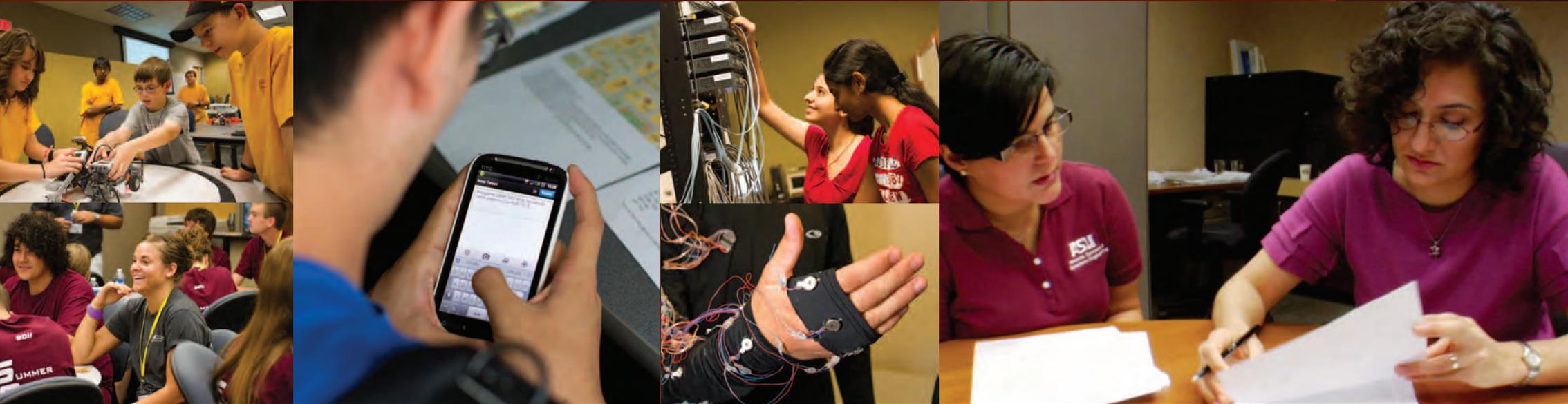


school of computing, informatics, and decision systems engineering



ANNUAL REPORT 2010–2011

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**global impact through
computing and engineering**

director's welcome



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Professor, Industrial Engineering



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John Fowler
Program Chair
Industrial Engineering



Yann-Hang Lee
Program Chair
Computer Science and Engineering

Dear Friends and Colleagues,

Hello from Tempe. It's been another exciting year in the School of Computing, Informatics, and Decision Systems Engineering (CIDSE) and I'm pleased to be able to bring you up to date with the achievements of our faculty, students and staff. This report presents an update on our on-going research and academic programs along with a preview of our new initiatives.

We continue to grow. Like many others, we are experiencing the resurgence of computer science enrollments as computing and information technology become ever-more pervasive in society. Our modern approach to industrial engineering with a growing focus on health informatics, urban services and global logistics is also attracting new students. Coupled with increasing visibility and understanding of the opportunity and synergy provided by our combined strengths in computing, modeling and decision making; new levels of energy and activity are starting to emerge. New bachelor's level programs in informatics and engineering management were approved this year and become active in Fall 2011 to complement our degrees in computer science, computer systems engineering and industrial engineering. At the graduate level, we have added master's and doctoral programs in computer engineering, recognizing the distinct knowledge and problem base of this discipline that has long been an area of strength at ASU. The new Computer Engineering graduate degree program is a collaborative effort with Electrical Engineering.

Once again, the information revolution paid off. Thanks to an investment from the university, we were able to acquire 9,000 square feet of space in our building that was previously occupied by a bookstore. While those of you that love the feel of paper may lament the loss of the hardback, the proliferation of electronic media allowed us to renovate this much needed space to add a 51-station computer classroom, faculty, post-doc and graduate student offices, meeting rooms with mediascape capability for team interactions, and research labs for robotics and HCI. This new space will be home for our personalized learning faculty and supports several other groups. In addition, it freed up space elsewhere that allowed

us to build new lab space for our Center for Embedded Systems with industrial support.

Our research spans many areas, including both the foundational aspects of our underlying disciplines and growing transdisciplinary collaborations that address emerging problems of national importance in health, security, sustainability, energy and education. We take pride in this bifurcated mission as we work to move society forward in the short term while laying the foundation for future technological developments. Given our breadth and multi-faceted mission, it's difficult to execute an affinity mapping that ties these activities into a few groups. Nonetheless, for the purposes of this report we discuss four major themes—computational intelligence, data management and information assurance, network science and systems, and software and systems engineering. In addition to a few stories that will give you a sampling of recent projects in each of these areas, you'll read about numerous faculty and student awards. For example, one student group excelled at the Microsoft Imagine Cup for the second year in a row, another junior faculty member received an NSF CAREER Award, and senior faculty received new Fellow and Distinguished Scientist awards. And, once again there were best paper awards at all levels.

Please take some time and peruse this report. But remember that this report focuses on our past year. With an expanding repertoire of academic offerings, growing enrollments, new research programs and collaborations, the future looks to be even brighter. So if you want to learn more or stay up to date with the most recent developments, visit our website at <http://engineering.asu.edu/cidse>. Or better yet, plan a visit to learn firsthand. We hope you will decide to join us as we transform the personal and professional lives of individuals around the world through anytime, anywhere, anything access to assured, accurate and affordable information. We look forward to hearing from you.

Ronald Askin, School Director

making a difference

our vision

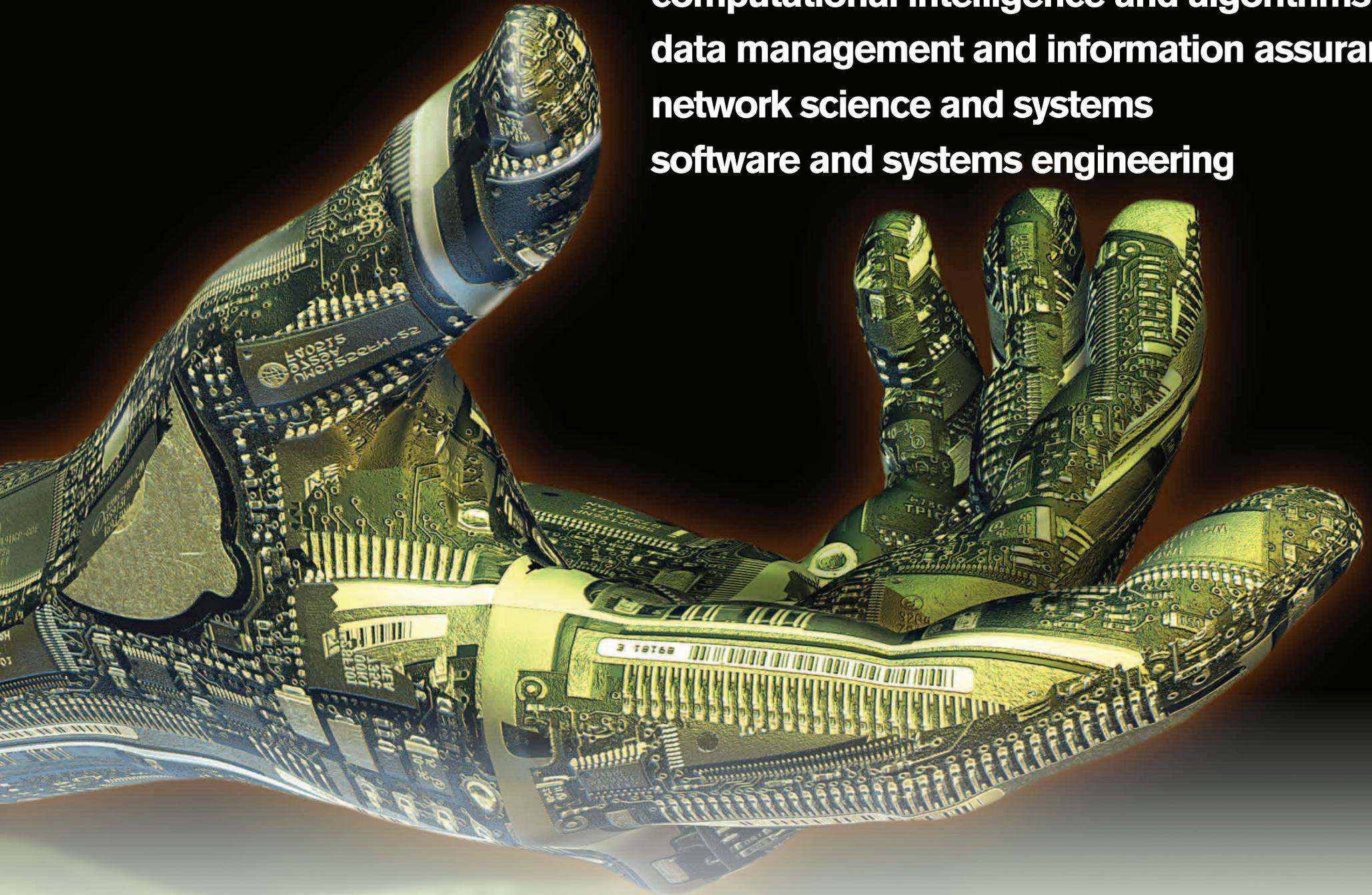
We envision a society where secure, accurate, and current information is ubiquitously available and data is seamlessly collected, managed, and converted into information that entertains individuals, empowers businesses and guides the decisions of both in their daily affairs.

Our vision includes helping the blind to see and companies to plan. We envision the ASU School of Computing, Informatics, and Decision Systems Engineering as a community recognized by its colleagues internationally as a leader in envisioning and enabling the information-driven society and by students as a preferred location for acquiring the knowledge and skills necessary to contribute to this vision.

We envision a community of scholars cooperatively engaged in transdisciplinary research addressing the grand challenges of modern society and supporting the intellectual growth of students and colleagues.

research

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



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 and Faculty Contacts

Artificial Intelligence. CIDSE researchers are addressing problems in automated planning and scheduling, constraint satisfaction, knowledge representation and reasoning, natural language processing, multi-agent systems, and the semantic web. (*Chitta Baral, Pat Langley, Joohyung Lee, Huan Liu, Subbarao Kambhampati, Kurt VanLehn, Jieping Ye*)

Theory and Algorithms. Understanding complexity and the theory of computation are 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. (*Rida Bazzi, Charles Colbourn, Andrea Richa, Muhong Zhang*)

Data Mining and Machine Learning. As scientific and enterprise data sets grow with respect to data characteristics (scale, accuracy, timeliness, media, dimensions and instances) it becomes imperative to develop new approaches to extract spatial and temporal relationships, correlation patterns and knowledge. The faculty are actively engaged in developing new methods for identifying patterns and extracting information. (*Vineeth Balasubramanian, Huan Liu, Sethuraman Panchanathan, Jeremy Rowe, George Runger, Teresa Wu, Jieping Ye, Nong Ye*)

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 CIDSE researchers. (*Gerald Farin, Baoxin Li, Ross Maciejewski, Gregory Nielson, Peter Wonka, Yalin Wang*)

Statistical Modeling. From universe to earth to nano scale, 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. (*Jing Li, Ross Maciejewski, Doug Montgomery, Rong Pan, George Runger*)





Minerva Initiative Helps Impact in U.S. Anti-terrorist Program (Sponsor: DOD)

ASU is one of seven universities in the United States selected for a new program to infuse university-based humanities and social science research into the Department of Defense.

“Finding Allies for the War of Words: Mapping the Diffusion and Influence of Counter-Radical Muslim Discourse” is a \$5.8 million grant to the Center for the Study of Religion and Conflict, a transdisciplinary research center in the College of Liberal Arts and Sciences. It is one of seven projects at U.S. universities funded by the Minerva Research Initiative, a program of the Secretary of Defense that focuses on areas of strategic importance to U.S. national security policy.

The Minerva Research Initiative, which deals with different sides of the problem of extremism in the Muslim world, was recognized at ceremonies in Washington, D.C., on Feb. 9 for “exceptional scientific achievements and contributions” by the Human Social Culture Behavior (HSCB) Modeling Program at the Department of Defense. The HSCB program was established in 2008 to develop a science base and associated technologies for modeling human, social and cultural behavior.

“Finding Allies for the War of Words” was recognized by the Department of Defense for its exceptional scientific achievements and contributions to the field of social cultural modeling.

“Your Minerva project, ‘Finding Allies for the War of Words: Mapping the Diffusion and Influence of Counter-Radical Muslim Discourse,’ has significantly increased our understanding in countering violent extremist ideologies,” wrote Capt. Dylan Schmorow, deputy director of the Human Performance, Training and BioSystems Research Directorate.

“The project is based on empirical research on extremist texts and statements with analyses and models,” says Steven Corman, professor, Hugh Downs School of Communication. “The research aims to create a database of Islamist narratives while revealing how these narratives are used to influence populations in areas such as the Middle East and Southeast Asia and North Africa. People from the U.S. often lack training and knowledge of the culture they reside in while overseas. This database will be useful for practical applications in field.”

The principal investigator for ASU's Minerva project is Mark Woodward, an associate professor in ASU's School of Historical, Philosophical and Religious Studies. He leads a multidisciplinary, multi-university international team that includes, from ASU, *Hasan Davulcu* and *Arunabha Sen*, School of Computing, Informatics, and Decision Systems Engineering; Tom Taylor, School of Mathematical and Statistical Sciences; and Corman; along with David Jacobson, University of South Florida; Riva Kastoryano, Centre d'Etudes et de Recherches Internationales, Sciences Po, France; and Muhammad Sani Umar, Northwestern University.

“One of the goals of the project is to deepen our understanding and knowledge of the types and complexity of counter-radical Islamic movements and networks in critical regions,” said Davulcu, who attended the ceremony on behalf of the team.

“By linking the deep knowledge of area experts and scholars of religious and Islamic studies with the quantitative and computational expertise of social and computer scientists, the Minerva project will provide a powerful visual tool for understanding the flow and influence of counter-radical ideas and movements across regions as well as globally,” Davulcu says.

“Scholars in the humanities have a rich history of studying the philosophical, social and historical dimensions of other cultures, hence they are able to pick up subtle nuances that are critical for understanding how counter-radicalism works on the ground across diverse communities and regions,” says Linell Cady, director of the Center for the Study of Religion and Conflict.

“The integration of the qualitative methods of the humanities with the quantitative and computational methods of social and computer science produces a whole that is significantly greater than the sum of its parts,” Cady says.

The center's Minerva project has already begun to produce a stream of publications that reflect the advances being made in sociocultural modeling.

Multi-source Data Integration and Biomarker Identification Provide Critical Data for Alzheimer's Disease Research

CIDSE associate professor works with Johnson & Johnson to fight Alzheimer's disease

Alzheimer's disease (AD), a highly prevalent neurodegenerative disease, is widely recognized as a major, escalating, epidemic, worldwide challenge to global healthcare systems. AD is the most common type of dementia, accounting for 60-80 percent of age-related dementia cases. AD is the sixth leading cause of death in the U.S. and the fifth leading cause of death for those age 65 and older.

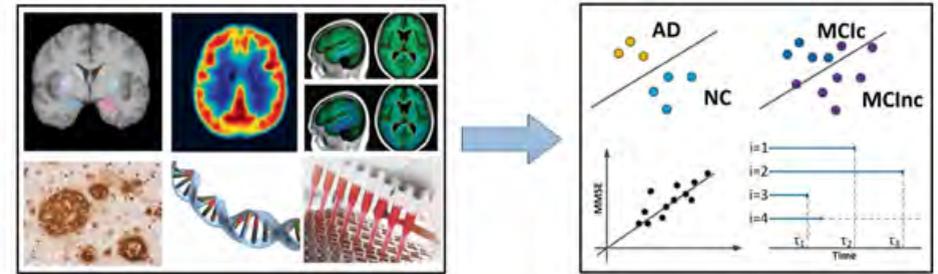
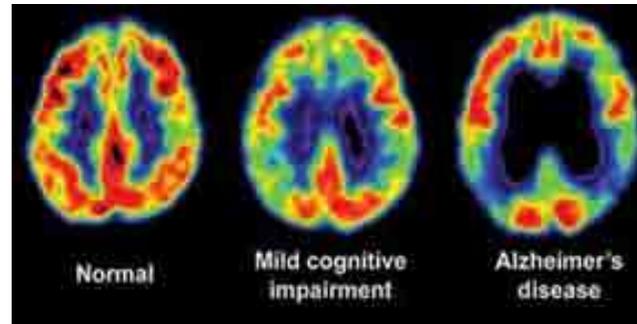
The direct cost of care for AD patients by family members or healthcare professionals is more than \$100 billion per year; this figure is expected to rise dramatically as the population ages during the next several decades. To avert a healthcare crisis, AD researchers have recently intensified their efforts to delay, cure, or prevent the onset and progression of the disease. These efforts have generated a large amount of data, including brain neuroimages, that provides unprecedented opportunities to investigate AD-related questions with higher confidence and precision.

In AD patients, neurons and their connections are progressively destroyed, leading to loss of cognitive function and ultimately death. It is well accepted that the underlying disease pathology most probably precedes the onset of cognitive symptoms by many years.

Clinical and research studies commonly acquire complementary brain images, neuropsychological and genetic data of each participant for a more accurate and rigorous assessment of the disease status and likelihood of progression.

Jieping Ye at CIDSE is collaborating with researchers from Johnson & Johnson to develop sparse learning methods for multi-source data integration and biomarker identification.

"The integration of multiple heterogeneous sources will not only provide more accurate information on AD progression and pathology, but also effectively predict cognitive decline before the onset or in the earliest stages of disease," states Ye.



In addition, an integrated genetics, biological biomarkers and multi-modal imaging analysis software system for brain function and disease studies has recently been developed.

Missing data presents a special challenge to current large-scale biomedical data integration. Incomplete data is ubiquitous in real-world biomedical applications. Missing data may be due to the high cost of certain measurements, poor data quality, dropout of the patients from the study, etc. A commonly adopted approach is to remove all samples with missing values, but this would throw away a vast amount of useful information and dramatically reduce the number of samples in the training set.

An alternative is to estimate missing entries based on the observed values, and many algorithms have been proposed for this. Most existing methods are less effective when a significant amount of data is missing. Dr. Ye and his group have developed a novel multi-task feature learning framework to integrate multiple incomplete data sources.



data management and information assurance

While networks connect entities, it is the data transmitted across those networks that empowers objects and enriches life. With terabytes of data being produced daily by single applications, 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 assured and secure functioning of this data management aspect in cyberspace is critical to developing a trustworthy system that can support the needs of our modern information society.

Specialty Areas and Faculty Contacts

Database Management and Information Retrieval. With close links to AI, query processing and extracting desired information from large, heterogeneous databases represents a major challenge being addressed by CIDSE researchers. Understanding data storage and designing storage protocols to enable efficient integrated workflow with data services and semantic web motivate research activities. *(Chitta Baral, Yi Chen, K. Selcuk Candan, Hasan Davulcu, Subbarao Kambhampati)*

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 computers and corporate servers are challenges being addressed as well as developing schemes for addressing new distributed technologies such as cloud computing. *(Gail-Joon Ahn, Partha Dasgupta, Dijiang Huang, Guoliang Xue, Stephen Yau, Nong Ye)*

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 and the creation of new technologies for multimedia educational experiences are under development. Additionally, CIDSE researchers are making advances in heterogeneous data fusion and developing new tools to aid physically-impaired individuals. *(Vineeth Balasubramanian, Winslow Burseson, K. Selcuk Candan, Baoxin Li, Jeremy Rowe, Sethuraman Panchanathan, Hari Sundaram)*



Exploring the Web: Beyond Document Search

With the prevalence of the Web, we are living in an age of information explosion. Today we rely on Internet search engines, like Google or Bing, to find the relevant documents among trillions or quadrillions of HTML documents on the Web.

While such documents are easily accessible, they may demand much time for us to dig out the exact information and knowledge that we are looking for. For instance, we may search for a smart phone with good battery life, plan a trip to a top-ranked beach in America in July, seek out a relevant conference to submit a manuscript, or maybe find an expert that we'd like to collaborate with.

Internet search engines are insufficient to provide good answers to these queries since it's very hard to "understand" HTML documents and correlate multiple documents to provide the desirable information. On the other hand, besides the easily searchable documents, there is an enormous amount of valuable information stored in "web databases," which cover a large range of topics including products, travel arrangements, publications, financial and public records, science and governments. The rich "metadata" in web databases offer a great potential to provide information and knowledge desired by the user beyond documents.

The mission of School of Computing, Informatics, and Decision Systems

Engineering (CIDSE) Associate Professor *Yi Chen* and her group is to enable web users to easily retrieve not just documents, but desirable information and knowledge from the Web using simple keyword-based queries.

This mission demands solutions to many technical challenges.

For instance, while the valuable information in databases can potentially improve search quality, databases do not support keyword based queries in general.

Additionally, how can we leverage the information in the documents and that in databases together? How should we extract valuable knowledge such as the objects and their relationships from documents?

Furthermore, how can we handle the high heterogeneity of information presentation format and information quality presented in different sources? Besides searching data, how can we support "social search," i.e. finding relevant people on the Web who can answer one's questions?

This research has been funded by several grants from National Science Foundation, including a CAREER award from Science Foundation of Arizona and by an IBM faculty award. These grants will enable this ambitious work, which promises to be "tremendously useful to everyone because search engines can no longer be restricted to a subset of information available in HTML documents," explains Chen.



Securing Digital Identities in Mobile Devices and Virtual Communities

Surveys and polling data confirm that the Internet is now a prime vehicle for business, community, and personal interactions. The notion of identity is the important component of this vehicle.

When users interact with services on the Internet, they often tailor the services in some way for their personal use.

In addition, we have organizational and software procedures that facilitate the exchange of interpersonal information in social networking sites, instant messaging, bulletin boards, online role-playing games, computer-supported collaborative work and online education.

All of these applications fit into the larger category of social media that supports virtual community. As we increasingly rely on this cyberspace, the issue of identity management including privacy protection in such a virtual community is also critically important. Furthermore, the weakness of the current identity management is often exploited on unsuspecting users and mobile devices through various malware.

Gail-Joon Ahn, an associate professor of computer science and engineering in the School of Computing, Informatics, and Decision Systems Engineering, and director of the Laboratory of Security Engineering for Future Computing (SEFCOM, <http://sefcom.asu.edu>), investigates usable and effective identity management solutions for mobile devices and virtual communities.

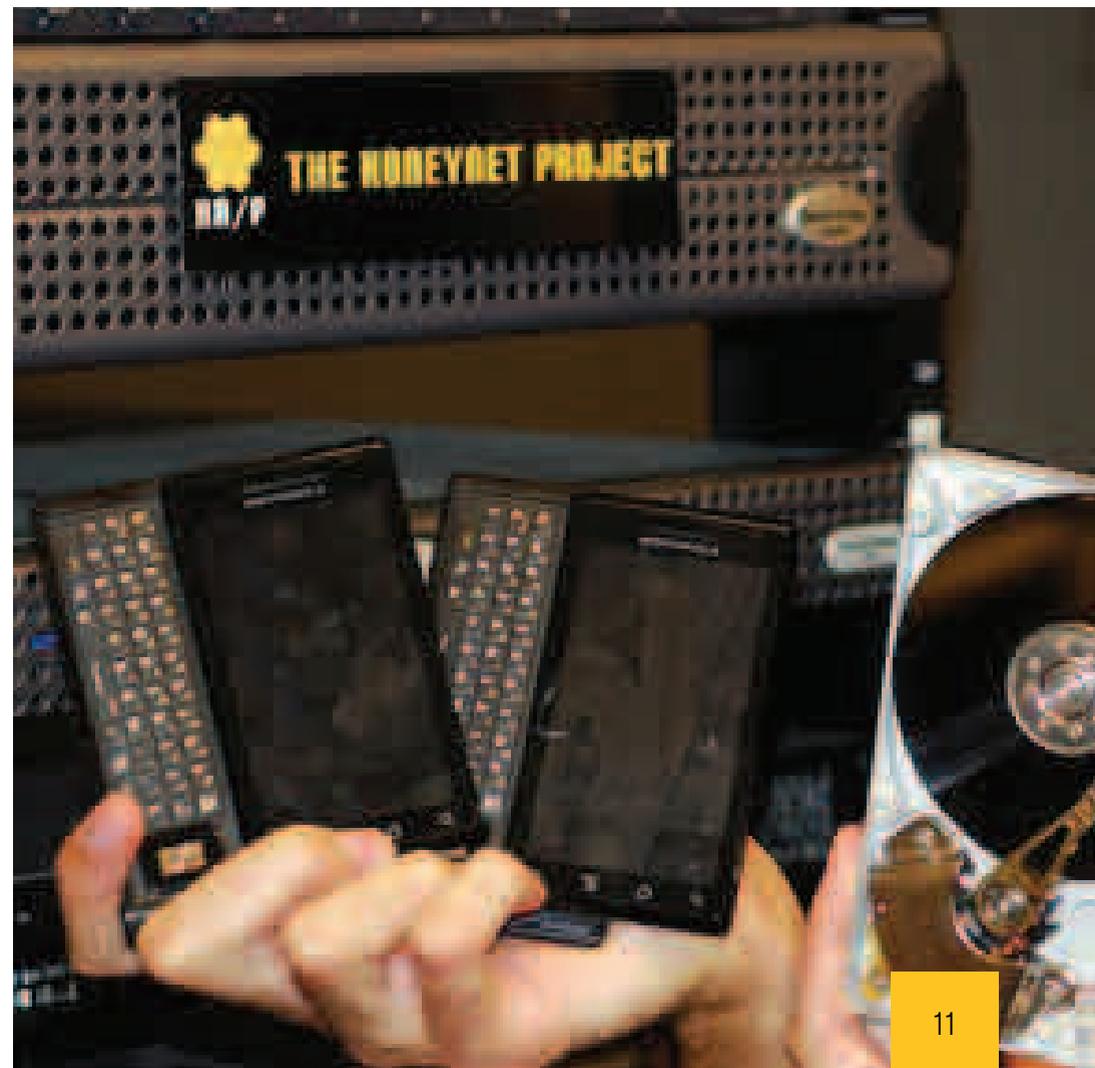
His research on identity management focuses on user-centric management of multiple personas while examining and reverse-engineering various malware that can exploit weaknesses and vulnerabilities in mobile devices and social networks.

This research has been supported by two research awards from the National Science Foundation and an award from an industry partner. Furthermore, his recent invention on identity management has been licensed to Open Invention Network, LLC whose customers include IBM, NEC, Novell, Philips, Red Hat and Sony and resulted in seven pending patent applications and news story in Yahoo! Finance.

In addition, his research team at SEFCOM has proposed an innovative approach to manage and share digital contents in social networks, accommodating multiparty concerns.

Ahn's research could prove invaluable to users of virtual communities and mobile devices who currently face many potential security issues. With the growing popularity of these communities and devices, Ahn believes his research could have a significant impact.

"Identity management has recently received considerable attention since it lacks a usable and effective method for handling user credentials," Ahn states. "Our approach seeks a way to solve critical security issues such as identity theft, fraud and privacy concerns related to all mobile computing devices and virtual communities."



network science and systems

Networks permeate modern life. From the open and virtual private networks that support electronic data interchange within and between commercial enterprises to the wireless, mobile networks that enrich our personal lives by keeping us in contact with our friends and family, to the sensor networks that protect the homeland and enable scientific exploration, 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 and Faculty Contacts

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. *(K. Selcuk Candan, Partha Dasgupta, Sandeep Gupta, Dijiang Huang, Yann-Hang Lee, Wei-Tek Tsai, Stephen Yau)*

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. Architectural design and parallelism issues are paramount in preparing for the paradigm of multi-thread and multicore processors. The Center for Embedded Systems forms the core of this research and provides numerous opportunities for industrial collaboration as well as addressing fundamental challenges.

(Karam Chatha, Georgios Fainekos, Sandeep Gupta, Yann-Hang Lee, Don Miller, Pitu Mirchandani, Aviral Shrivastava, Sarma Vrudhula)

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 ensure connectedness in mobile ad hoc networks. Location services, access control and scheduling, self-stabilizing protocols, coverage and connectivity, multi-path and QoS routing and congestion modeling are among areas of active interest by the research group.

(Sandeep Gupta, Pitu Mirchandani, Andrea Richa, Arunabha Sen, Violet Syrotiuk, Guoliang Xue)

Social Computing. Social computing research seeks to understand social behavior and context based on communication systems. Based on the integration of social, physical, psychological and governmental mechanisms, this research relies on multidisciplinary collaboration to develop 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 application for commercial sponsors, social scientists and security agencies alike. *(Robert Atkinson, Gail-Joon Ahn, Yi Chen, Hasan Davulcu, Huan Liu, Hari Sundaram, Guoliang Xue)*

Internet Topology Map

Countermeasures for Social Network Attacks

Even as Facebook moves to improve and simplify privacy options for the social network's 750 million users, a group of independent researchers is proposing even greater security measures, specifically for those social networks that place control and responsibility squarely in the hands of users.

The researchers presented their findings at the ACM Conference on Knowledge Discovery and Data Mining in San Diego. They've created an index that lets users determine how vulnerable their Facebook friends are to the myriad of attacks occurring on social networks and plan to develop an app based on their research.

The researchers looked at two million Facebook users and assigned a vulnerability index to each account based not only on the individual's behavior and privacy settings but those of their friends as well. The upshot is that an individual's privacy is only as secure as the weakest link (person) in that person's network of friends.

"The solution," says Pritam Gundecha, a doctoral student in computer science at Arizona State University and one of the authors of the study, "is to unfriend those with questionable behaviors or friends who have not set their privacy controls to acceptable levels."

"If you don't wish to unfriend someone, you can make them aware of their vulnerabilities and to ask them to address them," says Gundecha, whose studies focus on social media security.

Professor **Huan Liu** of the School of Computing, Informatics, and Decision Systems Engineering at ASU and other researchers hope to develop a Facebook application that will let users see the privacy attributes of their friends.

"The work is based on a relatively simple mathematical model that uses public information," says Gundecha.

Some types of malicious activities occurring on social networks:

- Scams
- Stalking
- Malware
- Malicious scripts
- Hacked accounts
- Malicious tagging
- Hacking into anonymous data to extract personal user information
- Phishing
- Impostors
- Sybil attacks that involve the creation of false IDs to carry out malicious activities
- Spamming
- Clickjacking
- Cyberbullying



Monitoring Traffic Using Airborne Sensors

CIDSE researchers lead a transdisciplinary multi-university team to develop novel traffic monitoring approaches

A team from Arizona State University and the University of Arizona has architected an approach to automatically, in real-time, collect geo-reference images from remote cameras for managing traffic. This is done by integrating the imagery with information on the height and GPS location of the camera. Using this camera data, in combination with a geographic representation (latitude-longitude) of the area to be monitored, leads to an explicit way to geo-reference the observed road and vehicle locations. Absolute values of vehicle positions, speeds, accelerations, decelerations and lane changes can be determined. Initial experiments show promise in geo-referencing the airborne imagery.

Using this technology, the ASU-UA team has developed prototype software to extract individual vehicle trajectories from aerial video. Using this

software, one is able to identify individual vehicles and their movement across consecutive images. By knowing the pixel coordinates and the approximate scale of the image, vehicle trajectories (in distance and time) can easily be determined. The ASU-UA team has demonstrated this technique using aerial videos in Tucson and Phoenix. Data sets of vehicle trajectories can also be used for calibration and validation of microscopic traffic simulation models. Such simulation models can then be used for investigating possible roadway improvements or to better explain existing and likely future traffic conditions.

In addition, this approach is viable for collecting aggregate traffic measures (delay, density, flow, speed, etc.) which are extremely useful for traffic managers to figure out how the freeways and surface streets are performing, especially when other ground sensors are absent or disabled.

The CIDSE researchers are led by Professors **Pitu Mirchandani** and **Ronald Askin**. Civil Engineering Professor Mark Hickman leads the UA researchers. The U.S. Department of Transportation has been supporting the research. Also, the German Aerospace Agency (DLR) in Berlin, Germany, collaborates with

the team. Led by Dr. Reinhart Kühne and Martin Ruhé, DLR researchers have developed an integrated platform that can be flown on fixed-wing planes and helicopters to acquire and transmit images at five frames per second and subsequently, also in real time, determine traffic parameters such as speeds and densities, and individual vehicle trajectories.

However, their system is expensive, especially because it requires a high-resolution professional camera and a high-precision inertial measurement unit (IMU) that very accurately localizes the camera. Instead, the ASU-UA approach uses a consumer camera, albeit a high-end one, to capture images, but accurately localizes the captured images on a geo-referenced map using fast image processing algorithms. Success of this research could lead to having cameras on UAV's that could be used for not only monitoring daily traffic congestion and incidents, but also assist in managing traffic during evacuations.

Mirchandani states, "This could revolutionize how well and how fast we respond to traffic congestion and incidents. I can imagine a future where a fleet of equipped UAVs will be available for dispatching to any location at any time, to assist first responders to get to incidents fast and assist traffic managers to proactively manage traffic."



Professor Pitu Mirchandani (left)

software and systems engineering

Software instantiates our intentions and controls modern devices. Its pervasiveness in society, new computing paradigms and the growing complexity of many systems dictate the need for ongoing 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 having an impact in the areas of health informatics, personalized learning, logistics, enterprise information processes and modeling and simulation.

Specialty Areas and Faculty Contacts:

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 being developed by the faculty. Methods for evaluating and improving systems engineering tools are also being developed. *(Dan Shunk, Teresa Wu)*

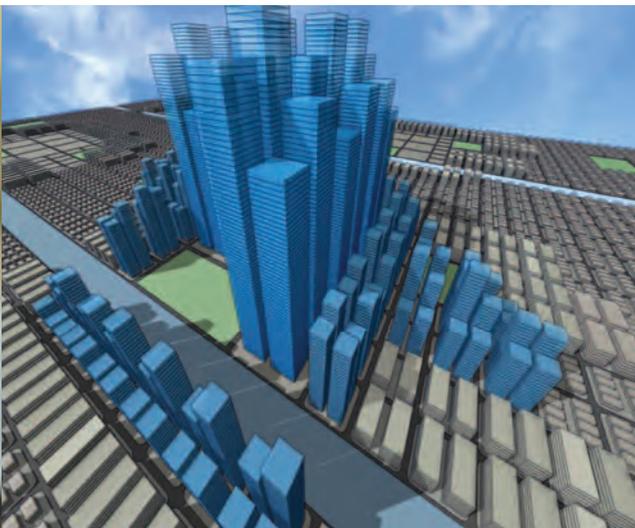
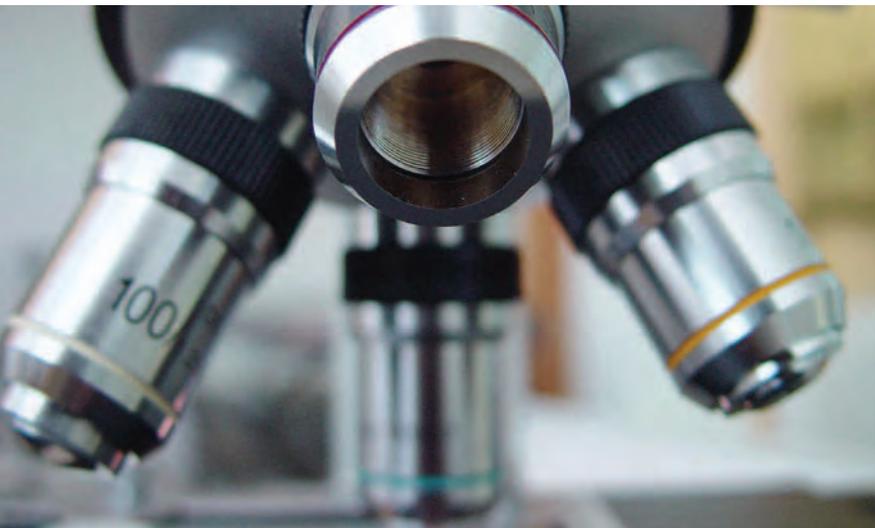
Health Informatics. CIDSE faculty is actively engaged in the development and application of data mining tools for diagnosing disease incidence from health records. Designing patient and workflow processes to improve system efficiency are also active healthcare initiatives for CIDSE researchers. An additional thrust focuses on utilizing ubiquitous and pervasive computing to increase functionality and independence of physically-challenged individuals. At a higher level, policy analysis studies for public health policy and emergency management are being conducted. *(Vineeth Balasubramanian, John Fowler, Baoxin Li, Jing Li, Sethuraman Panchanathan, George Runger, Yalin Wang, Teresa Wu, Jieping Ye, Nong Ye)*

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, taking HCI to a new level. *(Mary Anderson-Rowland, Robert Atkinson, Winslow Burleson, Brian Nelson, Kurt VanLehn)*

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. *(Ronald Askin, John Fowler, Esma Gel, Pitu Mirchandani, J. Rene Villalobos)*

Simulation Modeling and Systems. Throughout science, data-driven models take on a large role. CIDSE faculty are developing structured languages and modeling tools to support the expanding role of simulation in turning scientific advances into knowledge and engineered solutions. *(John Fowler, Hessem Sarjoughian, Wei-Tek Tsai, Teresa Wu)*

Software Engineering. Ensuring the reliability of software, assuring the provenance of data and the security of information transmittal are ongoing challenges addressed by CIDSE as we develop methods to enable new paradigms such as cloud computing. Research is ensuring effective functionality for middleware and application systems. *(James Collofello, Hessem Sarjoughian, Wei-Tek Tsai, Stephen Yau)*



Andes: An Intelligent Tutor for Physics

Working on problems with the aid of an expert human tutor is one of the most effective ways that a student can learn. However, expert human tutors are expensive and not available at a moment's notice. The main goal of the field of intelligent tutoring systems is developing software that is just as effective as expert human tutors.

CIDSE researchers, including CIDSE Professor **Kurt VanLehn**, have developed an intelligent tutor system, Andes, for learning introductory physics as students do their physics homework. Andes does not replace a physics class, human tutor or textbook, but instead works with them.

Whenever students would do a physics problem on paper, they do it on Andes instead. Andes mimics traditional pencil and paper. When solving a problem with Andes, students draw objects, and write equations and definite quantities on a free-form user interface. Unlike with pencil and paper, each step of their solution is evaluated immediately for correctness. If the student makes a mistake or becomes lost, they can ask Andes for a hint. Andes' hints are designed to help students learn physics, not just to finish their problems quickly.

Andes is infinitely patient, always available and runs in a browser without downloading, and has over 500 physics problems covering almost all topics in a two-semester college or AP high school physics course. Thousands of students have used Andes, which is available at www.andestutor.org. The software is free of charge thanks to funding from the Office of Naval Research and the National Science Foundation.

A laboratory for computer science

Internally, Andes contains an extensive artificial intelligence (AI) system that models the entirety of introductory physics. This AI system is used to construct solutions to the 500+ problems in the Andes library. As a student solves a problem, each step in their solution is compared to one of the constructed solutions. This AI system is one of the most sophisticated educational AIs in existence.

Professor Kurt VanLehn supervises his computer science capstone course with Brett van de Sande to create a collaborative whiteboard that allows remote groups of students to solve physics problems using the Andes intelligent tutor.

Andes provides a platform for cutting-edge research in AI, natural language parsing, educational technology, web technology and software development methodology. During the last few years, Andes has hosted several capstone course projects where CIDSE seniors pursued Andes-related research projects. For example, a recent project was to develop a system that allows physically separated students to collaboratively solve a problem with Andes.

A tool for education research

When a student solves a problem, Andes logs each student step of the solution together with its interpretation of the step. This log data provides a powerful probe into students' learning processes. Advanced machine learning and statistical techniques are applied to the data, contributing to an emerging field called learning analytics or educational data mining. Andes has also been used to experiment with different tutoring strategies, problems, hints and usage.

Different students use subtly different versions of Andes, and learning analytics measures the changes in their learning, motivation and conceptual development. Discoveries made with such experiments not only enrich our understanding of learning and instruction, they also make Andes better and better.

A Grand Challenge accepted

"The National Academy of Engineering has made personalized learning one of its grand challenges," says VanLehn. "We accept that challenge and are working hard to make Andes even more personalized and more effective."



Planning a Secure Food Supply Chain at the International Logistics and Productivity Improvement Laboratory (ILPIL)

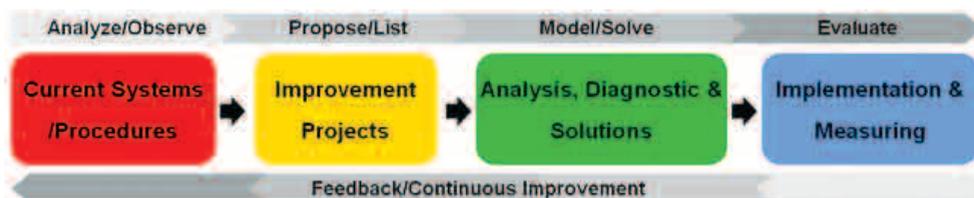
The International Logistics and Productivity Improvement Laboratory (ILPIL) at Arizona State University performs applied research in diverse supply chains. One of the focuses of activities of ILPIL has been the development of secure and efficient distribution strategies for agricultural fresh products. Two representative projects in this area are: development of logistics platforms for the distribution of fresh produce of Sinaloa in the USA and Intelligent Food Defense Systems for International Supply Chains. A brief description of goals of these projects follows.

In the project of development of logistics platforms, the purpose was to improve U.S. commercialization and distribution practices of fresh produce from the Mexican State of Sinaloa. The end goal is the development of long term, progressive strategies to vertically integrate the supply chain through a logistics platform, so that producers gain more control of the distribution of their products. "This research has resulted in methodologies, which farmers could apply in practical terms to progressively gain a greater share of the profits rendered by the value chain of fresh produce," explains **J. Rene Villalobos**, ILPIL director and associate professor in industrial engineering.

In the project Intelligent Food Defense Systems, the aim was to expand the state-of-the-art of inspection strategy research to accommodate the unique characteristics of fresh produce. Our vision is to develop information-based, adaptable inspection and detection strategies that will be driven by information collected throughout the production and distribution chain of fresh produce.

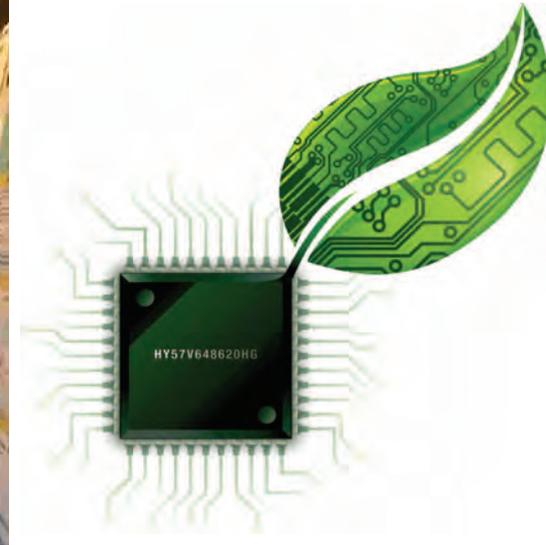
The resulting inspection methodologies will be highly adaptive, over time learning to detect new threats and also that over time can easily incorporate new sensors and sources of information.

ILPIL Project Approach



Fellow ILPIL researcher, **George Runger**, professor in industrial engineering states, "The aim of our efforts is to make optimal use of the resources available in such a way that the probability of detecting and removing from the market undesirable food shipments is maximized."

The ILPIL approaches every project by finding the right people for it. Usually composed by undergraduate, master's and doctoral students; each project team works under the leadership of our faculty to analyze and define, review and propose, model and solve, and evaluate the different problems faced by our sponsors.



Center for Cognitive Ubiquitous Computing (CUBiC)

The Center for Cognitive Ubiquitous Computing (CUBiC) at Arizona State University is an interdisciplinary research center focused on cutting edge research targeting a variety of applications.

Most ubiquitous computing research takes a technology-centric view in solving real-world problems. It is our belief that a balanced technology and problem-centric view is required in tackling challenging application domains. By targeting applications that require ubiquitous computing solutions, in contrast to applications with a ubiquitous computing flavor, brings out the underlying challenges that need to be addressed. In keeping with this spirit, we have chosen to serve the needs of physically-challenged individuals by empowering them with ubiquitous and pervasive computing technologies to enrich their lives.

Motivated by this approach, we have assembled focus groups of blind and hearing-impaired individuals, researchers involved in disability studies and mobility instructors to bring out the real needs in this application.

Center for Embedded Systems

The Center for Embedded Systems (CES) was established in 2001 as an industry/university partnership dedicated to developing a globally-recognized center for embedded computing system technologies. In March 2009, CES achieved the designation of National Science Foundation Industry/University Cooperative Research Center.

Objects ranging from an iPod to an automobile use advanced computer technology commonly concealed by a metallic or decorative cover. Advanced technology of this nature usually operates through an embedded computer system. The Center for Embedded Systems researches the inner workings of embedded computer systems. A simplified explanation of embedded systems is that they are special purpose computer systems designed to perform one or a few dedicated functions and are part of a complete device including hardware and mechanical parts. Although most people do not realize it, they use some form of embedded systems in their daily interactions at work and at home.



Information Assurance Center (IAC)

Information systems through various types of networks have been indispensable for modern societies in the information age. To use and process information with great confidence, both the information systems and networks as well as the information must be trustworthy. For this objective, users need not only dependable and secure information systems and networks, but effective mechanisms to ensure integrity and quality.

The Information Assurance Center (IAC) is a multi-disciplinary center focusing on both research and educational activities to address the broad issues of developing trustworthy information systems (TIS) and ensuring the quality of information being stored, processed and transmitted by information systems and networks. Current research activities involve foundational, network, system and application aspects of developing and testing TIS; steganography; facial recognition, video surveillance, multimedia data processing, dynamic and deterministic Quality of Service management; data mining for security, privacy in data management; and situation-awareness.

Center for Engineering Logistics and Distribution (CELDi)

CELDi is an applied research and education consortium consisting of nine major research universities, more than 30 member organizations from commercial, military and government sectors of the economy, and the National Science Foundation (NSF). The ASU center provides an international component to the consortium through its transborder studies.

CELDi's mission is to enable member organizations to achieve logistics and distribution excellence by delivering meaningful, innovative and implementable solutions that provide a return on investment. CELDi partnerships achieve logistics and distribution excellence by solving real problems that achieve bottom-line impact, graduating students with real-world project experience, producing generalized, cutting-edge research, and sharing research results amongst member organizations to leverage intellectual and monetary capital.

Partnership for Research in Spatial Modeling (PRISM)

PRISM is the focal point at Arizona State University for interdisciplinary research in modeling and visualization to permit intelligent analysis and create spatial and dynamic knowledge.

The Partnership for Research in Spatial Modeling (PRISM) has a history of collaborative partnerships that center around how to develop, capture, model, analyze and interact with three-dimensional data. Researchers work with large, complex data sets from scanning devices that include 3D laser scanners, optical facial scanners and probe microscopes. 3D algorithms and software created by PRISM researchers allow users to accurately model and automatically segment, extract, measure and analyze features of interest to discipline researchers.

The computer-aided geometric design (CAGD) modeling and analytic tools developed at PRISM apply to surfaces and volumes within complex data sets regardless of scale.

most outstanding research award

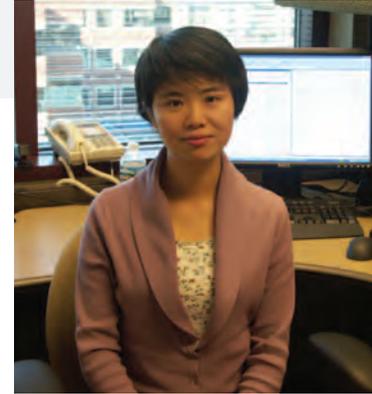
senior faculty



Huan Liu

“For Development and Application of New Methods to Understand the Process and Impact of Social Networks.”

junior faculty



Yi Chen

“For the Development of Novel Techniques to Enable Structured and Semi-Structured Queries in Relational and XML Databases.”

research activity

FACULTY RESEARCH ACTIVITY FY 2011

PROPOSALS



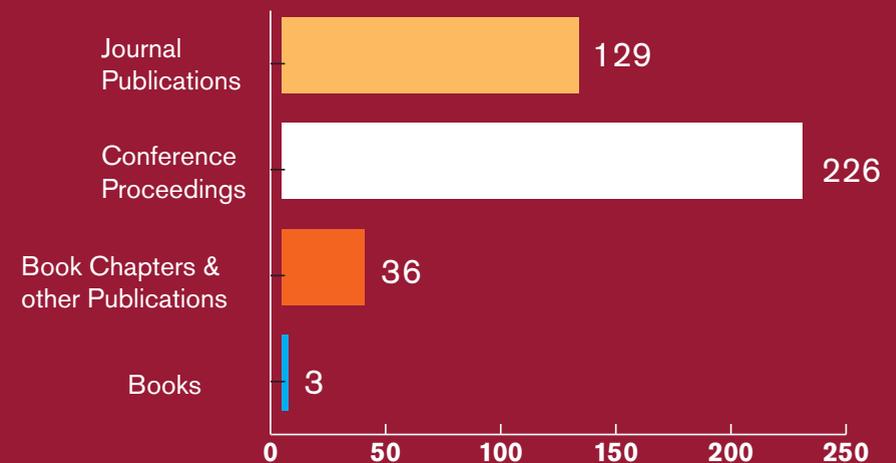
AWARDS



EXPENDITURES



2010 FACULTY PUBLICATIONS



Ahn, Gail-Joon, DOE, Assured Resource Sharing in Ad-hoc Collaboration, \$270,175, 6/1/2010 - 5/31/2013

Ahn, Gail-Joon, NSF, CT-M-Collaborative Research: Securing Dynamic Online Social Networks, \$16,000, 9/1/2008 - 8/31/2012

Ahn, Gail-Joon, NSF, TC:S, II: Collaborative Proposal: User-Controlled Persona in Virtual Community, \$23,634, 9/15/2009 - 8/31/2012

Anderson-Rowland, Mary, National Action Council for Minorities in Engineering, NACME Scholars Program, \$7,500, 8/16/2003 - 5/14/2013

Atkinson, Robert, DOD, Evaluating the Impact of Interactive Tutoring & Gaming Environments on Learning & Engagement, \$161,161, 11/1/2009 - 12/31/2012

Baral, Chitta, DOD, Effective Human Robot Interaction under Time Pressure through Natural Language Dialogue & Dynamic Autonomy, \$74,292, 10/1/2007 - 6/30/2012

Baral, Chitta, Lee, J., IARP Activity, Integrating Machine Learning and Knowledge Representation for Discovery of Social Goals of Groups and Group Members from their Language Usage, \$452,689, 8/24/2009 - 10/23/2012

Bazzi, Rida, NSF, Safe Live Updates of Scientific Workflows, \$160,000., 9/1/2008 - 8/31/2012

Burleson, Winslow, NSF, CIFellows Project, \$140,000, 2/1/2011 - 4/30/2012

Candan, K.S, Davulcu, H., Sundaram, H., NSF, MiNC: NSDL Middleware for Network and Context-aware Recommendations, \$509,168, 9/15/2010 - 8/31/2012

Candan, K.S., Kintigh, K., Spielmann, K., NSF, III: Small: One Size Does Not Fit All: Empowering the User with User-Driven Integration, \$499,946, 8/15/2010 - 7/31/2013

Chatha, Karamvir, NSF, CAREER: System-Level Design of Network-On-Chip Architectures, \$15,781, 3/15/2006 - 2/28/2012

Chatha, Karamvir, Semiconductor Research Corporation, SRC: System-level Design of Streaming Applications on Domain Specific Multi-core Processors, \$20,000, 8/1/2009 - 8/31/2012

Chen, Yi, NSF, CAREER: Analyzing and Exploiting Meta-information for Keyword Search on Semi-structured Data, \$87,911, 3/1/2009 - 2/28/2014

Corman, Steven, Bernardi, D., **Davulcu, H.**, Goodall, H., Trethewey, A., DOD, Identifying Terrorist Narratives and Counter-Narratives: Embedding Story Analysis in Expeditionary Units, \$640,352, 3/1/2009 - 5/31/2014

Davulcu, Hasan, NSF, CAREER: A Logic-Based Dynamic Policy Model for Adaptive Workflow Management, \$69,451, 1/16/2007 - 2/28/2012

Fainekos, Georgios, NSF, SHF: Small: Collaborative Research: Statistical Techniques for Verifying Temporal Properties of Embedded and Mixed-Signal Systems, \$239,319, 8/1/2010 - 7/31/2013

Gee, James, **Nelson, B.**, MacArthur Foundation, 21st Century Assessment Project, \$33,000, 10/1/2007 - 9/30/2011

Goss, Jeffrey, **Shunk, D.**, ManTech Telecommunications and Information Systems Corp, Task Order for Supplies or Services in Support of the Joint Interoperability Test Command, \$20,000, 1/5/2011 - 2/28/2011

Gupta, Sandeep, Kambhampati, S., Northrop Grumman, Metaplanning Framework to Evaluate and Select Decision Making Paradigms for UAV Missions, \$65,000, 2/8/2010 - 12/31/2011

Gupta, Sandeep, Phelan, P., NSF, II-EN: BlueTool: Infrastructure for Innovative Cyber-physical Data Center Management Research, \$150,000, 5/1/2009 - 7/31/2012

Huang, Dijiang, DOD, Traffic Analysis Models for Wireless Mobile Ad Hoc Devices, \$49,967, 7/1/2011 - 6/30/2012

Huang, Dijiang, DOD, MobiCloud: A Secure Mobile Cloud Framework for Mobile Computing and Communication, \$244,828, 5/1/2010 - 4/30/2013

Huang, Dijiang, Tsai, W-T., NSF, A Cloud-based Resource and Service Sharing Platform for Computer and Network Security Education, \$200,000, 6/15/2010 - 6/30/2012

Kambhampati, Subbarao, DOD, Assessing Robustness and Generating Robust Plans in the Presence of Partially Complete Models, \$100,000, 12/1/2010 - 2/28/2012

Kambhampati, Subbarao, DOD, Foundations of Model-lite Planning: The Challenges of Planning with Incomplete and Evolving Domain Models, \$14,000, 10/1/2008 - 9/30/2012

Kambhampati, Subbarao, DOD, Source and User Adaptive Information Integration, \$28,000, 10/1/2008 - 9/29/2012

Kambhampati, Subbarao, NSF, ICAPS-11 Doctoral Consortium Travel Awards, \$19,656, 2/15/2011 - 1/31/2012

Katz, Charles, **Liu, H., Rowe, J., Runger, G.**, DHS, DHS COE in Border Security and Immigration, \$156,102, 7/1/2008 - 6/30/2011

Kiaei, Sayfe, **Pan, R.**, Tamizhmani, G., Science Foundation of Arizona, PEPER- Photovoltaic Environmental Performance and Reliability for the Arizona-Wide Electric Grid, \$235,33, 6/30/2009 - 6/29/2012

research awards fy 2011

Lai, Ying-Cheng, **Ye, J.**, NSF, CDI-Type I: Data-based Prediction of Complex Networks and Applications, \$539,779, 9/15/2010 - 8/31/2013

Langley, Patrick, DOD, MURI: A Unified Computational Theory of Language and Cognition, \$215,799, 6/1/2009 - 5/31/2012

Lee, Yann-Hang, Electronics and Telecommunications Research Institute, Home Information Remote Aggregation and Context Inference Prediction Technology Development, \$73,170, 10/1/2010 - 9/30/2013

Lee, Yann-Hang, Electronics and Telecommunications Research Institute, Research of Logic Conflict Resolving Algorithm considering Home Network Service Functionalities, \$44,715, 6/1/2010 - 1/31/2011

Li, Baoxin, Black, J., Mayo Clinic Scottsdale, Quantifying Hypoxia in Pilots through Eye-tracking Data Analysis, \$25,468, 1/1/2011 - 12/31/2011

Li, Baoxin, NSF, CAREER: Enabling Independent Access to Digital Graphical Contents for People with Visual Impairment, \$97,174, 3/1/2009 - 2/28/2014

Li, Jing, HHS-NIH-NIGMS, Sparse Structure Identification from High-Dimensional Epigenomic, \$70,092, 9/1/2010 - 8/31/2014

Li, Jing, NSF, Real-Time Health Management for Hierarchical Engineering Systems through Heterogeneous Sensor Fusion, \$194,342, 4/1/2011 - 3/31/2014

Liu, Huan, DOD, Developing a Cultural Analysis and Sociological Network Theory for Understanding Virtual Communities and Their Intrinsic Relationships on the Web, \$105,266, 1/15/2009 - 11/30/2011

Liu, Huan, DOD, Modeling Group Interactions via Open Data Sources, \$24,549, 3/1/2008 - 8/31/2011

Liu, Huan, DOD, ARO SBP11 Conference Sponsorship Grant Proposal, \$7,625, 3/1/2011 - 7/31/2011

Liu, Huan, DOD, The Role of Social Media in Trusted Collaboration for Disaster Relief, \$47,933, 3/1/2011 - 12/31/2012

Liu, Huan, HHS-NIH-NIGMS, International Conference on Social Computing, Behavioral Modeling and Prediction, \$22,600, 3/4/2011 - 2/28/2015

Liu, Huan, Lim, M., DOD, BlogTrackers: Analyzing Social Media for Cultural Modeling, \$225,739, 1/31/2010 - 12/31/2013

Liu, Huan, Ye, J., NSF, III-COR-Small: Beyond Feature Selection and Extraction—An Integrated Framework for High-Dimensional Data of Small Labeled Samples, \$15,979, 9/1/2008 - 8/31/2012

Mchenry, Albert., Alford, T., Allison, M., Capaldi, E., Castillo-Chavez, C., De Los Santos, A., Diaz, R., Francisco, W., Garcia, A., Garcia-Pichel, F., Johnson, P., Keller, G., Menendez, J., Moore, A., Peralta, P., Rivera, D., Rodriguez, A., **Villalobos, J.**, Wheeler, Quentin, NSF, More Graduate Education at Mountain States Alliance (MGE@MSA) AGEP Phase II (2004-2009), \$1,650,000, 10/1/2004 - 3/31/2012

Mirchandani, Pitu, ADOT, Platform for Evaluating Emergency Evacuation Strategies - Phase II, \$77,285, 10/26/2010 - 6/25/2012

Mirchandani, Pitu, Private Industry, Integration of the RHODES Adaptive Control Algorithm with MIST Platform, \$80,360, 8/1/09 - 10/31/2014

Mirchandani, Pitu, Askin, R., DOT, Enhanced Monitoring and Planning of Network Infrastructure with Remote Data Collection, \$246,865, 9/28/09 - 1/2/2012

Montgomery, Douglas, DOD, The Science of Test: Advanced Test and Evaluation in Support of the DOD Test and Evaluation Enterprise, \$85,000, 5/2/2011 - 12/31/2011

Montoya, Mitzi, Amresh, A., Branaghan, R., Chattopadhyay, A., Clavijo, S., Cooke, N., Dahm, W., Diaz, R., Femiani, J., Humble, J., Rajadas, J., Razdan, A., Redkar, S., **Shunk, D.**, Waissi, G., **Wonka, P.**, DOE, Partnerships in Innovation, \$1,000,000, 11/1/2010 - 9/30/2011

Nelson, Brian, NSF, SAVE Science: Situated Assessment Using Virtual Environments for Science Content and Inquiry, \$137,431, 9/1/2008 - 8/30/2013

Nelson, Brian, NSF, SURGE: Scaffolding Understanding by Redesigning Games for Education, \$69,839, 5/17/2010 - 8/31/2011

Pan, Rong, Li, J., ADOT, ADOT Research Project SPR675: Effectiveness of Young Driver Training and Graduated Licensing Laws, \$120,000, 1/13/2009 - 6/30/2012

Panchanathan, Sethuraman, Mayo Clinic Scottsdale, Aerospace Vestibular Laboratory Services, \$35,000, 1/1/2011 - 12/31/2011

Razdan, Anshuman, Femiani, J., **Wonka, P.**, DOD, Geospecific Displacement Maps for Real Time, Steroscopic Training Simulation, \$26,665, 11/10/2010 - 4/12/2011

Richa, Andrea, NSF, AF: Small: Adversarial Models for Wireless Communication, \$368,218, 6/1/2011 - 7/31/2014

Runger, George, Rowe, J., DOD, Important Features for Complex Systems with Transient Effects, \$155,075, 3/16/2009 - 3/15/2012

Runger, George, Semiconductor Research Corporation, Demand-Pricing Relationships for a Better Demand Supply Chain Planning, \$106,000, 1/1/2009 - 12/31/2011

Sarjoughian, Hessam, Intel Corporation, Inventory Knowledge Interchange Broker Model Development and Simulation, \$84,346, 12/15/2010 - 12/15/2011

Semken, Steven, Anbar, A., **Burleson, W.**, Hodges, K., Taylor, W., NASA, NASA Triad: A Triangulated Program to Promote NASA STEM Education Nationwide, \$296,447, 8/15/2010 - 8/31/2012

Sen, Arunabha, DOD, Robust Network Design - Connectivity and Beyond, \$259,817, 4/1/2009 - 11/30/2013

Sen, Arunabha, DOD, Third International Workshop on Network Science for Communication Networks (NetSciCom), \$10,000, 4/4/2011 - 4/3/2012

Sen, Arunabha, Zhang, J., DOD, A Robust and Resilient Network Design Paradigm for Region-Based Faults Inflicted by WMD Attack, \$255,780, 4/8/2009 - 4/7/2012

Shah, Jami, Campana, E., **Langley, P.**, NSF, Major: Understanding and Aiding Problem Formulation in Creative Conceptual Design, \$741,000, 8/1/2010 - 7/31/2013

Shrivastava, Aviral, NSF, CAREER: Compiler Techniques for Power-Efficient Protection Against Soft Errors, \$69,436, 1/1/2011 - 12/31/2015

Shrivastava, Aviral, NSF, CCF-SHF: CSR: Small: Compilation for Multi-Core Processors with Limited Local Memories, \$8,000, 8/1/2009 - 7/31/2012

Shunk, Dan., Centro De Enseñanza Técnica Y Superior, Visiting Scholar Proposal for the Assistance in the Creation of Centers of Excellence and Elevation of Operational Excellence Understanding, \$66,623, 6/1/2011 - 7/1/2012

Syrotiuk, Violet, Colbourn, C., U.S. Govt., Autonomous Network Optimization and Compressive Sensing, \$119,059, 9/24/2009 - 2/28/2011

VanLehn, Kurt, Burleson, W., NSF, Deeper Modeling via Affective Meta-tutoring, \$15,979, 9/1/2009 - 8/31/2012

VanLehn, Kurt, DOD, ADAPT II: Adaptive Device for Adaptive Performance Training, \$75,000, 8/9/2010 - 2/8/2012

VanLehn, Kurt, DOD, Adaptive Training to Enhance Individual and Team Learning, \$10,000, 6/29/2009 - 10/12/2010

VanLehn, Kurt, NSF, PSLC LearnLab Course, \$249,496, 10/1/2009 - 1/31/2015

Villalobos, J. Rene, Askin, R., Gel, E., NSF, Arizona State University affiliation with the Center for Engineering Logistics and Distribution (CELDI), \$49,920, 6/3/2008 - 8/31/2012

Villalobos, J. Rene, Carter, P., Maltz, A., NSF, Development of a Logistics Efficiency Index, \$75,000, 6/1/2010 - 5/31/2012

Villalobos, J. Rene, NSF, Planning Visit: Development of a Research Framework for International Supply Chains of Perishable Commodities, \$18,436, 12/15/2010 - 2/28/2012

Vrudhula, Sarma, Chatha, K., NSF, Collaborative Research: Consortium for Embedded Systems, \$60,000, 3/1/2009 - 2/28/2014

Vrudhula, Sarma, QualComm, CES Member: QualComm Inc., \$50,000, 1/1/2010 - 12/31/2012

Vrudhula, Sarma, Toyota Technical Center, USA, Inc., CES Member: Toyota Motor Engineering - Manufacturing NA Inc., \$100,000, 6/21/2010 - 8/15/2012

Wonka, Peter, NSF, CAREER: Constraint Procedural Urban Modeling, \$82,642, 3/1/2007 - 2/28/2012

Woodward, Mark, Corman, S., **Davulcu, H.**, Taylor, T., DOD, Finding Allies for the War of Words: Mapping the Diffusion and Influence of Counter-Radical Muslim Discourse, \$1,353,032, 4/1/2009 - 3/31/2014

Wu, Tong, DOD, Translation of Decentralized Decision Framework for Collaborative Product Development via Center for Rapid Product Development, \$49,997, 9/1/2010 - 8/31/2011

Wu, Tong, Zhang, M., Mayo Clinic Scottsdale, Extending Dose Index Tracking System with Multiple Modalities - WU, \$36,000, 1/31/2011 - 12/31/2011

Xue, Guoliang, DOD, Multi-Constrained Multi-Path Routing Algorithms, \$87,237, 8/25/2009 - 8/24/2013

Yau, Sik-Sang, Ahn, G-J, Huang, D., DOD, ASU Application for DOD Information Assurance Scholarship Program, \$40,347, 9/24/2010 - 12/23/2011

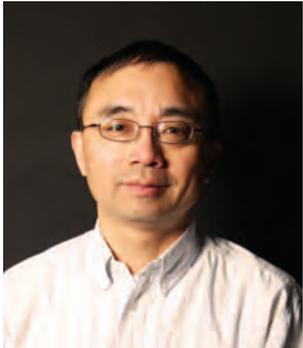
Ye, Jieping, DOD, SME: Guided Learning in Dynamic Environments (GLIDE), \$36,225, 10/1/2010 - 9/30/2011

Ye, Jieping, NSF, CAREER: Dimensionality Reduction for Multi-label Classification, \$73,693, 4/1/2010 - 3/31/2012

Ye, Jieping, Razdan, A., **Wonka, P.**, NSF, Multi-Source Visual Analytics, \$498,485, 8/1/2010 - 7/31/2013

Yi, Zhengping, Chen, S-C., Mandarino, L., Meyer, C., **Ye, J.**, HHS-NIH-NIDDK, Human Skeletal Muscle Proteome and Phosphoproteome in Obesity and Type 2 Diabetes, \$719,485, 12/1/2008 - 1/31/2011

Huan Liu honored by the Association for Computing Machinery (ACM)



Huan Liu has been named a Distinguished Member of the Association for Computing Machinery (ACM) for “contributions to broadening and deepening feature selection research for data mining and spearheading interdisciplinary research on social computing.”

Liu is a professor in the School of Computing, Informatics, and Decision Systems Engineering.

ACM, with close to 100,000 members, is the world’s largest educational and scientific computing society.

Liu is one of 47 ACM colleagues to be selected as Distinguished Members in 2010. He has been recognized for excellence in teaching and research in computer science and engineering at ASU. His research and teaching focus on artificial intelligence, machine learning, data mining, social computing and real-world applications.



Guoliang Xue named Fellow of the Institute of Electrical and Electronics Engineers (IEEE)

Professor Guoliang Xue of the School of Computing, Informatics, and Decision Systems Engineering has been named a Fellow of the Institute of Electrical and Electronics Engineers (IEEE), the world’s largest professional engineering association.

Fellow status is bestowed on institute members who have made significant contributions to their fields. IEEE Fellow is the highest grade of membership and recognized by the technical community as a prestigious honor and an important career achievement.

Xue has been selected for contributions to survivability and quality of service in computer networks. His work on the quality of service routing is aimed at finding a routing path that can transmit a large video file with guaranteed bandwidth in the network. This enables video stored at one location to be viewed at another location in real-time with a guaranteed viewing quality.

NSF CAREER Award winner Aviral Shrivastava



National Science Foundation has awarded Aviral Shrivastava a five year CAREER award to support his research on reliable computing.

Digital systems have integrated into our lives in an unprecedented way. From life-support systems (pacemakers, cochlear implants), communication and entertainment devices (cell phones, MP3 players), information hubs (Internet, TV), etc., digital systems help keep us entertained, comfortable, and generally increase the standard of life.

Shrivastava says, “At the time our reliance on computing systems is at its greatest, computing hardware is beginning to become unreliable. Cosmic particles, e.g., neutrons floating around in the environment, may strike a transistor, and switch its logic state. This can have dire consequences, from spectacular program and system crashes, to subtle wrong results. As the transistor sizes are shrinking, even low-energy particle strike can cause an error.”

“Even though the hardware is fundamentally becoming more susceptible to such ‘soft errors,’ we still want to keep our computation correct,” he says.

Shrivastava and his team of students are developing compiler techniques which will detect and compensate for such errors, and provide reliable computation on unreliable hardware.

2010-2011 AY Best Paper Award

Dejun Yang, Xi Fang, and Guoliang Xue, “OPRA: Optimal Relay Assignment for Capacity Maximization in Cooperative Networks,” IEEE International Conference on Communications, Kyoto, Japan, June 2011

2010-2011 AY Best Paper Award-Runner-Up

Dejun Yang, Guoliang Xue, Xi Fang, Satyajayant Misra and Jin Zhang; “Routing in Max-min Fair Networks: A Game Theoretic Approach,” IEEE International Conference on Network Protocols, Kyoto, Japan, 2010

James Collofello wins Daniel Jankowski Legacy Award



Three decades of numerous contributions to teaching, research and public service at ASU have earned Professor James Collofello special recognition from his peers.

Collofello is the recent winner of the Daniel Jankowski Legacy Award in recognition of the value of his efforts to advance the mission of ASU's Ira A. Fulton Schools of Engineering.

In addition to duties as an associate dean, he coordinates the computer software engineering distance learning program, and teaches in the School of Computing, Informatics, and Decision Systems Engineering.

"Jim is recognized and respected by our faculty, staff and students as a champion for student success by providing students with hands-on experience and by developing innovative courses and programs," says Paul Johnson, dean of the Ira A. Fulton Schools of Engineering.

The award was established in 2006 to honor Jankowski's distinguished academic career of 40 years as a professor in the College of Engineering and Applied Sciences (now the Ira A. Fulton Schools of Engineering). He retired in 2004.

2010-2011 Ira A. Fulton Schools of Engineering Teaching Awards

Engineering Best Teacher Award (Top 5%)

Robert Fleischner (IE)

Mutsumi Nakamura (CSE)

Yann-Hang Lee (CSE)

Farideh Tadayon-Navabi (CSE)

A. Alan B. Pritsker Outstanding IE Teacher Award

Linda Chattin

CSE Best Teacher Award

Mutsumi Nakamura

2010 Keynote Speeches and Plenary Talks

Anderson-Rowland, Mary, "A Retention Success Story: How We Did It," Institute for Women in Trades, Technology & Sciences (IWITTS), Cal Women Tech Project Partner Meeting, Emeryville, California, October 2010.

Askin, R.G., "Global Challenges in Production and Logistics for the 21st Century," 5th International Conference on Production Research: Americas 2010, Bogota, Colombia, July 2010.

Colbourn, C.J., "Combinatorial Restriction Problems," Workshop on Combinatorial Search, ZiF, Bielefeld, Germany, October 2010.

Colbourn, C.J., "Applications of Designs: Covering Arrays, and Optical Grooming," (10 lectures), AMSI 2010 Australian Graduate Theme Program in Mathematical Sciences, Brisbane, Australia, July 2010.

Colbourn, C.J., "Hash Families and Covering Arrays," Combinatorics 2010, Verbania, Italy, July 2010.

Colbourn, C.J., "Perfect Hash Families and Covering Arrays," (3 lectures), NATO Advanced Study Institute on Information Security and Related Combinatorics, Opatija, Croatia, June 2010.

Langley, Pat, "Cognitive Architectures and Virtual Intelligent Agents," Tenth Biannual Meeting of the German Society for Cognitive Science, Potsdam, Germany, October 2010.

VanLehn, Kurt, "Why are Step-based Tutoring Systems Almost as Effective as Human Tutors?" International Conference on Cognitive Modeling, Philadelphia, Pennsylvania, August 2010.

Yau, Stephen S., "Recent Advances and Future Directions in Software Technology," First Cross-Strait Conference on Software Technology, Taipei, Taiwan, March 2010.

Yau, Stephen S., "Development of Adaptive Service-based Systems in Ubiquitous Computing Environments," 8th IEEE/IFIP International Conference on Embedded and Ubiquitous Computing, Hong Kong, China, December 2010.

Education innovators join the Ira A. Fulton Schools of Engineering

Four of Arizona State University's leading education innovators have joined the Ira A. Fulton Schools of Engineering to help deepen the schools' commitment to cutting-edge engineering education.

"We are building a community of faculty who are intensely engaged in advancing the ways we educate engineering students," says James Collefello, associate dean of Academic and Student Affairs. "These four will strengthen that core group and bolster the educational research aspect of our mission."

Robert Atkinson and Brian Nelson, associate professors of educational technology, have joined the School of Computing, Informatics, and Decision System Engineering.

Professor of mathematics education James Middleton and assistant professor of engineering education Tirupalavanam Ganesh have joined the School for Engineering of Matter, Transport and Energy.

They will provide significant expertise in learning methods, cognitive theory and best teaching practices, Collofello says, as well as contribute to curriculum development and instruction planning.



Robert Atkinson's research explores the intersection of cognitive science, informatics, instructional design and educational technology. His scholarship involves the design of instructional material according to our understanding of human cognitive architecture and how to leverage its unique constraints and affordances. His current research focus is on the study of engagement and flow in games.

Robert Atkinson
Associate Professor

"My current research foci include personalized learning, social media, mobile learning, and learner analytics. My team is exploring the use of unobtrusive sensors including neurosignal wireless headsets to monitor users' state-changes in engagement and frustration while interacting with a game or other computer-based environment. We are also interested in learner analytics, particularly the application of sophisticated statistical techniques traditionally used in other disciplines such as industrial engineering to the task of building online learning environments able to adjust content and levels of support in real-time," he says.

Atkinson is the principal investigator for a project supported by a Navy research grant for the evaluation of interactive tutoring systems and game-based environments on learning and engagement. He is also the co-principal investigator for a project funded by an NSF grant for the development and evaluation of interactive, multimodal Web-based environments that provide resilience training for women pursuing doctoral degrees in STEM fields. Atkinson earned his Ph.D. in applied cognitive science from University of Wisconsin-Madison with a minor in statistics and research design in 1999, and has been at ASU since 2002.



Brian Nelson
Associate Professor

Brian Nelson's research involves theory, design and implementation of computer-based learning environments, focusing on immersive educational games. He has published and presented extensively on the viability of educational virtual environments for situated inquiry learning and assessment. Nelson was recently co-principal investigator on two projects supported by MacArthur Foundation grants: 21st Century Assessment, investigating new models for assessment in digital media-based learning environments, and Our Courts, creating and assessing an immersive game to promote civic engagement.

Nelson was the project designer on the River City Virtual World project through two NSF-funded studies, and is a co-principal investigator on the on-going NSF-funded SAVE Science and SURGE studies.

"The primary focus of my research is centered on the development and analysis of design models to support student knowledge building and reflection within immersive learning environments—especially educational games. Success in the use of immersive games for education depends on developing a clearer understanding of the nature of student interactions within the game environments, and of the design of the environments themselves from a theoretical perspective. It is critical, therefore, to develop and assess design models to provide better support for students in learning through educational games," Nelson says.

Nelson earned a doctorate in education from Harvard University in 2005.

Addition of education innovators to engineering schools will boost efforts to improve quality of engineering instruction and K-12 outreach



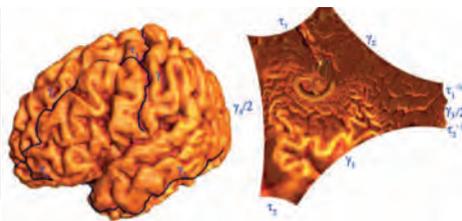
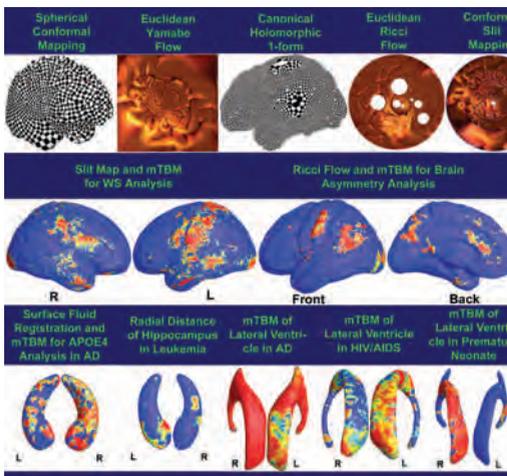
Yalin Wang
Assistant Professor

Yalin Wang received his Ph.D. in electrical engineering from University of Washington in 2002. Before joining ASU in August 2010, he was a founding member and key investigator at the UCLA Center for Computational Biology. Between 2004 and 2008, he was a cofounder and the CTO of Geometric Informatics, Inc., a NIST Advanced Technology Program Award recipient.

His research has focused on applying modern geometry knowledge to solve practical computer vision and medical imaging problems. His research interests include population-based brain mapping, cognitive science and 3D shape analysis.

He has published over 90 peer-reviewed journal and conference papers.

“As a fast growing university, ASU provides me the best environment to tackle challenging research problems. The knowledgeable and inspiring colleagues help me to prioritize my work and focus on the most important tasks. ASU will help me to succeed in my career development,” Wang says.



Wang developed brain surface conformal parameterization methods that can map brain surfaces into one of three parametric domains: sphere, Euclidean plane, or a Poincaré disk. Here is an illustration to map a brain cortical surface to the Poincaré disk with the Ricci flow method.

Ross Maciejewski received his Ph.D. in electrical and computer engineering from Purdue University in December 2009. Prior to his current position as an assistant professor at Arizona State University, he served as a visiting assistant professor at Purdue University and worked at the Department of Homeland Security Center of Excellence for Command Control and Interoperability in the Visual Analytics for Command, Control, and Interoperability Environments (VACCINE) group.



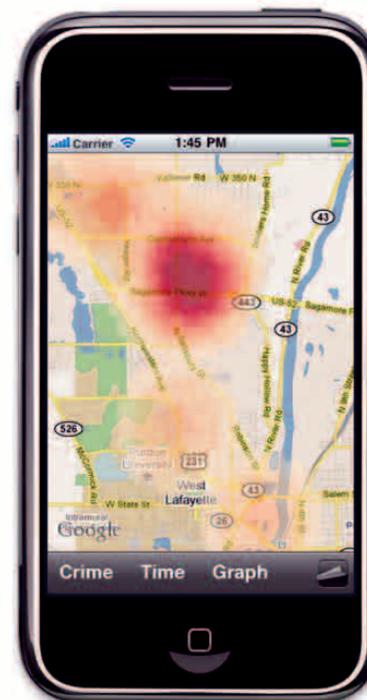
Ross Maciejewski
Assistant Professor

His research has focused on creating tools and techniques for the visual exploration of large, complex data sets. Past and ongoing projects

include the analysis and visualization of syndromic surveillance, crime, and point-of-sale business data. His research interests are geovisualization, visual analytics and non-photorealistic rendering.

“I chose ASU because of the opportunities to do interdisciplinary work. My research has focused on ways to analyze and explore a variety of different data types, and one of the key components of such research is working with end-users from a variety of backgrounds. ASU provides a wonderful environment for this type of research and I am looking forward to contributing here,” says Maciejewski.

Maciejewski developed a mobile crime analytics tool for the iPhone which provides users with detailed information on where criminal offenses have taken place in the past.



community outreach

ASU's Learning Sciences Research Lab (LSRL) Delivers Summer Math Program to Local Middle Schools

In the summer of 2010, under the direction of **Robert Atkinson**, the LSRL lab partnered with Mountain Pointe High School in the Tempe School District to design and administer a summer school algebra program using math-based intelligent tutoring systems.

The partnership was designed to allow LSRL, on behalf of the Office of Naval Research (ONR), to evaluate the effectiveness of three off-the-shelf math-based intelligent tutoring systems and for Mountain Pointe High School to upgrade their computer-based summer school algebra course.

This partnership then continued in fall 2010 for a curriculum integration project where the intelligent tutors were evaluated as practice tools within a remedial, high-school math course as well as an after-school AIMS remediation program.

In summer 2011, LSRL partnered with the Mesa School District to design and administer another summer school remediation program for algebra students. All three of the collaborative studies were designed to evaluate off-the-shelf intelligent tutoring systems while providing high school students the opportunity remediate their algebra skills. In each of these studies, LSRL provided the tutoring software and two researchers that also served as the technical support staff to allow the high school math teachers to stay focused on assisting the students rather than troubleshooting the software.

LSRL is also currently working with Rio Salado Community College to explore offering an online algebra remediation course using the intelligent tutoring systems.

Robotics Camp Offers Young Students a Gateway to Higher Education in Science and Engineering

ASU's Robotics Camp is a summer program series designed for middle school and high school students who intend to pursue a science and engineering career. The camps are sponsored by the U.S. Department of Education, Intel, and the School of Computing, Informatics and Decision Systems Engineering at Arizona State University.

The camp is part of the engineering school's contribution to the national effort to interest more students in careers in science, engineering, technology and mathematics.

"We are working in cooperation with the Department of Education's goal to ensure the country produces the top scientists and engineers needed to keep the United States a leader in technological innovation and technology development," says **Yinong Chen**, a lecturer in the faculty of computer science and engineering and leader of the Robotics Camp.

During the camp, Chen uses the intuitive Microsoft Visual Programming Language and Robotics Studio to engage students, while teaching the latest engineering design concepts and computing technologies. Students will also work with LEGO® Mindstorm NXT robots to demystify programming and robotics.

Chen explains, "We emphasize the logic rather than the syntax of the language. This program is more graphically oriented. 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 will enter a robotics competition and demonstration at the end of the camp."



CIDSE's Motivational Environments Research Launches the Inventors Workshop

With strong support from the Ira A. Fulton Schools of Engineering and partners across the university, CIDSE's Motivational Environments research group, led by Assistant Professor **Winslow Burlison**, launched the Inventors Workshop.

The Inventors Workshop is a transformative initiative to train the engineers, scientists and designers of 2020 and 2100 today. It is a resource for the ASU community, where individuals can access unique physical support (materials and machines), as well as concept support from an inventor-in-residence and inventioneers. It gives students the support and opportunity they need to engage in intrinsically motivated engineering and lifelong learning, while turning their invention concepts into reality. The initiative focuses on the National Academy of Engineering's Grand Challenges and works with ASU's Grand Challenges Faculty teams and students to advance the mission of the New American University.

The Inventors Workshop provides a next-generation shop environment and online community with networked access to the highest-end research tools across the university, facilitating innovative—potentially transformative—complex research and education projects. It makes high-end research tools broadly accessible to ASU's engineering community and the public through inventors-in-residence, mentors, and integrated research/education modules and seminars. Through NSF's Broadening Participation in Computing's STARS (Students & Technology in Academia, Research & Service) Alliance, student teams at Barrett, The Honors College, are engaging in open source transdisciplinary initiatives to DIY ASU's High Performance Computing facilities and the Decision Theater.

ASU's new National Science Foundation -Department of Energy Engineering Research Center, Quantum Energy and Sustainable Solar Technologies (QESST) is partnering with the Inventors Workshop to train the next generation of solar scientists. With the School of Earth and Space Exploration and \$1.2 million from NASA to advance cyberlearning and teacher training, Inventor Workshop teams are creating astronaut robot mission simulators in classrooms, museums and research settings.



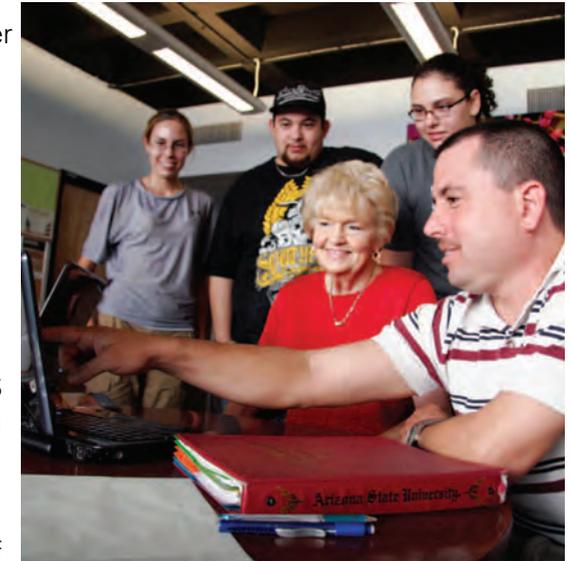
The Motivated Engineering Transfer Students (METS) Scholarship Program: An Opportunity to Excel

Over the past 10 years, the Ira A. Fulton Schools of Engineering have developed as a national role model for the encouragement, support and growth of upper division transfer students in engineering and computer science with an emphasis on women and underrepresented minority students.

The Motivated Engineering Transfer Students (METS) Program is sponsored by a National Science Foundation (NSF) STEP grant (\$2.5 million over 5 years) and an NSF S-STEM grant (\$600,000 for 4 years). Women and minority students especially, who often need extra encouragement to work to their potential, receive this encouragement through the METS Scholarship Program. The program has proved extremely successful.

During the past three years of the METS program, over 50 percent of the transfer graduates have gone on to graduate school in engineering. Other students have earned an MBA or have gone on to graduate school part-time. The PI, **Mary Anderson-Rowland** (industrial engineering) and co-PI, Armando Rodriguez, (electrical engineering) are qualified project directors with over 75 years of combined experience working with undergraduate and graduate students.

The scholarships help to eliminate the monetary barrier and the METS Center helps to eliminate the social and cultural barrier that upper division transfer students usually face. For the current fall 2011 semester, over 245 students (mostly upper division transfers) have enrolled in our METS Center with an average usage of over 40 students per day.



(above) Dr. Mary Anderson-Rowland (center) meets with some of her METS students.

student excellence

Note-Taker Device Promises to Help Students Overcome Visual Impairments

Millions of students will someday be less hindered by their visual impairments if a recent Arizona State University graduate and three current ASU students realize their ambitions.

David Hayden, Michael J. Astrauskas, Qian Yan and **Shashank Srinivas** are developers of the Note-Taker prototype. It's a portable, custom-designed camera connected to a pen-and-multitouch tablet personal computer.

The Note-Taker camera can tilt up and down, sweep side to side, and zoom in on a target.

The tablet computer provides a split-screen display. One half of the screen has a window that shows live video from the camera, while the other half has a window used for handwriting or typing notes.

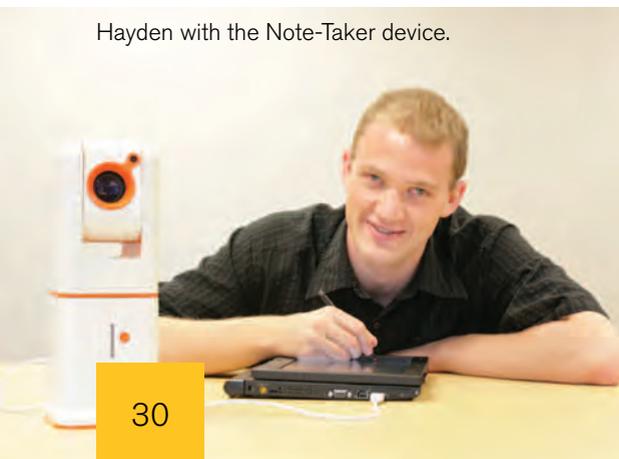
The device is designed to help students with low vision follow classroom instruction and take notes as easily as fully-sighted students.

The split-screen interface enables students with visual impairments to glance back and forth between the live video view of the classroom presentation and their notes. The video window allows the user to aim and zoom the camera by using simple dragging, tapping or pinching motions within the video window.

Calling themselves Team Note-Taker, the four developers of the device won the first prize in the software design category of the Microsoft Imagine Cup U.S. Finals last spring. Then in July they took second place in the same category of the Imagine Cup World Finals, the premier international student technology competition.

Those achievements are only a warm-up exercise, the team members say.

Hayden with the Note-Taker device.



Now they will concentrate on the ultimate purpose of their endeavor: to develop next-generation Note-Taker prototypes and see the device developed into a viable commercial product that can be made available to students with visual impairments.

"It's not a manufacturable product right now, but I think the team can

improve the design to the point where the Note-Taker could be manufactured affordably and marketed," says **John Black**, an ASU research scientist and Team Note-Taker's mentor.

Astrauskas is working toward an undergraduate degree in electrical engineering, and Srinivas toward a graduate degree in computer science, in ASU's Ira A. Fulton Schools of Engineering. Yan is seeking a master's degree in The Design School in ASU's Herberger Institute for Design and the Arts. Hayden, the initial inventor of the Note-Taker who created the device to help him overcome his own visual impairment, has earned an undergraduate degree in computer science in the Fulton Schools of Engineering, as well as a math degree through the ASU's College of Liberal Arts and Sciences. He spent the summer in an internship with Google, and will begin studies this fall toward a doctorate in computer science at the Massachusetts Institute of Technology.

Their first-place prize in the Imagine Cup U.S. Finals earned a \$25,000 grant from Microsoft Corporation for the Center for Cognitive Ubiquitous Computing (CUbiC)—the laboratory in ASU's School of Computing, Informatics, and Decision Systems Engineering where much of the work on the Note-Taker has been done.

CUbiC focuses on the design of technologies and devices to assist people with perceptual or cognitive disabilities.



Team Note-Taker at the Microsoft Imagine Cup World Finals (Photo courtesy of Microsoft)

Computer Science Student Excels at Research, Outreach

Fred Morstatter says he holds two unique titles from his ASU engineering experience: president of the Women in Computer Science Club and the only computer science student to go through the astro-physics lab science sequence.

"I had no physics experience, just an interest in astronomy," Morstatter says. "It was really tough."

What Morstatter does have is an innate talent in computer science. He says he was always interested in computers and tinkered around in high school. His first job at age 17 was a programmer for a trucking company.

At ASU, he has worked closely with Huan Liu, professor in the School of Computing, Informatics, and Decision Systems Engineering, whose research focus is data mining. Morstatter has published two papers as an undergraduate and won an Honorable Mention for the 2011 Outstanding Undergraduate Researcher Award from the Computing Research Association.

"Working with Dr. Liu, I have had the opportunity to pursue research that I really enjoy. He has also helped me understand what it means to be a graduate student. I've had a taste of it as an undergrad, but am looking forward to doing research and coming up with new things," he says.

Morstatter has had several internships along the way, including one coming up this summer at a local software firm. He says the first question that comes up in interviews is always related to Women in Computer Science and how he got to be president.

"I'm the perfect example of why we need to attract more women to computer science," he says.

As president of the club, he has helped grow membership—both men and women—and expand participation in the flagship computer programming event.

He has also worked to retain students in the computer science program, organizing a new tutoring center for first year computer science engineering courses and serving as an undergraduate teaching assistant.

Morstatter graduated in May with a bachelor's in computer science. He plans to pursue his doctoral degree, and continue research with Liu. It's likely that he'll pick up another title or two along the way.



Fred Morstatter,
2011 Outstanding
Senior in Computer
Science

Student Achievements

Best Computer Science-Focused Student Paper:

Nafarrate-Ramirez, Adrian, Fowler, John and Wu, Teresa, "Bi-Criteria Analysis of Ambulance Diversion Policies," Winter Simulation Conference 2010, Baltimore, Maryland, December 2010.

Student Paper Competition (First Place):

Hu, Mengqi, "A Study on Medical Imaging Equipment Productivity and Utilization," IIE Society for Engineering and Management Systems, Reno, Nevada, May 2011.

Dissertation Poster Award (Runner-Up):

Huang, Shuai, Doctoral Colloquium Dissertation Poster Competition, Industrial Engineering Research Conference (IERC), Reno, Nevada, May, 2011

2011 Outstanding Ph.D. Students:

Yu-Ru Lin (Computer Science)
Houtao Deng (Industrial Engineering)

2011 Outstanding Master's Students:

Xinxin Wang (Computer Science)
Stephanie Lee and Cesar Meneses (Industrial Engineering)

2011 Outstanding Seniors:

Fred Morstatter (Computer Science)
Patrick (Yen-Ting) Lu and Beatris Rusu (Computer Systems Engineering)
Eldaly Perez (Industrial Engineering)

fulton undergraduate research initiative

The Fulton Undergraduate Research Initiative (FURI) is designed to enhance and enrich a student's engineering education by providing hands-on lab experience, independent and thesis-based research and travel to national conferences. Students select, design and complete research projects under the guidance of faculty mentors and present their findings at a semi-annual public symposium.

Students, in collaboration with mentors, make proposals to fund the work they want to perform. Undergraduates earn money for creating knowledge based upon the scholarly method. Motivated students will find a thrilling experience in the intellectual community while enriching their graduate school aspirations or entry into industry.



Ira. A. Fulton with a Fall 2010 FURI student

CIDSE FURI students fall 2010-spring 2011

ROBERT FRUCHTMAN, Computer Science Engineering, "Learning Context-Specific Biological Interactions in Cancer."
Mentor: Seungchan Kim

REDA HERBZI, Computer Science Engineering, "Clustering Pathways to Unravel Regulatory Relationships in Cancer Data."
Mentor: Archana Ramesh

DAVID HAYDEN, Computer Science / Mathematics, "Using Clustering and Metric Learning to Improve Science Return of Remote-Sensed Imagery."
Mentor: John A. Black, Jr.

NATHAN JACK, Industrial Engineering, "Photovoltaic Reliability Project: A Statistical Model for Confirming and Analyzing Degradation Rates."
Mentor: Rong Pan

KIRAN JOTWANI, Industrial Engineering, "Engineered System Design for an Optimal Sentence and Strategy for Negotiating a Plea Bargain."
Mentor: Ronald G. Askin

WENYANG LI, Computer Systems Engineering, "Memory Minders: Reminders for Easier Independent and Assisted Living."
Mentor: Winslow Bureson

HAROON KHAN, Computer Systems Engineering, "Bondflow System."
Mentor: Janaka Balasooriya

CHRISTOPHER MCBRIDE, Computer Systems Engineering, "Achieving Higher Sensitivity in Non-Invasive Glucose Meters."
Mentor: Jeffrey T. La Belle

ZAW PHYO WAI NAUNG, Computer Science, "A Sociolinguistic System to Analyze Conversations and Identify Social Constructs."
Mentor: Chitta Baral

BEATRIS RUSU, Computer Systems Engineering, "Just in Time Teaching and Learning Classroom."
Mentor: Janaka Balasooriya

MATTHEW SOTO, Industrial Engineering, “Developing Theoretical Models to Represent System Resources Under Various Sharing Schemes.”

Mentor: Nong Ye

PHILLIP STEVENS, Computer Science, “Theory and Simulations of Dynamic DeBruijn Networks.”

Mentor: Andrea Richa

KRISTEN TRAVIS, Industrial Engineering, “Radiation Dose Correction for Patient-Specific CT Examinations.”

Mentor: Muhong Zhang

ERIC YEE, Industrial Engineering, “Distributed QoS Optimization for Service-Oriented Cyber-Systems.”

Mentor: Nong Ye

CIDSE Mentors and Envoy Team are Giving Back to ASU!

CIDSE Mentors volunteer at Freshman Orientation Programs and assist with CIDSE Freshman Group Advising. They play a key role in helping incoming students transition to CIDSE@ASU

The Envoy Team Members visit area high schools and represent CIDSE, Fulton Engineering and ASU. They are instrumental in educating students about the various degree programs offered through CIDSE. The Envoy program provides its members an opportunity to develop presentation skills while encouraging high school students to attend ASU.



Close Up: Undergraduate Honors Thesis— Barry Lumpkin

“Collaborative Platform for Natural Language Processing”

Thesis Director: Chitta Baral

Every day, thousands of medical articles are published by the scientific research community. Although, this demonstrates an impressive array of knowledge, it often goes unused because there is too much information for any one research group to read and analyze.

The Collaborative Bio Curation (CBioC) project was designed to facilitate research on bioentities and their relationships with other entities found in medical articles. By providing a means of easily finding specific entity information, scientists will be able to spend less time researching while at the same time finding more relevant articles than they normally could.



Honors College student Barry Lumpkin is now enrolled in the Computer Science master's program in the School of Computing, Informatics, and Decision Systems Engineering.

academic programs

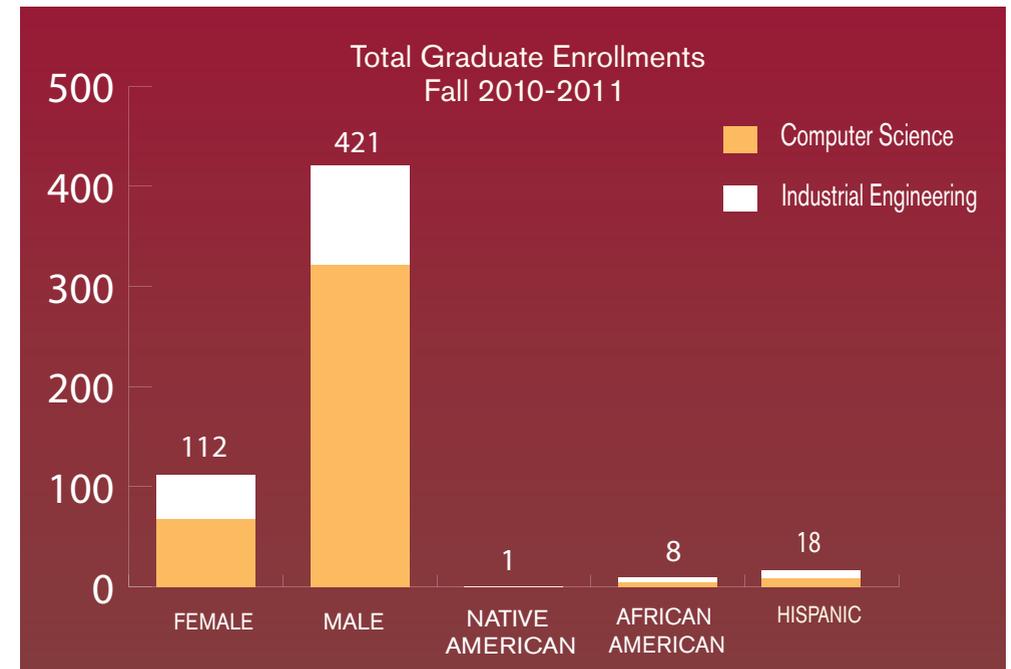
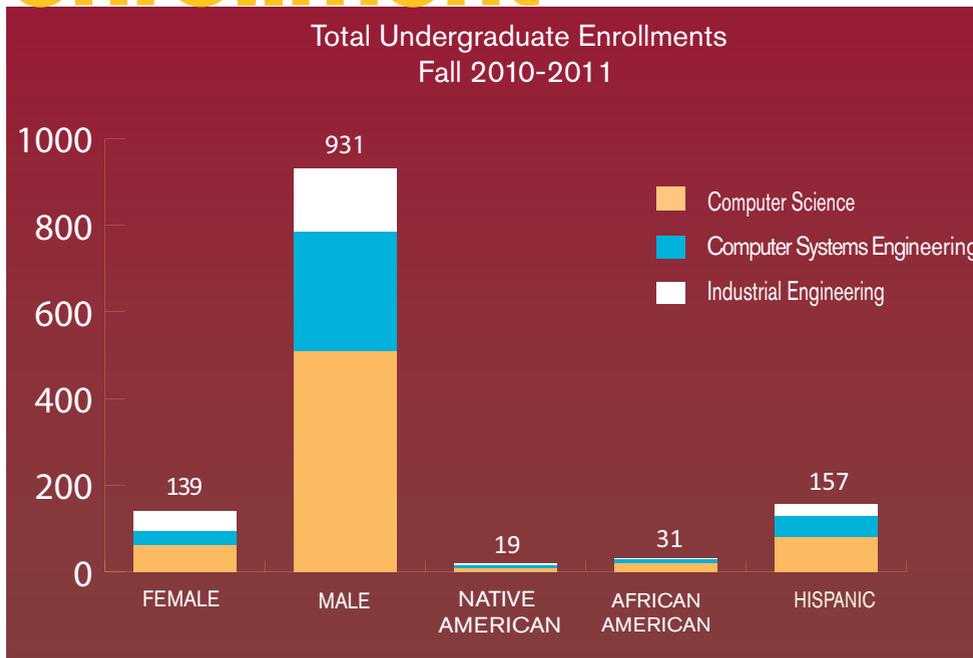
Undergraduate Degrees

The **Bachelor of Science in Engineering (B.S.E) in computer systems engineering** emphasizes the design and production of hardware and software components comprising a computer system. It 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** provides a solid background in computing principles and enables students to customize their degrees with 21 hours of computer science and technical electives. More than 30 senior-level courses are offered within the program. 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 semester 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.

enrollment



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 College of 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 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. Students will complete a project portfolio. 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 Consortium for Embedded Systems, a partnership of ASU, Intel and Freescale, supports work that applies academic research to industrial problems in embedded systems and networks.

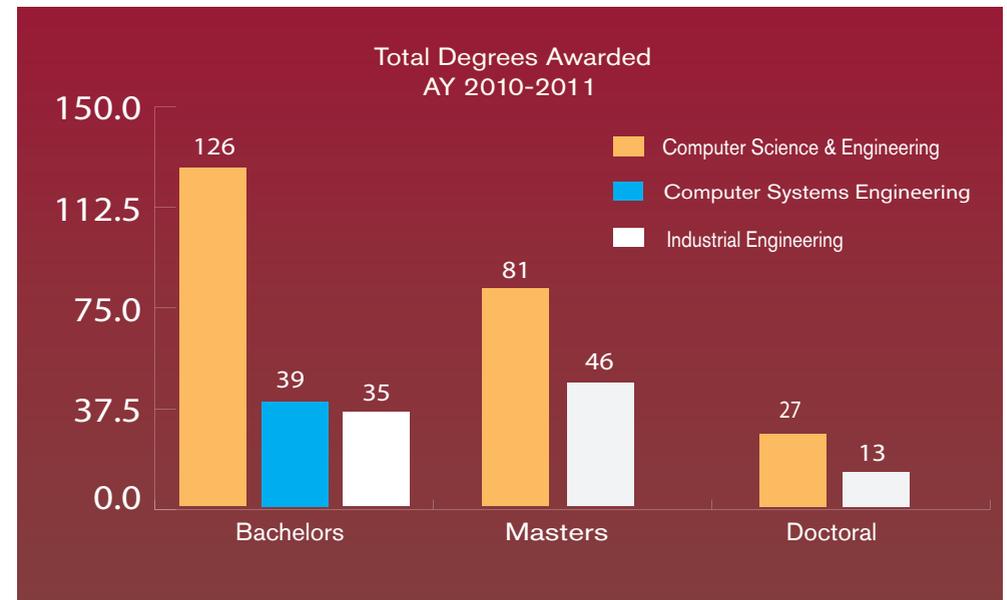
The **Master of Science (M.S.) in industrial engineering** is designed for students interested in pursuing original research. The 30-credit hour program requires four core courses, three area courses, one elective and a six-hour thesis with an oral defense. Students complete four core courses to expose them to fundamental IE topics, including courses in information systems, simulation, industrial statistics and operations research. The 30-credit hour, non-thesis program requires four core courses, four area courses, two electives and a written comprehensive examination instead of a thesis. This non-thesis option is for those students who may be interested in a course-work only program of study and a broader understanding of the discipline.

Certificate Programs

Technology Entrepreneurship is a 15-credit hour technology entrepreneurship certificate program limited to students in the Ira A. Fulton Schools of Engineering and is designed to help technically-oriented students analyze, launch and operate an entrepreneurial venture. Courses are approached from the perspective of the student whose main interest is in technological innovation, whose primary concentration is on engineering, and who has little or no prior business education.

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 the 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.



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 developing deep interactions with other fields, not just in engineering and science, but throughout the arts and humanities, education, law, medicine and business. While computers have become essential tools in these areas, the depth of interaction of fundamental computer science with each is rapidly evolving.

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 Consortium for Embedded Systems and the Translational Genomics Research Institute (TGen). The interdisciplinary strength of the Ph.D. degree is enhanced by a concentration in arts, media and engineering (AME), as well as a concentration in information assurance.

The Doctor of Philosophy (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. The industrial engineering program is ranked in the top 20 nationally by U.S. News & World Report and is among the top programs in the Western United States.

Our faculty are internationally recognized for their research, conducting many funded, state-of-the-art research projects for both government and industry. They are not only involved in leading-edge research from both methodological and applications perspectives, but they also actively advise students, are excellent teachers and continuously improve the curriculum.



Antonio Cardenas, “Detecting Sybil Nodes in Static & Dynamic Networks,” A. Richa, Chair.

Saylisse Davila, “Public Health Surveillance in High Dimensions w/ Supervised Learning,” G. Runger, Chair. Placement: University of Puerto Rico

Su Kim, “Collaboration of Mobile & Pervasive Devices for Embedded Networked Systems,” S. Gupta, Chair. Placement: Samsung

Yu-Ru Lin, “Community Discovery in Dynamic, Rich-Context Social Networks,” H. Sundaram, Chair. Placement: Harvard University

Gautam Pohare, “An Efficient Approach to Situation-Aware Service Discovery in Pervasive Computing Environments,” S. Yau, Chair.

Li Tang, “Learning w/ Large Scale, Social Media Networks,” H. Liu, Chair. Placement: Yahoo!

Krishnan Chatapuram, “Computational Framework for Wearable Accelerometer-Based Activity & Gesture Recognition,” S. Panchanathan, Chair. Placement: Washington State University

Houtao Deng, “System Complexity Reduction via Feature Selection,” G. Runger, Chair. Placement: Intuit

Busaba Laungrungrong, “Multivariate Charts for Multivariate Poisson-Distributed Data,” D. Montgomery, C. Borror, Co-Chairs.

Ziyang Liu, “Enhancing the Usability of Complex Structured Data by Supporting Keyword Searches,” Y. Chen, Chair. Placement: NEC Laboratories

Yang Qin, “Anonymous Communications in Wireless Ad Hoc Networks: Protection & Attacks,” D. Huang, Chair. Placement: Microsoft

Wandaliz Torres-Garcia, “Integrative Analysis of Diverse Biological Data Sources,” G. Runger, D. Meldrum, Co-Chairs. Placement: University of Texas MD Cancer Research Center

Mahesh Chaudhari, “Materialized Views over Heterogeneous Structured Data Sources in a Distributed Event Stream Environment,” S. Dietrich, Chair. Placement: Arizona State University

Mengying Fu, “Production Scheduling & System Configuration for Capacitated Flow Lines w/ Application in the Semi-Conductor Test Process,” R. Askin, M. Zhang, Co-Chairs. Placement: Progressive Casualty Insurance

Jang Lee, “Association Based Gene Prioritization,” G. Gonzalez, Chair.

Yu Han Moon, “Cooperative Multi-Channel MAC Protocols for Wireless Ad Hoc Networks,” V. Syrotiuk, Chair. Placement: Samsung

Abdulahim Shamayleh, “Operating Room Planning and Scheduling: Mathematical Models & Simulation Modeling,” J. Fowler, M. Zhang, Co-Chairs. Placement: King Fahd University of Petroleum & Minerals

Priyamvada Tripathi, “Creativity & Activity Environs (CRAVE): Investigating the Relationship of Group Movement & Face-to-Face Interaction w/ Group Creativity,” W. Burleson, Chair.

Samuel Leshner, “Modeling & Implementation of Threshold Logic Circuits & Architectures,” S. Vrudhula, Chair.

Erika Murguia, “Analysis of Bucket Brigade Protocols in Manufacturing Environments w/ Discrete Stations,” E. Gel, D. Armbruster, Co-Chairs. Placement: ITESM

Shanshan Wang, “Modeling Supply Chain Dynamics w/ Calibrated Simulation using Data Fusion,” J. Fowler, T. Wu, Co-Chairs. Placement: GE Global Research

Qihong Shao, “Towards Effective & Intelligent Multi-Tenancy SAAS,” W-T. Tsai, Chair.

Tae-Yeon Cho, “Mixture-Process Variable Experiments w/ Control & Noise Variables within a Split-Plot Structure,” D. Montgomery, C. Borror, Co-Chairs.

Serhat Gul, “Optimization of Surgery Delivery Systems,” J. Fowler, B. Denton, Co-Chairs. Placement: Northeastern University

Balasubramanian Vineeth Nallure, “Conformal Predictions in Multimedia Pattern Recognition,” S. Panchanathan, Chair. Placement: Arizona State University

Abdulahim Shamayleh, “Operating Room Planning and Scheduling: Mathematical Models & Simulation Modeling,” J. Fowler, M. Zhang, Co-Chairs. Placement: King Fahd University of Petroleum & Minerals

Zheshen Wang, “Mining Semantics from Low-Level Features in Multi-Media Computing,” B. Li, Chair. Placement: Amazon

Ming Cui, “Methods for Hyperspectral Image Visualization and Analysis,” P. Wonka, Chair. Placement: Google

Shilpa Gupta, “Profiling Monitor-Control Chart Schemes for Monitoring Linear & Low Order Polynomial Profiles,” D. Montgomery, C. Borror, Co-Chairs. Placement: Risk Management Solutions

Quing Li, “Multi-Objective Operating Room Planning and Scheduling,” J. Fowler, S. Mohan, Co-Chairs. Placement: Microsoft Corp.

Ashish Amresh, “Smooth Surfaces for Video Game Development,” G. Farin, A. Razdan, Co-Chairs. Placement: Arizona State University

Oleg Bakun, “Adaptive Decentralized Routing & Detection of Overlapping Communities,” A. Richa, Chair.

Nibidita Das, “Coverage & Connectivity Problems for Sensor Networks,” A. Sen, Chair.

Shuiwang Ji, “Computational Analysis of Drosophila Gene Expression Pattern Images,” J. Ye, Chair. Placement: Old Dominion University

Dana Krueger, “Semiconductor Yield Modeling Using Generalized Linear Models,” D. Montgomery, Chair. Placement: Kansas State University

Peyman Nayeri, “Post-Optimization: Necessity Analysis for Combinatorial Arrays,” C. Colbourn, G. Konjevod, Co-Chairs. Placement: Arizona State University

Raghunathan Srinivasan, “Determining the Integrity Applications & Operating Systems using Remote & Local Attesters,” P. Dasgupta, Chair. Placement: Intel

Abdulahim Shamayleh, “Operating Room Planning and Scheduling: Mathematical Models & Simulation Modeling,” J. Fowler, M. Zhang, Co-Chairs. Placement: King Fahd University of Petroleum & Minerals

Michael Baker, “Topics in Power & Performance Optimization of Embedded Systems,” K. Chatha, Chair. Placement: US Army Research Development & Engineering Command

Elodie Billionniere, “Analysis of Freshman Problem Design & Solving in Introductory Programming Courses,” J. Collofello, T. Ganesh, Co-Chairs.

graduate

Computer Engineering (M.S., Ph.D.)

The Computer Engineering degree is a synergy of resources from the School of Computing, Informatics, and Decision Systems Engineering (CIDSE) and the School of Electrical, Computer and Energy Engineering (ECEE). The design of this degree program will require students to determine the concentration area they are interested in pursuing at the time of application to the program.

- Concentration in Computer Systems Engineering (CIDSE)
- Concentration in Electrical Engineering (ECEE)

The CENG degree provides the knowledge and skills necessary to advance and develop new paradigms for the design, system integration, testing, evaluation and deployment of state-of-the-art hardware and software systems that include 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.



undergraduate

Engineering Management (B.S.E.)

The Engineering Management (EM) program is designed to provide the graduate with the skills for effective management and leadership of engineering-driven enterprises.

The curriculum provides a breadth of engineering science and design with depth in one specific area suitable for practice. This knowledge is augmented with an understanding of business practices, organizational behavior and management skills to enable the graduate to succeed in the management of a scientific or engineering enterprise.

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.

The graduate will be prepared to begin as a project management team member or lead, system specification and customer relationship management specialist, production supervisor, supply logistics engineering or similar role and then progress through successively higher levels of management responsibility.

Informatics (B.S.)

Informatics is the engine driving the modern information society. As an academic discipline, it is the bridge connecting computer science to a particular field of study such as biology, chemistry, education, fine arts, telecommunications, geography, business, economics, journalism, etc. That bridge enables the skilled practitioner to perform effectively in their chosen field and advance the state of knowledge in that discipline.

While technology-focused disciplines like computer science seek answers to fundamental problems of technology and to develop new general purpose methodologies, informatics explores the specific problems of interest to a discipline, and shows how information technology can be used to solve those problems.

Informatics combines aspects of software engineering, human-computer interaction, decision theory, organizational behavior, and information technology infrastructure. Informatics challenges include designing, developing, and applying computational tools that model, aid or automate mental activities.

Additionally, informatics designs solutions in context, and takes into account the social, cultural and organizational settings in which computing and information technology will be used. The program is designed to produce graduates that can utilize IT to advance the knowledge base across numerous disciplines and provide the basis for solving key scientific and societal problems.

computer science and engineering faculty
industrial engineering faculty
emeritus faculty
staff



computer science and engineering



Gail-Joon Ahn, Associate Professor

Ph.D. *Information Technology*, George Mason University, 2000

Email: gail-joon.ahn@asu.edu

Research interests: Vulnerability and risk management, authentication and access control, security architecture for distributed systems, identity management, policy analysis and enforcement, formal models for computer security, and cyber crime analysis

Honors and Awards: DoE CAREER award (2003), Educator of the Year award (Federal Information Systems Security Educators' Association, 2005)

Key Activities: Tutorial Chair for ACM CCS '10; Guest Ed. *ACM Trans. on Info & Systems Security (TISSEC, 2007)* Information Dir. ACM SIGSAC; Steering Comm. Chair, ACM SACMAT; PC Co-chair for WWW '09 Security and Privacy Track



Robert Atkinson, Associate Professor

Ph.D. *Applied Cognitive Science*, University of Wisconsin, 1999

Email: robert.atkinson@asu.edu Website: <http://www.lsrllab.asu.edu>

Research Interests: Personalized learning, social media, learner analytics, mobile learning, cognitive science, usability testing, human-computer interaction



Vineeth Balasubramanian, Assistant Research Professor

Ph.D. *Computer Science*, Arizona State University, 2010

Email: vineeth.nb@asu.edu Website: <http://www.public.asu.edu/~vnallure>

Research Interests: Pattern recognition, machine learning, human-centered multimedia computing, computer vision; assistive, rehabilitative and healthcare applications.

Honors and Awards: IEEE HAVE 2008 Best Paper Award, ASU Entrepreneurship Advantage Program (EAP) award

Key Activities: Program Committee Member of IEEE WACV 2011-12, ICPRAM 2012; Referee for journals *JVCI, CVIU, IJPRAI, Pattern Recognition, IEEE Signal Processing*; Local Arrangements Chair for ACM Multimedia 2011



Janaka Balsooriya, Lecturer

Ph.D. *Computer Science*, Georgia State University, 2006

Email: janakab@asu.edu Website: <http://www.public.asu.edu/~jbalasoo/>

Research Interests: Distributed, internet and grid computing, web service coordination primitives and system architectures, biological data integration and interoperability, middleware and embedded software



Chitta Baral, Professor

Ph.D. *Computer Science*, University of Maryland, 1991

Email: chitta@asu.edu Website: <http://www.public.asu.edu/~cbaral/>

Research Interests: Knowledge representation, temporal logics, logic programming, dynamic systems, text extraction, question answering, natural language semantics, bioinformatics

Honors and Awards: NSF Career Award 1995

Key Activities: Associate Editor of *Journal of AI Research*, Area Editor of *ACM Transactions on Computational Logic*, Editorial Board Member of *Journal of Theory and Practice of Logic Programming*



Rida Bazzi, Associate Professor

Ph.D. *Computer Science*, Georgia Institute of Technology, 1994

Email: bazzi@asu.edu

Research Interests: Computer security, reliability, fault tolerance, distributed computing

Honors and Awards: NSF CAREER award 2000

Key Activities: Co-chair HotSwup 2011, General chair PODC 2008, Steering committee PODC 2008, 2007, Committee member ICDCN 2011, SSS 2010, ICDCS 2008, PODC 2010, 2009, 2005, 2000, DISC 2001



Amiya Bhattacharya, Assistant Research Professor

Ph.D. *Computer Science & Engineering*, University of Texas at Arlington, 2002

Email: amiya@asu.edu Website: <http://www.public.asu.edu/~abhatta1>

Research Interests: Computer science in education, programming languages, software maintenance

Key Activities: Program Co-chair ACM CCS-SPSM 2011 Workshop, Program Committee Member of past years of IEEE MASS, WASA, AMOC, ICDCN, WoWMoM, HiPC, Referee of journals/magazines such as *IEEE Transactions on Mobile Computing, IEEE Wireless Communications, ACM/Kluwer Wireless Networks*.



Kevin Burger, Lecturer

M.S. *Computer Science*, University of Kansas, 1988

Email: burgerk@asu.edu Website: <http://www.public.asu.edu/~kburger2>

Research Interests: Embedded systems, introductory programming, data structures and algorithms, computer architecture and organization, web development

computer science and engineering



Winslow Burleson, Assistant Professor

Ph.D. *Media Arts and Sciences*, MIT, 2006

Email: winslow.burleson@asu.edu

Research Interests: Human-computer interaction applied to creativity and innovation, design engineering, scientific exploration, gaming and educational technology.

Honors and Awards: AI in Education 2009 Overall Best Paper Award, AI in Education 2009 Overall Best Demo Award, NSF Affective Learning Companions (2007), NSF Game As Life–Life As Game (2007), JPL SURP (2007)

Key Activities: 2005-2007 Invited participant and member of the program committee for the NAS US-Chinese Frontiers of Science Symposium



Debra Calliss, Lecturer

Ph.D. *Computer Science*, Arizona State University, 1991

Email: debra.calliss@asu.edu

Research Interests: Computer science in education, programming languages, software maintenance



K. Selcuk Candan, Professor

Ph.D. *Computer Science*, University of Maryland 1997

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Research Interests: Database systems, storage/querying/retrieval of multimedia and web data, heterogeneous information integration and retrieval, assistive technologies for information and data access, data clouds, ambient media systems

Key Activities: Associate Editor, *VLDB*, Associate Editor, *Journal of Multimedia*, Publicity Chair-ACM SIGMOD 2006, PC Co-chair- ACM Multimedia 2008, Program Group Leader, ACM SIGMOD Conference 2010, Review Board member, the *Proceedings of the VLDB Endowment (Journal track) 2008 - 2010*, Program Co-Chair, Workshop on Information and Software as a Service (WISS) 2009 - 2010, PC Co-chair-ACM Int. Conference on Image & Video Retrieval (CIVR) 2010



Karamvir Chatha, Associate Professor

Ph.D. *Computer Science & Engineering*, University of Cincinnati, 2001

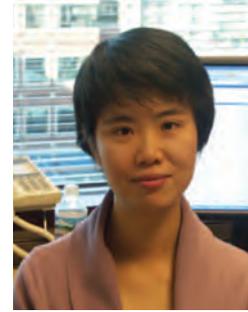
Email: karamvir.chatha@asu.edu

Website: <http://www.eas.asu.edu/~kchatha/>

Research Interests: Computer-aided design (CAD) for embedded and VLSI systems, system-on-chip (SoC) design, network-on-chip design, hardware software co-design, reconfigurable and adaptive computing

Honors and Awards: NSF CAREER Award 2006; IEEE/ACM William J. McCalla Best Paper Award, International Conference on Computer-Aided Design (ICCAD), 2007

Key Activities: Finance Chair, IEEE/ACM Symposium on Networks-on-Chip (NOCS) 2009, 2007; Member of Technical Program Committee of DAC (2008, 2007), ASPDAC (2009, 2008), CODES+ISSS (2008, 2007, 2006)



Yi Chen, Associate Professor

Ph.D. *Computer Science*, University of Pennsylvania, 2005

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Research Interests: Data management in web and scientific applications, data modeling, storage and query optimization, data streams, information integration

Honors and Awards: NSF Career Award, 2009,

Key Activities: Publicity and Proceedings Chair for PODS 2009, Program Committee member for ICDE 2009, APWeb-WAIM 2009, AAAI 2008, CIKM 2008, VLDB 2008



Yinong Chen, Lecturer

Ph.D. *Computer Science*, University of Karlsruhe, Germany, 1993

Email: yinong.chen@asu.edu Website: <http://www.public.asu.edu/~ychen10>

Research Interests: Service-oriented computing, embedded systems, fault-tolerant computing, distributed computing

Honors and Awards: Teacher of the Year Award, (SCI), 2007-2008, 2008-2009.

Key Activities: Summer Robotics Camp 2008, 2009, 2010



Charles Colbourn, Professor

Ph.D. *Computer Science*, University of Toronto, 1980

Email: chareles.colbourn@asu.edu website: <http://www.public.asu.edu/~ccolbou>

Research Interests: Combinatorial design theory and its applications in communications and networking

Honors and Awards: The Euler Medal for Lifetime Achievement in Research (2003). Keynote/invited speaker at numerous conferences internationally;

Key Activities: Editor-in-chief of the *Journal of Combinatorial Designs*, Editorial boards of *Designs Codes and Cryptography*, *Journal of Combinatorial Theory Series A*; *Discrete Mathematics*



James Collofello, Associate Dean

Ph.D. *Computer Science*, Northwestern University, 1978

Email: james.collofello@asu.edu

Research Interests: Software engineering, software project management, software quality assurance

Honors and Awards: Daniel Jankowski Legacy Award



Partha Dasgupta, Associate Professor

Ph.D. *Computer Science*, SUNY Stony Brook, 1984
Email: partha@asu.edu Website: <http://cactus.eas.asu.edu/Partha/>
Research Interests: Computer security, operating systems, distributed and parallel systems
Honors and Awards: Best Paper Awards PDCS '05, ICDCS'95
Key Activities: Program Vice Chair, ICDCS'03, CNIS'07



Xuerong Feng, Lecturer

Ph.D. *Computer Science*, University of Texas (Dallas), 2005
Email: xuerong.feng@asu.edu Website: <http://www.public.asu.edu/~xfeng13>
Research Interests: Algorithm design and analysis, including network algorithms, Bioinformatics algorithms and parallel algorithms



Hasan Davulcu, Associate Professor

Ph.D. *Computer Science*, SUNY Stony Brook, 2002
Email: hasandavulcu@asu.edu Website: <http://cactus.eas.asu.edu/~hdavulcu>
Research Interests: Data mining, web and text mining, data cleaning and information extraction, workflows and semantic web services, database systems
Honors and Awards: NSF Career Award, 2007
Key Activities: PC member, National Conference on Artificial Intelligence (AAAI 2007), PC Member, International Conference on Data Engineering (ICDE 2007) Co-chair, Workshop on Information Integration on the Web; PC member, National Conference on Artificial Intelligence (AAAI 2004)



Sandeep Gupta, Professor

Ph.D. *Computer Science*, Ohio State University, 1995
Email: sandeep.gupta@asu.edu Website: <http://impact.asu.edu>
Research Interests: Wireless networks, mobile and ubiquitous/pervasive computing, embedded sensor networks for biomedical applications, parallel and distributed computing
Honors and Awards: Best Paper Award in 4th Int'l Conf. on Intelligent Sensing and Information Processing, 2006, Best Researcher Award, Senior Faculty, (SCIDSE) 2009
Key Activities: TPC chair for Third Int'l Conf. on Body Area Networks (BodyNets 2008,) Editorial Board Member of *IEEE Communication Letters*, TPC Co-chair of GreenCom 2007



Georgios Fainekos, Assistant Professor

Ph.D. *Computer Science*, University of Pennsylvania, 2008
Email: fainekos@asu.edu Website: <http://www.public.asu.edu/~gfaineko>
Research Interests: Cyber-physical systems: hybrid dynamical systems, real-time and embedded systems; Formal methods w/ applications to automation & control: system testing and verification, formal languages and logic; motion planning in robotics; unmanned aerial vehicles (UAV)
Honors and Awards: 2008 Frank Anger Memorial ACM SIGBED/SIGSOFT Student Award
Key Activities: Guest Editor of *ACM Transactions on Embedded Computing Systems Special issue: Numerical Software Verification of Cyber-Physical Software Systems*; Co-organizer of Int. workshop on Numerical Software Verification Program Committee member of IEEE Real-Time Systems Symposium



Dijiang Huang, Associate Professor

Ph.D. *Computer Science*, University of Missouri, 2004
Email: dijiang@asu.edu Website: <http://dj.eas.asu.edu/dhuang/index.html>
Research Interests: Network security, privacy prevention techniques, key management, secure ad hoc network routing, trust management for VANETs
Honors and Awards: ONR Young Investigator Award 2010
Key Activities: PC Co-chair for Information Security Symposium (ICC) 2010, Publication Chair for HPSR 2008, Finance Chair for ISADS 2007, FTDCS, 2007,2008



Gerald Farin, Professor and Graduate Program Chair

Ph.D. *Mathematics*, University of Braunschweig, 1980
Email: farin@asu.edu Website: <http://www.farinhansford.com/gerald>
Research Interests: 3D modeling, curver and surface design, scientific visualization.
Honors and Awards: Dagstuhl Award for achievements in geometric modeling
Key Activities: Co-director, PRISM, 2004-present, Internal Scientific Advisory Board, Arizona Alzheimer Research Center, 1996-present, Computer Systems Engineering Outstanding Teaching Award, 1999 Editor-in-chief, *Computer-Aided Geometric Design (Elsevier)*, Editorial board, *The Visual Computer (Springer)*



Subbarao Kambhampati, Professor

Ph.D. *Computer Science*, University of Maryland 1989
Email: rao@asu.edu Website: <http://rakaposhi.eas.asu.edu/rao.html>
Research Interests: Artificial intelligence, automated planning, machine learning, data and information integration
Honors and Awards: NSF Research Initiation (1992), NSF Young Investigator (1994); College of Engineering Teaching Excellence award (2002), Fellow of AAAI (Association of Advancement of Artificial Intelligence) (2004), IBM Faculty Award (2004), Google Research Award (2008)
Key Activities: Program Co-chair, AAAI 2005; Advisory board member, *Journal of AI Research*; Executive Council of Intl. Conf. on Automated Planning & Scheduling

computer science and engineering



Yoshihiro Kobayashi, Lecturer

Ph.D. *Architecture on Design Computation*, University of California, 2001
Email: ykobaya@asu.edu website: <http://www.yoshikobayashi.com>
Research Interests: Game design, game development, digital fabrication, AI in design, virtual reality, building information modeling, procedural modeling, computer graphics, Prism Lab at ASU
Honors and Awards: IFC Award at Build Live Tokyo 2010, Technical Award, 7th VR Simulation Contest 2008, Honorable Judge Award, 6th VR Simulation Contest 2007, Best Award on CG Animation, JAPAN CG Grand Prix 1994, SANAE Prize, Waseda University, 1994, Best Graduate Essay Award in Dep. of Arch., Waseda Univ, 1992
Key Activities: Founding Executive Editor of *Machine Learning*, Founding Board Member, International Machine Learning Society, Program, Co-chair of Integrated Intelligence track for AAAI-07 and AAAI-08, Editorial board member of *Machine Learning*, Editorial board member of *Data Mining & Knowledge Discovery*



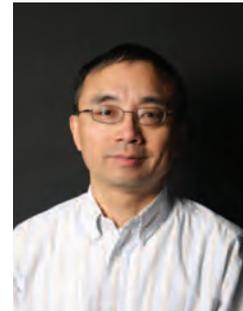
Baoxin Li, Associate Professor

Ph.D. *Electrical Engineering*, University of Maryland, 2000
Email: baoxin.lee@asu.edu
Research Interests: Computer vision and pattern recognition, image/video processing, statistical methods in visual computing
Honors and Awards: NSF Career Award, 2009
Key Activities: PC Member: CVPR 2008, ACM-MM 2008 (Content Track), ISS 2009, ICME 2007. TPC Chair: VPQM 2006 and 2007. Organizing Committee & Finance Chair: CIVR 2006, ICIP 2008. Editorial Board & Area Editor, *Signal Processing: Image Communications*



Patrick Langley, Professor

Ph.D. *Cognitive Psychology*, Carnegie Mellon University, 1980
Email: langley@asu.edu
Research Interests: Cognitive architectures for intelligent agents, computational scientific discovery, Interactive assistants for complex cognition, computational models of human behavior, computational biology and ecology
Honors and Awards: Fellow of AAAI, Fellow of the Cognitive Science Society
Key Activities: Founding Executive Editor of *Machine Learning*, Founding Board Member, International Machine Learning Society, Program, Co-chair of Integrated Intelligence track for AAAI-07 and AAAI-08, Editorial board member of *Machine Learning*, Editorial board member of *Data Mining & Knowledge Discovery*



Huan Liu, Professor

Ph.D. *Computer Science*, University of Southern California, 1989
Email: huan.liu@asu.edu Website: <http://www.public.asu.edu/~huanliu>
Research Interests: Social computing, data/web mining, machine learning, feature selection, text classification
Honors and Awards: Most Influential Paper Award, PAKDD, 2010
Key Activities: PC co-chair for SIAM Data Mining 2009, Conference, Co-chair for PAKDD 2008, founding co-organizer of workshop series of Social Computing (SBP'08 and SBP'09), Editorial Board and Advisory Board member for handbook and journals



Joohyung Lee, Assistant Professor

Ph.D. *Computer Science*, University of Texas at Austin, 2005
Email: joolee@asu.edu website: <http://peace.eas.asu.edu/joolee>
Research Interests: Knowledge representation and reasoning, computational logic, logic programming, logics in security, computational semantics of natural language
Honors and Awards: AAAI 2004 Outstanding Paper Honorable Mention Award
Key Activities: Co-chair of ASPOCP 2008, 2009. PC Member: AAAI 2010, KR 2010, JELIA 2010, NMR 2010, Nonmon@30, IJCAI 2009, LPNMR 2009, Commonsense 2009, AAAI 2008, NMR 2008.



Ross Maciejewski, Assistant Professor

Ph.D. *Computer Engineering*, Purdue University, 2009
Email: rmacieje@asu.edu
Research Interests: Information visualization, geographical visualization, computer graphics, syndromic surveillance, volume rendering, non-photorealistic rendering, decision support systems
Honors and Awards: VAST 2010 Challenge Award: Support for Future Detection, IEEE Conference on Visual Analytics Science and Technology, October 2010 for "VACCINATED"
Key Activities: Program committee member of IEEE Conference on Visual Analytics Science and Technology (2010-2011)



Yann-Hang Lee, Professor and CSE Undergraduate Program Chair

Ph.D. *Computer, Information and Control Engineering, Univ of Michigan, 1985*
Email: yhlee@asu.edu website: <http://rts-lab.eas.asu.edu>
Research Interests: Real-time computing, embedded system and software, fault-tolerant computing, distributed computing, and service-oriented computing
Honors and Awards: Best Paper Award ISEQED 2008, Outstanding Paper Award MIXDES 2001
Key Activities: Keynote - SNPD(07) and CAINE(06), Co-Chair -ICCESS(07), Advisory and Publicity Committee - ISORC(06), Steering Committee - SEUS(06), PC - WESE(06, 07, 08), SCC(06), IWEC(06), ESO(06), IWSSPS(06), SOCA(07), ICOIN(07), SEC(07), SAC(06)



Donald Miller, Associate Professor

Ph.D. *Electrical Engineering*, University of Southern California, 1972
Research Interests: Operating systems, computer architecture, computer networks, virtual machine implementation, embedded operating system and network software. single address space operating systems



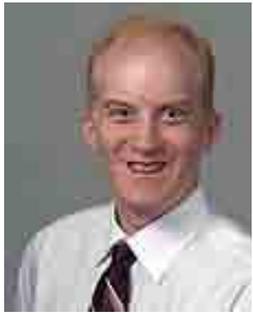
Mutsumi Nakamura, Senior Lecturer

Ph.D. *Computer Science/Math Sciences*, Univ of Texas, 2001
Email: mutsumi@asu.edu Website: <http://www.public.asu.edu/~mutsumi>
Research Interests: Active database systems, Web-based database systems
Honors and Awards: Best Teacher, Ira A. Fulton Schools of Engineering, 2009, Best CSE Teacher, (SCIDSE) 2009



Andrea Richa, Associate Professor

Ph.D. *Computer Science*, Carnegie Mellon University, 1998
Email: aricha@asu.edu Website: <http://www.public.asu.edu/~aricha>
Research Interests: Algorithms for distributed wireless and mobile networks, graph algorithms, randomized algorithms, approximation algorithms, combinatorial optimization, distributed resource allocation
Honors and Awards: NSF CAREER Award 2000
Key Activities: Plenary Speaker, AdHocNow'07. Publicity Chair, ACM SPAA'08; Guest Editor, *ACM Baltzer Journal on Mobile Networks and Applications (MONET)*, *Special Issue on Foundations of Mobile computing*, 2004, PC Member, ACM-SIAM SODA, 2008. ACM DIALM-POMC, 2007, 2008



Brian Nelson, Associate Professor

Ed.D. Educational Technology, Harvard University, 2005
Email: brian.nelson@asu.edu
Research Interests: Learning theory, instructional design, educational technology, game-based learning environments, simulations, multimedia, collaborative learning
Honors and Awards: Outstanding early career faculty - invited speaker at AECT 2010; Co-author of invited NAS paper on educational games and simulations, 2009; Invited speaker at "Distributed Learning & Cognition" workshop, 2006.
Key Activities: : (Author)"Design for Learning in Virtual Environments", 2012; Treasurer of Advanced Research in Virtual Environments for Learning SIG, American Educational Research Association, 2009-2011; Co-editor, special issue of the *Journal of Educational Data Mining*, 2011



Jeremy Rowe, Academic Professional

Ed.D. *Educational Policy & Admin/Higher Ed*, Arizona State University, 1997
Email: jeremy.rowe@asu.edu
Research Interests: Informatics and digital libraries incorporating 3-D data, 3-D handwriting, enterprise distributed authentication and authorization, water policy planning, 3-D digital libraries



Gregory Nielson, Professor

Ph.D. *Mathematics*, University of Utah, 1970
Email: nielson@asu.edu
Research Interests: Scientific visualization, geometric modeling
Honors and Awards: IEEE Meritorious Award, Dagstuhl (John Gregory Memorial) Research Award, ASU Mentor of Year Award, IEEE Golden Core Member, IEEE Outstanding Contribution Award
Key Activities: Director, IEEE Technical Committee on Computer Graphics and Visualization, Editorial Board, Computer-Aided Geometric Design, Editorial Advisory Board & Founding Editor, *Trans. on Visualization and Computer Graphics*



Hessam Sarjoughian, Associate Professor

Ph.D. *Electrical and Computer Engineering*, University of Arizona, 1995
Email: sarjoughian@asu.edu Website: <http://www.eas.asu.edu/~hsarjou>
Research Interests: Agent-based modeling, multiformalism modeling, simulation-based design, software architecture
Key Activities: Area Editor for *SIMULATION: Transactions of The Society for Modeling and Simulation* (2004-)



Sethuraman Panchanathan, ASU Sr. Vice President for Knowledge Enterprise Development and Professor

Ph.D. *Electrical Engineering*, University of Ottawa, 1989
Email: panch@asu.edu Website: <http://asuresearch.asu.edu>
Research Interests: Multimedia computing, face/gait recognition, genomic signal processing, haptic interfaces
Honors and Awards: Fellow of IEEE, Fellow of SPIE, Best poster paper awards: Medicine Meets Virtual Reality Conference (2006, 2007, 2008), Governor's Innovator of the Year in Academia Award (2004)
Key Activities: Editor-in-chief, *IEEE Multimedia*; Conference Chair, Third International Conference on Body Area Networks (BodyNets 2008); Associated Editor, *Journal of Visual Communication & Image Representation*



Arunabha Sen, Professor

Ph.D. *Computer Science*, University of South Carolina, 1987
Email: asen@asu.edu Website: <http://www.public.asu.edu/~halla>
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
Key Activities: Associate Editor, *IEEE Transactions on Mobile Computing*, Program Committees of IEEE Infocom, Globecom, ICC, ACM Foundations on Mobile Computing

computer science and engineering



Aviral Shrivastava, Assistant Professor

Ph.D. *Computer Science*, University of California, Irvine, 2006
Email: aviral.shrivastava@asu website: <http://www.public.asu.edu/~ashriva6>
Research Interests: Compilers and micro architectures for embedded systems, including techniques for power, performance reliability, temperature and code size improvement
Honors and Awards: Best Paper Candidate at ASPDAC 2008
Key Activities: Program Committee Member of CASES 2007, 2008, LCTES 2008, RTCSA 2007, 2008, DSD 2007, 2008, Referee of Journals, *TCAD, TVLSI, TECS, TODAES*



Wei-Tek Tsai, Professor

Ph.D. *Computer Science*, University of California, Berkeley, 1985
Email: wtsai@asu.edu
Research Interests: Software engineering, Internet, parallel and distributed processing
Honors and Awards: Best Paper Award, Int'l Conf. on System Sciences, 1988, IEEE Meritorious Service Award 1992
Key Activities: 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, ECommerce and E-Services, 2008



Hari Sundaram, Associate Professor

Ph.D. *Electrical Engineering*, Columbia University, 2002
Email: hari.sundaram@asu.edu
Website: <http://www.public.asu.edu/~hsundara>
Research Interests: Multimedia, computational models for experiential systems
Honors and Awards: IBM Faculty Award (2007, 2008), IBM UIMA Innovations Award (2006), Best Student Paper Award (Joint Conf. on Digital Libraries 2007), Best Paper Finalist (ACM Multimedia 2007)
Key Activities: Associate Editor: *ACM Trans. on Computing, Communications and Applications*, *IEEE Signal Processing Magazine*, ACM SIG Multimedia web editorial board (2004-07). Guest Editor: *Special Issue on Communities and Media Computing*, *IEEE Trans. on Multimedia*



Kurt VanLehn, Professor

Ph.D. *Computer Science*, MIT, 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 and Awards: Fellow of the Cognitive Science Society, Fellow of the Center for Advanced Study in the Behavioral Sciences, nine best paper awards
Key Activities: 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



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Research Interests: Cross-layer design and optimization in changing network conditions, modelling and monitoring, medium access control protocols, multi-hop wireless networks including MANETs, WSNs, WMNs, and cognitive radio networks
Key Activities: Associate Editor, *Computer Networks*. Associate Editor, *International Journal of Communication Systems*, TPC Co-chair ACM MSWIM'08 (11th ACM/IEEE International Symposium on Modeling, Analysis and Simulation of Wireless and Mobile Systems)



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Ph.D. *Computer Science*, Arizona State University, 2004
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Research Interests: Parallel and distributed computing, mobile computing, algorithm analysis, combinatorial analysis and optimization, online computation, cyber-physical analysis and modeling



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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 and Awards: Best Researcher, Senior Faculty (SCIDSE) 2009
Key Activities: Director, Consortium for Embedded Systems



Yalin Wang, Assistant Professor

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Research Interests: Computer vision, medical imaging, computer graphics, geometric modeling, statistical pattern recognition
Honors and Awards: Best visualization software tool in software competition at UCLA Center for Computational Biology, "Automated Brain Sulcal Detection Tool & Conformal Spherical Analysis Tool," 2006
Key Activities: Co-organizer of Mini-Symposium "Mathematics for Brain Mapping" in Society of Industrial and Applied Mathematics (SIAM) Annual Meeting, Boston, MA, Jul. 2006



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Research Interests: Computer graphics, visualization, information visualization, procedural modeling, visibility, real-time rendering, urban environments
Honors and Awards: NSF CAREER award 2006, Günther Enderle Award for the best paper at Eurographics 2001



Guoliang Xue, Professor

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Research Interests: Network science; QoS provisioning; cross-layer design of wireless networks; privacy, anonymity and survivability
Honors and Awards: Paper Award, IEEE Globecom'2007; Distinguished Invited Speaker at IEEE ICCCN'2008
Key Activities: TPC co-Chair of IEEE INFOCOM'2010; TPC co-Chair of IEEE ICC'2009 Symposium on Adhoc and Sensor Networks; Associate Editor of *IEEE Transactions on Wireless Communications*; Associate Editor of *IEEE Network Magazine*; Area Editor of *Computer Networks*



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Research Interests: Trust management and security, software engineering, distributed systems, service based systems, ubiquitous/pervasive computing
Honors and Awards: Information Resource Center (IRC) 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
Key Activities: Keynote speaker, 2008 IEEE Intl Conf. on Services Computing; Editorial Board member of *IEEE Trans. on Service Computing*

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Arnaud Ehgner, Faculty Associate

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Kyle Gilsdorf, Faculty Associate

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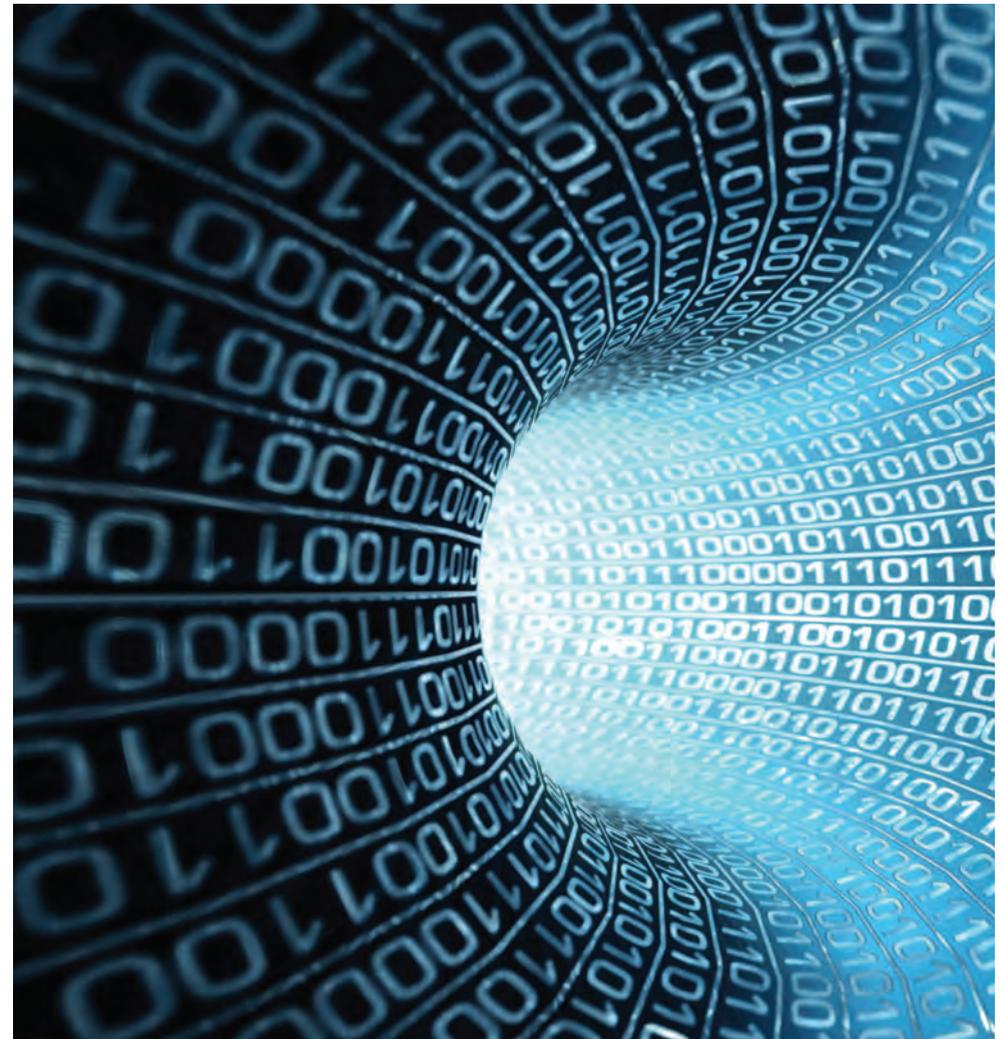
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industrial engineering



Mary Anderson Rowland, Associate Professor

Ph.D. *Mathematics*, University of Iowa, 1966

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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 and Awards: 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

Key Activities: : SWE National Board, Special Appointee, 2009; WEPAN Proceedings Chair, 2007; ASEE PIC IV Chair, 2006-2008; ASEE Women in Engineering Division Chair, 2005



Esma Gel, Associate Professor

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Research interests: Applied probability, stochastic processes, queuing theory, stochastic modeling and control of manufacturing systems

Key Activities: Associate Editor, *Journal of Flexible Services and Manufacturing*



Ronald Askin, Director and Professor

Ph.D. *Systems & Industrial Engineering*, Georgia Institute of Technology, 1979

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Research Interests: Logistics; manufacturing systems analysis; production planning and scheduling; operations research; applied statistics

Honors and Awards: IIE Transactions on Design and Manufacturing Best Paper Award (1998, 2000), IIE Joint Publishers Book-of-the-Year Award (1994, 2003) Shingo Prize for Excellence in Manufacturing Research (1994) Eugene L. Grant Award (1986); NSF Presidential Young Investigator Award (1984); IIE Fellow

Key Activities: Editorial Board, *Int. Journal of Industrial & Systems Engineering*; Special Issue Co-editor, *Int. Journal of Production Economics*, Board of Trustees, Institute of Industrial Engineers; Chair-elect CIEADH



Jing Li, Assistant Professor

Ph.D. *Industrial & Operations Engineering*, University of Michigan, 2006

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Research Interests: Applied Statistics, process control, data mining, causal modeling and inference

Honors and Awards: Best Paper Award in Quality & Reliability, 2008

Key Activities: Member-Institute for Operations Research and the Management Sciences (INFORMS); Member- Institute of Industrial Engineers (IIE)



Linda Chattin, Senior Lecturer

Ph.D. *Industrial Engineering*, University of New York, 1994

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Research Interests: Discrete optimization, stochastic processes and probabilistic modeling, emergency service location

Honors and Awards: A. Alan B. Pritsker Outstanding IE Teacher Award, 2009



Pitu Mirchandani, Professor

Sc.D. *Operations Research*, MIT, 1975

Email: pitu@asu.edu

Research Interests: Optimization, decision-making under uncertainty, real-time control and logistics, application interests in urban service systems, transportation, and homeland security

Honors and Awards: Recipient of "2007 Member of the Year" by the ITS Arizona Society for contributions to ITS in the State of Arizona.

Research Interests: Optimization, decision-making under uncertainty, real-time control and logistics, application interests in urban service systems, transportation, and homeland security

Key Activities: 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



John Fowler, Professor and IE Undergraduate Chair

Ph.D. *Industrial Engineering*, Texas A&M University, 1990

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Research Interests: Deterministic scheduling, discrete event simulation methodology, semiconductor manufacturing systems analysis, healthcare systems analysis, applied operations research.

Honors and Awards: Avnet Professorship, 2009

Key Activities: Editor in Chief, *IIE Transactions on Healthcare Systems Engineering*, Area Editor, *SCS Transactions on Simulation*; Area Editor, *Computers and Industrial Engineering*; Associate Editor, *IEEE Transactions and Electronics Packaging Manufacturing*; Associate Editor, *Factory Modeling and Control*, *IEEE Transactions on Semiconductor Manufacturing*



Douglas Montgomery, Regents' Professor

Ph.D. *Industrial Engineering*, Virginia Polytechnic Institute, 1969

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Research Interests: Statistical design of experiments, optimization and response surface methodology, empirical stochastic modeling, and industrial statistics

Honors and Awards: Engineering Lifetime Achievement Award (2009); Greenfield Industrial Medal (2009); Shewhart Medal; Shewell Award; Brumbaugh Award; William G. Hunter Award; Lloyd S. Nelson Award; Fellow of the American Statistical Association, the American Society for Quality Control, the Royal Statistical Society, the Institute of Industrial Engineers, and an Elected Member of the International Statistical Institute

Key Activities: Chief Editor, *Quality & Reliability Engineering International*



Rong Pan, Associate Professor

Ph.D. *Industrial Engineering*, Pennsylvania State University, 2002
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Research Interests: Industrial statistics, reliability analysis and time series modeling
Honors and Awards: Air Force Summer Faculty Fellowship, 2009, Stan Ofsthum Award by the Society of Reliability Engineers, 2008
Key Activities: Associate Editor, *Journal of Quality and Technology*



Teresa Wu, Associate Professor

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Research Interests: Information systems, supply chain management, multi-agent systems, data mining, Petri nets, Kalman filtering
Key Activities: Editorial Boards: *International Journal of Electronic Business Management*; *Computer & Standard Interface*, Guest Editor-*International Journal of Electronic Business Management Special Issue on Enabling Distributed Product Development*



George Runger, Professor

Ph.D. *Statistics*, University of Minnesota, 1982
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Research Interests: Statistical Learning, process control, data mining for massive, multivariate data sets
Honors and Awards: 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
Key Activities: Department Editor- *Journal of Quality Technology*; Associate Editor- *Journal of Mathematical and Management Sciences*



Nong Ye, Professor

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Research Interests: Information and systems assurance, data mining and modeling, quality optimization and control of system operations
Key Activities: Associate Editor-*Information, Knowledge, Systems Management*, Associate Editor-*IEEE Transactions on Systems, Man, & Cybernetics, Part A*; Editorial Boards: *International Journal of Human-Computer Interaction*; *Information, Knowledge, Systems Management*



Dan Shunk, Professor

Ph.D. *Industrial Engineering*, Purdue University, 1976
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Research Interests: Agile, enterprise and CIM systems, group technology, planning systems, economics of computer-integrated manufacturing (CIM) strategy and strategic role of technology
Honors and Awards: Best Teacher Award (Top 5%), 2009, Fulbright Award, 2002-2003, SME International Award for Education, 1996, I&MSE Faculty of the Year award, 1991 & 1999, SME Region VII Educator of the Year award, 1989
Key Activities: Editorial Boards: *Int. Journal of Flexible Automation & Integrated Manufacturing*; *Int. Journal of Logistics*; *Int. Journal of Product Development*



Muhong Zhang, Assistant Professor

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Research Interests: Integer programming, robust optimization, computational optimization, network optimization
Key Activities: Member-Institute for Operations Research and the Management Sciences (INFORMS)



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Research Interests: Logistics, automated quality systems, manufacturing systems and applied operations research, International Logistics and Productivity Improvement Laboratory (ILPIL)
Honors and Awards: NSF Career Award, 1995
Key Activities: 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

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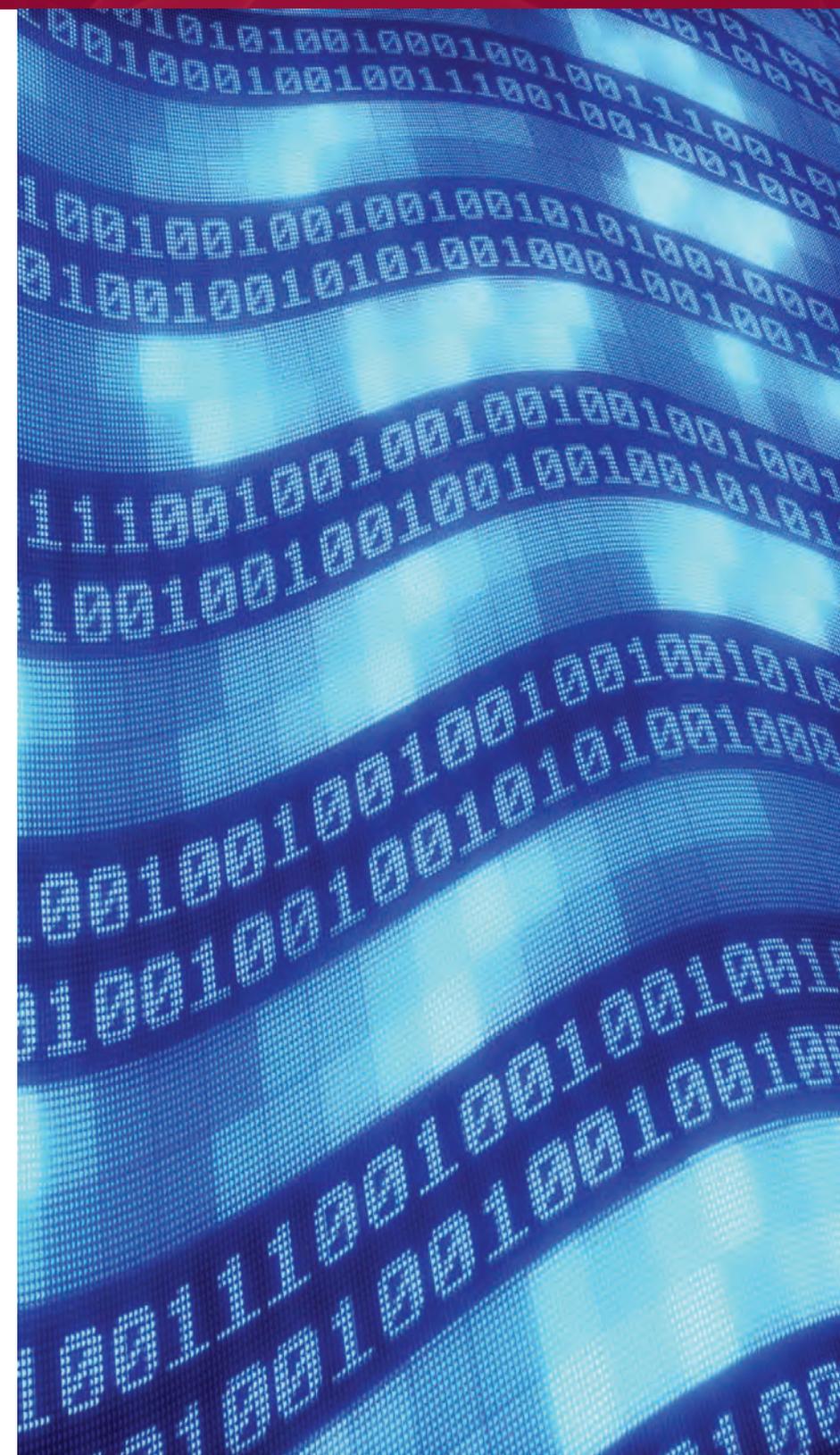
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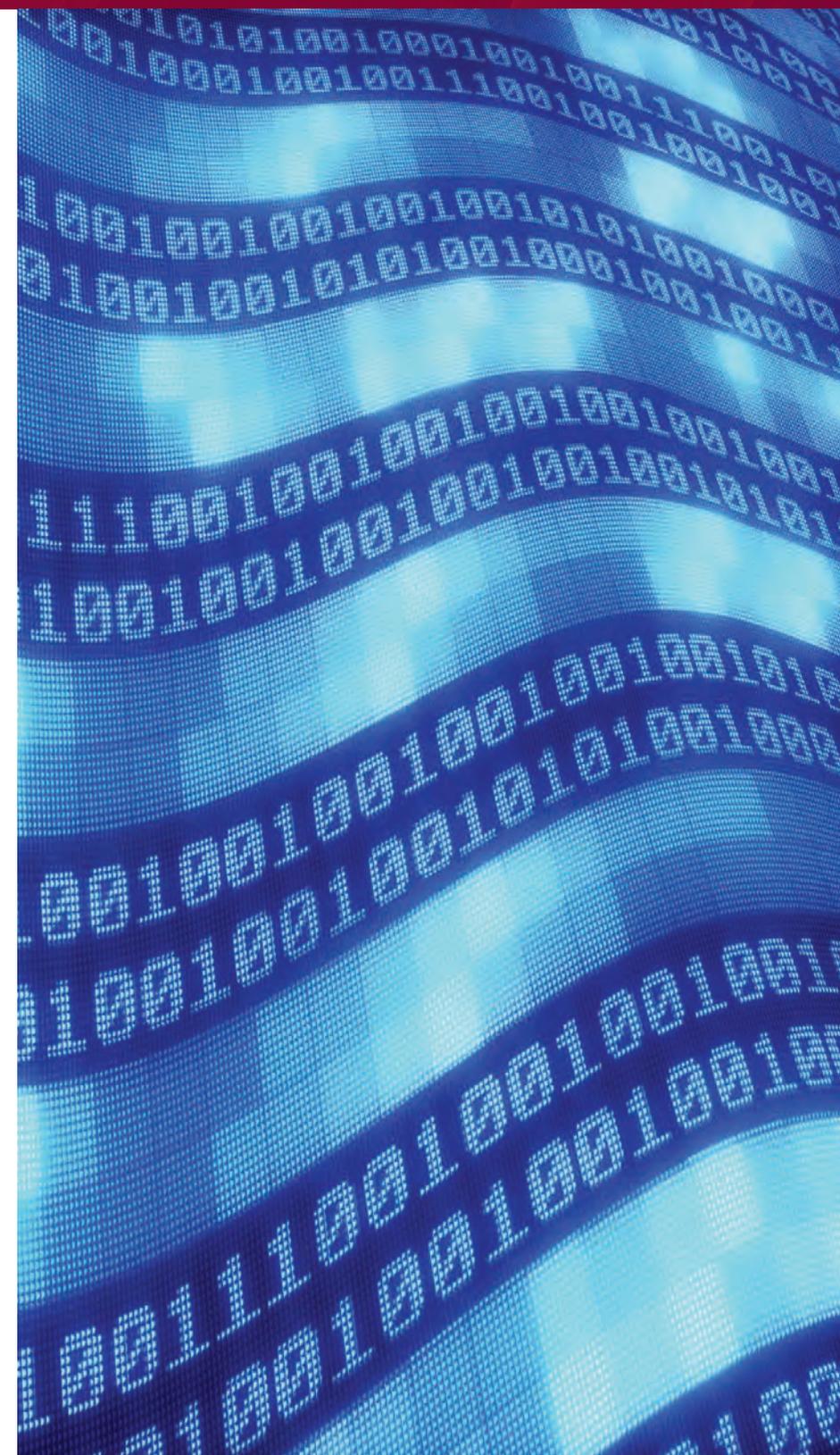
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For details about the programs or research highlighted in this magazine, please contact the editor or sources directly.

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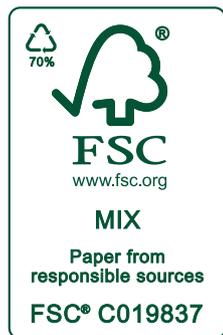
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To be sustainable, our actions must reflect what is important to us—qualities such as clean air, clean water, health, security and prosperity. In keeping with the spirit of ASU President Crow's Sustainability Initiative, we are producing a more "sustainable" Annual Report. The paper we are using is highly recycled, compared to both foreign and domestic grades, and the mill at which it is produced is a "clean mill" with a sustainability charter.



CIDSE Director Ron Askin (right) and Amy Sever, manager of non-credit programs for Global Outreach and Extended Education, strike a pose with Sparky.



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