions in multiple high-impact application domains such as the medical informatics, manufacturing and social media domains.



Paulo Shakarian

Ph.D., University of Maryland, College Park

Shakarian, an assistant professor, spent three years with the U.S. Military Academy prior to joining ASU and has received multiple military awards including a Bronze Star. He has developed software currently in use by police departments utilizing social data analysis to fight violent street gangs. When asked why he chose to teach at ASU, Shakarian explains that “As an institution [ASU] is aggressively pursuing high-impact research that can directly impact society.” Over the next few years, he hopes to set up his Cyber-Socio Intelligent Systems (CySIS) Laboratory to start engaging in research in which artificial intelligence techniques can be applied to problems of social network mining and cyber security.



I-Han “Sharon” Hsiao

Ph.D., University of Pittsburgh

Hsiao, an assistant professor, focuses on social systems for personalized learning, which she said are “innovative learning technologies that everyone can use and afford.” Prior to joining ASU, Hsiao was a postdoctoral researcher at the Columbia University EdLab, where she developed and tested novel approaches for incorporating adaptive and social networking systems into online learning. Hsiao chose to work at ASU for its research support and opportunities, as well as the youthful and energetic environment she feels the university fosters. Her main goal for the next few years is to consolidate systematic research in artificial intelligence-supported computer science education.



Hanghang Tong

Ph.D., Carnegie Mellon University

Tong, an assistant professor, focuses on mining graphs and multimedia in the context of “big data.” In the last four years, he has been awarded \$15 million as either a PI or co-PI, and some of his mining graphs have been or are being deployed in industries, leading to more than 20 U.S. patents filed. Tong received the Best Paper Award at the 2012 ACM International Conference on Information and Knowledge Management. Prior to joining ASU, he was an assistant professor at City College, CUNY. Tong said he chose to work at ASU because of the people. “I am very impressed by the research at CIDSE, and ASU in general, and see great opportunity to collaborate with and learn from many of the researchers.” Over his next few years at ASU, Tong hopes to gain a more in-depth understanding of the big graphs generated from many high-impact application domains. He also wants to develop effective and efficient tools to better utilize these graphs.

undergraduate degrees

The Bachelor of Science in Engineering (B.S.E.) in computer systems engineering focuses on the systems that enable computation and communication and about the integration of systems software and hardware. It emphasizes the design and development of hardware and software components comprising a computer system. The curriculum includes courses on computer organization and architecture, system programming, operating systems, embedded micro systems and digital hardware design. Although the program addresses numerous application areas, a unique focus on embedded systems sets it apart. A concentration in information assurance is also available.

The Bachelor of Science (B.S.) in computer science has its foci on computational processes for problem solving, and information transfer and transformation with an emphasis in improving software and system quality, security, performance and usability. It provides a solid background in computing principles and enables students to customize their degrees with technical electives. Students may also select courses in mathematics, other engineering areas and biology to meet requirements. This degree also offers a software engineering concentration consisting of courses in which students have an opportunity to master software development techniques while working in teams. A concentration in information assurance is available for this degree as well.

The Bachelor of Science in Engineering (B.S.E.) in industrial engineering is ranked among the top 20 in the nation. The program concentrates on the design, operation and improvement of the systems required to meet societal needs for products and services. Students complete 33 hours of upper division industrial engineering courses, three semesters hours of technical electives and nine hours of career-focused study area electives. Undergraduates learn to apply systems modeling and analysis skills to ensure that high-quality products and services are achieved with the optimal use of resources.

The Bachelor of Science in Engineering (B.S.E.) in engineering management prepares students to effectively lead engineering-driven enterprises. The curriculum provides a breadth of engineering science and design with depth in one practice area. Study of business practices, organizational behavior and management skills are emphasized. Topics such as project and resource management, financial engineering, risk management, configuration management, service plans, product liability,



entrepreneurship and operations management are covered in addition to product design and process development. Graduates will be employable as project management team members, system specification and customer relationship management specialists, production supervisors, supply logistics engineers or similar roles.

The Bachelor of Science (B.S.) in informatics provides an interdisciplinary experience that responds to the rapidly growing need for skilled informaticians that focus on how people use information. With the tremendous growth in knowledge about computation and its application, informatics represents a large and growing body of knowledge that fits in between disciplinary majors to help utilize computing technology in specific problem domains. Students in the program learn various subjects in software engineering, human-computer interaction, decision theory, organizational behavior and information technology infrastructure. Graduates will develop innovative ways to help people interact with technology and new ways for users to create and share information and to design computational tools that model, aid or automate activities within disciplines such as science, business, geography, education and entertainment.

The Bachelor of Science (B.S.) in software engineering is a unique project-driven curriculum, establishing a new model for software engineering education. The program is built around the concepts of engaged learning, discovery-based education and learn-by-doing. Students complete projects in every semester of the program to provide emphasis on communication, teamwork, critical thinking and professionalism. Students have flexibility in designing their course of study; they select a software engineering application area such as Web applications, mobile systems, or graphics and game development, as their primary focus, and may obtain interdisciplinary knowledge through a secondary area of their design.

master's degrees

The Master of Science (M.S.) in computer science

is a research-oriented degree targeted at students with an undergraduate education in the science of computation. It provides advanced coursework and emphasizes student research as well as offering numerous opportunities for interdisciplinary study. Within this degree, a concentration in arts, media and engineering (AME) is offered in collaboration with faculty in the Department of Electrical Engineering and the Herberger Institute for Design and the Arts. Master's students can also pursue concentrations in information assurance and biomedical informatics.

The Master of Computer Science (M.C.S.)

is an advanced degree targeted at students with an undergraduate education in computer-related disciplines who can benefit from further breadth and background. The M.C.S. also provides an opportunity for students employed in industry to seek advanced education in computer science. M.C.S. students can pursue a concentration in information assurance. The graduate-level course work emphasizes research topics of current interest, such as embedded systems, information assurance and computer security, multimedia and the arts, database systems, algorithm design and analysis, bioinformatics, sensor and ad-hoc networks, data mining, information integration, optical networks and computer aided-geometric design.

The Master of Science (M.S.) in industrial engineering

is designed for students interested in combining knowledge from the physical, mathematical and social sciences to design efficient manufacturing and service systems that integrate people, research, production and supply-chain logistics and enterprise information systems in challenging manufacturing and service environments. Successful industrial engineering concepts are also spreading to the financial, logistics and healthcare services industries, affording new areas of opportunity for graduates. Students choose from a non-theses or theses track in the program.

The Master of Science (M.S.) in Computer Engineering

degree combines resources from the School of Computing, Informatics, and Decision Systems Engineering (CIDSE) and the School of Electrical, Computer and Energy Engineering (ECEE). The program provides the knowledge and skills necessary to advance and develop new paradigms for the design, computing, communications and networking (wired and wireless), control functions, sensing, signal processing and actuation.

It is a multidisciplinary program that builds on the fundamentals of computer science, electrical engineering, industrial engineering and applied mathematics, with a balance between hardware and software courses.

The Master of Science (M.S.) in software engineering

program focuses on developing advanced knowledge and abilities in the design and application of software. Students will learn to apply engineering principles to software development, including design methodologies, operation principles and maintenance and testing approaches. The program involves the application of engineering principles to software development including design methodologies, operation principles, and maintenance and testing approaches. It is aimed at developing professional skills in this discipline as well as providing opportunities for students to engage in and develop research abilities.

doctoral degrees

The Doctor of Philosophy degree (Ph.D.) in computer science

prepares students to undertake fundamental and applied research in computer science in academia, government and industry. Having matured as a discipline in its own right, computer science is now interacting at a new level with other fields, not just in engineering and science, but throughout the arts and humanities, education, law, medicine and business. A wealth of experience for computer science doctoral students is available through collaborations with other engineering schools in the Ira A. Fulton Schools of Engineering, the Herberger Institute for Design and the Arts, the Center for Embedded Systems and the Translational Genomics Research Institute (TGen). The interdisciplinary strength of the degree is enhanced by a concentration in arts, media and engineering, as well as a concentration in information assurance.

The Doctor of Philosophy degree (Ph.D.) in industrial engineering

offers students a program focused on industrial statistics and quality engineering, applied operations research, production and supply-chain logistics and enterprise information systems in challenging manufacturing and service environments. To complement our traditional strengths in manufacturing, in recent years we've developed a focus on health systems. The program has a strong track record of placing graduates in academic positions, as well as in leading industrial labs.

The Doctor of Philosophy (Ph.D.) in computer engineering

is designed for students with excellent skills in mathematics and physical science who are interested in gaining an in-depth knowledge of the foundation principle of engineering, as they pursue a career in academia, research or a highly technical entrepreneurial innovation. The Ph.D. program provides a broader and more in-depth preparation than the M.S. program, in anticipation of a demonstrated ability to independently pursue more creative and substantive innovation with higher impact. Students may choose to follow a concentration in either electrical engineering or computer systems engineering.

certificate programs

Computer Gaming Certificate is an 18-credit-hour certificate open to any student at ASU (undergraduate, graduate and non-degree seeking) and is designed to provide a comprehensive game development skill set that the student can apply to his or her major. The goal is to apply gaming technology to domain-specific problems. The certificate can also be used as one of the areas of concentration for the Bachelor of Interdisciplinary Studies (B.I.S.) degree.

Informatics Certificate is defined as the study of ways in which computer technology can be used to gather, synthesize, store, visualize and interpret information. This certificate is available to students in non-computing majors and will provide them with an understanding of the capabilities and technologies of informatics. The certificate can also be used as one of the areas of concentration for the B.I.S. degree.

Lean Six Sigma Black Belt is a graduate certificate aimed at engineers and managers who oversee tactical and strategic projects as well as various operational functions in their organizations. Six Sigma is a proven systematic approach to continuous improvement of critical processes in a wide range of industrial environments such as banks, manufacturing facilities and hospitals. The American Society of Quality (ASQ) defines the Certified Six Sigma Black Belt as "a professional who can explain Six Sigma philosophies and principles, including supporting systems and tools.

name	major	semester(s)	title	field	mentor
Kareem Abuobeid	CSE	Spring 2014	Low temperature defect characterization of high power SiC MOSFETs	Energy	Michael Goryll
Sichun Ai	CS	Spring 2014	Vibrotactile Cueing using Wearable Computers for Overcoming Learned Non-Use in Chronic Stroke	Health	Sethuraman Panchanathan
Lisa Baer	CS	Spring 2014	Harnessing Social Media Power in Finding Lost Pets--Developing a Mobile Geo-Spatial Tool	Security	Huan Liu
Shantanu Bala	CS	Fall 2013	Exploring Audio-to-Tactile mappings for Sensory Substitution	Health	Sethuraman Panchanathan
Amy Baldwin	CS	Spring 2014	Learning the Initial Lexicon in Translating Natural Language to Formal Language	Health	Chitta Baral
Nicholas Berk	CSE	Spring 2014	TAG System: Interactive Geometry	Education	Erin Walker
Chaley Boreland	CS	Summer 2013	Aneurysm Model Database Development	Health	David Frakes
Tara De Vries	CS	Summer 2013, Fall 2013, Spring 2014	Gender Differences in K-12 Student Engineering Outreach Effectiveness	Education	Martin Reisslein
Kathleen Duggan	IE	Fall 2013, Spring 2014	Student Productivity in Higher Education as a Function of Thermal Comfort	Education	Kristen Parrish
Patrick Gaines	CS	Summer 2013, Spring 2014	Towards the Development of Web and Mobile Tools for the Modeling, Analysis, Simulation, Animation, Design, and Control of Complex, Uncertain, Dynamical Systems	Education	Armando Rodriguez
Raji Ganesan	INFORMATICS	Spring 2014	Serious Games for Stroke Rehabilitation Using Sifteo Cubes	Health	Sethuraman Panchanathan
Matthew Hartenbower	CSE	Spring 2014	Development of an Easy-To-Use Toolkit for End-User Created Sensor-Augmented Behavior Change Applications	Health	Sethuraman Panchanathan
Melissa Ip	CSE	Spring 2014	Estimating Trio Model Parameters to Improve Detection of De Novo Mutations	Health	Jieping Ye
Grant Marshall	CS	Spring 2014	Predicting Trends in Twitter	Security	Huan Liu
Sami Mian	CSE	Fall 2013, Spring 2014	Strategies for hardware accelerated low power video processing and transmission for real world human sensor networks	Security	Martin Reisslein
Jeffery Morgan	CS	Summer 2013, Fall 2013, Spring 2014	A Cross Platform Framework for Segmented Video Retrieval and Playback Across Wireless Sensor Networks	Security	Martin Reisslein
Alexandra Porter	CS	Spring 2014	Personal Visualization for Dietary Analysis	Health	Ross Maciejewski
Sumbhav Sethia	CS	Spring 2014	Teach Me How to Work: Natural Language Model Updates and Action Sequencing	Health	Subbarao Kambhampati
Arda Unal	CS	Spring 2014	E-SDMS: Energy Simulation Data Management System Software	Energy	Selçuk Candan
Louis Wilson	CS	Fall 2013, Spring 2014	Conditional Expectation Algorithms for Matrices	Security	Charles Colbourn



The Fulton Undergraduate Research Initiative (FURI) provides hands-on lab experience, independent and thesis-based research, and travel funding to national conferences.

In the competitive process, students work with faculty mentors to develop research proposals. Undergraduates earn money for creating knowledge based upon the scholarly method.

Students perform research under their faculty mentor's supervision, submit progress reports and present their findings at semi-annual poster symposium.

Motivated students find a thrilling experience in the intellectual community, while enriching their graduate school aspirations or entry into industry.



student	graduated	title	chair	members	placement
Adibi, Azadeh	Fall 2013	A P-value based approach for Phase two Profile Monitoring	Connie Borrer	Douglas Montgomery, Jing Li, Muhong Zhang	JDSU
Adler, Jonathan	Spring 2014	Routing and Scheduling of Electric and Alternative-Fuel Vehicles	Pitu Mirchandani	Ronald Askin, Esma Gel, Guoliang Xue	Promontory Growth and Innovation
Anwar, Saadat	Spring 2014	Representing, reasoning and answering questions about biological pathways-various applications	Chitta Baral	Yi Chen, Hasan Davulcu, Katsumi Inoue, Joohyung Lee	Arizona State University
Bai, Ke	Spring 2014	Compiler and Runtime Integration for Memory Management on Software Managed Manycore Processors	Aviral Shrivastava	Guoliang Xue, Chaitali Chakrabarti, Karamvir Chatha	Advanced Micro Devices (AMD)
Haghevis, Moeed	Summer 2013	An Integrated Optimization and Agent Based Modeling Frame work for Engineered Complex Adaptive Systems with Application to Demand Response in the U.S. Electricity Markets	Ronald Askin	Hans Armbruster, Pitu Merchandani, Kory Hedman, Tong Wu	Progressive Casualty Insurance Company
Kennedy, Kathryn	Summer 2013	Bridging the Gap Between Space-Filling and Optimal Designs	Douglas Montgomery	Rachel Johnson, Connie Borrer, John Fowler	Independent
Leary, Glenn	Summer 2013	System Level Synthesis of Dataplane Subsystems for MPSoCs	Karamvir Chatha	Rudy Beraha, Sarma Vrudhula, Aviral Shrivastava	Intel Corp.
Lutz, Jonathan	Fall 2013	Scheduled Medium Access Control in Mobile Ad Hoc Networks	Charles Colbourn	Violet Syrolluk, Errol Lloyd, Goran Konlevod	Intel Corp.
Mechtley, Brandon	Fall 2013	Techniques for Soundscape Retrieval and Synthesis	Andreas Spanias	Hari Sundaram, Perry Cook, Baoxin Li	University of London
Morris, Scott	Spring 2014	Design, Analytics and Quality Assurance for Emerging Personalized Clinical Diagnostics Based on Next-Gen Sequencing	Esma Gel	George Runger, Joseph Paulauskis, Ronald Askin	Paradigm Diagnostics
Sahu, Anshuman	Spring 2014	Non-Linear Variation Patterns and Kernel Preimages	George Runger	Ross Maciejewski, Rong Pan, Teresa Wu	Hitachi America Ltd
Shirazipourazad, Shahrzad	Spring 2014	Resource Allocation in Communication and Social Networks	Arunabha Sen	Guoliang Xue, Andrea Richa, Srikanth Saripalli	Arizona State University
Stone, Brian	Summer 2013	No-confounding Designs of 20 and 24 runs for Screening Experiments and a Design Selection Methodology	Douglas Montgomery	John Fowler, Connie Borrer, Rachel Johnson	Air Force Institute of Technology
Verdicchio, Michael	Summer 2013	Gene Regulatory Networks: Modeling, Intervention and Context	James Collofello	Seungchan Kim, Chitta Baral, Gustavo Stolovitzky	The Military College of South Carolina
Yang, Dejun	Summer 2013	Coping with Selfish Behavior in Networks using Game Theory	Guoliang Xue	Arunabha Sen, Junshan Zhang, Andrea Richa	Colorado School of Mines
Yang, Tao	Fall 2013	Optimal Experimental Design for Accelerated Life Testing and Design Evaluation	Rong Pan	Douglas Montgomery, Connie Borrer, Steven Rigdon	First Solar



**Outstanding Senior Award
Computer Science**

Keilan Jackson



**Outstanding Senior Award
Computer Systems
Engineering**

Ryan Kral



**Outstanding Senior Award
Industrial Engineering**

Kate Duggan



**Outstanding Senior Award
Engineering Management**

Jill Fralick



**Outstanding Senior Award
Informatics**

Brian Castellanos

**student awards and
recognition**

**Outstanding Industrial Engineering
Ph.D. Dissertation Award**

Jonathan Adler

**Outstanding Industrial Engineering
TA Award**

Michael Clough

**Outstanding Computer Science
Ph.D. Student**

Dejun (DJ) Yang

**Outstanding Computer Science
TA Award**

Reza Zafarani

**Outstanding Computer Science
M.S. Student**

Xiaolan Wang

Google Anita Borg Scholarship

Amy Baldwin, Computer Science

**Visual Analytics Science and
Technology Challenge Award**

Yafeng Lu and Feng Wang (Ross Maciejewski, Advisor) received the Visual Analytics Science and Technology (VAST) Challenge award for their work entitled "Excellent Visual Analysis of Structured and Unstructured Data".

**Systems Demonstration
People's Choice Award**

Lydia Manikonda, Tathagata Chakraborty, Sushovan De, Kartik Talamadupula and faculty member Subbarao Kambhampati received the Systems Demonstration People's Choice Award for "AI Mix: How a Planner can Help Guide Humans Towards a Better Crowdsourced Plan" at the International Conference on Planning and Scheduling (ICAPS 2014)

ASU team among winners at major international computer systems competition

A team of students from the Ira A. Fulton Schools of Engineering won a first-place award at the Intel Cup Undergraduate Electronic Design Contest, the premiere international student competition in embedded system design in Shanghai, China in July 2014.

The Fulton team's project was an educational program designed to introduce students to fundamental concepts of computational thinking. It combines a web-based programming environment and a physical robotics platform to teach students the fundamentals of programming in an engaging and less expensive way.

Held every two years, the Intel Cup competition is part of Intel's commitment to education and is designed to showcase the use of embedded systems using the latest Intel processors, said **Yinong Chen**, a senior lecturer in the School of Computing, Informatics, and Decision Systems Engineering.

An embedded system is a combination of computer hardware and software specifically designed for a particular function. Embedded systems are used in objects such as phones, cameras, airplanes, household appliances and toys.

Invitations to the Intel Cup are extended to top research universities that have ongoing collaborations with Intel, Chen said. Teams were asked to design, implement and document a working prototype of an embedded system, but there are no set parameters on what the system can do.

In addition to providing the participating universities the necessary hardware, software and training for competition, Intel provides additional devices for teaching. This year, ASU received 35 Intel Galileo boards for regular teaching.

"We are the first group to get this next-generation equipment," Chen said.

Intel Intelligent Systems Group, based in Chandler, is one of the largest employers of Fulton engineering graduates, Chen said. The company works closely with ASU to help ensure the university's computer science and engineering courses are relevant to the industry.

This year, two teams worked together as part of the senior capstone course. They created a robot that students can use to learn programming skills. The software team created a user interface and a simulator, which allows novice students to program a robot without knowing how to write computer code.

Members of that team are David Humphries, Garth Bjerk, Ian Plumley, Nathanael Stout, and Tracey Heath, all computer science majors in the School of Computing, Informatics, and Decision Systems Engineering, Bjerk is also a student in Barrett, The Honors College.

The hardware team used the Intel processor to build a robot and write embedded code in the robot. Members of that team are Corey Jallen, Matthew Recchia, Randy Queen, Rizwan Ahmad, who had been awarded the James F. Golder Memorial Scholarship, and Stephen Pluta, all computer systems engineering majors in CIDSE.

The competition team was coached by Professor **Yann-Hang Lee**, a professor in the School of Computing, Informatics, and Decision Systems Engineering. Lee also teaches multiple ASU classes using the latest Intel architecture and devices.

Graduate student Garret Walliman designed the project and mentored students who developed it as their senior-year engineering capstone design project and is working with the team as part of his thesis.

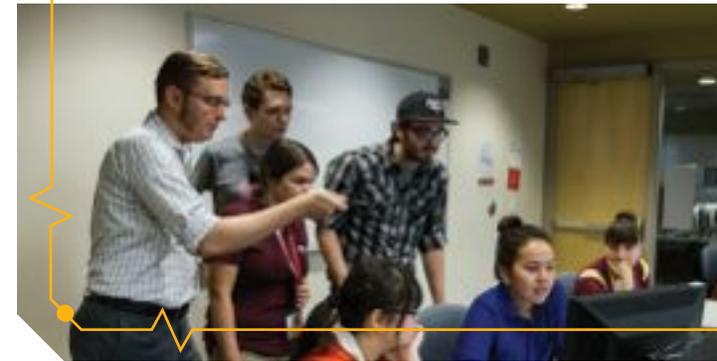
Walliman said the graphical user interface makes learning easier.

"It allows students to learn the concepts of loops, and 'if' statements, without having to learn computer programming languages like Java or C++," Walliman said. "It uses programming blocks that students can put together and then send to a simulator to test, or send directly to a robot. Keeping the syntax simple allows them to focus on the concepts."

The simulator shows a tiny robot in a maze, and the students drag and drop the programming blocks into a window to tell the car to move forward a certain distance, turn right and move forward again. The maze gets more complex as the student better understands the programming concepts.

"In the first course, students learn Java and C++, but it's difficult and boring," Chen said. "They get discouraged and think they don't like programming. But when you use the graphic drag-and-drop program, which keeps it very simple and puts the programming in context, students really understand it."

The hardware team designed a robot that the students can use to test the programming. It can be used for the 100-level computer programming class that all engineering students are required to take.



Currently, students use a LEGO robot that costs about \$350 and uses LEGO's closed architecture, which is proprietary and cannot be viewed or altered by the students.

The ASU-designed robot costs \$150, about as much as a college textbook, and uses open architecture, which will allow students to see and learn more about how everything works together.

It would allow students to purchase a robot for the 100-level course and use it for later courses, too.

"It is an open, reusable architecture for multiple courses," Chen said.

The team is testing the system with students in the freshman class, FSE 100. Walliman said the program could be used for middle school students up to college students.

"I've worked with people who had significant trouble learning to program because they didn't understand the fundamental concepts," Walliman said. "They don't know how to design and build algorithms. Instead, their biggest takeaway from FSE101 is: God help you if you forget a semicolon!"

At the same time, Walliman said learning to get "Hello World" to show up on your computer screen isn't always a big motivator for students, so working with a robot can make it more fun and keep them engaged.

Walliman said the program can be used in schools or summer camps, and even could become a phone app game, like Angry Birds, that would allow kids to play and learn.

Walliman hopes it eventually could become a startup business that would improve the way computer programming is taught.

ASU students stepping into zero gravity to study planetary formation

NASA has selected five students from the Dust Devils Microgravity Team at Arizona State University to fly an experiment on the "Vomit Comet," the endearing nickname given to an airplane that simulates zero gravity.

The airplane, a modified Boeing 727-200 owned by the Zero-G Corporation, was once used to train astronauts in the 1960s. It is now used for NASA's Reduced Gravity Student Flight Opportunities Program. Based out of Houston, this program gives undergraduate students in the United States the opportunity to propose, build and fly an experiment designed for zero gravity.

The Dust Devils are studying the microphysics of dust. Specifically, the team is looking at how dust in space becomes electrically charged and clumps together to form planets. "How do planets form?" is a question scientists don't have a full answer to, said team lead Jack Lightholder.

"We're not developing a hypothesis that's been tested a million times," Lightholder said. "(The experiment) is cutting-edge because we're not really sure of the answer." The team's experiment, which flew with NASA in 2012, is the first of its kind to study planetary formation from dust particles.

Lightholder (computer science), Elizabeth Dyer (astrobiology), Zachary Priddy (computer systems engineering), Alison Gibson (aerospace engineering) and RJ Amzler (astrobiology) will fly the experiment at NASA's Johnson Space Center in Houston during the week of April 4-12, 2014. John Conafay (economics) is an alternate flyer. Paul Reesman (computer science) and Libby Loyd (aerospace engineering) make up the Dust Devils' ground team. Lightholder and Gibson are ASU/NASA Space Grant interns.

The idea for the experiment came from team adviser and theoretical astrophysicist Steve Desch, who is an associate professor in the School of Earth and Space Exploration at ASU. The team's engineering advisor is experimental astrophysicist Chris Groppi, an assistant professor in the school.

The experiment is made of 12 chambers filled with different kinds and volumes of dust. The team chose dust compositions based on material that is found in interstellar space.



One chamber contains dust from the Murchison meteorite. The meteorite sample was donated by ASU's Center for Meteorite Studies.

This year, the team has also mounted GoPro video cameras next to the chambers to record how the dust behaves in zero gravity. The team will only experience about 20 seconds of zero gravity at a time, so the experiment needs to be quick and reliable.

"We're just simplifying the system like crazy," said Lightholder. "It's basically just one click to turn it on and off."

Although NASA foots the \$5,000-per-person flight bill, the Dust Devils have to pay to build the experiment, and to travel to and from Houston for flight week — a total of about \$10,000. ASU/NASA Space Grant is helping to cover some project expenses. To help make ends meet, the team started an Indiegogo crowdfunding campaign.

"Crowdfunding is essentially you put out a pitch and you say, 'Hey this is what we're doing, this is what we need the money for and here are the different perk levels,'" said Conafay, team treasurer and economics major.

For example, for a \$25 donation the team will give the donor photos from the flight, a social media shout-out and an ASU Dust Devils Mission Patch. For a \$500 donation, the donor will get one of the GoPro Hero 3+ Silver Edition cameras used on the experiment, along with the perks offered at lower price levels.

The team is hoping to raise \$2,000 through its Indiegogo campaign.

The amount of time spent on the experiment is comparable to a full-time job. And all of that work is done on top of being a full-time student. But the team members are grateful for the experience.

"My stance is that the whole college experience is three parts: It's the academics you learn in your classes, it's networking and it's hands-on experience, because there's a lot you just can't learn from a book," Lightholder said.

ASU team's robot driver in top-10 at Cornell Cup competition

A student team that taught a robot to drive an electric car placed in the top 10 of 34 finalists at the Cornell Cup USA, an embedded technology competition presented by Intel.

The annual competition, designed to encourage students to use embedded technology, provided teams with Intel development boards featuring Atom processors.

At the competition, held May 1-3, 2014 at Florida's Walt Disney World Resort, teams vied for up to \$10,000 and recognition for design, innovation and entrepreneurship.

ASU's six-member team was led by Sami Mian, and included Joe Boeding, Ryan Sterry, Mila Arezina, Cameron Stewart, and Bijan Fakhri, all seniors in computer systems engineering.

The work was the students' senior capstone design project, which is also a project of ASU's Sun Devil Robotics club. The team's advisors were assistant professor **Georgios Fainekos** and senior lecturer **Yinong Chen** in the School of Computing, Informatics, and Decision Systems Engineering. Fainekos mentored the team and provided resources and Chen facilitated and reviewed the designs.

The project, called Nao Navigators, used Nao, an autonomous, humanoid robot developed by Aldebaran Robotics, a French robotics company headquartered in Paris. Nao, a robot with a body shaped like a human, can operate on its own with minimum or no human intervention. It can be programmed before or during operation.

The Defense Advanced Research Projects Agency, or DARPA, chooses a technological issue that it believes needs a solution and sets a grand challenge. The challenge for this competition was to use humanoid robots in disaster zones.

ASU's Cornell Cup team was inspired by the challenge and a love for robotics. The team members also wanted to figure out how robots could help in disaster relief efforts, so they decided to teach Nao to drive a small electric car.

The idea is to use robots to perform tasks in environments that are too dangerous for humans. A robot can walk to a site, but if it is a long distance, it would need transportation, which would require greater power and capabilities. To drive, the robot must use the steering wheel and acceleration pedal of the car. It also must be able to avoid obstacles and use three-dimensional vision.



It also needs to be able to respond to general and common events, such as stopping the vehicle at a red signal, or moving over when another vehicle approaches.

Equipment and supplies also may have to be transported by the robot to the disaster area. And the robot may have to operate heavy machinery vehicles at the disaster site.

The project became easier with new embedded technologies such as laser range finders and Microsoft's Kinect sensor for Xbox that simulates stereoscopic vision. The robot system uses Intel's Atom processor running Robot Operating System on Linux.

The team split the project into four stages: simulation, prototyping, programming and testing. Team members worked on it from mid-September until the competition. They plan to improve the software and hardware framework of the robot, and hope that one day human-sized robots will be able to operate any type of vehicle.

ASU students bring home award from international supercomputing competition

A team of ASU undergraduate students brought home a first-place award from the Supercomputing 2013 (SC13) Student Cluster Competition held November 20-21, 2013 in Denver. The competition required students to work nearly non-stop over a 48-hour period to assemble and test a small computing cluster — a group of tethered computers that can perform a series of applications.

The team included juniors Clint Shuman, a computer science major, Gabe Martin a computer systems engineering student, Ben Prather a physics major, and Christian Ivaneok an informatics major.

The students competed against three teams in the Commodity Cluster track, which limits the students to a budget of \$2,500 and a strict energy draw limit of 15 amps. Prior to the competition, the students worked with mentors from ASU's Advanced Computing Center (A2C2) to build the cluster, using affordable and commercially available components. A2C2 was the ASU team's sponsor. Support for the team was also provided by CIDSE.

“The team’s goal was to have all of the hardware selected and set up so that all we had to do at the competition was power it up, do some fine-tuning, submit it different tasks, and watch the machine successfully complete each challenge,” said Frank Timmes, a team mentor and the director of A2C2.

Teams raced to complete the most software applications in front of an audience and other competitors. For one task students were given the data set for Weather Research Forecasting software to run on their cluster. They were instructed to set it up and simulate the monitoring of Hurricane Sandy. After working through a variety of tasks, each team was interviewed by a team of judges who tested their knowledge of the diverse applications.

In the Commodity Cluster track, the ASU team won an award for the Lowest Dollars-per-gigaFLOPS by spending just \$4.96 per gigaFLOPS. FLOP refers to “floating point operations.” In simple terms, the ASU team was able to do the most cluster operations per dollar spent.

“Using minimal energy is important because it generates less heat, and less heat means less money has to be spent on an advanced cooling system,” said team member Ivaneok. The Commodity Cluster track included a “green



computing” goal that the ASU team’s cluster was able to meet by performing the most gigaFLOPS (per dollar) per watt of energy.

Ivaneok said the team chose to pursue the Commodity Cluster track challenge because it didn’t want to rely too heavily on industry sponsors to provide good equipment. “We liked the challenge of doing it with limited means,” said Martin.

An additional challenge for the ASU team was competing with only four team members while other teams had five. Ivaneok said he is proud of their ability to bring home a first-place award despite this disadvantage.

Both Ivaneok and Martin describe the competition as a lot of fun. “We’re all a bunch of geeks and we had a lot of fun getting to know the other teams. There wasn’t anything cutthroat about the competition,” said Ivaneok.

Most team members got involved because of their interest in the technical aspects of learning to build a cluster. But in the end, they say they’re glad they entered the competition because of the time spent together and the networking opportunities.

“It was especially motivating to meet industry workers who got their start at the same competition five years earlier,” said Ivaneok.

“The competition taught me a lot about networking and social skills,” adds Martin.

The ASU team was mentored by Timmes and other A2C2 staff members, including Charlie Collins, the operations manager, Mohamed Sayeed, applications specialist, and Marisa Brazil, the senior coordinator of projects and programs.

“We wanted to mentor this team because we believe in the fantastic educational and career enhancing opportunities this provided for the students,” said Timmes. “The opportunity will give them a deeper understanding of the technology used in much of 21st century science and engineering,” he adds.

Ivaneok said, “I speak on behalf of all of us in expressing our appreciation for the mentorship that the A2C2 mentors provided us. Honestly, working with them and my teammates in this competition is one of the best things I’ve ever done. It’s even up there with hockey and off-roading.”

The team hopes to obtain the sponsorship they will need to compete again next year.

The Student Cluster Competition was part of the annual Supercomputing Conference (SC13) sponsored by the Association for Computing Machinery and the Institute of Electrical and Electronics Engineers Computer Society. The conference offers a complete technical education program and an exhibition to showcase the many ways high-performance computing, networking, storage and analysis lead to advances in scientific discovery, research, education and commerce.

Computer science student chosen for summer research fellowship

Sichun Ai, a sophomore majoring in computer science at Arizona State University, was selected for a prestigious Summer Undergraduate Research Fellowship that enabled her to spend the summer at the National Institute of Standards and Technology in Boulder, Colorado.

When Ai was nine, her family moved to Arizona from their home in Dandong, China. She later graduated from the international baccalaureate program at North High School in Phoenix.

“Throughout high school, my favorite subjects were math and science and I even participated in the Joaquin Bustoz Math-Science Honors Program at ASU,” Ai said.

“When I came to ASU, I didn’t know much about computer science. I was just looking for something relevant to my interests, and the classes that excited me.”

Ai started doing research at the Center for Cognitive Ubiquitous Computing (CUBiC). CUBiC’s human-centered multimedia computing focuses on assistive, rehabilitative and healthcare applications.

Ai is continuing work on a project started by other CUBiC researchers.

“It’s a haptic wristband that helps stroke survivors self-rehabilitate,” Ai said. “When they wear it, it sends vibration cues and discretely serves as a reminder for movement. We’re hoping it will allow stroke survivors to make the rehabilitation process more personal and available for at-home settings.”

Through her summer fellowship in Boulder, Ai worked on electro-optic sampling and state-of-the-art, high-speed oscilloscopes, while implementing her programming skills as well as adopting new ones.

“It’s different, which I’m excited about,” Ai said.

Ai, a student in Barrett, The Honors College, is considering the 4+1 program that would allow her to finish a master’s degree in one year, following completion of her bachelor’s degree. She also has been admitted to the Grand Challenge Scholars Program, a program designed by the National Academy of Engineers to prepare students to solve the grand challenges facing society in this century.

Hu invited to Heidelberg Laureate Forum

Xia “Ben” Hu, who is working on his doctorate in the School of Computing, Informatics, and Decision Systems Engineering has been selected to participate in the Second Heidelberg Laureate Forum to be held in Germany from Sept. 21-26, 2014.

Hu’s research explores the area of social media mining, which lies at the intersection of data mining, information retrieval, natural language processing, machine learning and social computing.

“Social media has emerged as an important platform for large-scale information sharing and communication in fields like marketing, journalism, public relations, etc.,” Hu said. “Understanding and processing this new type of data produced by social media services is necessary to improve the quality of user experience, and to positively impact the overall value of the social systems going forward.

“My research focus is on developing computational algorithms to glean actionable patterns from social media data. I aim to provide analytic tools that enable a person or analyst to possibly study large-scale data, discover and study different questions in social media, that would otherwise be impossible.”

Hu received his bachelor and master’s degrees from the School of Computer Science and Engineering of Beihang University in China.

He is writing a book, “Exposing Social Spammers — A Data Mining Perspective,” with **Huan Liu**, a professor in the School of Computing, Informatics, and Decision Systems Engineering. It will be published by Cambridge University Press.

After Hu completes work for his doctoral degree in December, he hopes to secure a faculty position at a prestigious university where he can continue his research and help students build their careers in computer science.

Hu was selected for the Forum by the Scientific Committee of the Heidelberg Laureate Forum Foundation. Only 200 of the most qualified young researchers in the world were chosen, 100 working in mathematics, 100 in computer science.

The Forum was created in 2013, when 38 laureates and 200 young researchers from across the globe met in Heidelberg for a week of scientific exchange and interdisciplinary dialogue across generations and beyond cultural barriers.



According to a report of the first Forum, the gatherings are designed to provide a place for dialogue and networking, as well as to awaken interest and understanding of mathematics and computer science in the general public and create a more positive attitude toward the fields.

The one-week event combines scientific, network and outreach activities. Winners of the most prestigious awards in mathematics and computer science are invited and decide the focus of the Forum. Then, young researchers apply and are selected.

“I hope to meet and discuss my future research plans with leading computer scientists and mathematicians,” Hu said. “In addition, it is good for me to connect with young researchers, find common research interests and explore possible future collaborations.”

The Heidelberg Laureate Forum Foundation was founded by the Klaus Tschira Stiftung, a nonprofit foundation that promotes the natural sciences, mathematics and computer science. It is among Europe’s largest nonprofit privately funded foundations.

computer science and engineering

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computer science and engineering

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computer science and engineering

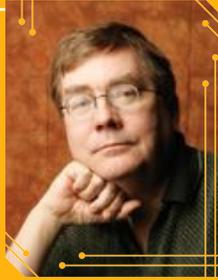
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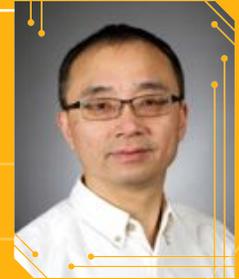
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computer science and engineering

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Sehuraman Panchanathan

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Ph.D., University of Ottawa, 1989

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research interests: Ubiquitous Computing Environments for enhancing quality of life for individuals with disabilities, multimedia computing, haptic user interfaces

honors, awards & key activities: Fellow of IEEE and SPIE; Member of Canadian Academy of Engineering; Governor's Innovator of the Year in Academia Award (2004); Microsoft Imagine Cup Awards (2010, 2011); Editor-in-chief, *IEEE Multimedia*; Associate Editor, of 12 (past and present) Journals and Transactions; Member, US-India Business Council (USIBC) [President Obama's Executive Mission to India]; Member, Arizona Governor Napolitano's Strategic Mission to Canada; Executive Committee Member, Council on Research Policy & Graduate Education, Association of Public and Land-Grant Universities (APLU); Member, Governor of Arizona e-Health Steering Committee



Andrea Richa

Associate Professor

Ph.D., Carnegie Mellon University, 1998

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research interests: Active database systems, Web-based database systems

honors, awards & key activities: Algorithms for distributed wireless and mobile networks, graph algorithms, randomized algorithms, approximation algorithms, combinatorial optimization, distributed resource allocation
honors, awards & key activities: NSF CAREER Award 2000; Founder, IEEE Workshop on Network Science for Communication Networks (NetSciCom); General Chair and Founder, NSF Workshop on Self-organizing Particle Systems, 2014; Associate Editor, IEEE Transactions on Mobile Computing; General Chair, ACM Symposium on Principles of Distributed Computing (PODC), 2010; PC Chair ACM DIALM-POMC 2003 & 2010; SSS 2012; IEEE NetSciCom 2009, 2010, 2011; Publicity Chair, ACM SPAA'08; Guest Editor, *ACM Baltzer Journal on Mobile Networks and Applications (MONET)*, *Special Issue on Foundations of Mobile computing*, 2004



Hessam Sarjoughian

Associate Professor

Ph.D., University of Arizona, 1995

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research interests: Modeling theory, poly-formalism modeling, collaborative modeling, simulation-based science, software engineering, simulation tools

honors, awards & key activities: DEVS M&S First Place Award; Distinguished Service Award, The Society for Modeling and Simulation International; ACIMS Co-Director; Director of the Modeling & Simulation Masters Online Program; Associate Editor, *Simulation Transactions*.



Mohamed Sarwat

Assistant Professor

Ph.D., University of Minnesota, 2014

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research interests: Database Systems, Spatial/Temporal Data Management, Social Data Management, Recommender Systems, Large-Scale Data Management and Analytics

honors, awards & key activities: Doctoral Dissertation Fellowship, University of Minnesota 2013; Best Research Paper Award in the 12th International Symposium on Spatial and Temporal Databases SSTD 2011; Best of Conference Citation in the 28th IEEE International Conference on Data Engineering ICDE 2012; Registration Chair for ACM SIGMOD 2016; General Co-Chair for ACM SIGSPATIAL PhD Symposium 2014; PC member for IEEE ICDE 2015, ACM CIKM 2014, ACM SIGSPATIAL GIS 2014; Reviewer for IEEE Transactions on Knowledge and Data Engineering (TKDE), Transactions on Mobile Computing (TMC), Transactions on Information Systems and Technology (TIST), ACM Transactions on Spatial Algorithms and Systems (TSAS), and Geoinformatica Journal



computer science and engineering

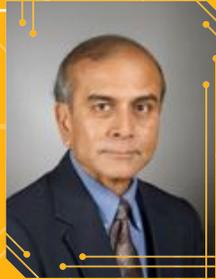
Arunabha Sen

Professor

Ph.D., University of South Carolina, 1987
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research interests: Resource optimization in optical, wireless and sensor networks, video transmission over mobile ad-hoc networks, network processors, system/network on chip design, combinatorial optimization, algorithm design and analysis

honors, awards & key activities: Associate Editor, IEEE Transactions on Mobile Computing; Program Committees of IEEE Infocom, Globecom, ICC, ACM Foundations on Mobile Computing



Paulo Shakarian

Assistant Professor

Ph.D., University of Maryland, College Park, 2011
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research interests: Artificial intelligence, social network mining, cyber-security

honors, awards & key activities: DARPA Service Chiefs' Fellows Program (2007); Bronze Star recipient; Director, Cyber-Socio Intelligent Systems (CySIS) Laboratory; Co-Chair, *SI 2014: Workshop on Social Influence* (held in conjunction with SocInfo 2014); Co-Chair, *Workshop on Cyber Warfare: Building the Scientific Foundation* (2014)



Aviral Shrivastava

Associate Professor

Ph.D., University of California, Irvine, 2006
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research interests: Compilers and micro architectures for embedded systems, including techniques for power, performance reliability, temperature and code size improvement

honors, awards & key activities: NSF CAREER Award 2010; Best Paper Candidate at ASPDAC 2008; Best Paper Candidate at LCTES 2016, 2010; Program Committee Member of CASES 2007, 2008, LCTES 2008, RTCSA 2007, 2008, DSD 2007, 2008; Referee of journals, TCAD, TVLSI, TECS, TODAES



Violet Syrotiuk

Associate Professor

Ph.D., University of Waterloo, 1992
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research interests: Protocols for wireless networks especially for medium access control, design and analysis of experiments, experimentation on testbeds such as GENI/FIRE, and software defined networking



Farideh Tadayon-Navabi

Senior Lecturer

M.S., University of Louisiana at Lafayette, 1991
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research interests: Computer science education, programming languages



Hanghang Tong

Assistant Professor

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research interests: Large scale data mining and machine learning, especially for graph and multimedia data with applications to social networks analysis, healthcare, cyber-security and e-commerce

honors, awards & key activities: "Data Mining Reveals the Secret to Getting Good Answers", MIT Technology Review, 2013; IBM Research Accomplishment Award on "Social and Cognitive Network Science", 2012; Statistical Analysis and Data Mining on "Bests of SDM 2011", 2011; Frontiers of Computer Science on "Bests of ICDM 2010", 2010; Associate Editor in ACM SIGKDD Exploration; Senior Program Committee in CIKM 2013 and PAKDD 2013-2014



Wei-Tek Tsai

Professor

Ph.D., University of California, Berkeley, 1985
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research interests: Software engineering, internet, parallel and distributed processing

honors, awards & key activities: Best Paper Award, Int'l Conf. on System Sciences, 1988; IEEE Meritorious Service Award 1992; Associate Editor, IEEE Trans. on Knowledge and Data Engineering, 2002- 06, Service-Oriented Computing and Applications, 2006-present; Program co-chair, ISADS 2007 and IEEE Int'l Conf. on E-Commerce Technology and Enterprise Computing, E-Commerce and E-Services, 2008



Kurt VanLehn

Professor and The Diane and Gary Tooker Chair for Effective Education in Science, Technology, Engineering and Math

Ph.D., Massachusetts Institute of Technology, 1983
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research interests: Applications of AI to education (Intelligent Tutoring Systems; teachable agents; tutorial NL dialogue systems); human learning (student modeling; cognitive modeling); cognitive science

honors, awards & key activities: Fellow of the Cognitive Science Society and the Center for Advanced Study in the Behavioral Sciences; nine best paper awards; Former senior editor, *Cognitive Science*; Editorial boards of *AI in Education, Cognition and Instruction, Machine Learning, Journal of the Learning Sciences*; Senior PC member for ITS, AI&Ed, Cognitive Science Conference



computer science and engineering

Sarma Vrudhula

Professor and Director of Center for Embedded Systems

Ph.D., University of Southern California, 1985
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research interests: CAD for VLSI circuits, logic synthesis and verification, low-power design, power, energy and thermal management in processors performance, power and yield optimization of VLSI circuits, novel logic structures and applications to biology

honors, awards & key activities: Best Researcher, Senior Faculty (SCIDSE), 2009, 2011; former associate editor for the *IEEE Transactions on VLSI*; current associate editor for the *IEEE Transaction on CAD* and the *ACM Transactions on Design Automation of Electronic Systems* (TODAES); former visiting scientist with Motorola's Advanced Design Tools group, Austin, TX



Erin Walker

Assistant Professor

Ph.D., Carnegie Mellon University, 2010
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research interests: Intelligent tutoring systems, computer-supported collaborative learning, online learning communities, tangible embodied environments, human-computer interaction

honors, awards & key activities: CRA/NSF Computing Innovation Postdoctoral Fellowship, 2011-2012; Nominated for Best Technology Design Award; International Conference on Computer-Supported Collaborative Learning, 2011; Best Young Researcher Paper; International Conference on Artificial Intelligence in Education, 2005; Executive committee member, International Society of Artificial Intelligence in Education, 2013-present; Workshops & Tutorials Co-Chair; International Conference on Artificial Intelligence in Education, 2013



Yalin Wang

Assistant Professor

Ph.D., University of Washington, 2002
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research interests: Computer vision, medical imaging, computer graphics, geometric modeling, statistical pattern recognition

honors, awards & key activities: Best visualization software tool in software competition at UCLA Center for Computational Biology, "Automated Brain Sulcal Detection Tool & Conformal Spherical Analysis Tool," 2006; Co-organizer of Mini-Symposium "Mathematics for Brain Mapping" in Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, Boston, MA, July 2006



Peter Wonka

Associate Professor

Ph.D., Vienna University of Technology, 2001
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research interests: Computer graphics, visualization, information visualization, procedural modeling, visibility, real-time rendering, urban environments

honors, awards & key activities: NSF CAREER Award 2006, Günther Enderle Award for the best paper at Eurographics 2001



Carole-Jean Wu

Assistant Professor

Ph.D., Princeton University, 2012
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research interests: Energy-efficient heterogeneous architecture, energy harvesting for emerging computing devices, performance characterization, analysis and prediction, high-performance and power-efficient LLC designs
honors, awards & key activities: Bisgrove Early Career Scholar, Science Foundation of Arizona 2013-15; Intel Ph.D. Graduate Fellow, 2011-12; Excellence in Leadership Award, Princeton 2009; Technical PC for ACM/IEEE International Symposiums on Computer Architecture (ISCA), Microarchitecture (MICRO) and High Performance Computer Architecture (HPCA), IEEE International Symposium on Workload Characterization (IISWC), IEEE International Parallel and Distributed Processing Symposium (IPDPS), ACM International Conference on Computing Frontier (CF); Finance chair for IISWC-2014; student travel grant chair for ISPASS-2014; publicity and local arrangement chair for NOCS-2013



Guoliang Xue

Professor

Ph.D., University of Minnesota, 1991
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research interests: Privacy and security in mobile social networks and smart grid, and optimization and economic approaches to network applications, crowdsourcing to smart phones

honors, awards & key activities: IEEE Fellow, Class of 2011; Keynote Speaker at IEEE LCN'2011 and IEEE ICNC'2013; Vice Chair of the Steering Committee of IEEE INFOCOM; co-Chair of IEEE CNS'2014; TPC Member of ACM CCS'2014; co-Chair of IEEE INFOCOM'2010; Associate Editor of IEEE/ACM Transactions on Networking



Stephen Yau

Professor

Ph.D., University of Illinois, 1961
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research interests: Trust management and security, software engineering, distributed systems, service based systems, ubiquitous/pervasive computing

honors, awards & key activities: Information Assurance Center awarded recognition as National Center of Academic Excellence, NSA; Overseas Outstanding Contributions Award of the Chinese Computer Federation (2006); Tsutomu Kanai Award of IEEE Computer Society (2002); Fellows of IEEE and AAAS; Keynote speaker, 2008 IEEE Intl Conf. on Services Computing; Editorial Board member of IEEE Trans. on Service Computing



computer science and engineering

Jieping Ye

Associate Professor

Ph.D., University of Minnesota, 2005
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research interests: Machine learning, data mining, bioinformatics
honors, awards & key activities: KDD Best Research Paper Runner-Up 2013; SDM Best Research Paper Runner-Up Award 2013; KDD Best Research Paper Nomination 2011, 2012; KDD Best Research Paper Award Honorable Mention 2010; NSF CAREER Award 2010; ICML Outstanding Student Paper Award 2004; Action Editor, Data Mining and Knowledge Discovery (2014—present); Associate Editor, IEEE Transactions on Knowledge and Data Engineering (2014—present); Associate Editor, IEEE Transactions on Pattern Analysis and Machine Intelligence; Program Committee Co-Chair, SIAM International Conference on Data Mining, 2015; Area Chair, International Joint Conference on Artificial Intelligence, 2015; Co-Chair, Cancer Pathways: Automatic Extraction, Representation, and Reasoning in the Big Data Era, Pacific Symposium on Biocomputing, 2015; Area Chair, International Conference on Machine Learning, 2014



Ron Askin

Director and Professor

Ph.D., Georgia Institute of Technology, 1979
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research interests: Logistics, manufacturing systems analysis, production planning and scheduling, decision analysis, operations research and applied statistics
honors, awards & key activities: *IIE Transactions on Design and Manufacturing* Best Paper Award (1998, 2000); IIE Joint Publishers Book-of-the-Year Award (1994, 2003); IIE Fellow Award (1995); *IIE Transactions* Development and Applications Award (1985); Shingo Prize for Excellence in Manufacturing Research (1994); Eugene L. Grant Award (1986); NSF Presidential Young Investigator Award (1984); Editor-in-Chief, *IIE Transactions*; General Chair, 2012 INFORMS Annual Conference; Past Chair, Council of Industrial Engineering Academic Department Heads; Past President, IIE Council of Fellows; Past Chair, INFORMS Manufacturing and Service Operations Management Society



Shimeng Yu

Assistant Professor

Ph.D., Stanford University, 2013
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research interests: Privacy and security in mobile social networks and smart grid, and optimization and economic approaches to network applications, crowdsourcing to smart phones
honors, awards & key activities: Emerging devices and circuits beyond CMOS, new computing paradigms beyond Boolean Logic



Linda Chattin

Senior Lecturer

Ph.D., State University of New York at Buffalo, 1994
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research interests: Discrete optimization, stochastic processes and probabilistic modeling, emergency service location
honors, awards & key activities: A. Alan B. Pritsker Outstanding IIE Teacher Award, 2009, 2010



Esma Gel

Associate Professor

Ph.D., Northwestern University, 1999
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research interests: Healthcare delivery systems engineering, medical decision-making, revenue management in airline industry, dynamic price and lead time quotation for manufacturing and service systems, building resilience against hazards through cooperative interactions
honors, awards & key activities: Dr. Hamed K. Eldin Outstanding Young Industrial Engineer of the Year, given by the Institute of Industrial Engineers (IIE), 2008; Program Chair of Industrial, Operations and Systems Engineering, CIDSE, since Fall 2011; Member of the Dean's Executive Committee, 2012-2014; Member of Meetings Committee, INFORMS, since 2013; Associate Editor, OMEGA



industrial engineering

Mary Anderson-Rowland

Associate Professor

Ph.D., University of Iowa, 1966
mary.anderson@asu.edu

research interests: Statistics and probability for quality control, academic scholarship programs for all engineering students with an emphasis on women and underrepresented minority students
honors, awards & key activities: Best Teacher Award (Top 5%) 2009; WEPAN Educator's Award, 2009; ASEE Minorities in Engineering Award, 2006; SHPE National Educator of the Year Award, 2005; Seven national awards; SWE National Board, Special Appointee, 2009; WEPAN Proceedings Chair, 2007; ASEE PIC IV Chair, 2006-2008; ASEE Women in Engineering Division Chair, 2005; Director of three Academic Scholarship and Professional Development programs; PI of two NSF grants; Instructor of IEE 490 Senior Design Projects



Jing Li

Associate Professor

Ph.D., University of Michigan, 2006
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research interests: Data mining, big data analytics, quality and reliability modeling, biomedical informatics, network statistics
honors, awards & key activities: NSF CAREER Award 2012; Guest editor for IIE Transactions; Associate Editor for Asian Journal of Industrial and Systems Engineering; Editorial Board for Quality and Reliability Engineering International; Chair for INFORMS Subdivision on Data Mining



industrial engineering

Daniel McCarville

Professor of Practice

Ph.D., Arizona State University, 1999
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research interests: Quality engineering, industrial statistics, engineering management

honors, awards & key activities: Motorola Scientific and Technology Award, 1994; Member: American Society for Quality (ASQ), American Statistical Association (ASA), Institute of Industrial Engineers (IIE), and American Society for Engineering Management



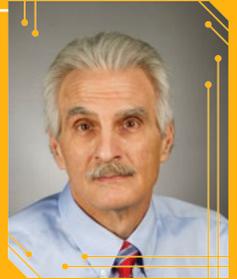
George Runger

Professor

Ph.D., University of Minnesota, 1982
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research interests: Statistical learning, process control, data mining for massive, multivariate data sets

honors, awards & key activities: Best Application Paper Award, *IIE Transactions*, 2007; Brumbaugh Award-American Society for Quality, 1994, 2003; Ellis R. Ott Foundation Award, 1990; IBM Outstanding Achievement Award; Department Editor, *Journal of Quality Technology*; Associate Editor, *Journal of Mathematical and Management Sciences*



Pitu Mirchandani

Professor

Sc.D., Massachusetts Institute of Technology, 1975
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research interests: Optimization, decision-making under uncertainty, real-time control and logistics, application interests in urban service systems, transportation, and homeland security

honors, awards & key activities: Recipient of "2007 Member of the Year" by the ITS Arizona Society for contributions to ITS in the State of Arizona; Editorial boards of: *IIE Transactions on Scheduling and Logistics*; *Transportation Science*; *Advanced Transportation*; *Industrial Mathematics*; *Transportmetrica*; Director of the Advanced Traffic and Logistics: Algorithms and Systems (ATLAS) Laboratory



Soroush Saghafian

Assistant Professor

Ph.D., University of Michigan, 2012
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research interests: Healthcare operations research, control of queueing systems, operations and supply chain management/optimization, contract theory

honors, awards & key activities: 2012 Manufacturing and Service Operations Management (MSOM) Best Student Paper Award; 2012 IOE Richard Wilson Prize for the Best Student Paper; INFORMS 2010 Pierskalla Award for the Best Paper in Healthcare (from INFORMS Healthcare Applications Society); INFORMS 2011 Doing Good with Good OR Award (finalist); University of Michigan College of Engineering 2011 Outstanding Ph.D. Research Award; POMS 2011 College of Healthcare Best Student Paper Award (second place); 2010 Katta Murty Prize for the Best Research Paper on Optimization



Douglas Montgomery

Regents' Professor

Ph.D., Virginia Tech, 1969
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research interests: Statistical design of experiments, optimization and response surface methodology, empirical stochastic modeling, industrial statistics

honors, awards & key activities: Distinguished Service Medal, ASQ; Engineering Lifetime Achievement Award; Greenfield Industrial Medal; Shewhart Medal; Shewell Award (twice); Brumbaugh Award; William G. Hunter Award; Lloyd S. Nelson Award; Honorary member of the American Society for Quality; Fellow of the American Statistical Association, the Royal Statistical Society, and the Institute of Industrial Engineers; Elected Member of the International Statistical Institute, and Academician of the Internal Academy for Quality



Dan Shunk

Professor

Ph.D., Purdue University, 1976
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research interests: Material/information/knowledge supply, network integration, collaborative commerce, enterprise modeling, lean / agile enterprise, time compression

honors, awards & key activities: Franz Edelman Award Finalist, ORSA/TIMS 1992; SME International Manufacturing Education Award, 1996; Chaired the SME Ad Hoc Global Committee on Supply Network Integration and Communities of Common Interest; United States Representative to the Global Intelligent Manufacturing Systems organization; Won a Fulbright Scholarship during 2002-2003 to create a supply network curriculum and research agenda at University College Cork in Ireland; Board of Directors, Value Chain Group, 2006 – 2010; PIMSA Chair, CETYS Universidad, Baja, Mexico; Organizer of colloquia and conference program chair; chair of invited clusters/sessions for national and international conferences; Referee for academic journals and several textbooks; reviewer in NSF panels; Editorial Board of the *Agility and Global Competition Journal*, the *International Journal of Flexible Automation and Integrated Manufacturing* and the *International Journal of Product Development*



Rong Pan

Associate Professor

Ph.D., Pennsylvania State University, 2002
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research interests: Industrial statistics, reliability analysis and time series modeling

honors, awards & key activities: Air Force Summer Faculty Fellowship, 2012; Quality Engineering Best Reliability Paper Award 2012; Stan Ofsthum Award by the Society of Reliability Engineers, 2008; Editorial Board Member, *Journal of Quality Technology and Quality Engineering*; Associate Editor, *Journal of Industrial Engineering*



industrial engineering

J. Rene Villalobos

Associate Professor

Ph.D., Texas A&M University, 1991
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research interests: Logistics, automated quality systems, manufacturing systems and applied operations research, International Logistics and Productivity Improvement Laboratory (ILPIL)

honors, awards & key activities: NSF CAREER Award, 1995; Member, Institute for Operations Research and the Management Science; Member, American Society for Engineering Education; Technical Advisory Board Member, Int. Journal of Interactive Design and Manufacturing; Director, Center for Engineering Logistics and Distribution



Teresa Wu

Professor

Ph.D., University of Iowa, 2001
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research interests: Health information system, Imaging informatics, Distributed Decision Support

honors, awards & key activities: NSF CAREER Award, 2003; ASU Tenure and Promotion Exemplar, 2006; President Academic Council (2009 – present); Councilor of Institute of Complex Medical Engineering (2013-present); ASU representative for Health Systems Engineering Alliance (2012-present)



Nong Ye

Professor

Ph.D., Purdue University, 1991
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research interests: Information and systems assurance, data mining and modeling, quality optimization and control of system operations

honors, awards & key activities: Associate Editor: *Information, Knowledge, Systems Management*, *IEEE Transactions on Systems, Man, & Cybernetics, Part A*; Editorial Boards: *International Journal of Human-Computer Interaction*; *Information, Knowledge, Systems Management*



Muhong Zhang

Assistant Professor

Ph.D., University of California, Berkeley, 2006
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research interests: Integer programming, robust optimization, computational optimization, network optimization

honors, awards & key activities: Member-Institute for Operations Research and the Management Sciences (INFORMS)



software engineering

Ashish Amresh

Assistant Professor

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research interests: Serious games research, computer graphics, human-computer interaction, computer science education, K-12 STEM education
honors, awards & key activities: ASU President's Award for Innovation, 2012; College of Technology and Innovation Faculty Mentor Award, 2011; Microsoft Outstanding Educator Award, 2009; Founding Faculty, SPARK App League; Session Chair, Special Interest Group in Computer Science Education (SIGCSE), 2013; Director, Ultimate Technology Boot Camp and Camp Game Programs



Ajay Bansal

Senior Lecturer

Ph.D., University of Texas at Dallas, 2007
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research interests: Logic programming, constraint programming, answer set programming, data mining, machine learning, semantic computing, service-oriented architecture

honors, awards & key activities: Department of Engineering's Teaching recognition award for 2013 at ASU; Postdoctoral Fellowship, Dept. of Computer Science, Georgetown University, 2008; Best Paper Award at the European Conference On Web Services (ECOWS) for the paper titled "Universal Service-Semantics Description Language (USDL)" in 2005; Faculty Mentor, CS Club on Polytechnic Campus; Co-Chair of the Web Services Challenge (WSC), 2009; Academic Director, Computer Science Summer Camp for high school students at Georgetown University, 2008



Srividya Bansal

Assistant Professor

Ph.D., University of Texas at Dallas, 2007
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research interests: Semantic computing; big data integration; semantics-based solutions for outcome-based instruction design in STEM education; delivery models for software engineering education; web service description, discovery, and composition

honors, awards & key activities: Editorial Board Member: *International Journal of Semantic and Infrastructure Services*; 2014-2018; Editorial Board Member: *International Journal of Big Data*; 2013-2015; Reviewer for journals: *Service Oriented Computing and Applications (SOCA)*, *Knowledge and Information Systems (KIS)*, *IEEE Internet Computing (IC)*, *IEEE Transactions on Services Computing (TSC)*, *Computer Languages, Systems And Structures (COMLAN)*; Won the Best Paper Award for paper titled "Universal Service-Semantics Description Language (USDL)" at the European Conference On Web Services (ECOWS) 2005



software engineering

John Femiani

Assistant Professor

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research interests: Computer graphics, computer vision, pattern recognition, and image processing



Ashraf Gaffar

Assistant Professor

Ph.D., Concordia University, 2005

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research interests: Human Centered Design, HCI and human cognition, Human-Car Interaction, Human-Robot Interaction, Software Design Methods, Software concept visualization

honors, awards & key activities: FQRNT Scholarship (le Fonds Québécois de la Recherche sur la Nature et les Technologies, Canada); Power Corporations of Canada Scholarship; External Grant Holder Scholarship, Concordia University Research Chair Grant; SAP Design Innovation Award; SAP Peer-to-Peer Recognition Award; SAP Field Enablement Award



Kevin Gary

Associate Professor

Ph.D., Arizona State University 1999

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research interests: Software architecture and design, open source software, agile methods, applications in healthcare (image-guided surgery and mHealth), and e-learning

honors, awards & key activities: ASU President's Award for Innovation, 2011; ARCs Foundation Scholar; UPE Honor Society



Arbi Ghazarian

Assistant Professor

Ph.D., University of Toronto, 2009

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research interests: Software Engineering, Requirements Engineering, Software Traceability, Software Architecture and Design, Domain-Specific Software Engineering, Theory Building in Software Engineering

honors, awards & key activities: Editorial board member, International Journal of Cognitive Performance Support; Keynote Speaker, European Conference of Computer Science, Paris, France, 2012; Chairman, Simulation & Modeling at Applied Computing Conference, Anger, France, 2011; Program Committee Member and Session Chair, IASTED International Conference on Software Engineering and Applications (SEA'10 & SEA'11); Co-Author, IEEE Reliability Society Annual Technical Report, 2010 & 2011; Reviewer for several journals and conferences (IEEE Software, Elsevier Science of Programming, OOPSLA)



Tim Lindquist

Professor and Software Engineering Program Chair

Ph.D., Iowa State University, 1979

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research interests: Software engineering, distributed and mobile systems, Web applications, and programming languages

honors, awards & key activities: Professor of the Year, Corporate Leaders Program (2003); ABET Program Evaluator (2004-); ABET Computing Accreditation Commission member (2009-2014); ASEE/Navy Summer Faculty Fellow (1999, 2001); Visiting Professor, CRIN-CNRS-LORIA, Nancy France (1993); Visiting Scientist, Institute for Defense Analyses (1991)



Anshuman Razdan

Professor

Ph.D., Arizona State University, 1995

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research interests: Geometric modeling/design, computer graphics, document exploitation and geospatial visualization and analysis, low level vision/image processing. Recent interests also include training in variety of disciplines such as renewable energy and software development globally

honors, awards & key activities: Innovator of the year, AzTE, Arizona State University, 2006; *Top Ten Non Resident Indians Abroad*, The Hindustan Times, 2005; Two patents on 3D face authentication and 2D to 3D mapping for text documents



Sohum Sohoni

Assistant Professor

Ph.D., University of Cincinnati, 2004

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research interests: Computer architecture, performance analysis, computer science education, engineering education

honors, awards & key activities: Selected to participate in the National Academy of Engineering's fifth Frontiers of Engineering Education (FOEE) symposium, October 2013; IETE-CDIL Award for Industry (best paper award) for, "A Cross Section of the Issues and Research Activities Related to Both Information Security and Cloud Computing", July 2012; Regents Distinguished Teaching Award in 2010 at Oklahoma State University; 2011-2012 OSU IEEE ECE Professor of the Year, awarded by Oklahoma State University IEEE Student Branch, April 2012; ASEE Midwest Section, 1st Place Outstanding Paper Award for, "Transforming a Microprocessors Course through the Progressive Learning Platform", September 2011



Richard Whitehouse

Senior Lecturer

M.S., University of Tennessee, 1985

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research interests: Software Engineering, Distributed Web-Based Applications, Computer Aided Educational Systems



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Nadya Bliss, Professor of Practice, OKED
Mirek Fatyga, Mayo Clinic
Jeff Goss, Professor of Practice, Global Outreach
Karl Kempf, Intel Corporation
Ross Mitchell, Mayo Clinic
Maria Luisa Sapino, University of Torino, Italy
Fran Zenzen, Professor of Practice, ASURE

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Arthur Sainz, Academic Financial Specialist, Sr.
Frances Salas, Assistant to the Director
Andreas Sandin, System Support Analyst
Mayumi Sato, Research Advancement Accountant
Segrid Simms, Academic Success Specialist
Lincoln Slade, IT Manager
Christina Sebring, Academic Success Specialist
Deborah Smith, Academic Success Specialist
Stacy Stuart, Research Advancement Specialist
Dave Vega, Academic Success Specialist
Erik Wirtanen, Communications Specialist



Inspiring future engineers

The School of Computing, Informatics, and Decision Systems Engineering and the Ira A. Fulton Schools of Engineering host a variety of on-campus activities, after-school programs, summer camps and collaborations with faculty and engineering student organizations in an effort to engage Arizona's K-12 students and create pathways that encourage them to become technically savvy, prepare for studies in science, technology, engineering and math (STEM)-related fields and pursue careers in engineering. Through creative, hands-on activities, we hope to inspire these young students and show how engineering impacts our lives every day.

Game Camp

Game Camp is a unique, hands-on opportunity for middle and high school students to learn intensive video game creation, visualization and production. Campers use the latest software, hardware and development tools to create concepts and prototypes for 2-D and 3-D video gaming.

App Camp

App Camp teaches high school students the basics of iPhone app development. Participants learn the skills needed to create and develop smartphone apps. This year, the camp covered Apple XCode, Objective-C, Javascript, HTML5, user-interface design principles, mobile application design and development considerations, iPhone app construction, advanced debugging techniques, Web application development for portability and more.

Robotics Camp

ASU's Robotics Camps are a summer program series designed for middle school and high school students who intend to pursue a science and engineering career. Camp instructors use component-based robot construction, robotics programming, Web programming and Alice game programming as a vehicle to teach the latest engineering design concepts and computing technologies. The robots built by students enter a robotics challenge and demonstration at the end of the camp.

Ultimate Technology Boot Camp

ASU's Ultimate Technology Boot Camp is a completely residential camp where high school students experience life on the Polytechnic campus for 10 days. Campers learn how to create mobile apps, develop cutting-edge games, design and build robots and more from award-winning faculty and instructors. They work together in teams to learn design, development and content integration for software like games and apps.

FIRST LEGO League

FIRST LEGO League (FLL) is a global program created to get children excited about science, technology, engineering and math. FLL uses theme-based challenges to help young students discover the fun in solving real-world problems through robots, research projects and teamwork. FLL emphasizes learning, community involvement and friendly sportsmanship. Fulton Engineering coordinates all FIRST Lego League efforts statewide in Arizona. FLL invites students between the ages of 9 and 14 to participate in teams of 4-10 kids in robotics competitions, as well as competitions in research, writing and presentations.



ASU computer science program sees rise in reputation

Arizona State University has one of the leading computer science programs in the world according to a prominent international academic ranking organization. The Academic Ranking of World Universities (ARWU), conducted by researchers at the Center for World-Class Universities at Shanghai Jiao Tong University in China, places ASU's computer science program at 33rd internationally and 22nd among universities in the United States in its recently released 2014 report.

"These ranking are based largely on quantitative measures, not on subjective criteria, so they are especially meaningful," said professor Ronald Askin, director of the School of Computing, Informatics, and Decision Systems Engineering.

Academic programs are ranked by the ARWU after "rigorous assessments of hard data rather than perceptions," said computer science professor Chitta Baral, chair of the computer science graduate program. Askin and Baral attribute the ASU program's high ranking to notable improvements in several areas, but in particular to the quality of research being done by faculty and the accomplishments of students.

"Many of our faculty are focusing on research that has high impact in the computer science field, and that is raising our profile," Askin said.

Faculty members increasingly have their research papers selected for publication in leading science, engineering and technology journals, and are chosen to give presentations about their work at the most prominent professional conferences in the field, he said.

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