A Welcome from

President Michael M. Crow

As president of Arizona State University, I would like to welcome you to one of the premier metropolitan public research universities in the nation. Enrolling more than 50,000 undergraduate, graduate, and professional students on three campuses in metropolitan Phoenix, ASU maintains a tradition of academic excellence in core disciplines, and has become an important global center for innovative interdisciplinary teaching and research.
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The past year has been an amazing one for Department of Computer Science and Engineering at Arizona State University. This department has taken President Crow’s plan to make ASU a model of a “New American University” and is rapidly becoming a world-class CSE department. In June 2003, Mr. Fulton, CEO of Fulton Homes, donated $50 million to endow the Ira A. Fulton School of Engineering, of which CSE is a significant part.

This gift will help establish scholarships, recruitment of top-notch faculty and students, research, and curriculum development in Fulton School. In addition, ASU created the Institute for Computing and Information Science and Engineering (InCISE) to foster inter/multi/transdisciplinary interactions between researchers in the computer and information sciences and other disciplines across ASU. InCISE and CSE are housed in a new state of the art building in downtown Tempe. This new venue has resulted in doubling our space, thus enabling us to embark on exciting new research projects.

CSE has a vibrant student body with about 1,300 undergraduates and 400 graduate students, including 26 National Merit Scholars. CSE students have been recipients of NSF Graduate Research Fellowship, AT&T Labs Fellowship, and Department of Homeland Security Scholarship. In Fall 2004, we will begin offering a graduate concentration in media arts in collaboration with the Arts, Media and Engineering Program. CSE research has been organized into several key areas: embedded systems, information assurance, intelligent information integration, cognitive ubiquitous computing, bioinformatics, spatial modeling, and enterprise computing. Faculty are also collaborating on transdisciplinary projects with Translational Genomics Research Institute (TGen), Herberger College of Fine Arts, W.P. Carey School of Business, as well as departments within Fulton School, College of Liberal Arts and Sciences, and Disability Resources.

Several government agencies and industrial partners fund research in CSE, including NSF, NIH, DARPA, ONR, FAA, NASA, Navy, State of Arizona, Intel, Motorola, Microsoft, and Boeing. In 2003-2004, CSE faculty submitted $33.8 million of proposals, a 160 percent increase over two years. Research awards and expenditures have doubled in the last three years and annual current expenditures are at $7.2 million. Other indicators of the culture of excellence that permeates our department, include:

- our success in three highly competitive NSF-ITR grants
- three faculty served as editors-in-chief of premier journals in their research areas
- two faculty published books by Cambridge press and Springer publishers.
- four faculty chaired prestigious conferences
- two faculty members were awarded the status of fellow of AAAI and IEEE.
- one faculty was awarded the prestigious IEEE Kanai award.

CSE is also hiring several new faculty and are recruiting top quality students whose talents will help accelerate CSE’s efforts to becoming a world-class department.

Sincerely,

Sethuraman Panchanathan
Stephen Yao receives IEEE Kanai Award

Personal digital assistants ride around Stephen Yau’s laboratory strapped to remote-controlled toy monster trucks. They look like normal PDAs, but these personal digital assistants incorporate reconfigurable context-sensitive middleware. This software, in development in Yau’s lab, allows the PDAs to do the right thing at the right time and at the right location while the PDAs’ environments are dynamically changing.

Designing this middleware is only the latest project in a long and productive career for which the Institute of Electrical and Electronics Engineers (IEEE) Computer Society has honored Yau, a professor of computer science and engineering at ASU, with the Tsutomu Kanai Award. The award, named for the former president of Hitachi, recognizes an individual who has made a lasting contribution to the field of distributed computing. Previous recipients of this award are Ken Thompson of Bell Labs, C. V. Ramamoorthy of UC Berkeley, and Alfred Spector of IBM Research.

Yau has worked in distributed computing systems for more than 30 years to solve both practical and theoretical problems related to software development and information assurance techniques. Currently, he works on situation-awareness and trustworthiness in service-based systems.

Yau’s research in distributed computing systems has been funded by industry and various government agencies, including U.S. Air Force Research Lab., Office of Naval Research (ONR), Army Research Office (ARO) and National Science Foundation (NSF). Besides the aforesaid middleware project, Yau is currently performing two other research projects, supported by NSF and ONR.

In addition, over the years Yau has mentored more than 95 Ph.D. students and more than 120 M.S. students; has served as president of two professional organizations and editor-in-chief of Computer, the IEEE Computer Society’s flagship publication; has published more than 180 papers; and has established three annual or biennial international conferences in the field of software and applications, especially for distributed computing systems.

Subbarao Kambhampati receives AAAI Fellowship

Kambhampati has been with Fulton School since 1991 and directs the Yochan research group. His research interests are split between Artificial Intelligence (automated planning, scheduling) and Databases (intelligent information integration). In recognition of his contributions to automated planning, this spring, the American Association of Artificial Intelligence (AAAI) honored Prof. Kambhampati by electing him an AAAI Fellow.

He leads ET-I^3 a faculty initiative on intelligent information integration. This spring he received an IBM Faculty Award in recognition of his planning and information integration work.

His research group’s most recent contributions involve search heuristics for planning under a variety of situations— including those that involve time and uncertainty. This technology finds many uses from NASA mission planning scenarios to automated composition of web services. Over the years, his work in planning has been supported by several prestigious federal grants, including an NSF Young Investigator award, two grants from NASA and two from DARPA. While automated planning has been his first love, for the past seven years, he has also been interested in the problem of integrating the enormous amounts of structured and unstructured data on the web. As a testbed for this research, his group developed BibFinder, a popular system for integrating online bibliography sources.

He was the recipient of the 2002 Teaching Excellence Award from the College of Engineering and Applied Sciences (now the Fulton School of Engineering). Kambhampati is an associate editor of Journal of AI Research, and the program co-chair of the 2004 National Conference on National Conference on Artificial Intelligence.
Charles J. Colbourn was selected as the 2003 Buckingham Scholar by the Department of Mathematics at Miami University, Oxford, Ohio, for “excellence in research in mathematics.” Colbourn uses discrete mathematics to solve problems in computer science. Colbourn recently was awarded the Euler Medal for Lifetime Achievement in Research by the Institute for Combinatorics and Its Applications.

Nicholas Findler received a golden diploma from the Rector of the Technical University in Budapest in recognition of lifelong contributions to the computing profession, and was elected as a Permanent and Honorary Member of the Research Institute for Computing and Automation of the Hungarian Academy of Sciences. Findler also received a finalist commendation in the Takeda Foundation’s 2002 Takeda Techno-Entrepreneurship Award Competition.

In 2001-2002 Ben Huey served as the first Chair of the Computing Accreditation Commission (CAC) after the merger of the Computing Sciences Accreditation Board with ABET. ABET’s 2001-2002 Annual Report called it “a transition marked by respect, cooperation, flexibility and focus on providing a high quality accreditation process.” For two years Huey also served on the ABET Accreditation Council, which aims to bring greater commonality to the accreditation policies and procedures of the four ABET Commissions. He continues to be an active part of CAC.

Suzanne Dietrich and Susan Urban jointly received the CSE Faculty Teaching Award. Collaborators for many years, Dietrich and Urban have also received two NSF grants to support the development of undergraduate database courses, including the use of cooperative group projects that relate theory to practice in the introductory database management class and the development of a national model for an advanced database course for undergraduates.

Andréa Richa received a NSF CAREER Award for her proposal, “Accessing Shared Objects and Routing in Distributed Environments.” Richa’s research develops efficient access schemes for shared objects and point to point routing protocols in a variety of networks.
Tristan Weir, a senior computer science major, received an Honorable Mention in the 2004 Computing Research Association’s Outstanding Undergraduate Award competition. Weir, who performs research under Professor Stephen Yau, is also a Department of Homeland Security Scholar and founder of eKIDZ, a computer education program for middle school students.

Graduate student Karen Chancellor has received an NSF Graduate Research Fellowship to support her work with Professor Chitta Baral on knowledge representation and reasoning in biologic pathways. The award provides Chancellor, who already holds an M.D. from Duke University, with tuition and a stipend for three years.

Graduate student Toni Farley received a 2003 AT&T Labs Fellowship to support her work on Internet and network security under Professors Andrea Richa and Nong Ye. The award provides tuition and a stipend for three years. Farley also has a mentor from AT&T, Patrick McDaniel of the Secure Systems Group, and will intern at AT&T next summer.

Danny Greg Little, a computer science major, won ASU’s first annual Programming Competition in 2003. In 2004, he participated as an honorary judge for the event. Dr. Panchanathan also invited Greg to perform research as an undergraduate research assistant for the Center for Ubiquitous Computing (CUbiC). Greg is currently studying face recognition in the context of an assistive device for people who are blind.

“Holding Hands” on Campus Is Popular

Under the guidance of the Center for Ubiquitous Computing (CUbiC) faculty, four students in the Ira A. Fulton School of Engineering and the College of Technology and Applied Science placed third overall in Microsoft’s Imagine Cup 2004 national software design competition. Students Vish Ramachandran, Srinivas Vadrevu, Swami Venkataramani and Sriram Thaiyar won a $2,000 prize for their product Holding Hands, a personal mobile device that tells a user who is blind what is in their environment and how they can interact with it. The device can be used in everyday navigational and functional scenarios. Smart features are also included in the device, allowing the system to identify and predict user action over time. Microsoft’s Imagine Cup is an international competition that awards a $25,000 grand prize for inventing a product that affects lives through smart technology and mobile devices.
Hasan Çam
Hasan Çam joined the CSE faculty in 2001 after a year as an assistant professor at the University of Arkansas in Fayetteville. He earned his Ph.D. from Purdue University in 1992. Research in Çam’s group focuses on wireless and computer networks, network security, mobile computing, ATM switches, and low power processor architectures. A Senior Member of the IEEE, Çam has also created a new graduate course on wireless networks.

Karamvir Chatha
Karamvir Chatha joined the CSE faculty in 2001 after receiving his Ph.D. from the University of Cincinnati. His research focuses on design methodologies and computer-aided design tools for embedded and VLSI systems. The Consortium for Embedded and Inter-Networking Technologies (CEINT) has extensively funded Chatha’s work, and recently he was a co-recipient of a NSF award for research on sensor networks-based media-flow applications. Chatha has also been involved in developing new courses for the computer systems engineering undergraduate major.

Hasan Davulcu
Hasan Davulcu joined the CSE faculty in 2002 after receiving his Ph.D. from the State University of New York at Stony Brook. His research focuses on developing novel data mining techniques for structuring and organizing unstructured sources such as Web, text documents and gene sequences. Recently Davulcu received a grant from the U.S. Army Medical Research Institute of Infectious Disease and the Department of Defense to develop a Toxin Knowledge Base for the fight against bioterrorism.

Goran Konjevod
Goran Konjevod joined the CSE faculty in 2000 after receiving his Ph.D. from Carnegie Mellon University. Research in Konjevod’s group focuses on algorithm design, discrete optimization, machine learning and statistical methods in computer science, and network design and set-covering problems. He has been a Visiting Scientist at Los Alamos National Laboratory and has applied for a patent on a population mobility generator and simulator.
Kyung D. Ryu
Kyung D. Ryu joined the CSE faculty in 2001 after receiving his Ph.D. from the University of Maryland at College Park. His research focuses on distributed computing and embedded systems; in one project he is developing a device to monitor and correct embedded systems while they run. Ryu has also created a new graduate-level class on Advanced Issues in Parallel and Distributed Computing as well as a Linux Lab.

Hessam S. Sarjoughian
Hessam S. Sarjoughian joined the CSE faculty in 2001 after three years as an assistant research professor at the University of Arizona, where he earned his Ph.D. in 1995. His professional experience has been with Honeywell and IBM. Sarjoughian’s research focuses on the modeling and simulation frameworks and software tools that can support specification and development of software-intensive systems. His educational aim is to help promulgate disciplined simulation modeling through an online graduate program.

Hari Sundaram
Hari Sundaram joined the CSE faculty in 2002 with a joint appointment in the Institute for Studies in the Arts. He received a Ph.D. in electrical engineering at Columbia University, where he received the 2002 Eliahu I. Jury Award for best dissertation. Sundaram’s work focuses on developing computational models for experiential systems, through which the user gains insight by direct interaction with the computer mediated environment.

Violet Syrotiuk
Violet Syrotiuk joined the CSE faculty in 2002 after three years as an assistant professor at the University of Texas at Dallas. She received her Ph.D. from the University of Waterloo, Canada, in 1992. Syrotiuk’s research in mobile ad hoc networking and computing focuses on medium access control (MAC) protocols’ cross-layer interaction and intelligent protocol adaptation to unknown or changing network conditions. She also directs the Mobile Ad Hoc Research Lab at ASU.
The Department of Computer Science and Engineering has a long tradition of diverse students who lead and participate in technical student organizations. These clubs allow students an opportunity to expand on skills learned in the classroom as well as learn about computer science and engineering outside academia.

**Windows Interest Group (WIG)**

The Windows Interest Group aims to increase knowledge of and create interest in the science, design, development, construction, languages, management, and application of today’s computer technology. It specializes in Microsoft technology, though not exclusively, and offers presentations, tutorials, help on projects, and various other activities, both independently and with support of Microsoft.

Biweekly meetings feature presentations on technologies such as ASP.Net or MultiThreading that members want to explore independently. WIG’s main goal is to provide a place for both beginning and experienced programmers to learn about new technologies that may be outside of their current course work and to involve them in technical projects.

**Women in Computer Science**

The Women in Computer Science organization fosters interaction between women faculty and students in the CSE department. Faculty serve students; upper-class students mentor the younger students; and faculty and students of all years volunteer to help middle school and high school children. The organization has hosted faculty-student luncheons and a programming contest, and members reach out to the community through programs with the American Indian Science and Engineering Society, WISE Investments, and the Intel Clubhouse.

“I used to be scared of professors, but meeting them and hearing about their lives on both a personal or professional levels has made me realize that they have been through the same things I am going through,” said Patricia Johnson, a senior computer science major.

**Association for Computing Machinery**

ASU’s student chapter of the Association for Computing Machinery has held a number of programs, industry panels, company visits, and resume building workshops to prepare students for careers in computing. In addition, ACM has co-sponsored events with other computing-oriented groups, including a recent Linux Install-Fest in conjunction with the ASU Linux Users Group.

**IEEE Computer Society**

With nearly 100,000 members, the IEEE Computer Society is the world’s leading organization of computer professionals. Founded in 1946, it is the largest of the 35 societies organized under the umbrella of the Institute of Electrical and Electronics Engineers (IEEE).
Events bring students, faculty together

_Throughout 2003 the CSE department held events to bring together faculty and students as well as honor students for their achievements. Here’s a look at some of these get-togethers._

Each spring the department holds an **Honors Convocation** so that students can receive scholarships in the presence of donors. Both individual donors and representatives from companies that sponsor scholarships have the opportunity to meet the students they support.

**In April** the department’s **Women in Computer Science** organization hosted a programming contest for undergraduates. Forty-two students in 19 teams received seven programming problems to solve in four hours. Faculty and members of WCS acted as judges. Intel and Microsoft donated prizes for the event, including an Intel P4 laptop and $600 for the winner.

“It’s a great opportunity for students to apply their problem solving skills and to compete for prizes,” said Renee Turban, lecturer and advisor to WCS. The contest will be held again this spring.

**In April CS Night** provided an opportunity for faculty, students and scholarship sponsors to socialize and recognize student accomplishments. The speaker of the evening was Wendy Vittori, VP and General Manager at Motorola Computer Group. There was also a presentation of scholarships to students.

**In October 125 graduate students** attended a get-together with faculty at CSE’s new space in the Brickyard building. “Part of the reason we held the event was to introduce the new building to graduate students,” said Arunabha Sen, associate chair for research and graduate programs. “It was the first time they came to their new home.”

The first half of the event was devoted to short presentations by faculty about areas of research in the department. Faculty and students mingled during the second half, discussing both academic and non-academic subjects. Students enjoyed the event so much that they have requested one each semester.

**In November undergrads** had two opportunities to tour the Brickyard with advising office staff. After the tours, students ate cookies and punch and shared their questions and concerns about the move.

**The Summer Institute in the Ira A. Fulton School of Engineering** promoted five summer camps during the summer of 2004. The Computer Science and Engineering camp was a one-week commuter program designed to provide information about the career opportunities in the fields of Computer Science and Engineering. A graduate student, Mr. Chandra, under the direction and leadership of Dr. Urban, coordinated and presented the entire Computer Science and Engineering curriculum. In addition, to the curriculum direction that Dr. Urban gave to Mr. Chandra, Dr. Urban also contacted the industry speakers, coordinated the laboratory tours, and did the CSE Program presentation.

**In the fall CSE** held a get-together for faculty and CSE students who are also part of the Barrett Honors College at ASU. BHC requires an undergraduate thesis for graduation; the pizza lunch allowed honors students to learn about the research opportunities available to them in CSE.
InCISE Institute for Computing and Information Science and Engineering

Computing is pivotal to advancing research endeavors in many disciplines, not just computer science and engineering. To foster interdisciplinary research, education and entrepreneurship in computing, in spring 2003 ASU’s Vice President for Research and Economic Affairs created the Institute for Computing and Information Science and Engineering (InCISE) led by CSE Chair Sethuraman Panchanathan.

InCISE is a collaboration of interdisciplinary research units that share expertise in computer and information science, informatics, and their application to research problems in academic disciplines and in our communities. The mission of InCISE is to foster computer science and applications of data storage, security, modeling, visualization, analysis and interpretation in interdisciplinary research, education and entrepreneurship. Synergies have been identified with researchers in cognitive, earth and environmental sciences, biosciences, disabilities studies, business, and linguistics. The goal is to leverage selective investments in collaborative, interdisciplinary projects to build partnerships between researchers, improve internal and external visibility and generate successful larger scale collaborative proposals. InCISE will continuously evolve to promote and enable new collaborations, as well as meet the demands of applications domains and societal needs.

InCISE contains: the Arts, Media and Engineering Research Center, the Center for Advancing Business through Information Technology, the Center for Cognitive Ubiquitous Computing, the Consortium for Embedded Systems; Information Assurance, Intelligent Information Integration, the Partnership for Research in Spatial Modeling; and the Software Factory.

InCISE is housed in the Brickyard complex on Mill Avenue in downtown Tempe, adding an additional 130,000 square feet of academic and research space for the Department of Computer Science and Engineering and provides the facilities ASU needs to create a top-ranked and world-class program.
Information Assurance

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

The Information Assurance Program at ASU addresses the broad issues of developing trustworthy networked information systems (TNIS) and ensuring the quality of information being stored, processed and transmitted by information systems and networks. Created only a year ago, the IA program has already attracted more than 20 faculty members from several departments.

Current research activities involve in foundational, network, system and application aspects of developing TNIS, including logic, languages and tools for development of secure systems, composition methods; ways to measure, model, analyze, verify, and test TNIS; steganography; survivable network design; dynamic and deterministic Quality of Service management; data mining for security, privacy in data management; and situation-awareness.

Many proposals have been submitted in IA program. At least four of projects have already been funded, and several proposals are still pending. A prototype of a service-oriented infrastructure for rapidly building trustworthy networked information systems has been developed with some demonstration applications to show the important features of trustworthy networked information systems.

In addition, IA faculty members are also engaged in both academic and outreach training programs. A number of courses have been or will be offered, including Introduction to Information Assurance; Computer and Network Security; Applied Cryptography; Reliable and Secure Computer Systems and Networks; Data Mining for Security Applications; and Data and Application Security. A short training program in Information Assurance and Security for practicing engineers is also planned.
The explosive growth of the Internet has provided unprecedented availability of and access to information and services. But common tasks such as organizing, searching, retrieving, and filtering information on the Web are difficult and mostly done in a semi-manual fashion. Enabling Technologies for Intelligent Information Integration, or ET-I3, is a collaborative program that addresses the challenge of information integration.

The overall goal of ET-I3 is to develop enabling integration technologies for scalable “Do What I Mean” (DWIM) processing for sources and services over the Internet. DWIM-integration involves using the higher level information goals of the user to decide what sources and services on the available information web are directly or indirectly relevant. After accessing these sources, the system efficiently composes the relevant services to answer requests. Technologies to support DWIM-integration will be critically important for high-profile areas such as bioinformatics and e-business, and useful in other disciplines.

After only a year of existence, the ET-I3 program has made considerable progress. For example, Zaiquing Nie, a graduate student in the laboratory of Professor Subbarao Kambhampati, has developed a computer science bibliography information integration system called BibFinder. It incorporates eight databases and search engines, and regularly receives several hundred hits each day. Students of Assistant Professor Hasan Davulcu have developed ontology mining techniques and a system called OntoMiner that was invited for publication in the special issue of the prestigious IEEE Intelligent Systems. In addition, BioLog, a prototype system to enable knowledge sharing among biologists, has been developed and deployed recently at the Translational Genomics Research Institute (TGen).
BioLog
Prof. Baral, Prof. Davulcu, Prof. Kim, and Prof. Liu's collaboration with TGEN and IGC includes the BioLog Project, which aims to create scalable on-the-fly recommendation algorithms for enabling knowledge sharing about new and relevant genes, abstracts and researcher profiles among biologists while they explore the Web resources.

ToxinKB
Dr. Davulcu was awarded a joint research grant, funded by the U.S. Army Medical Research Institute of Infectious Disease and Department of Defense. The grant will be used to establish a Toxin Knowledge Base, a resource that will help in the fight against bioterrorism.

IIWeb
Prof. Kambhampati co-Chaired IJCAI-03 Workshop on Information Integration on the Web (IIWeb-03). The purpose of this workshop is to bring together researchers that are working in a variety of areas, such as databases and artificial intelligence, that are all related to the larger problem of integrating information on the Web. The workshop resulted in a Special Issue of IEEE Intelligent Systems on Information Integration on the Web as well as a Sigmod Record invited workshop report. This year, Prof. Davulcu co-Chaired IIWeb-04 in conjunction with the prestigious VLDB Conference and more that 45 researchers attended the IIWeb-04 resulting in a very successful and visible workshop.

OntoMiner
Prof. Davulcu's OntoMiner project aims to develop novel web mining techniques, that detects and exploits regularities within Web sites, to turn them into the so called "Semantic Web" representations. Such representations enable creation of conceptual and perceptual maps of specific areas of interest, as well as operators for analyzing content to allow users to explore the Web of facts and relationships to discover trends and unusual instances.
The term ubiquitous computing, as coined by Mark Weiser, describes a world populated with an invisible, all pervasive collection of dedicated computing devices that are interconnected to share information with each other. These devices have the ability to quietly analyze and respond to sensor data that they collect from their environment. In Weiser’s words, ubiquitous computing “is in the woodwork everywhere,” and is “so natural, that we use it without even thinking about it.”

CUBiC has expanded upon Weiser’s concept by adding a perceptive and cognitive dimension to it. The overall mission of CUBiC is to design and develop a wearable perceptive computer that (1) perceives and experiences its environment in terms of human concepts, and (2) shares that environmental experience with the person who is wearing it. Because this perceptive computer represents information in terms of human concepts, it can readily communicate with a human user at the conceptual level, allowing that user and the computer to solve real-world problems in a collaborative manner. This collaborative approach to problem solving is based on the hypothesis that the best way to solve novel problems (such as those encountered in day-to-day life) is with a balanced technology and user-centric approach, with the focus on the needs of the human user.

CUBiC’s flagship research project, is called iCARE. It aims to enrich the lives of people who are blind by developing visually perceptive wearable computers. A
PDA-sized computer receives a video input stream from a wearable camera (which is mounted in a pair of glasses worn by the user) and communicates what it “sees” through tiny sound emitters in the earpieces of those same glasses. This wearable device can also communicate with the “smart objects” that populate ubiquitous environments. Private and public environments will be increasingly populated with intelligent devices that are capable of communicating wirelessly with other devices. Information about rest rooms, vending machines, signs, kiosks, and even restaurant menus can be communicated wirelessly to this wearable computer.

Based on inputs collected from focus groups of people who are blind, mobility instructors, and relatives of those who are blind, CUBiC identified several types of problems that the participants identified as being a top priority. Based on these problems, Cubic researchers then began research to support the development of the following assistive devices:

- The iCARE Reader allows users to read and study books, and other hardcopy textual material. As part of this project, CUBiC researchers are running experiments in which two people (one blind and one sighted) collaboratively read books. By analyzing the video captured during these reading sessions, CUBiC researchers can study the interactions needed to support collaborative reading, and then define an intuitive protocol for human-computer collaborative reading.

- The iCARE Interaction Assistant facilitates person-to-person interaction between users who are blind and other people that they encounter in their day-to-day life. It recognizes faces, facial expressions, non-verbal communication (such as eye contact and gestures), and human gait.

- The iCARE Information Assistant facilitates access to web sites that were designed to be navigated with mouse clicks. It downloads the content of the target web site, and parses that content based on semantic content. The user indicates what type of information he/she is most interested in, and the Information Assistant essentially “restructures” the web site content to bring the most relevant information close to the user. This relevant content can then be accessed through a serial list of hyperlinks.

- The iCARE Haptic Interface allows persons who are blind to explore their distant environment with their hands. Haptic gloves create virtual objects in the hands of the user, to represent objects within the field of view of a head-mounted camera. The user aims the wearable camera in any direction, and “feels” the objects captured by the camera.

- The iCARE Cognitive Interface allows persons who are blind to exchange information with a wearable computer at the conceptual level, instead of at the data level which is the current paradigm. In order to this, CUBiC researchers are determining what visual concepts are evoked in the minds of sighted people, as they view their environment. One special application is face description, in which the face of a person, (as captured by a wearable camera) is described in terms of salient facial features.

Helping the blind to see is a worthwhile, but daunting, goal. To achieve it, CUBiC Director Sethuraman Panchanathan has assembled an interdisciplinary team of researchers from Computer Science, Disability Studies, Psychology, and University Evaluation, as well two computer science students who are blind, and one psychology student who is blind. Their work is already helping people who are visually impaired, and is destined to have a significant impact on the future direction of ubiquitous computing research.
Karayil is actually a senior in computer science at ASU. He works at Motorola through the CEINT internship program.

The Consortium for Embedded and Inter-Networking Technologies, or CEINT, is a partnership between the Ira A. Fulton School of Engineering, Motorola, and Intel designed to facilitate world-class research as well as prepare a talented and skilled workforce. The consortium receives $1.5 million per year from its members to support its various programs, including the CEINT Internship Program run by Professor David Pheanis.

Interns usually spend multiple semesters with a company working on a specific project. They have two mentors, one from the company and one from ASU. At the end of each semester, the intern writes a paper and makes a presentation about his or her research.

CEINT also provides financial assistance to graduate and undergraduate students interested in embedded systems. CEINT Graduate Research Assistantships help attract top students to ASU. Juniors and senior undergraduates can apply for merit scholarships of $1,500 per semester through the CEINT Scholars program. Once selected, students receive an award each semester if they continue to meet the academic qualifications.

Curriculum development is also essential to CEINT’s mission. Each semester ASU professors compete for grants to develop courses and laboratories focused on embedded systems. Professor Yann-Hang Lee has received grants to develop two new courses.

The first class focuses on embedded systems that must respond in real time, such as those in telecommunications, medical or aerospace applications. From a systems point of view, the class examines how to design more efficient software and architecture, meet deadlines, do scheduling, and generally make a system better. As part of the grant Lee set up a new laboratory with development systems donated by Intel.
“The environment used in the course is very close to what industry uses,” Lee said. “What students learn in this course is a very good selling point. I think they can find a challenging and promising job to start their career.”

The second course explores hardware/software interfaces in embedded systems, with a focus on peripheral interfaces. Students control these hardware components that interact with the environment using software written with high-level language. Motorola helped outfit the development systems in a laboratory for this course, which is intended to complement the one on real-time embedded systems.

Students appear to be pleased with the new classes, each of which has been offered once. One student wrote on evaluation for the hardware/software interface course, “This was one of the best classes I have attended at ASU in terms of educational value.”

Of course, the consortium isn’t all for the students. The creation of new embedded systems technology is a vital part of CEINT activities. The consortium provides one year of seed funding to researchers to perform initial work on a project such that an outside agency or corporation would be interested in it. Although embedded systems are found in many different devices, work funded by CEINT focuses on telecommunications applications.

The work of Assistant Professor Karamvir Chatha is a good example. One of his projects looks at advanced architectures for embedded processors in high performance communication systems.

As embedded processor technology becomes smaller—90 nanometers or less—a communication signal requires more than one clock cycle to travel across the chip. Signal integrity is also an issue, as signals are corrupted due to crosstalk errors during communication. Thus, typical bus-based architectures can’t be utilized for these embedded processors.

One solution is to build a network on a chip. This advanced architecture enables communication within a single embedded processor just as a computer network allows PCs to talk. But the hardware for a network on a chip must be area and power efficient. Chatha has created a prototype of a nanoscale router, and is testing it now.

With the success of both research and academic programs, CEINT has proved what a university-industry partnership can achieve. In March 2003 Intel, Motorola and ASU extended their commitment to CEINT through July 2005. Recruitment of new members is underway. The ultimate goal of all CEINT’s activities is to turn the Phoenix metro area and the state of Arizona into a globally recognized center for embedded systems. It’s an ambitious goal, but the consortium is well on its way.
Arts, Media and Engineering Program connects computer science to performance. “The medium is the message,” Marshall McLuhan, a 1960s pop culture icon, informed the world. By suggesting that how we interact with a medium is more important than any individual message from that medium, McLuhan changed how people thought about communication and technology.

Fast forward to 2004. From wireless internet access to camera phones, technology has made many media more accessible. But the way people interact with some media, particularly art, has not changed drastically. Watching a ballet performance in 2004 is much the same as watching it in 1904. Electronic books are still read left to right and use conventions such as flipping pages.

In the ASU Arts, Media and Engineering Program (AME), researchers explore ways to use technology to enhance media, particularly performance art. Research focuses on three areas: distributed, context-aware sensing and modeling; information representation, retrieval and feedback; and experiential construction.

“By bringing information technology to media artists, we give them a new way to interact with their audience,” said CSE associate professor K. Selcuk Candan.

Candan works on the Intelligent Stage, which is equipped with pressure, motion, and other sensors. The goal is for the stage to react to a dancer’s movements, for example by changing the lighting or displaying an image on a screen in the background. Candan is part of a team creating a computer program to handle such vast amounts of real time data.

In one project Candan, partnering with other CSE and AME researchers, is developing a framework that will allow choreographers and artists to describe how to map the real time data to the performance. He is also developing an index structure into which the real time data from a performance can be fed. The index structure will allow quick access and reveal patterns; for example, is a dancer repeatedly moves his hands in a certain way, that movement might be used as a trigger.

In related research, CSE chair Sethuraman Panchanathan works with dancers in understanding and analyzing movement as part of the Motione project. Dancers have videotaped performances for years, but these records do not express the true three-dimensional range of motion, nor are they searchable. When a dance performance is recorded by 3D motion sensors, researchers want to be able to archive, index and retrieve the performance based on specific gestures. Panchanathan is working to program gesture boundaries into such a computer system, so that the change from one gesture to another determined by the computer is the same as that marked by an artist.

“Artists look at things very differently than engineers. In designing an environment that is human-centered, AME is very enriching for both groups,” Panchanathan said.

Although performance art is a focus of AME, researchers look at other media as well. Assistant professor Hari Sundaram, who has a joint appointment with CSE and AME, studies experiential documents.
Storytelling is an important part of cultures around the world, but the arrival of computers and other technologies has not significantly changed literature. Sundaram uses mathematical models to develop new ways to communicate meaning in books.

He also employs computational models to look at communicating meaning in other types of documents. One project examines ways to encourage people to annotate digital photos, which usually have nonsense filenames. Sundaram hopes to create a system in which after the user tells the computer something about the photo, the computer can express something about the user and photo that the user did not know.

“The humanities end up asking different and profound questions about the models developed in engineering that force us to reevaluate,” Sundaram said. “This questioning by our collaborators broadens our research vision and allows us to construct much more sophisticated models.”

But research is only one component of AME. The program also allows students the opportunity to work and learn in an interdisciplinary environment. The demand for talented workers in multimedia is growing, particularly in entertainment but also in security and medicine. In fall 2004 CSE will begin to offer master’s and Ph.D. degrees with concentrations in Media and Arts. Students will take classes in computer science and the arts as well as courses that bridge the two disciplines.

The Arts, Media and Engineering Program grew out of the Distributed Media and Arts laboratory, which was established in 2001. Although a joint project of the Fulton School of Engineering and Herberger College of Fine Arts, AME also includes researchers from several liberal arts disciplines. Such an interdisciplinary venture has both benefits and challenges.

One of the biggest advantages of AME is that it allows researchers to see their work used in actual performances. Artists and engineers almost speak different languages, however, so researchers have worked to understand one another.

“The arts don’t have the formalism present in science, but the challenge in both arts and science is the communication of meaning,” Sundaram said. “It comes down to the fundamental problem of human communication.”

AME’s motion analysis team has been awarded two prestigious grants in the past year for their groundbreaking work in dance analysis and interactive art tools. The motion analysis team at AME was awarded a National Science Foundation CISE research infrastructure grant. The CISE research infrastructure grant is the first for ASU. The motion analysis team at AME was awarded a National Science Foundation CISE research infrastructure grant in the amount of $1.4 million. The CISE research infrastructure grant is the first for ASU.
**PRISM**

**Partnership for Research in Spatial Modeling**

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.

PRISM leads the modeling and visualization research within InCISE, and brings together researchers from computer science, the arts and design, life sciences, social sciences, and engineering in a unique, interdisciplinary laboratory.

Prism researchers work with large, complex data sets from scanning devices such as 3D laser scanners, optical facial scanners, confocal and scanning probe microscopes, MRI and CAT scanners or other sources of surface and volumetric geometry as x, y and z coordinates. 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.

Research has emphasized creating digital libraries of 3D objects and developing new algorithms and tools that permit 3D spatial searches of man-made and natural objects in databases ranging from Native American ceramics and forensic analysis of bones, to DNA and cellular structures.

Recently PRISM Director, and CSE Affiliate Faculty member, Anshuman Razdan and CSE Professor Gerald Farin received an NSF-ITR grant for “3D Face Authentication for Biometric Access Control.” PRISM is also the technical lead in developing the immersive 3D Visualization capability at ASU called the Decision Center for the New Arizona.

3D digital face scanning is now being investigated for biometric analysis and authentication at PRISM. Supported by a 3 year grant from the National Science Foundation, this project focuses on developing fast and intelligent 3D algorithms to represent, extract, segment, query and match 3D facial shapes.
### Research Awards & Expenditures

#### BAZZI

<table>
<thead>
<tr>
<th>Project Description</th>
<th>Sponsor</th>
<th>Start Date</th>
<th>End Date</th>
<th>Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Answering Complex Questions and Performing Deep Reasoning in Advance Question Answering Systems</td>
<td>DOD-NSA/ARDA</td>
<td>5/3/06-10/31/06</td>
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<td>Knowledge Representation, Reasoning and Problem Solving in a Cellular Domain</td>
<td>NSF</td>
<td>8/1/04-7/31/07</td>
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<td>Reasoning and Planning with Sensing Actions and Their Applications</td>
<td>NSF</td>
<td>4/1/00-3/31/05</td>
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#### BARAL

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<tr>
<td>Enabling the Study of Long-Term Human and Social Dynamics: A Cyberinfrastructure for Archaeology</td>
<td>NSF-SBE</td>
<td>9/15/04-8/31/05</td>
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#### CANDAN

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<tr>
<td>Farin, Qian, Bedard, Birchfield, He, Hill: CISE RI: An Interdisciplinary Research Environment for Motion Analysis</td>
<td>NSF-CISE</td>
<td>8/31/05-8/31/09</td>
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<tr>
<td>Chatha, Ryu, Sundaram: Development of Quality-Adaptive Media-Flow Architectures to Support Sensor Data Management</td>
<td>NSF-CISE</td>
<td>9/15/03-8/31/06</td>
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#### CAM

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<td>Power-Aware Sensor Nodes for Monitoring and Data Aggregation</td>
<td>CEINT</td>
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#### CHATHA

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<tr>
<td>Ganod: A Product Line Approach for the Development of Network Processor Programming Tools</td>
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<td>Panchanthan: Study of Media and Communication Functions on Parallel/Vector</td>
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<td>5/17/02-10/15/03</td>
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<td>Laboratory Development: Capstone Design Project</td>
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<td>Chakrabarti, Chaitali: Memory-Efficient Design of Next Generation</td>
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<td>Lee: Curriculum and Laboratory Development for Advanced Hardware</td>
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<td>Graduate Level Course on Co-Design</td>
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#### Awards and Expenditures

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<thead>
<tr>
<th>Year</th>
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<tr>
<td>2002</td>
<td>$6.1</td>
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<td>2003</td>
<td>$7.3</td>
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<tr>
<td>2004</td>
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In millions

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ARIZONA STATE UNIVERSITY 21
Research expenditures have doubled since 2001, to over $7 Million.

FY 2004 saw a 63 percent increase in research proposals submitted by faculty. CSE faculty have also received a number of highly competitive and prestigious research grants from funding agencies such as National Science Foundation (NSF), National Institute of Health (NIH), DoD, DARPA, Office of Naval Research, NASA, FAA, and Industry (including Intel, Motorola, Microsoft and Boeing).
## Research Awards & Expenditures

### GANNOD

Career: A Two-Tier Approach for the Analysis and Evolution of High-Integrity Software Product Lines  
**NSF-CISE**  
2/1/02-1/31/07  
$176,589

### GUPTA

Wireless Solutions for Smart Sensors Biomedical Applications  
**Wayne State Univ.**  
9/1/00-8/31/05  
$633,295  
Mobility Tolerant Adaptive Multicast Protocols for Ad Hoc Networks  
**NSF-CISE**  
1/1/01-7/31/05  
$264,700

### KAMBHAMPATI

Supporting Continual Planning and Replanning in Metric, Temporal Domains  
**NASA-AMES Research Ctr**  
1/29/01-6/15/04  
$482,779  
Scalable Multi-Objective Planning for Metric Temporal Domains: Heuristics, Algorithms and Tradeoffs  
**NSF**  
7/1/03-6/30/06  
$472,642  
Heuristic Control of Metric/Temporal Planners. An Approach Based on Loosely Coupled Arch  
3/1/01-2/28/04  
$192,351

### LEE

Safety and Certification Approaches for Ethernet-Based Aviation Databases  
**FAA**  
9/26/01-10/14/04  
$360,000  
Collaborative Research: Adaptive Performance and Power Management for Real-Time Systems  
**NSF-CISE**  
9/15/01-8/31/05  
$214,939  
Adaptive Intrusion Detection in NEST  
**Univ. of Mass**  
9/9/02-12/9/05  
$167,901

### Chatha, Gannod

Timing and Race Condition Verification of Real-Time Systems  
**NASA**  
1/1/03-12/31/03  
$167,664

### Collofello

Dynamic QOS Management for Network-Centric Computing Environment  
**Boeing Aero Division-Seattle**  
1/1/04-12/31/04  
$108,662

### Tsai

Testing Embedded Systems and Software  
**NSF**  
1/1/02-12/31/04  
$100,000  
Software and Hardware Integration in Microprocessor Systems Course  
**CEINT**  
1/15/03-6/30/04  
$52,082

### LIU

Intelligent Driving Data Analysis  
**Motorola**  
1/1/03-12/31/03  
$19,549

### Banks

Collaborative Project: Development of an Undergraduate Data Mining Course  
**NSF**  
1/1/03-12/31/04  
$52,720  
Synthesis of Streaming Data from Multiple Sensors via Embedded Data Extraction  
**CEINT**  
1/1/04-12/31/04  
$52,102  
Modeling Driving Data  
**Motorola**  
5/16/04-8/16/04  
$13,605  
Data Mining Approach for Detecting Egeria in Digital Imagery  
**San Francisco State**  
1/1/02-12/31/03  
$101,918

### NIELSON

**McCartney, Razdan**  
Observations and Modeling of Orographic cumulus Development Using Digital Imaging and Data Cataloguing  
**NSF-GEO**  
6/1/04-5/31/06  
$156,678  
Applications of Volume Modeling Techniques to Dynamic Containment Regions for Naval Applications  
**DOD - Office of Naval Research**  
3/15/02-12/31/03  
$100,501

### Submitted Proposals

![Bar chart showing 2002, 2003, and 2004 expenditures](chart.png)

*31% increase in 2004 ($13.0 in FY02; $26.0 in FY 03; $33.8 in FY 04)
**PANCHANATHAN**

*Kumar, Newfeld*
Computational Analysis of Gene Expression Pattern Images
HHS-NIH-NHGRI 1/1/03-6/30/06 $2,439,206

*Candan, Black, Hedgpeth*
ITR: iLEARN: IT-Enabled Intelligent and Ubiquitous Access to Education Opportunities for Blind Students
NSF 9/1/03-8/31/08 $1,224,212

*Qian, Rikakis, McBeth, He*
CISE RI: An Interdisciplinary Research Environment for Motion Analysis
NSF 9/15/04-8/31/09 $1,021,339

*Kumar*
Design of Bioinformatic Database for Functional Evolutionary Footprints in Multigene Families
NSF 7/1/00-6/30/04 $677,398

*Reisslein*
Video Traces: Create Disseminate, Analyze
NSF-CISE 9/15/02-8/31/06 $733,308

*Gannod, Golshani, Huey, Lee*
Concentration Track in Embedded Systems
NSF 9/1/01-8/31/05 $490,139

*Candan, Hedgpeth, Donderler*
PPD-FRI: Ubiquitous Environment to Facilitate Engineering Education for Blind Persons
NSF-HER 10/1/03-9/30/05 $172,538

*Anderson, Crittenden, Fernando*
MEASURES: A Proof of Concept Demonstration
NSF-ENG 8/15/04-7/31/05 $91,071

**RYU**

*Sigma-Watch: Adaptive Multi-Resolution Performance Monitoring and Tuning of Large-Scale Networked Embedded Systems*
CEINT 1/1/04-12/31/04 $65,448

*Integrated Tool for Performance Monitoring Visualization and Tuning*
CEINT 1/1/03-12/31/03 $63,900

**SARJOUGHIAN**

*Arrowsmith*
Landuse and Landscape in the Mediterranean Basin
NSF 8/15/04-7/31/09 $1,499,996

*DEVS as a Formal Modeling and Simulation Framework for Scalable Enterprise Design*
UofA 9/1/01-12/31/04 $1,430,493

*Mittellmann*
GOALI: Process Control Approaches to Supply Chain Management in Semiconductor
NSF 8/1/04-9/30/07 $120,000

A Scalable Approach to Model Validation
INTEL 7/1/03-6/30/06 $70,000

**SEN**

*Hardware-Software Co-Design of Network Process System*
Motorola Labs 8/15/03-8/14/06 $116,257

*Multi-Application Partitioning System (MAPS) - A Design Tool for Hardware/Software Partitioning of Network Processor Systems*
CEINT 1/1/04-12/31/04 $86,357

*Ritcha*
Hardware-Software Co-Design of Network Processors and Packet Classification
CEINT 1/1/03-12/31/03 $81,357

Case for An Inexpensive, Highly Available ISCSI Storage Solution
CEINT 5/16/03-5/15/04 $81,000

Introduction of a New Course on Network Processing and Programming
CEINT 1/1/04-12/31/04 $56,395

Introduction of a New Course on Network Processing and Programming
CEINT 5/17/02-8/30/03 $51,395
### SYROTIUK

**Collaborative Research: Characterizing Protocol Interaction in News: A Network Environment Wireless State Service**  
**NSF-CISE**  
6/1/03-5/31/06  
$221,324

**ITR: MERIT: A Formal Framework for Systematic Protocol Assessment**  
**Univ. of Texas at Dallas**  
10/1/02-9/30/05  
$215,542

**META-MAC Protocols: A New Dimension to Adaption in Medium Access Control**  
**Univ. of Texas at Dallas**  
9/1/02-8/31/05  
$135,159

### TSAI

**Adaptive End-to-End Interpretation Test and Evaluation Using Scenarios, Object-Oriented Test Frameworks and Verification Patterns**  
**Univ. of South Florida**  
12/1/02-9/30/03  
$447,885

**Web Application Development Tool and Testing Framework**  
**Hitachi Software Engineering**  
10/1/99-3/31/05  
$350,000

**TR: TADE - Timeless-Assured Design Environment for Distributed Object-Based Embedded Computing**  
**Univ. of California-Irvine**  
$54,000

**Configurable Business Logic Software**  
**Intel**  
$45,000

### URBAN, S.

**Dietrich**  
Active Declarative Rules for Developing Distributed Multi-Tiered Applications  
**NSF**  
10/99-9/03  
$435,000

**XUE**  
Robustness and Survivability Issues in Wireless Ad Hoc Networks  
**DOD-ARMY-ARO**  
$255,734

**Numerical Algorithms for Location Problems Arising in Wireless Sensor Networks and Other Applications**  
**NSF-CISE**  
$200,000

**ITR Collaborative Research: Fault Tolerance in WDM Optical Networks: Multifailure Recovery and Multilayer Survivability**  
**NSF-CISE**  
$162,500

**ROSEN ET: Robustness Issues in Wireless Sensor Networks**  
**CEINT**  
$68,166

**IEEE Workshop on High Performance Switching and Routing in Phoenix April 2004**  
**CEINT**  
$2,000

### YAU

**Davulcu**  
Adaptable Situation-Aware Secure Service-Based Systems  
**DOD-ONR**  
7/5/04-7/1/06  
$1,011,194

**Gupta**  
Adaptive Middleware Services for Situation-Aware Communication in Ubiquitous Computing  
**NSF-CISE**  
9/15/01-8/31/05  
$736,000

**Trustworthy Data Sharing and Management for Collaborative Pervasive Computing Applications**  
**NSF-CISE**  
9/15/04-8/31/07  
$320,000

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The department has built upon ASU President Crow’s blueprint for the New American University and has endeavored to rapidly achieve world-class ranking.
The Department of Computer Science and Engineering offers two degree programs at the undergraduate level. The Computer Systems Engineering degree emphasizes the design and production of hardware and software components comprising a computer system. This degree program includes courses on computer organization and architecture, system programming, operating systems, microprocessor system design and digital hardware design. Although the program addresses numerous application areas, its emphasis on embedded systems sets it apart. The Consortium for Embedded and Internetworking Technologies, a partnership of ASU, Intel and Motorola, sponsors curriculum development projects that enable faculty to develop new and innovative courses such as “Software Engineering for Embedded Systems” and “Testing Embedded Systems,” which the students can take as technical electives. The consortium also provides internship opportunities through which students can earn credit toward their degree.

The Computer Science degree provides a solid background in computing principles and enables the student to customize their degree with 24 hours of computer science and technical electives. More than 30 senior level courses are offered within the department as options to students. Students may also select courses in mathematics, other engineering areas, and biology to meet department requirements. This degree also offers a software engineering concentration consisting of four courses in which students have an opportunity to master software development techniques while working in teams.

Undergraduate research opportunities exist for students in both degree programs. The department provides scholarship funds to encourage these activities, which can culminate in an undergraduate thesis through the university’s Barrett Honors College.
The Department of Computer Science and Engineering offers two degree programs at the Master’s level. The Master of Science in Computer Science (MS) is a research-oriented degree targeted at students with undergraduate education in the science of computation. It provides advanced course work and emphasizes student research as well as offers numerous opportunities for interdisciplinary study. Within this degree, a Concentration in Arts, Media, and Engineering (AME) has recently been established in collaboration with faculty in the Department of Electrical Engineering and the Herberger College of Fine Arts.

The Master of Computer Science (MCS) is an advanced degree targeted at students with undergraduate education in related disciplines who can best profit from further breadth and background. The MCS also provides an opportunity for students employed in industry to seek a breadth of advanced education in computer science. Admission to both degrees is highly competitive.

The graduate level course work emphasizes research topics of current interest, bringing students to the research frontier in areas such as embedded systems; information assurance and computer security; multimedia and the arts; database systems; algorithm design and analysis; computational biology; sensor and ad-hoc networks; data mining; information integration; optical networks; and computer aided-geometric design. Independent study in research is encouraged as part of the MS program. The Consortium for Embedded and Internetworking Technologies, a partnership of ASU, Intel and Motorola, supports work that applies academic research to industrial problems in embedded systems and networks. This is one of the many ways in which the MS and MCS programs combine academic excellence and relevance to industry.

The Doctor of Philosophy (Ph.D.) degree 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. Indeed, while computers have become essential tools in these areas, the depth of interaction of fundamental computer science with each is rapidly evolving.

The program here strives to reflect the depth and breadth of computer science as a science, an art, an engineering discipline, and primarily as a creative human endeavor. Strong collaborations with the six other engineering departments in the Fulton School; the Department of Mathematics and Statistics; the School of Life Sciences and the Arizona Biodesign Institute; the William P. Carey School of Business; the Herberger College of Fine Arts; the Consortium for Embedded and Internetworking Technologies (CEINT); and the Translational Genomics Research Institute (TGen), provide a wealth of experience for our doctoral students. Recently, the interdisciplinary strength of the program has been enhanced by the introduction of an option to concentrate on studies and research in Arts, Media, and Engineering (AME) within the Ph.D. degree.
Although most of the grants to the department are for research in computing, some support the development of new courses. Here are a recent few.

**Suzanne Dietrich** and **Susan Urban** have received two NSF grants to improve undergraduate courses in the area of databases. The most recent grant (NSF DUE-9980417) allowed them to develop a new course, “Advanced Database Concepts.” This course covers object-oriented conceptual modeling, object-oriented databases, object-relational databases, and coverage of databases and the web. Dietrich and Urban have also created an accompanying textbook, *An Advanced Course in Database Systems: Beyond Relational Databases*, to be published by Prentice Hall. Funding from a Microsoft Curriculum grant will allow extension of this work to advanced features in the SQL Server.

With their first NSF grant (DUE 9451489), Dietrich and Urban added a laboratory project to CSE 412, “Database Management.” The project allows students to acquire practical experience using a commercial database product and developing a database application as well as practice cooperative learning techniques.

**Huan Liu** has developed the undergraduate course “Introduction to Data Mining” through a grant from the National Science Foundation (DUE 023144). The class covers a variety of basic data mining concepts, including data preparation and feature selection, association rules, scalability, and spatial and sequence mining. It also includes two student projects that use data from microarrays, tools that indicate the level of expression of different genes.

An undergraduate course on “Testing on Embedded Systems and Software” (PIs are W. T. Tsai and Y. H. Lee) is sponsored by NSF-CCLI, with NSF funding $100K and ASU matching of $100K from Jan. 2002 to Dec. 2003. This course trains students on modern testing techniques including verification patterns, software safety, reliability models and estimations, testing object-oriented software, regression testing, testing timing, dependency analysis, and test coverage. Several V&V standards from DoD, NASA and FAA are consulted to develop the materials. This course is further supplemented by industrial guest speakers to give realistic context.

Several CSE professors, including **Sethuraman Panchanathan**, **Gerald Gannod**, **Ben Huey**, **Yann-Hang Lee**, and **David Pheanis**, are working together to create a concentration track in embedded systems through a National Science Foundation Educational Innovation Grant (EIA-0122600). The track is intended to combine important aspects of academic content with the latest in research and industrial practices. The core material—not currently found in traditional computer engineering programs—provides content that industry consultants have specifically identified as critical for engineers to function productively in the area of embedded systems. The Consortium for Embedded and Internetworking Technologies (CEINT) has been essential in the design and development of this program.
Recent Books by CSE Faculty

Knowledge Representation, Reasoning and Declarative Problem Solving
Chitta Baral

Introduction to Programming Languages: Principles, C, C++, Scheme, and Prolog
Yinong Chen

Understanding Relational Database Query Languages
Suzanne W. Dietrich

Curves and Surfaces for CAGD: A Practical Guide (5th Ed.)
Gerald Farin

Fundamentals of Mobile and Pervasive Computing
S. K. S. Gupta (with F. Adelstein, G. Richard, and L. Schwiebert)

An Advanced Course in Database Systems: Beyond Relational Databases
Suzanne W. Dietrich and Susan D. Urban

Affiliated and Adjunct Faculty

Nong Ye, Ph.D.
Ph.D. Information fusion and intelligent systems; production planning and control; agile manufacturing; advanced interfacing technology; information and system engineering

Anshuman Razdan, Ph.D.
Department of Computer Science and Engineering. Geometric design; visualization; computer graphics

Tim E. Lindquist, Ph.D.

Sudhir Kumar, Ph.D.
Ph.D., Penn State School of Life Sciences. Evolutionary and developmental bioinformatics with computational focus on developing novel algorithms, software tools, and bioinformatics analysis of large scale databases

Forouzan Golshani, Ph.D.
PhD Computer Science, Warwick University, UK, 1982. Digital Multimedia and Virtual Environments

Chitta Baral
Professor
E-mail: chitta@asu.edu
Phone: 480-727-6047
Office: BY 512
Ph.D. University of Maryland, 1991
Chitta Baral has been at ASU since 1999.

Principal Areas of Teaching and Research:
Baral’s main research interests are threefold: (i) developing language constructs and surrounding building block results for representing knowledge and reasoning with it, (ii) developing a theory of actions and their impact on an environment, and using it in autonomous agent design, planning, and diagnosis, (iii) Using (i) and (ii) in modeling cell behavior, and reasoning with it to explain observations, and develop plan of actions so as to alter pathways that could suggest therapeutic procedures.

Honors and Distinctions:
■ NSF CAREER Award, 1995
■ Member, senior program committee, AAAI 2002 and 2004
■ Best paper awards at CoopIS 2000 and ATAL 1999
■ Team advisor of robot teams that placed 1st (1997) and 3rd (1996) in AAAI robot contests

Selected Publications:
Rida A. Bazzi
Associate Professor
E-mail: bazzi@asu.edu
Phone: 480-965-2796
Office: BY 430
Ph.D. Georgia Institute of Technology, 1994

Rida Bazzi joined ASU in August 1996. Prior to that he was an assistant professor at Florida International University, Miami, FL. In 1995 he was a senior consultant at I-cube, Cambridge, MA.

Principal Areas of Teaching and Research:
Bazzi’s research focuses on distributed computing, software engineering for distributed systems, fault-tolerance algorithms, and computer vision.

Honors and Distinctions:
NSF CAREER Award

Selected Publications:

Tom Boyd
Lecturer
E-mail: Thomas.A.Boyd@asu.edu
Phone: 480-965-3689
Office: BY 416
Ph.D. Arizona State University, 2001

Tom Boyd joined ASU in 2001. Before that he worked for more than 30 years in industries such as banking, telephony, manufacturing and insurance adjudication systems. He has had experiences in software and hardware design, development, sales, support and management.

Principal Areas of Teaching and Research:
Boyd’s research interests include distributed computing, computing communities, process migration, software decay and failure prevention. He currently focuses on teaching computer science topics and researching software failure prevention.

Selected Publications:

Hasan Çam
Assistant Professor
E-mail: hasan.cam@asu.edu
Phone: 480-727-6348
Office: BY 596
Ph.D. Purdue University, 1992

Hasan Cam joined ASU in 2001.

Principal Areas of Teaching and Research:
Çam’s research interests include wireless cellular and sensor networks, computer networks, low-power processor architectures, and interconnection networks.

Honors and Distinctions:
Editorial Board Member, “Computer Communications” and “International Journal of Communications Systems”

Selected Publications:
Kasim Selçuk Candan
Associate Professor
E-mail: candan@asu.edu
Phone: 480-965-2770
Office: BY 588
Ph.D. University of Maryland, 1997

Kasim Candan joined ASU in 1997.

Principal Areas of Teaching and Research:
Candan’s research focuses on database systems; storage/querying/retrieval of multimedia and Web data; integration of database and Internet technologies; heterogeneous information integration and retrieval; distributed multimedia systems; and multimedia document authoring and presentation.

Honors and Distinctions:
- NSF ITR Medium grant, iLearn: IT-enabled Ubiquitous Access to Educational Opportunities for Blind Individuals, 2003-2008
- NSF PPD-FRI grant, Ubiquitous Environment to Facilitate Engineering Education for Blind Persons, 2003-2005
- NSF grant, Replication of Heterogeneous Multimedia Data, 2001-2004

Selected Publications:


Karamvir S. Chatha
Assistant Professor
E-mail: karamvir.chatha@asu.edu
Phone: 480-727-7850
Office: BY 592
Ph.D. University of Cincinnati, 2001

Karamvir Chatha joined ASU in 2001.

Principal Areas of Teaching and Research:
Chatha's research interests are in system-level design methodologies and computer-aided design tools for embedded and VLSI systems. In particular, he has focused on hardware-software co-synthesis and low power design of System-on-Chip (SoC) architectures. He is currently engaged in development of novel computer-aided performance evaluation and design tools for Network-on-Chip based SoC architectures. His research is funded by NSF and Consortium for Embedded and Inter-Networking Technologies (CEINT).

Honors and Distinctions:
- Best Paper Award for “Hardware Software Co-design for Dynamically Re-configurable Architectures” at the Field Programmable Logic and Applications Conference, 1999

Selected Publications:


Yinong Chen
Lecturer
E-mail: yinong.chen@asu.edu
Phone: 480-965-2769
Office: BY 414
Ph.D.: University of Karlsruhe, Germany, 1993

Yinong Chen joined ASU in 2001. From 1994 to 2000, he was a lecturer and senior lecturer in the School of Computer Science at the University of the Witwatersrand, Johannesburg, and was the founder and leader of the Research Program for Highly Dependable Systems there. He performed postdoctoral research at the University of Karlsruhe and at LAAS-CNRS in France. Chen has (co-) authored three textbooks, one research book, and more than 50 research papers.

Principal Areas of Teaching and Research:
Chen’s primary research interests are fault-tolerant computing, software testing, distributed systems, communication protocols and networks.

Honors and Distinctions:
- 1994 European Commission’s Human Capital and Mobility (HCM) research fellowship award

Selected Publications:


Charles J. Colbourn
Professor
E-mail: charles.colbourn@asu.edu
Phone: 480-727-6631
Office: BY 444
Ph.D.: University of Toronto, 1980

Charlie Colbourn joined ASU in 2001. He has authored more than 250 refereed journal papers and is funded by NSERC Canada, NSF and ARO. Colbourn has written three books and supervised 15 Ph.D. students.

Principal Areas of Teaching and Research:
Colbourn’s research employs combinatorial mathematics and combinatorial algorithms to address problems in diverse areas including computational molecular biology, optical communications (optical, wireless, wireline), secondary storage systems, software testing, and experimental design. He develops deep combinatorial results with real applications.

Honors and Distinctions:
- Euler Medal for Lifetime Achievement in Research, Institute for Combinatorics and Its Applications, 2004
- Outstanding Teaching Award, University of Waterloo, 1995
- Keynote/Invited speaker in China, Japan, Korea, Australia, New Zealand, Chile, Brazil, Mexico, England, Italy, United States, Germany, Czech Republic, Finland, Greece, Israel, Iran, and Canada
- Editor of Networks; Journal of Combinatorial Designs; Journal of Combinatorial Theory (A); Designs, Codes and Cryptography; and Discrete Mathematics

Selected Publications:

James S. Collofello
Professor and Associate Chair for Undergraduate Programs
E-mail: james.collofello@asu.edu
Phone: 480-965-3733
Office: BY 552
Ph.D. Northwestern University, 1978

James Collofello joined ASU in 1979 and was instrumental in the start of the computer science degree program. For his entire career he has maintained a close relationship with software development firms in the state working on joint research projects, developing industry training programs and serving as a software engineering consultant.

Principal Areas of Teaching and Research:
Professor Collofello’s research interests lie in the software engineering area. Within software engineering, his primary emphasis is software process modeling, software quality assurance and software project management. He is also very active in software engineering education projects and outreach projects to local high schools.

Selected Publications:

Partha Dasgupta
Associate Professor
E-mail: partha.dasgupta@asu.edu
Phone: 480-965-5533
Office: BY 428
Ph.D. State University of New York at Stony Brook, 1984

Partha Dasgupta joined ASU in 1991. Prior to then he had an appointment with Georgia Tech. He held visiting faculty positions at New York University in 1993-1994 and 1998-1999. NSF, DARPA and other sources have consistently funded Dasgupta’s research.

Principal Areas of Teaching and Research:
Dasgupta’s work focuses on distributed operating systems, security, networking and distributed computing.

Honors and Distinctions:
- Department of Computer Science and Engineering Outstanding Teaching Award, 1998
- Outstanding Paper Award, Int’l Conf. on Distributed Computing Systems, 1995

Selected Publications:
Hasan Davulcu
Assistant Professor
E-mail: hasan.davulcu@asu.edu
Phone: 480-965-6385
Office: BY 564
Ph.D. State University of New York at Stony Brook, 2002

Hasan Davulcu joined ASU in August 2002. Prior to joining ASU, Davulcu performed research and development in intelligent Web agent technologies at a technology start-up.

Principal Areas of Teaching and Research:
Davulcu's main research interest is using ontology-directed data mining techniques for structuring and organizing unstructured data, such as Web, text documents and gene sequences. Semantic Web enables information to be machine processable so that machines can distinguish between words and meanings and "do the right thing" with the data on the Web. Davulcu's research focuses on (i) mining ontologies from Web documents (ii) ontology-directed annotation of web sources (iii) enriching and maintaining ontologies and (iv) techniques for merging ontologies to achieve information integration. This ontology-directed Web mining approach enables rapid creation of domain-specific search engines and extraction of structured and organized knowledge bases from heterogeneous documents and data sources. One current project aims to establish a Toxin Knowledge Base, a resource for the fight against bioterrorism.

Honors and Distinctions:
■ U.S. Army Medical Research Institute of Infectious Disease and Department of Defense grant, “A System for Discovering Biologically Engineered Threats by Knowledge Base Driven Mining of Toxin Data” (subcontract from BNL), 2003-2005

Selected Publications:


Joseph DeLibero
Lecturer
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Phone: 480-965-1493
Office: BY 516
M.S. Purdue University, 1972

Joseph DeLibero joined ASU in 1991 and teaches lower division and service courses. Before coming to ASU he had extensive teaching experience and leadership positions in education and corporate training. He is a member of IEEE, ACM and ASEE.

Principal Areas of Teaching and Research:
DeLibero’s interests are in lower division education and how to make technology and its implications more relevant to students. As advisor to the Windows Interest Group (WIG), Joe supports several hundred students each year. WIG provides regular presentations and opportunity for hands-on activities for topics in the current curriculum. Microsoft has funneled more than $200,000 in kind to these students.

Honors and Distinctions:
■ Department of Computer Science and Engineering Outstanding Teaching Award, 2000
■ Associated Students of ASU Centennial Professorship Award Finalist, 2001; Nominee, 2002
■ ASU Upward Bound Program Honors, 2000
■ Scottsdale Community College Adjunct Faculty of the Year, 1999-2000
■ Fellowship in Biochemistry, Massachusetts Institute of Technology, 1972

Selected Publications:

DeLibero has also created PowerPoint presentations for:

Suzanne W. Dietrich
Associate Professor
E-mail: dietrich@asu.edu
Phone: 480-965-2786
Office: BY 482
Ph.D. State University of New York at Stony Brook, 1987

Suzanne W. Dietrich joined ASU in 1987. Her educational and research efforts have been supported by grants from the National Science Foundation. She is a member of ACM, SIGMOD, and SIGCSE.

Principal Areas of Teaching and Research:
Dietrich’s areas of teaching and research include the educational, theoretical and practical aspects of databases. Currently, her research is investigating the design and evaluation of an active integration rule language and the development of a middle-tier, rule-processing framework that uses events and active rules for the integration of enterprise applications. Her educational efforts are focused on the ongoing development of the WinRDBI educational tool for understanding relational database query languages and the development of a national model for an advanced database course for undergraduates, including object-oriented conceptual data models (EER and UML), object-oriented databases, object-relational databases and databases and the web (JDBC and XML).

Honors and Distinctions:
■ Department of Computer Science and Engineering Outstanding Teaching Award, 2001
■ Office of Naval Research Graduate Fellowship, 1983-1987
■ Valdecitarian, State University of New York at Stony Brook, 1983

Selected Publications:
Leonard Faltz  
Associate Professor  
E-mail: faltz@asu.edu  
Phone: 480-965-1581  
Office: BY 418  
Ph.D. University of California, Berkeley, 1977  

Faltz joined ASU in 1979 and the Department of Computer Science and Engineering in 1985. His educational background is in mathematics and linguistics.

**Principal Areas of Teaching and Research:**  
Faltz’s research examines the formal aspects of natural language morphology, syntax, semantics, and lexicon.

**Selected Publications:**  
L. Faltz and E. L. Keenan, Boolean Semantics of natural language morphology, syntax, semantics, and lexicon.


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Gerald E. Farin  
Professor  
E-mail: farin@asu.edu  
Phone: 480-965-5142  
Office: BY 346  
Ph.D. Technical University of Braunschweig, 1979  

Gerald Farin joined ASU in 1987. He has also worked at the University of Utah and spent four years in CAD/CAM development at Mercedes-Benz, Stuttgart, Germany. He has taught CAGD tutorials worldwide. Farin has given over 100 invited lectures worldwide.

**Principal Areas of Teaching and Research:**  
Farin’s primary research interest is in Computer Aided Geometric Design, an interdisciplinary area concerned with computational aspects of modeling 3D objects.

**Honors and Distinctions:**  
- CAGD conference honoree, Athens, Greece, 1994  
- Executive board, PRISM, 1995-present  
- Internal scientific advisory board, Arizona Alzheimer Research Center, 1996-present  
- Department of Computer Science and Engineering Outstanding Teaching Award, 1999  
- Chair, SIAM special interest group on Geometric Design, 2002-present  
- Schloss Dagstuhl award for achievements in CAGD, 2002  
- Scientific advisory board, Mathematics for key technologies, Berlin, 2003-present  
- Editor-in-chief of the journal Computer Aided Geometric Design, published by Elsevier  
- Editorial board member, Springer-Verlag series on Mathematics and Visualization

**Selected Publications:**  

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Nicholas V. Findler  
Professor Emeritus  
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Phone: 480-965-5834  
Office: BY 558  
Ph.D. Budapest University of Technical Sciences, 1956  

Nicholas Findler joined ASU as a research professor in 1982. Since 1996 he has been Professor Emeritus of Computer Science and Engineering, and Mathematics, as well as Director Emeritus of the Artificial Intelligence Lab. Findler has authored or co-authored 220+ refereed articles and written/edited/contributed to 45 books.

**Principal Areas of Research:**  
Findler’s research interests include: artificial intelligence; automatic analysis and synthesis of strategies; simulation of human cognitive behavior; man-machine systems; pattern recognition; self-adaptive systems; computational linguistics; information, fact and knowledge retrieval; multi-agent systems; and complex systems.

**Honors and Distinctions:**  
- Medal of Merit from the Rector of the University of Helsinki, Finland, 1980  
- Consultant at the RAND Corporation, Santa Monica, California, 1981  
- Member, USIA Advisory Committee for Selecting Senior Fulbright Scholars, 1982-90  
- Participant in the U.S.-India Exchange of Scientists Program, 1984  
- Recognition of Service Award, Council for International Exchange of Scientists, 1985  
- Member of Editorial Boards and contributor to several encyclopaedias on computing  
- Centennial Award of Merit from the ASU President for organizing the Nobel Symposium, 1986  
- Fellow, British Computer Society, 1986  
- Senior Member, IEEE, 1986  
- ACM Recognition of Service Award, 1986  
- Special Award by the South-East Asia Computer Confederation, 1986  
- Member, Nominating Committee for the Kyoto Prize, Inamori Foundation, Japan, 1987-Life-long Honorary Member of the Computer and Automation Research Institute, Hungarian Academy of Sciences, 1989-  
- Referee for the NATO Scientific Exchange Programs, 1990-  
- NATO lectures in Estonia, Latvia, Lithuania, Poland and Czech Republic, 1996  
- Award and Golden Diploma for Life-long Achievements, Technical Univ. of Budapest, 2003  
- Visited 119 countries for lecturing and conferences
Gerald C. Gannod  
Assistant Professor  
E-mail: ggannod@asu.edu  
Phone: 480-727-4475  
Office: BY 470  
Ph.D. Michigan State University, 1998

Gerald Gannod joined ASU in 1998.

Principal Areas of Research and Teaching:  
Gannod’s research interests fall generally in the area of software engineering and specifically in the areas of software product lines, reverse engineering, formal methods for software analysis and design, and software for embedded systems. In addition to performing basic research, he also has interests in technology transfer, especially in the area of tools and methodologies that can assist practitioners in developing high-integrity and high-consequence systems (e.g., systems whose failure results in catastrophic loss).

Honors and Distinctions:  
- NSF CAREER Award, 2002-2007  
- Motorola Summer Faculty Fellowship, Motorola Computer Group, 2000  
- NASA/ASEE Summer Faculty Fellowship, NASA/Cal Tech Jet Propulsion Laboratory, 1999  
- NASA Graduate Student Researchers Program Fellowship, 1994-97

Selected Publications:  

Sandeep K. S. Gupta  
Associate Professor  
E-mail: sandeep.gupta@asu.edu  
Phone: 480-965-3806  
Office: BY 522  
Ph.D. Ohio State University, 1995

Sandeep K. S. Gupta joined ASU in 2001, before which he held teaching and/or research positions at Duke University, Ohio University, and Colorado State University.

Principal Areas of Teaching and Research:  
Gupta’s research interests include mobile and pervasive computing (location management, data caching, context-aware computing, middleware etc.), and wireless sensor networking (energy-efficient and reliable data dissemination and aggregation protocols, security, biomedical applications, etc.).

Honors and Distinctions:  
- NSF ITR/SII grant, Wireless Networking Solutions for Smart Sensor Biomedical Applications (with Wayne State University), 2000-2004  

Selected Publications:  

Ben M. Huey  
Associate Professor and Associate Dean for Planning and Administration  
E-mail: ben.huey@asu.edu  
Phone: 480-727-7770  
Office: BY 640  
Ph.D. University of Arizona, 1975

Ben Huey joined ASU in 1979, and since 1984 has served the department as assistant chair, acting chair and associate chair. In 1999 he became associate dean for Planning and Administration in Ira A. Fulton School of Engineering. Huey is a member of ASEE, Eta Kappa Nu, Upsilon Pi Epsilon and Alpha Chi.

Principal Areas of Teaching and Research:  
Huey’s interests include language-based models for architecture, silicon compilation, design verification and automatic test generation.

Honors and Distinctions:  
- Institute of Electrical and Electronics Engineers, Senior Member  
- IEEE EAB Accreditation Policies Committee, 2003-present  
- IEEE Phoenix Section Executive Committee, 1981-1989; Chair 1988  
- IEEE Computer Society, Phoenix Section, President, 1981; Vice President, 1980; Treasurer, 1982  
- ABET Computing Accreditation Commission, 2000-present; Executive Committee 2000-2003; Chair 2001-2002  
- Computer Science Accreditation Board, Visiting Team Chair, CSAC Commissioner, 1993-present; Visitor 1990-1992  
- ASU Corporate Leaders Program Professor of the Year, 1994

Selected Publications:  
Subbarao Kambhampati
Professor
E-mail: rao@asu.edu
Phone: 480-965-0113
Office: BY 560
Ph.D. University of Maryland, 1989

Subbarao Kambhampati joined ASU in 1991.

Principal Areas of Teaching and Research:
Kambhampati’s research interests include artificial intelligence (automated planning, scheduling, speedup learning, CSP, SAT, etc.) and databases (data/information integration, query planning, statistics gathering, Web services, etc.)

Honors and Distinctions:
■ NSF Young Investigator, 1994
■ College of Engineering and Applied Sciences Teaching Excellence Award, 2001-2002

Selected Publications:


Goran Konjevod
Assistant Professor
E-mail: goran@asu.edu
Phone: 480-965-2783
Office: BY 450
Ph.D. Carnegie Mellon University, 2000

Goran Konjevod has been at ASU since 2000.

Principal Areas of Teaching and Research:
Konjevod’s main research interests are theoretical computer science and discrete mathematics, in particular the design of efficient algorithms for difficult computational problems. He has also been collaborating with the Los Alamos National Laboratory since 1998 on research in transportation and simulation science.

Honors and Distinctions:
■ NSF CCR-Theory of Computing Grant for research on Set-covering problems in combinatorial optimization, 2002

Selected Publications:


Yann-Hang Lee
Professor
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Phone: 480-727-7507
Office: BY 594
Ph.D. University of Michigan, Ann Arbor, 1985

Yann-Hang Lee joined ASU in 2000. Before then he was a professor at the University of Florida-Gainesville.

Principal Areas of Teaching and Research:
Lee’s research interests have been centered in real-time embedded systems over the past few years. Real-time embedded systems have been one of the foci of growing interest in science and engineering disciplines. They have emerged as intelligent controllers in many large-scale infrastructure networks and coordinated subsystems on which our society and daily lives depend. Lee’s research course is to explore scientific principles and technology to renew the development approaches for real-time embedded systems of a broad range of applications, including effective analysis, design, and implementation methods to meet the system requirements and application characteristics.

Honors and Distinctions:

Selected Publications:


William E. Lewis  
Professor, Chief Information Officer and Vice Provost  
E-mail: william.lewis@asu.edu  
Phone: 480-965-9059  
Office: CPCOM 462  
Ph.D. Northwestern University, 1966  

Bill Lewis joined ASU in 1965 and became the founding chair of the Department of Computer Science in the fall of 1980. He assumed the role of Associate Dean of the College of Engineering and Applied Sciences in the fall of 1985. In July of 1993 he accepted the position of Vice Provost for Information Technology. Dr. Lewis assumed his current position of Chief Information Officer and Vice Provost in January of 2003 and continues to hold the rank of Professor in the Department of Computer Science and Engineering.

Principal Areas of Teaching and Research: Lewis’ primary research interests are computer science; operations research; performance evaluation and advanced systems concepts; and intra- and internets.

Honors and Distinctions:
- Outstanding Teacher Award, Alpha Pi Mu, Arizona State Chapter, 1976
- Editor of COGWHEEL, the Alpha Pi Mu national publication, 1970-1976
- Arizona State University Faculty Senate, 1968-1973
- NSF grant, “Enabling and Extending the Arizona Infrastructure for Advanced Networking and Applications Research Via the vBNS” (co-PI), 1998-2000
- U.S. West Foundation grant, “US West/NEA Teacher Network” (co-PI), 1997-2001
- Best Western grant, “Best Western International, Inc.” internship program, 1997-98

Huan Liu  
Associate Professor  
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Phone: 480-727-7349  
Office: BY 566  
Ph.D. University of Southern California, 1989

Huan Liu joined ASU in 2000 after conducting research in Telecom (Telstra) Australia Research labs and teaching at the National University of Singapore. He has extensive experience in research and development.

Principal Areas of Teaching and Research: Liu’s research and teaching focuses on machine learning (ensemble methods, active learning, rule extraction, feature selection and discretization, subspace clustering), data mining (data quality and integration, stream data reduction, bioinformatics, algorithm scaling-up), and real world applications (CRM, Egeria detection in imagery, intelligent driving data analysis, recommender systems).

Honors and Distinctions:
- IEEE, Senior Member since 1997
- Conference Co-chair, 1993, Austrasia Joint Conference on AI, Melbourne, Australia
- Program Co-chair, 2000, Conference of Pacific-Asia Knowledge Discovery and Data Mining (PAKDD), Japan
- Program Co-chair, 2005, Conference of PAKDD, Vietnam
- Editorial Board/Associate Editor, Informatica, 1999; KAIS, 2003; IJCSA, 2004; USIT, 2004
- Advisory Board, Handbook of Data Mining, 2003; Encyclopedia of Data Warehousing and Data Mining, 2004

Selected Publications:

Donald S. Miller  
Associate Professor  
E-mail: donald.miller@asu.edu  
Phone: 480-965-5935  
Office: BY 436  
Ph.D. University of Southern California, 1972

Donald Miller has been at ASU since 1981. From 1977 to 1981 he was an Assistant Professor of Computer Science at Washington State University. Prior to that he worked in industry in California. He has received research and equipment funding from IBM, Motorola, Honeywell, NSF and Sun, and has written more than 50 research papers.

Principal Areas of Teaching and Research: Miller’s primary research interest is distributed single address space operating systems. His work focuses on operating system internals and related computer architecture and computer network issues.

Honors and Distinctions:
- Recent grants include funding for setting up an Embedded Linux course sequence 2001 and 2002 and for research into OS and Network Software for Embedded Systems in 2001.

Selected Publications:
- R. Fagten, A. Skousen and D. Miller, “Reduction of Software Development Costs under the Sombrero Distributed Single Address Space Operating System,” Int’l Conf. on Parallel and Distributed Processing Techniques and Applications (PDPTA2002).
- A. Skousen and D. Miller, ”The Sombrero Single Address Space Operating System Prototype A Testbed for Evaluating Distributed Persistent System Concepts and Implementation,” Int’l Conf. on Parallel and Distributed Processing Techniques and Applications (PDPTA2000).
Mutsumi Nakamura
Lecturer
E-mail: mutsumi@asu.edu
Phone: 480-965-1757
Office: BY 520
Ph.D. University of Texas at Arlington, 2001

Mutsumi Nakamura joined ASU in 2000.

Principal Areas of Teaching and Research:
Nakamura’s research focuses on active and web-based database systems. She has taught courses in data structures and algorithms, automata theory, and Java programming language.

Honors and Distinctions:
■ ASU Student Affairs Honors, 2002

Selected Publications:


Faye Navabi
Lecturer
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Phone: 480-965-3228
Office: BY 518
M.S. University of Louisiana at Lafayette, 1991

Faye Navabi joined ASU as a lecturer in 1997. Before then she served as a full time faculty at the University of Louisiana at Monroe for four years.

Principal Areas of Teaching and Research:
Navabi is interested in improving the undergraduate program curriculum. She works on developing strategies to help students succeed in introductory courses and to retain students in the program.

Honors and Distinctions:
■ ASU SUN award, 2001
■ Ira A. Fulton CEAS Teaching Excellence Award Nominee, 2004

Selected Publications:
Faye Navabi, Mary R Anderson-Rowland, James S. Collofello, Debra Banks “Increasing the Probability of Success in the First Computer Science Course” ASEE/IEEE Frontiers in Education Conference (FIE 2004) T2H-16


F. Navabi, tech. report 90-4-8, CACS.

Gregory M. Nielson
Professor
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Office: BY 344
Ph.D. University of Utah, 1970

Gregory Nielson joined ASU in the Department of Mathematics in 1970; he moved to CSE in 1985. Before coming to ASU he worked as a visiting research scientist at Lawrence Livermore National Laboratory.

Principal Areas of Teaching and Research:
Nielson's research interests include computer graphics, scientific visualization, computer aided geometric design, and scientific computing.

Honors and Distinctions:
■ IEEE Meritorious Service Award, 1993
■ CS Golden Core Member, 1994
■ IEEE Outstanding Contribution Award, 1995
■ John Gregory Memorial Award in Geometric Modeling, 1996
■ ASU Mentor Award, 2000

Selected Publications:


Pearse O’Grady joined the ASU faculty in 1977. Prior to that he worked for McDonnell-Douglas Astronautics Company in Houston, Texas and the Defense Communications Agency in Virginia and taught at the University of Maryland in College Park, MD. He was a NASA-ASEE Faculty Fellow at Goddard Space Flight Center and spent a year at University College, Cork, Ireland, as a Fulbright Lecturer.

Principal Areas of Teaching and Research: O’Grady’s teaching and research interests are in the areas of computer architecture, parallel processing, and continuous system simulation.

Honors and Distinctions:
- Faculty Recognition Award, CEAS–Student Outreach and Retention Programs (SORP), 2002
- Recognition for contributing in a significant way to students, ASU Office of the Vice President for Student Affairs, 2000

Selected Publications:


Sethuraman Panchanathan has been at ASU since 1997. He is currently professor and chair of the Department of Computer Science and Engineering as well the director of the Institute for Computing and Information Sciences and Engineering (InCISE) and director of the Center for Cognitive Ubiquitous Computing (CUBIC).

Principal Areas of Teaching and Research: Panchanathan’s research focuses on ubiquitous multimedia computing; visual computing and communications; media processor designs; content-based and compressed domain indexing and retrieval of images and video; multimedia communication, face/gait analysis and recognition; genomic signal processing; and ubiquitous computing environments for blind persons.

Honors and Distinctions:
- Fellow, Institute of Electrical and Electronics Engineers (IEEE), 2001
- Fellow, Society for Photo-Optical Instrumentation Engineers (SPIE), 1999
- Academic Collaboration Award, Disability Resources for Students, ASU, 2004

Selected Publications:


Andréa W. Richa
Associate Professor
E-mail: aricha@asu.edu
Phone: 480-965-7555
Office: BY 440
Ph.D. Carnegie Mellon University, 1998

Andréa Richa joined ASU in 1998. Her seminal work on distributed hash tables for peer-to-peer network scenarios has been cited by more than 115 academic journals and conferences in the past four years.

Principal Areas of Teaching and Research:
Richa’s research interests lie primarily in the design and analysis of algorithms for distributed, wireless, and mobile networks. For example, some of her previous work focuses on algorithms related to routing, load balancing, name lookup, and data tracking in a distributed environment. She is also interested in algorithms in general (e.g., graph algorithms, randomized algorithms, approximation algorithms), combinatorial optimization, distributed resource allocation, and parallel network architectures.

Honors and Distinctions:
■ NSF CAREER Award, 2000
■ Guest Editor, ACM Baltzer Journal on Mobile Networks and Applications (MONET), Special Issue on Foundations of Mobile Computing, 2004
■ Program Chair, ACM DIALM-POMC Joint Workshop on Foundations of Mobile Computing, 2003

Selected Publications:

Kyung Dong Ryu
Assistant Professor
E-mail: kdryu@asu.edu
Phone: 480-727-6592
Office: BY 590
Ph.D. University of Maryland, 2001

Kyung Dong Ryu joined ASU in 2001. As a Ph.D. candidate, Ryu worked at IBM TJ Watson Research Center as a research intern. He currently directs the scalable computing systems lab, which consists of several graduate research assistants researching peer-to-peer computing and high-performance Grid computing.

Principal Areas of Teaching and Research:
Ryu’s interests lie in operating systems, distributed systems, networked embedded systems, and high performance computing systems. His funded projects include Sigma-Watch: embedded system performance tool and ARIA: quality-adaptive media-flow architecture.

Honors and Distinctions:
■ Graduated with honors from Seoul Nat’l University in Korea
■ Scholarships from IBM Korea and the Il-Joo Scholarship Foundation

Selected Publications:

Hessam S. Sarjoughian
Assistant Professor
E-mail: hessam@asu.edu
Phone: 480-965-3983
Office: BY 476
Ph.D. University of Arizona, 1995

Hessam Sarjoughian joined ASU in fall 2001. He is co-director of the Arizona Center for Integrative Modeling & Simulation. His recent research has been funded by NSF, Lockheed Martin, and Intel. Sarjoughian’s professional experience has been with Honeywell and IBM.

Principal Areas of Teaching and Research:
Sarjoughian’s research aims to develop a framework supporting specification of composable and scaleable simulation models in collaborative settings. The research strands enabling this framework are (i) multi-formalism modeling, (ii) distributed simulation, and (iii) software architecture. His educational goal is to help establish Modeling & Simulation into a discipline.

Honors and Distinctions:
■ Jointly established the Arizona Center for Integrative Modeling & Simulation (ACIMS) in 2001.
■ Area Editor [Methodology], SIMULATION: Transactions of The Society for Modeling & Simulation International.

Selected Publications:
Arunabha (Arun) Sen  
Associate Professor and Associate Chair for Graduate Programs and Research  
E-mail: arunabha.sen@asu.edu  
Phone: 480-965-3190  
Office: BY 554  
Ph.D. University of South Carolina, 1987  

Arunabha Sen joined ASU in 1987.  

Principal Areas of Teaching and Research:  
Sen’s teaching focuses on networks and algorithms. His research interests are in resource optimization problems in telecommunication networks. He also works on physical design of VLSI circuits, hardware-software co-design and network security.  

Selected Publications:  

Hari Sundaram  
Assistant Professor  
E-mail: hari.sundaram@asu.edu  
Phone: 480-965-3196  
Office: BY 398  
Ph.D. Columbia University, 2002  

Hari Sundaram joined ASU in 2002. He holds a joint appointment with the department of Computer Science and Engineering and the Arts, Media and Engineering Program (AME).  

Principal Areas of Teaching and Research:  
Sundaram is interested in problems relating to multimedia, including segmentation, databases, structure discovery and summarization. His current work focuses on the development of computational models for experiential systems. He is also interested in investigating relationships between natural language, vision, audition and comprehension, as well as representational and algorithmic approximations for real-time multimedia content analysis.  

Honors and Distinctions:  
■ Associate editor, ACM Transactions on Multimedia Computing, Communications and Applications (TOMCCAP)  
■ Eliahu I. Jury Award for best Ph.D. dissertation, 2002  

Selected Publications:  

Violet R. Syrotiuk  
Assistant Professor  
E-mail: syrotiuk@asu.edu  
Phone: 480-965-7034  
Office: BY 434  
Ph.D. University of Waterloo (Canada) 1992  

Violet Syrotiuk joined ASU in the Fall of 2002. The MARS Lab, under her leadership, is conducting research on three NSF funded projects and a DARPA subcontract.  

Principal Areas of Teaching and Research:  
Syrotiuk’s research interests are in mobile ad hoc networks including adaptive medium access control protocols (NSF/ANIR), scalable protocol assessment (NSF/ITR), characterizing protocol interaction (NSF/ANIR), energy-efficient cross-layer design (General Dynamics), and dynamic spectrum management (Raytheon).  

Honors and Distinctions:  
■ Editorial board, Computer Networks  

Selected Publications:  
W. T. Tsai
Professor
E-mail: wtsai@asu.edu
Phone: 480-727-6921
Office: BY 404
Ph.D. University of California, Berkeley, 1985

Wei-Tek Tsai has been at ASU since 2000.

Principal Areas of Teaching and Research:
Tsai's main research interests are software testing, software engineering, and embedded system development.

Honors and Distinctions:
■ Associate Editor, IEEE Transactions on Knowledge and Data Engineering, 2002-present
■ IEEE Computer Society Distinguished Lecturer, 1990-1993

Selected Publications:

Renee Turban
Lecturer
E-mail: renee.turban@asu.edu
Phone: 480-965-8267
Office: BY 474
M.S. Rensselaer Polytechnic Institute, 2000

Turban has been a lecturer at ASU since 2002. She teaches undergraduate courses and also serves as a faculty advisor for the Women in Computer Science group at ASU.

Honors and Distinctions:
■ CSE Instructor of the Year Award, 2001
■ ASU Women in Science and Engineering Investments award for contributions to the program, 2002
■ American Indian Science and Engineering Society award for contributions to their summer engineering camp, 2003

Selected Publications:

Joseph E. Urban
Professor
E-mail: urban@asu.edu
Phone: 480-965-3374
Office: BY 480
Ph.D. University of Louisiana at Lafayette, 1977

Joseph E. Urban worked at the University of Miami, the University of Southwestern Louisiana, and part-time at the University of South Carolina while with the US Army Signal Center before joining ASU in YEAR. He currently serves the Ira A. Fulton School of Engineering as Inclusive Learning Communities program director in addition to being a CSE professor. Urban leads the Software Process, Environment, and Automation Research Group. He has authored more than ninety technical papers and has supervised the development of seven software specification languages.

Principal Areas of Teaching and Research:
Urban's research areas include software engineering, computer languages, data engineering, and distributed computing.

Honors and Distinctions:
■ IEEE Computer Society's Meritorious and Distinguished Service Awards
■ Distinguished Professor Award, University of Louisiana at Lafayette
■ Association for Computing Machinery Doctoral Forum Award, 1977-1978
■ Chair of the IEEE Computer Society's Technical Committee on Computer Languages
■ Computer Entrepreneur Award Committee chair
■ International Federation for Information Processing (IFIP) Technical Committee (TC) 2 - Software: Theory and Practice representative
■ Vice chair, IEEE Computer Society Press Activities Board
■ Chair, IEEE Annals of the History of Computing Editor in Chief Search Committee
■ Editorial board, International Journal of Software Engineering & Knowledge Engineering
■ Chair, IEEE Computer Society Technical Committee on Distributed Processing
■ IEEE Computer Society Board of Governors Chair
■ Chair, IEEE Computer Society Awards Committee
■ IEEE Computer Society representative on the IEEE Publications Board and the Technical Activities Board's Finance Committee
■ IEEE Computer Society's second and first vice president responsible for conferences and tutorials
Susan D. Urban
Professor
E-mail: s.urban@asu.edu
Phone: 480-965-2794
Office: BY 472
Ph.D. University of Louisiana at Lafayette, 1987

Susan D. Urban joined ASU in 1989. Before then she was at the University of Miami.

Principal Areas of Teaching and Research:
Urban's research interests include object-oriented data modeling; object-oriented and object-relational database systems; event and rule processing for enterprise application integration; and distributed object computing.

Honors and Distinctions:
- Member, Microsoft Research University Relations Advisory Board, 2003
- Department of Computer Science and Engineering Outstanding Teaching Award, 2001

Selected Publications:

Guoliang Xue
Associate Professor
E-mail: xue@asu.edu
Phone: 480-965-6218
Office: BY 442
Ph.D. University of Minnesota, 1991

Guoliang Xue joined ASU as an associate professor in 2001. He previously worked at the University of Vermont and completed his postdoctoral training at the Army High Performance Computing Research Center. He has published 57 journal papers and 53 conference papers.

Principal Areas of Teaching and Research:
Xue’s research interests are in algorithms, bioinformatics and computer networks.

Honors and Distinctions:
- NSF Research Initiation Award, 1994
- NSF-ITR award, 2003
- Associate Editor, Journal of Global Optimization
- Associate Editor, IEEE Transactions on Circuits and Systems-I

Selected Publications:

Stephen S. Yau
Professor
E-mail: yau@asu.edu
Phone: 480-965-2647
Office: BY 488
Ph.D. University of Illinois, Urbana-Champaign, 1961

Stephen S. Yau joined ASU in 1994 as professor and chair of the CSE department. He was professor and chair of the Department of Computer and Information Sciences at the University of Florida from 1988 to 1994. In 1961, he joined the faculty of Northwestern University, Evanston, Illinois, and later became the Walter P. Murphy Professor and Chair of the Department of Electrical Engineering and Computer Science at Northwestern University. He has published more than 170 journal and conference papers, and his research has been supported by NSF, AFOSR, ONR, ARO, and companies including Hitachi and Fujitsu.

Principal Areas of Teaching and Research:
Yau’s research focuses on software engineering, distributed computing systems, middleware, information assurance and security.

Honors and Distinctions:
- IEEE Computer Society Tsutomu Kanai Award, 2002
- Special Award of the American Federation for Inspired Leadership of the World Computer Conference 89, 1990
- Silver Core Award of International Federation for Information Processing, 1989
- IEEE Computer Society Outstanding Contribution Award, 1985

Selected Publications:


New Faculty 04-05

Fall 2004

Debra Calliss
Ph.D., Computer Science, Arizona State University;
Programming Languages, Software Engineering, Computer Science Education

Seungchan Kim, Ph.D.
Ph.D, Electrical Engineering, Texas A&M University
Incorporate mathematical, statistical, computational and engineering tools into the study of biological systems, focusing on cancer biology and other biological systems, Molecular classification of cancers and understanding and mathematical modeling of genetic regulatory networks

Baoxin Li
Ph.D., University of Maryland, College Park
Multimedia processing, computer vision, statistical inference
Classes:  CSE408 Multimedia Information Systems  (Fall)
          CSE509 Digital Video Processing  (Spring)

Peter Wonka
Ph.D., Vienna University of Technology;
computer graphics, real-time rendering, procedural modeling, architectural modeling,
visualization for urban planning
Planned classes:  355 Introduction to Theoretical Computer Science
                 591 Real-time Rendering and Procedural Modeling

Spring 2005

Sarma Vrudhula
Ph.D., University of Southern California;
VLSI CAD, Digital Systems Testing, Design of Low Power VLSI Systems,
High Performance Asynchronous Digital Systems
Department of Computer Science and Engineering

Successfully Passed

ABET Accreditation

We are pleased to announce that both the Computer Science and Computer Systems Engineering degrees successfully passed accreditation by ABET Accreditation Board for Engineering and Technology. In particular our Computer Systems Engineering degree was accredited through the ABET EAC (Engineering Accreditation Commission) and our Computer Science degree was accredited through the ABET CAC (Computing Accreditation Commission). Both programs were extensively evaluated by separate external review teams in November 2003. The Computer Systems Engineering program was evaluated by Richard Case (a successful industry consultant) and the Computer Science program was evaluated by a team lead by Stu Zweben (Chair of the Computer Science Department at Ohio State University).

No deficiency, weakness, or concerns were found. During their visit to ASU the teams met with students, faculty, department chair, engineering dean, and other school and university representatives. Both teams concluded that our programs met all criteria for accreditation and were given the maximum possible new accreditation period.

The program's strengths include a diverse faculty, fine facilities, and a well thought out curriculum that is reviewed and updated on a regular basis. The program has good relations with industry in the greater Phoenix area. There is regular feedback from constituencies, including alumni and employers of graduates, and this feedback impacts future curricular developments. The new university president, Michael Crow, started a campaign to improve the university and increase its visibility with an emphasis on science and engineering.