Dear Colleagues, Alumni, Friends, and Parents,

Welcome to the 2008-2009 CSE Annual Report, in which you will read about our progress in the year. The global economic recession has affected many academic institutions in the U.S. Fortunately, in this critical time, the State of Ohio has protected the higher education by not cutting the budgets of Ohio’s public universities. This munificence allowed CSE to continue hiring new faculty and maintain our standards in many other activities. Let me highlight several accomplishments to be presented in this report.

- The Ph.D. program in Computer Engineering was ranked in the top 20 by *US News and World Report 2010 Edition List of America’s Best Graduate Schools*. This reflects CSE’s continuous improvement of quality and reputation of experimental oriented research and education activities.

- Two more faculty members have been named *IEEE Fellows*, Anish Arora and Xiaodong Zhang. This increases the Fellow memberships in CSE to 8, plus two *ACM fellows* and one *AAAI Fellow*.

- The department established two Fellowships named for two retired professors Mile Liu and Balakrishnan Chandrasekaran. They were founding members of the department and have made significant contributions in their technical fields.

- We welcome to the Department two new assistant professors: Luis Rademacher and Christopher Stewart. Luis works in the area of theory and algorithms, and Chris’s interests are in systems.

- We have expanded the Industrial Advisory Committee, adding another two well established CSE alums: Matt Desch (CIS BA’80), Chairman and CEO of Iridium Satellite LLC, and Michael Fortin (CSE Ph.D.’91), Distinguished Engineer, Microsoft.

- The Ph.D. production continues its high momentum with a total of 26 graduates last year.

- Finally I would like to give my congratulations to Prasun Sinha on his promotion to the rank of Associate Professor with tenure.

Increasingly we have more interactions with our alums via the Buckeye Blog newsletters, CSE’s Facebook page, and many mutual visits. I hope you enjoy reading this annual report. We look forward to hearing more comments and suggestions from you. We will report more accomplishments of the CSE family in the next issue in 2010.

Cordially yours,

Xiaodong Zhang
Robert M. Critchfield Professor and Chair
Department of Computer Science and Engineering
The Ohio State University
Mission Statement

The Department of Computer Science and Engineering will impact the information age as a national leader in computing research and education.

We will prepare computing graduates who are highly sought after, productive, and well-respected for their work, and who contribute to new developments in computing.

We will give students in other disciplines an appropriate foundation in computing for their education, research, and experiences after graduation, consistent with computing’s increasingly fundamental role in society.

In our areas of research focus, we will contribute key ideas to the development of the computing basis of the information age, advancing the state of the art for the benefit of society, the State of Ohio, and The Ohio State University.

We will work with key academic partners within and outside of OSU, and with key industrial partners, in pursuit of our research and educational endeavors.
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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

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Faculty Recognitions and Awards

Faculty Members Recognized for Innovation
It has long been known within the OSU-CSE community that Drs. Tim Long (left in picture) and Bruce Weide (right) bring more than just smarts to their classrooms. This year, the state of Ohio recognized the fact. The Ohio Board of Regents named them “Faculty Innovators,” along with eight other Ohio educators, in this first recognition of faculty and teams who have introduced “digital course materials in the classroom that enrich learning and make college textbooks more affordable for their students.”

“Making college more affordable, including leveraging technology to reduce out-of-pocket textbook costs for students, is a priority of the University System of Ohio,” said Chancellor Fingerhut. “We commend the awardees for developing outstanding, affordable materials for their students and want to share their 21st century ideas and practices with others across the System.”

The awardees used a variety of means to save their students money. In some instances, textbooks were replaced completely while others used online sources to share class notes, audio files, music recordings, and video clips. Some taught classes in the use of online technology.

In The Ohio State University’s introductory Computer Science and Engineering courses (a three-quarter sequence taken by about 250 students per year), Long and Weide put all of the course materials online where students can access everything using a web browser. If they wish, students can still buy paper copies of the two textbooks (of which professors Weide and Long are the authors), but this purchase is optional because the books and all other course materials are also available online. There is no cost to students for course materials, and this innovation is made possible by using web-based technology.

This award is not the first recognition Drs. Long and Weide have received for their teaching skills. In 2000, they received the International Institute of Electrical and Electronics Engineers (IEEE) Computer Science & Engineering Undergraduate Teaching Award. Dr. Long received The Ohio State University Alumni Award for Distinguished Teaching. Bruce Weide has received the CSE Teaching Award several times.

New Scholarship Fund Honors Retiring Professor

The Department of Computer Science and Engineering is pleased to announce the creation of a new graduate student scholarship fund named The Mike Liu Scholarship Fund. This fund was conceived to honor Dr. Ming-Tsan (Mike) Liu as he retires this year. The fund was formerly established with gifts from CSE alumni and Dr. Liu’s colleagues within OSU and the research communities, as well relatives and long time friends and admirers. Dr. Lui and this scholarship were given special recognition at the 13th Annual CSE Awards Banquet on May 13th, 2009.

The purpose of the scholarship fund is to recognize, encourage, and assist outstanding graduate students in Computer Science and Engineering at The Ohio State University who demonstrate promise in contributing much to their technical field. The scholarship winners will be chosen for their academic merit and research achievements with no regard to their financial need. Recipients will be named annually, typically at the annual awards banquet in the spring.
Research of Zhang and Advisee Gains Real-World Prominence

The research of Song Jiang (pictured on right) and Xiaodong Zhang (pictured left) was adopted by MySQL, one of the foremost database systems, supporting numerous applications all over the world. The LIRS (Low Inter-Reference Recency Set) caching algorithm, originally published in the ACM Conference of SIGMETRICS in 2002, entitled “LIRS: an Efficient Low Inter-Reference Recency Set Replacement to Improve Buffer Cache Performance,” is such an integral part MySQL’s most recent version 5.1 (released in November 2008), it is called “Jiang-Zhang LIRS Caching Algorithm” in the MySQL documentation.

MySQL is the world’s most widely used open source database software, with over 100 million copies of its software downloaded or distributed throughout its history. This relational database management system has more than 11 million installations. The LIRS caching algorithm serves as a critical component in the buffer pool management in MySQL, which can maximize the hit ratio of data accesses in the DRAM memory to significantly improve the database performance.

Many of the world’s largest and fastest-growing organizations use MySQL to save time and money powering their high-volume Web sites, critical business systems, and packaged software including industry leaders such as Yahoo!, Alcatel-Lucent, Google, Nokia, YouTube, Wikipedia, and Booking.com. Several high-traffic web sites (including Flickr, Facebook, Wikipedia, Google, Nokia and YouTube) use MySQL for its data storage and logging of user data.

“When our paper was published 7 years ago, we were very confident that the LIRS caching algorithm had fundamentally addressed the limits of the commonly used LRU caching algorithm. Since then, this work has continuously shown its transformational impact on memory management in major software systems on different types of computing platforms, first in operating systems, and then in database systems. For example, a system implementation based LIRS called Clock-Pro was first reported in a USENIX’05 paper, then was quickly adopted in the NetBSD operating system and patched in Linux kernels, and in other data-processing servers.” said Professor Xiaodong Zhang who joined Ohio State in 2006 as the Robert M. Critchfield Professor in Engineering and Department Chair of Computer Science and Engineering. “We feel very happy and rewarding to see the influential contributions of our research work to MySQL that provides indispensable services to millions of important data transactions in the human society.”

The original research and article were done while Song Jiang was Professor Zhang’s Ph.D. student at the College of William and Mary. Dr. Jiang is now an Assistant Professor in the Department of Electrical and Computer Engineering at Wayne State University in Detroit, Michigan. He received a National Science Foundation CAREER Award this year.

Dr. Rountev Received IBM Award

Associate Professor Atanas (Nasko) Rountev has been awarded IBM Software Quality Innovation Faculty Award. According to IBM, proposals for this program are invited from a few, carefully selected leaders in the field. These proposals are judged on technical merit and potential collaboration opportunities between faculty members and researchers at IBM and elsewhere.

Rountev’s project, titled “BIGFOOT: Searching for the Elusive Small Memory Footprint for Java Applications,” was chosen under the research focus on static and dynamic program analysis for identifying software quality problems. His work considers the excessive memory usage which is common in real-world Java applications. Such memory bloat can create serious scalability and performance problems for large-scale Java software systems. The goal of the project is to allow programmers to explore multiple semantically-equivalent implementation choices for a particular software design, leading to smaller and healthier memory footprint.

Nasko, who joined CSE in 2002, was recently promoted to Associate Professor. He leads the Program Analyses and Software Tools (PRESTO) Research Group and his interests generally
encompass software engineering, programming languages, and compilers focusing on static and
dynamic program analysis; component-based software; parallel and distributed software; high-
performance computing; software understanding and evolution; software testing. He received his
PhD from Rutgers University in 2002 under the mentorship of Prof. Barbara Ryder.

IBM is well known and well appreciated for its work with academia through their IBM University
Research & Collaboration programs. Information may be found at their website.

Two CSE Professors Elected as IEEE Fellows

The Institute of Electrical and Electronics Engineers (IEEE) Board of Directors elected Professors
Anish Arora and Xiaodong Zhang on November 12, 2008. The grade of IEEE Fellow is awarded to
recognize extraordinary accomplishments to its members world-wide as one of the Institute’s most
prestigious honors. The total number of IEEE Fellows selected in any one year is limited to no more
than 0.1% of the total IEEE memberships.

Dr. Anish Arora received this recognition for his contributions to scalability and stabilization of
networks of sensors and computers. Dr. Arora joined CSE in 1992 and quickly became a strong
member of the networking research group. Leading the Dependable Distributed and Networked
System Group a description of his recent work in People-Centric Wireless Sensor Networking may
be found in the CSE 2007-2008 Annual Report.

IEEE honored Dr. Xiaodong Zhang, CSE Chairperson and Robert M. Critchfield Professor
in Engineering, for his contributions to computer memory systems. A member of both the
Networking and System Groups, Dr. Zhang came to CSE from the College of William and Mary in
2006 and has made exceptional impact in the growth of the Department’s research productivity
and academic excellence. As Director of the High Performance Computing and Software
Laboratory, his research covers a wide spectrum in the areas of high performance and distributed
systems, a common thread being a focus on fast data accesses and resource sharing with cost-
and energy-efficient management at different levels of the memory and storage hierarchies in
computer, distributed, and Internet systems.

The CSE Department at Ohio State has a total of 8 IEEE Fellows, 2 ACM Fellows and one AAAI
Fellow.

Dual Best Papers

CSE researchers gave the selection committee for the IEEE Cluster a very difficult task and they
resorted to compromise; two papers tied for best paper! The papers are “Efficient One-Copy
MPI Shared Memory Communication in Virtual Machines” by Wei Huang (CSE alum Ph.D., ’08),
Matthew Koop (CSE Grad Student), and Dhabaleswar K. Panda (CSE Faculty) and “Are Non-
Blocking Networks Really Needed for High-End-Computing Workloads?” by Pavan Balaji (CSE alum
PhD ’04) and Narayan Desai (Argonne National Laboratory), P. Sadayappan (CSE Faculty), and
Mohammed Islam (CSE Grad Student).

The IEEE Cluster conference is a forum for fellow cluster researchers to present and discuss
new directions, opportunities and ideas that will shape Cluster Computing. The department also
received a best paper award at Cluster 2007 entitled “High Performance Virtual Machine Migration
with RDMA over Modern Interconnects” by Wei Huang, Qi Gao, Jiuxing Liu and Dhabaleswar
K.Panda.

Four Faculty Receive 2009 Lumley Awards

Drs. Anish Arora, Atanas Rountev, Prasun Sinha, and Dong Xuan were awarded Ohio State
College of Engineering Lumley Research Awards. The Lumley Research Award was established to
promote and enhance research within the OSU - CoE and is given to a select group of outstanding
researchers who have shown exceptional activity and success pursuing knowledge within their
fields. A total of 27 Lumleys have been earned by CSE faculty members.
Professor Anish Arora, a new IEEE Fellow as previously mentioned, joined OSU-CSE in 1992 after receiving his Ph.D. in University of Texas at Austin. This is his second Lumley Award.

The College recognition for Atanas Rountev follows closely on the heels of achieving his NSF CAREER award. Atanas’s research interests are in software engineering and programming languages. In particular, he is working in static and dynamic program analysis, software understanding and evolution, software testing, component-based software, distributed software, aspect-oriented software, and high-performance computing. Prior to his arrival in Columbus in 2002, he received his Ph.D. and Masters degrees from Rutgers University.

Another Lumley and CAREER recipient is Dr. Prasun Sinha. Prior to joining CSE, Sinha took a detour from academia into industry, spending two years at Bell Labs in New Jersey. He received his PhD from the University of Illinois at Urbana-Champaign in 2001 and his MS degree in Computer Science from Michigan State University in 1997. His research focuses on the design of wireless network architectures and protocols, with emphasis on mesh networks, wireless LANs, and sensor networks.

Dong Xuan, is the fourth Lumley awardee. Dong received his B.S. and M.S. degrees in Electronic Engineering from Shanghai Jiao Tong University (SJTU), China, in 1990 and 1993, and Ph.D. degree in Computer Engineering from Texas A&M University in 2001. Xuan also won an NSF CAREER grant in 2006. His research interests include distributed computing, computer networks and cyberspace security.

**Student Awards**

**LISA ’09 Best Student Paper**

PhD candidate Xiaoning Ding was awarded the Best Student Paper at the 22nd USENIX Annual Large Installation System Administration Conference (LISA 2008). The paper, entitled “Automatic Software Fault Diagnosis by Exploiting Application Signatures”, is in collaboration with IBM T.J. Watson Research Center and his advisor, CSE Professor and Chair Xiaodong Zhang. The paper proposes an automatic approach to diagnose application faults. It represents a promising step toward automating application problem solving, and could lead to significant time and cost savings in enterprise IT environments.

Xiaoning’s research includes operating, storage and distributed systems. He received his undergraduate degree in Computer Science from Northwestern Polytechnic Institute. He received the departmental graduate research award in 2008.

**Undergrad Receives Recognition**

Chad Sowald received a First Place in the Denman Undergraduate Research Forum for this work in “File Harvest: Targeted, Legal Crawling & Downloading of Online Media”. The project aimed to combine the benefits of two disparate forms of online information gathering: crawling and downloading. While there are plenty of tools available today that do either one or the other quite well, combining the two into a single integrated application was novel.

Chad, from Centerville, Ohio, was mentored through his work by Dr. Paul Sivilotti. Dr. Sivilotti said, “Working with Chad was a real pleasure. He is self-motivated and energetic, so he was always coming up with new ideas for how to improve his project.”

The Denman Undergraduate Research Forum was created to showcase outstanding student research and encourage all undergraduates to participate in research as a value-added element of their education. Originally conceived in 1996, it is a cooperative effort of The Ohio State University’s Honors & Scholars Center, The Undergraduate Research Office, and The Office of Research.
Alumni Highlights

Alum Named IEEE Fellow

CSE is very pleased to learn one of its alumni, Dr. David S. Ebert, has been named an IEEE Fellow. IEEE bestowed this honor in for his for contributions to data visualization and its applications.

Dr. Ebert is a Buckeye through and through receiving not just his PhD. from OSU in 1991, but also his Masters ('87) and his BS ('86), graduating with the last Summa Cum Laude. Dr. Rick Parent mentored David through his studies. Currently, David is a Professor of Electrical and Computer Engineering at Purdue University. Purdue also recognizes him as a University Faculty Scholar, a program that “recognizes outstanding faculty members on accelerated path for academic distinction.” Within the School of Electrical and Computer Engineering, he is Director of the PURVAC: Purdue University Regional Visualization and Analytics Center and PURPL: Purdue University Rendering and Perceptualization Lab. His research interests range over the topics of visual analytics, computer graphics, visualization, mobile graphics, modeling natural phenomena, photorealistic and non-photorealistic rendering. He was recently elected into the IEEE Board of Governors.

According to their website, IEEE honors accomplishments that have contributed importantly to the advancement or application of engineering, science and technology, bringing the realization of significant value to society. The IEEE Fellows are an elite group from around the globe, they are looked to for guidance and leadership as the world of electrical and electronic technology continues to evolve. Every year only 0.1% of the IEEE members are elected Fellows, the highest rank within the IEEE. Currently, about 2% of the membership holds the Fellow rank.

2008 COE Distinguished Alumnus

Dr. M. Tamer Özsu was named a Distinguished Alumnus by the Ohio State College of Engineering. This is one of the highest honors an alumnus may receive from the College. The “Distinguished Alumnus” Awards were established in 1954. Their purpose is to recognize distinguished achievement in one's profession by reason of significant inventions, important research or design, administrative leadership, or genius in production.

Dr. Özsu is currently a professor of Computer Science and Director of the David R. Cheriton School of Computer Science at the University of Waterloo, and holds a University Research Chair at Waterloo which he joined in 2000 as a Faculty Research Fellow. Prior to this position, he occupied a McCalla Research Professorship from 1993-1994 at the University of Alberta where he was a faculty member between 1984 and 2000. Tamer, as he is informally known, is a fellow of the Association for Computing Machinery (ACM), a senior member of the Institute of Electrical and Electronics Engineers (IEEE), and a member of Sigma Xi. He was awarded the ACM SIGMOD Contributions Award in 2006.

He earned a Master of Science degree from The Ohio State University in 1981 and his PhD in 1983 in Computer and Information Science and Bachelors and Master of Science degrees in Industrial Engineering (1974 and 1978) from the Middle East Technical University.

Özsu's current research focuses on Internet-scale data distribution that emphasizes stream data management, peer-to-peer databases and Web data management; multimedia data management, concentrating on similarity-based retrieval of time series and trajectory data; and the integration of database and information retrieval technologies, focusing on XML query processing and optimization.
Alumnus Named ACM Fellow

Dr. Ozsu was also elected as a Fellow of the Association for Computing Machinery (ACM). This is the ACM’s most prestigious honor, reserved for its distinguished members who have made outstanding contributions in research and information technology. A candidate’s accomplishments are expected to place him or her among the top 1% of ACM members.

Alum named Microsoft New Faculty Fellow

Susan Hohenberger (BS, 2000) (pictured right) is one of five young faculty members named as Microsoft Research New Faculty Fellows 2008. Susan was chosen from a pool of approximately 100 nominees. She achieved this recognition for her work in cryptography. This award gives her $200,000 as well as access to other Microsoft resources, such as software, invitations to conferences, and engagements with Microsoft Research. This award is intended, according to Microsoft’s web site, to give “recipients considerable freedom in planning the focus of their academic research. The funds can be applied to a wide variety of uses to pursue novel research.”

Dr. Hohenberger was recognized as a talented research prospect early in her academic career. Dr. Bruce Weide invited her to join the Europa Undergraduate Research Forum before the end of the introductory course sequence. She then worked on a number of projects, including a senior thesis that used genetic algorithms to help solve manufacturing plant layout problems for Dr. Shahrukh Irani in Industrial and Systems Engineering.

Hohenberger’s research interests lie in the cryptographic challenges in verifying authenticity of incoming messages and encrypting outgoing ones in energy, data and time constrained applications, computer security, algorithms and complexity theory. After leaving OSU-CSE in 2000, pursued her graduate studies at Massachusetts Institute of Technology (MIT) under the mentorship of Dr. Ronald Rivest. She received her doctorate in 2006 and accepted a tenure track position as an Assistant Professor with John Hopkins University.

Microsoft began this program in 2005 and there are now 20 Microsoft Research Fellows pursuing their dreams and gaining recognition in their respective fields of endeavor. OSU-CSE is proud one of our students is included in this elite group.
**Annual CSE Department Awards**

**Scholarships**
- Central Ohio Chapter of Association of Computing Machinery (ACM)
  - Jamie Colley
- Ernest William Leggett, Jr. Scholarship
  - The Leggett Family Award
  - Cody Baith
  - Zhangpeng (Jack) Cheng
  - Eric George
  - Justin Landers
- Lockheed Martin
  - Andrew Stock
  - Brandon Sorg
- Northrop Grumman
  - Isaac Chan
- The O’Connell Family Award
  - Adam Cotner
  - Hyun Lee
- Raytheon Corporation
  - Ross Amore
  - Christina Deiters
  - Luke MacAdam
- The Department of Computer Science & Engineering
  - Conner Campassi
  - Minh Pham
  - Parmeet Singh
  - Zhitu Chen
  - Hoa Vu
- The Department of Computer Science & Engineering
  - Undergraduate Research Award
  - Jamie Colley

**Faculty & Staff Awards**
- Chair’s Service Recognition Award
  - Laurie Maynell
- Eleanor Quinlan Memorial Awards
  - Outstanding Graduate Student Teaching
  - David Chiu
  - Matthew Lang
- Outstanding Research Awards
  - Sitaram Asur
  - Xiaole Bai
  - Matthew Koop
- Outstanding Service Award
  - Don Havard
- Outstanding Teaching Award
  - Dr. Han-Wei Shen

- Sharing the enjoyment of the evening are Dong Xuan and his student, Xiaole Bai.

- DK Panda and his student, Matt Koop.

- Luke MacAdam receives his award from Raytheon representative and friends of CSE, Dennis Frailey.
Dr. Ming-Tsan Liu Retires

After forty years of teaching, research, and service to the Department of Computer Science and Engineering and The Ohio State University, Professor Ming-Tsan (Mike) Liu retired.

Mike, as he prefers to be called, is one of the friendliest, kindest, and most humble gentlemen that can be found. He came to OSU-CSE (then named Computer and Information Science) in 1969. His research has been in the areas of Distributed Computing and Computer Networking. He has graduated 55 Ph.D. students during his time here. His students are playing leadership roles in industry and academia, in America, China and elsewhere around the world.

Mike has always been very active in service to the greater computing field. He has been honored with many awards over the years, most recently receiving the Institute of Electrical and Electronics Engineers (IEEE) Presidential Service Award (2007). In 2000, IEEE gave him their Millennium Award and named him a Life Fellow; he had been a Fellow since 1983. The IEEE Computer Society Technical Committee on Distributed Computing acknowledged his research contributions with their Distinguished Achievement Award in 2006.

Dr. Liu received his Ph.D. in Electrical Engineering from the University of Pennsylvania in 1964, as well as a Masters. He began his academic career at the National Cheng Kung University where he earned his Bachelors of Science in Electrical Engineering.

In his retirement, Mike will spend more time with his lovely wife Lily and, using his vast camera collection, fill many gigabytes of memory with photos of his grandchildren and parakeets.

Retirement is the Trend

Following the example set by Dr. Liu, Dr. Stuart Zweben decided to spend his more of his time away from campus and has retired as well.

Dr. Stuart H. Zweben joined the Ohio State Computer & Information Science Department (now named the Dept. of Computer Science and Engineering) in 1974 and became its chairperson twenty years later in October 1994. He remained the Chair until the Autumn of 2005 thus setting a record for length of occupancy in that role. He then moved up the Administration ladder becoming Associate Dean of Academic Affairs for the OSU College of Engineering.

He received his Masters (1971) and Ph.D. (1974) degrees from Purdue University in 1974 after having received his Bachelors of Science in Mathematics from City College of New York. He is a Fellow and former president of ACM (Association for Computing Machinery) and former president of the Computing Sciences Accreditation Board (CSAB). Currently he serves on the Board of Directors of the Computing Research Association (CRA) and on the editorial board of the Empirical Software Engineering Journal.

Stu has been an award winning chair. The Columbus Technology Council named him Top Contributor to the Advancement of Technology (Outstanding Educator Advancing Technology) in 2002. He previously had received the Columbus Technical Council’s Technical Person of the Year Award (2000). He also received an Outstanding Service Award from the ACM in 1997.

His research interests are in software engineering and computer science education. He is co-director of the Reusable Software Research Group along with Bruce Weide and Tim Long. His special interests are in the testing of object-based software, and in doing empirical studies to assess the effectiveness of various software engineering principles and practices.

During his tenure as leader of CSE, Stu dealt with many issues including irate students slamming his door to the loss of a dear colleague to entertaining the dogs his secretary raised for Canine Companions for Independence. His In Box was labeled “Big Kauna” and a mug on his desk read “El Jefe.” His name was misspelled and mispronounced. Throughout it all he kept his head, smiled and managed the chaos.
Even the death of friends will inspire us as much as their lives ... Their memories will be encrusted over with sublime and pleasing thoughts as monuments of other men are overgrown with moss; for our friends have no place in the graveyard. ~ Henry David Thoreau

The Department of Computer Science and Engineering family has experienced passings of a more permanent kind this year.

**Eitan Gurari 1947 - 2009**

Our department and the computer science community lost a scientist suddenly and unexpectedly. Dr. Eitan Gurari, Associate Professor, passed away Monday, June 22, 2009.

Dr. Gurari was born in Israel in March 1947. He attended Technion - Israel Institute of Technology where, in 1971, he received Bachelors of Science in Physics. He continued his studies there, but changed focus to Computer Science receiving a Masters degree in 1974. The University of Minnesota granted him a Ph.D. in 1978 (Computer Science) after which he taught at the University of Wisconsin - Milwaukuee and the State University of New York at Buffalo. He joined the Ohio State University Department of Computer Science and Engineering in 1982.

Dr. Gurari started his career as a theoretician. He made fundamental contributions to automata and complexity theory. His textbook, An Introduction to the Theory of Computation, was highly praised and he published frequently in JACM, SIAM Computing, ACM STOC, and IEEE FOCS. After joining OSU, Gurari switched his research focus, starting to build software systems. His most recent Software Engineering research interests covered hypertext processing and Braille production. His creation, the TeX4ht system, has been widely used worldwide in the scientific community for publishing research papers on the Internet and is generally considered to be the best application to translate LaTeX into other formats. He often received emails from users praising and appreciating the various software systems he had single-handedly built.

Eitan left behind his wife, Shaula Gurari, two sons and three daughters.

**Loss of a Former CSE Office Commander**

This year, CSE learned one of its first staff members had passed. Commander **Ernest Staveley**, USN, Ret., of Upper Arlington, passed away July 6, 2009 at the age of 83. Ernest, commonly known as Ernie, joined CSE (then Computer and Information Science) in 1968 as our Chief of Staff. In this position, Ernie hired many of the office staff who built the Department and assisted with establishing its position in the College of Engineering. He was a tolerant task master; tolerating office chair racers through Caldwell hallway and leading the team as the Department successfully grew. He was also the pitcher of the less successful WYSIWYGS Softball Team. He retired effective July 1, 1991.

Before coming to OSU-CSE, Ernie Stavely was Commander Staveley of the United States Navy and held a Masters degree from Navy Postgraduate School.

Ernie is survived by his wife of 59 years, Dorothy. He had five children; Mary (Paul), David (Kathy), Helen (Tom), Joan (David), Ruth (John). Joan is an OSU alum and participated in the 1999 Animation Celebration.

**Loss Far Too Soon**

To work in academia means students will move in and out of your life, but when the loss is sudden and permanent, it affects the community. Jeremy Bryon George came into the world November 24, 1986, and left us March 4, 2009. By George, as he liked to be called, was a true bright light in this world. A favorite with his instructors, he was known for having a good mind, being an exceptional student, and was interested game design, poetry and music.
The Department of Computer Science and Engineering continues to expand its Industrial Advisory Board. This year two new members have joined the board, Matt Desch and Michael Fortin.

Since the day he graduated from OSU, Matt Desch's career has been in ascension. He earned his BS in 1980 and began working for AT&T Western, now Alcatel Lucent. Moving within the company to Chicago, in 1986, he was able to gain his MBA taking night classes from the University of Chicago. Interested in greater challenges, he moved to Northern Telecom which has become Nortel Networks. He climbed the ladder there until he found himself living in London, England, and in charge of Nortel's international business. At this point, he decided to become involved with starting new companies and the venture capital front. In 2003, he became CEO of Telcordia Technologies which he then sold in 2005. He was then recruited to be the Chairman and CEO of Iridium Satellite, where he leads today. An avid pilot since getting his license as a high school student in Kettering, Ohio, Matt uses his small airplane to get his wife Ann and their Jack Russell terrier to and from Ohio State activities from their homes in Washington, Dallas, and Pinehurst, NC.

Michael Fortin is a Distinguished Engineer working in the Windows Core Operating Systems Division where he has management and architectural oversight responsibilities for disciplines such as performance, reliability, feedback, application compatibility, and diagnosis. He was employed by IBM before joining Microsoft, and worked primarily as a performance analyst and architect on a variety of operating systems. Fortin received a doctorate in computer science from The Ohio State University in 1991, and a Masters in 1987. It was at Ohio State where he developed a strong appreciation for the art of performance analysis and improvement. He also has an undergraduate computer science degree from Cincinnati’s Xavier University. In his spare time, Fortin enjoys most competitive sports, skiing with his daughters, a good poker game, and spending time with his family.

The primary mission of the CSE Industrial Advisory Board is, as it has always been, to insure the world is aware of the quality research and teaching done in CSE. Additionally, through the members’ prominent corporate positions or via interaction with their extensive network connections, they will watch for internships, jobs, and grant situations for CSE students and assist them in attaining those goals. Board members will also aid faculty members with collaboration opportunities as well as acquiring new funding sources. As leaders in their respective areas, they will inform the Department of changes and new trends within the computing field and suggest adjustments in strategic planning to meet these shifts. Their guidance will be a vital component in raising the Department of Computer Science and Engineering to a greater level of prominence and influence.

During these challenging economic times, the Board will give direction for organizing individual and major donation activities. They will watch for and develop relationships with substantive donors affecting large endowments for increased research funding and expansion of scholarship funds.

Besides Matt Desch and Michael Fortin, the current board includes: James Cates (MS ’71, Altera, Corp.); Wayne Clark (BS ‘73, Cisco Systems); David Cohen (Ph.D ’77, sente.com, Inc); Bruce Flinchbaugh (Ph.D ’80, Texas Instruments); Shivnandan (Shiv) Kaushik (MS, ‘91, Ph.D. ‘95, Intel); Doug Roble (MS, ’87, Ph.D., ‘92, Digital Domain); Feng Zhao (former CSE faculty member [1992-2000] Microsoft Research).

Wayne Clark (center in long sleeves and tie) of the Industrial Advisory Board talks with CSE Students about working in Industry.
The faculty continually makes impact and contributions within CSE’s five focus areas of research. The Department of Computer Science and Engineering strives with great determination to excel.

- The **Artificial Intelligence** Cluster has been a source of stable growth since Dr. B. Chandrasekaran’s (now Senior Research Scientist) established its first lab, LAIR (Laboratory for Artificial Intelligence Research) forty years ago. Chandra, along with John Josephson, Research Scientist, continues overseeing students in LAIR, but it is not the only busy lab. Five faculty members; Professor DeLiang (Leon) Wang, Associate Professors Chris Brew and James Davis, and Assistant Professors Mikhail Belkin, and Eric Fosler-Lussier, are all questioning ideas, searching for answers and mentoring students. They examine questions in the dimensions of Speech and Language Technologies, Perception and Neurodynamics, Computer Vision and Machine Learning research.

- The **Graphics Area** continues to expand and grow as much now as it did in the field’s infancy. Professor Rick Parent, working in Computer Animation, gains greater worldwide recognition for his expertise. Professor Tamal Dey, Associate Professor Raphael Wenger and Assistant Professor Yusu Wang will soon be joined by Luis Rademacher in the area of Computational Geometry and Algorithms. Considering the questions and finding answers in Computer Graphics and Visualization are Associate Professors Roger Crawfis, Raghu Machiraju and Han-Wei Shen.

- The **Networking Group**, will miss its founder Professor Ming-Tsan (Mike) Liu, but its faculty is strong and has a breadth of research offering many opportunities for graduate students. Professor Ness Shroff, working within both CSE and ECE, oversees projects in wireless and wireline communication networks. Professor David Lee leads the work security research. Professor Anish Arora leads a large sensor network project along with his colleagues Professor Ten-Huang (Steve) Lai, Associate Professor Dong Xuan, and Assistant Professor Prasun Sinha who are working in other realms of sensor research. Professor Xiaodong Zhang’s research crosses into the Networking sphere through his work in Internet and Distributed Systems.

- The **Software Engineering** Group research is a product-oriented view of software which prioritizes process and management, but maintains vigilance to the details so the systems work correctly. A uniquely structured group, a common theme runs through the work: establishing behavioral properties of a software system by reasoning -- modularly -- about the source code of its components. The faculty includes Professors Bruce W. Weide, Associate Professors Timothy J. Long, Atanas (Nasko) Rountev, Neelam Soundarajan, Paolo A.G. (Paul) Sivilotti, and Ken Supowit. Also included are Senior Research Scientist Jay Ramanthan and Clinical Assistant Professor Rajiv Ramnath who oversee CETI, “CERCS for Enterprise Transformation and Innovation.” CERCS is the National Science Foundation funded multi-institutional Center for Experimental Research in Computer Systems at Georgia Institute of Technology.

- The **Systems Group** grows forcefully and abundantly. Whether the questions are in Core Computer Systems and Architecture, High-End and Distributed Systems, or Datamining and Databases, these researchers will search for answers. Full Professors Gagan Agrawal, D. K. Panda, P. Sadayappan and Xiaodong Zhang serve as senior leaders striving to keep ahead of the Associate Professors Hakan Ferhatosmanoglu and Srinivasan Parthasarathy and Assistant Professors Feng Qin and Radu Teodorescu. Associate Professor Atanas (Nasko) Routev also collaborates with several system faculty on compiler and software reliability. New Assistant Professor Christopher Stewart will join the group October 2009.
Many applications in science and engineering require modeling and analysis of a geometric shape for scientific simulations, rapid prototyping, visualizations, and various other purposes. For example, if a car body is modeled digitally within a computer, several scientific analyses can be performed on this model to predict and improve its performance. Using sophisticated laser scanners available nowadays, one can scan the surface of the car to generate points from them. A computer program can then connect these points with triangles to reproduce the surface. Various geometric structures can then be computed for different physical simulations and/or visualizations.

The above example embodies a series of problems that need efficient and robust solutions. The conversion of a point data into a polygonal surface is the Surface Reconstruction problem. To improve the shape quality of the surface elements, one needs to mesh it further without destroying the geometry and topology of the shape. This leads to the problem of Mesh Generation. After generating a good mesh for the shape, post-processing applications may need to extract various geometric and topological structures which gives rise to the problem of Shape Analysis. Tamal Dey and his research group Jyamiti focused on the three problems in shape modeling mentioned above. The main emphasis of Prof. Dey's research is to design algorithms for the above problems with mathematical guarantees, that is, the output of the algorithms is quantifiable with provable geometric and topological properties. Almost all of these algorithms have been implemented into robust software some of which are routinely used in academia and industry.

In Surface Reconstruction Dey and his group developed a well known suite of solutions called Cocone algorithms and software based on them (http://www.cse.ohio-state.edu/tamaldey/cocone.html). Various issues such as noise, boundary effects, scales, and robustness are addressed in these developments. The Cocone software have gained a considerable popularity over the years which is evident from its several thousand downloads. See Figure 1 for an example reconstruction by Cocone. Prof. Dey summarized the recent developments in provable surface reconstruction algorithm designs in a book titled Curve and Surface Reconstruction: Algorithms with Mathematical Analysis published by Cambridge University Press in 2007.

In Mesh Generation the Jyamiti group focused on how to generate meshes from various kinds of input domains in three dimensions with provable guarantees. These domains include implicit and polygonal surfaces, and volumes enclosed by them. In a recent work the difficult problem of meshing piecewise smooth domains and non-manifolds has been addressed. In fact, Dey and his group provided the first viable solution for the problem which is both practical and is theoretically sound. A software application called DelPSC (http://www.cse.ohio-state.edu/tamaldey/delpsc.html) has been released which is slowly gaining the popularity.

In Shape Analysis, Dey and his group developed new methods to extract and identify geometric features from point data and meshes. For example, a novel algorithm based on topological ideas was designed to identify the head, arms, legs, and torso of a human body automatically from a laser scanned point sample. This feature identification algorithm is used in retrieving shapes that are similar to a given shape from a pool of shapes. Figure 3 shows some examples of feature identifications and medial axis computations with our software. A software application, SegMatch
After working on algorithm/software design for shape representation and shape analysis mainly for three dimensional geometries, Prof. Dey wants to focus on the generalization of these problems in higher dimensions. In particular, he aims to apply his experience and expertise in computational geometry and topology to the problem of data analysis which deals with point data in high dimensions. In some of his recent works, he and his co-researchers have designed new algorithms for computing homology groups and their representatives from point data in high dimensions. These are important topological information that can aid in understanding the space from where the data are sampled. For high dimensional data, the main challenge is to extract information with as little as possible computations. The hope is that looking at the problem of data analysis from a geometric point of view would open up new opportunities.
Managing and Analyzing Peta-Scale Data

Advances in technology have enabled us to collect large amounts of data in all walks of human endeavor. Examples include scientific observations (e.g. astronomical surveys), experimental studies (e.g. Gene expression arrays), simulation studies (e.g. molecular dynamics), clinical testing (e.g. MRIs), the World Wide Web and social network analysis (e.g. Facebook). Such data can be preprocessed and abstracted in many forms and modalities. Integrating, managing, and mining such data so that useful information can be gleaned efficiently from them is at the heart of Professor Parthasarathy’s research agenda.

Over the last few years Associate Professor Srinivasan Parthasarathy and his group (the Data Mining Research Laboratory) have been targeting several important real-world problems along these lines. Past work with local physicists has sought to understand the dynamics of defect evolution in materials through the analysis of molecular dynamics simulations. His group has also been working with local clinical vision scientists toward the development of a novel modeling and classification system for the early detection of Keratoconus, a corneal eye disease that is the second leading cause of blindness in the US. Another major direction of work has been the development of a toolkit (MotifMiner) for mining structural motifs in molecular datasets. Next, we highlight two recent high profile projects actively underway in the data mining research laboratory.

Architecture Conscious Data Mining and Management: Prof. Parthasarathy’s work at the intersection of data mining and high performance computing, in the late nineties resulted in the development of several novel scalable algorithms for mining dynamic and distributed datasets. Several of these papers have been quite influential both in terms of their wide-spread adaptation and in terms of citations from peer researchers. A substantive recent effort along these lines has focused on algorithms and runtime support for architecture conscious data mining and management. With recent advances in computer architectures (e.g. multi-cores, GPGPUs), they have found that a large majority of data mining and management tasks heavily under-utilize the capabilities of such architectures. In an effort to redress this limitation they have made a number of fundamental algorithmic contributions over the last decade that demonstrate how several data mining and indexing algorithms can significantly benefit and effectively scale to peta-scale data by leveraging succinct data structures and cache-, memory-, disk- and network-aware designs. Based on some of the initial findings Prof. Parthasarathy and his group are currently designing a prototype runtime framework wherein different system services that can aid and abet in designing and prototyping such applications (e.g. scheduling, data placement, I/O, caching) can be interconnected using simple plug-and-play semantics. As part of future work they plan to investigate the use of energy-aware algorithm designs for architectures ranging from embedded systems to hybrid supercomputers. Their work in this project has appeared in many of the top conferences and journals in the field highlighted by a best paper award from the VLDB 2005 conference.

Extract, Analyze and Visualize: A Framework for Network Science: A second project currently underway aims to unravel common principles, events, algorithms, and tools that govern network behavior across different domains ranging from social networks to biological networks. Of particular interest here are not just scalable algorithms for module discovery, link discovery, anomaly detection and event detection but also usable systems infrastructure that can enable researchers to effectively query, visualize, and analyze such networks under various trust, probabilistic and provenance models. In addition to several novel systemic and algorithmic contributions, Prof. Parthasarathy and his group have also worked closely with domain scientists making important contributions to their particular discipline. For example, working together
Understanding structures in natural data is one of the fundamental issues facing researchers in machine learning and pattern analysis. The goal is to get a grip on these structures by creating some model or summary of the data. One of the oldest and most common data modeling tools is mixture of Gaussian distributions. The data is represented as a sum of several Gaussians and the centers of those Gaussians are often thought as representatives for clusters in the data. This model is used widely in areas ranging from speech recognition and synthesis (where it is ubiquitous) to computer vision to bioinformatics and many other fields. Even though the model is so useful, simple, and has a long history (going back to the 19th century!) many aspects of inference are not well understood.

The standard method for learning a mixture from data is Expectation Maximization (EM), which is usually initialized using the standard k-means clustering algorithm. However, as it turns out, the behavior of this algorithm can sometimes be surprisingly unpredictable and counterintuitive even in one or two dimensions. Dr. Mikhail Belkin, in his joint work with Tao Shi (Ohio State University, Department of Statistics) and Bin Yu (University of California, Berkeley, Department of Statistics), has proposed a new algorithm for learning Gaussian mixture distributions. The algorithms have theoretical guarantees when the mixture components are sufficiently separated and can be seen to outperform the standard methods for several datasets. The researchers are now in the process of applying it to real-world problems, such as speech recognition. A part of this work was published in the International conference on Machine Learning (ICML) 2009 and will soon appear in the Annals of Statistics.

The second important direction the team focuses on is the theoretical properties of learning Gaussian mixture distributions. Relatively little is currently known about this fundamental problem.

Interestingly, all existing theoretical results for learning these mixtures require large separation between the components. Together with graduate student Kaushik Sinha, Belkin’s team has been able to produce the first algorithm for provable polynomial time learning of Gaussian mixture distributions in high dimensions with arbitrarily small separation between the mixture components.
<table>
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<th>Grant Title</th>
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<td>A Language Independent Framework for Compiling Data-Intensive Applications on Highly Parallel Systems</td>
<td>National Science Foundation</td>
<td>9/1/08 – 08/31/11</td>
<td>$502,000</td>
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<td>Technical Support – Decision Support for Persistent Layered Sensing</td>
<td>SAIC, Inc.</td>
<td>8/6/08 – 9/30/09</td>
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<td>Genifying and Federating Autonomous Kansei Wireless Sensor Networks</td>
<td>BBNT Solutions, LLC</td>
<td>9/1/08 – 8/31/11</td>
<td>$500,000</td>
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<td>Inferring Topology and Geometry for Dynamic Shapes</td>
<td>National Science Foundation</td>
<td>6/1/09 – 5/24/10</td>
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<td>Similarity-based indexing and integration of protein sequence and structure databases DBI</td>
<td>National Science Foundation</td>
<td>8/15/08 – 7/31/11</td>
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Pandemic Influenza Program Initiative
B-Project 6 Program: Addressing Vulnerabilities in Populations
Co-PI: Rajiv Ramnath
Summit County Health District
$30,000 8/10/08 – 8/9/09

NW Ohio REMS Project
Co-PI: Rajiv Ramnath
The Hospital Council of Northwest Ohio
$20,000/12/01/08 – 8/9/09

Rajiv Ramnath
Curriculum for Accelerated Services Engineering (CASE)
Co-PIs: Jay Ramanathan, Neelam Soundarajan, D’Agostino
National Science Foundation
$149,981 9/1/09 – 2/28/11

Atanas Rountev
IBM Gift Award
$20,000

P. Sadayappan
A Platform-Aware Compilation Environment
Co-PI: Atanas Rountev
DARPA (Rice University Subaward)
$630,438 4/1/09 – 3/31/10

Collaborative Research: CPA-CPL-T: An Effective Automatic Parallelization Framework for Multi-core Architectures
National Science Foundation:
Co-PI: Atanas Rountev
$500,000 8/1/08 – 7/31/11

Scalable Faulty Tolerant Runtime Technology for Petascale Computers
DOE
Pl: Sadayappan
$375,820 8/1/08 - 7/31/11

I/O Forwarding Scalability Layer (IOFSL) Project
Argonne National Lab
Pl: Sadayappan
$10,783 3/30/09 – 6/30/09

Ness Shroff
National Science Foundation
Co-PI: Prasun Sinha and Can Emre Koksal, OSU-ECE
$500,000 9/1/08 – 8/31/12

Paul Sivilotti
Development and Integration of ODOT Geological Hazard Management System (GHMS): Subcontract for Remediation Cost Estimation
Ohio Department of Transportation
$33,523 9/15/08 – 6/30/09

DeLiang (Leon) Wang
Robust Speaker Recognition Using Auditory-Based Features and Computational Auditory Scene Analysis
RADC
$300,000 2/20/09 – 2/19/11

Oticon: Integrating Monaural CASA and Binaural Localization for Robust Speech Separation
$180,000 7/1/08 – 6/30/11

Bruce Weide
CPA-SEL: Collaborative Research: Continuing progress toward verified software
Co-PI: Harvey Friedman, OSU-Dept. of Mathematics
National Science Foundation:
$248,590 9/1/08 – 8/31/10

Xiaodong Zhang
Collaborative Research: CSR-PSCE, TM: Effective Resource Sharing and Coordination Inside Multicore Processors for High Throughput Computing
National Science Foundation:
$330,000 9/1/08 – 8/31/11
### Awards in Good Standing Initiated Before July 1, 2008

Legend

**Primary Investigator (in alphabetical order according to the name of the first CSE member to whom the funds are assigned)**

- Grant Title
- Co-PIs (CSE members' names are in blue)
- (OSU Department name initials defined at the end of the section.)
- Sponsor
- Term - Amount

#### Gagan Agrawal

- **ST-CRTS: Enabling Processing of Large-Scale Scientific Data through Compilers Supported XML Abstractions**
  - National Science Foundation (NSF)
  - 1/15/06-12/31/08 $299,997

#### James Davis

- **Wright Center of Innovation, Institute for the Development and Commercialization of Advanced Sensor Technology (IDCAST)**
  - Ohio Department of Development
  - Randy Moses (OSU-ECE), John Volakis (OSU-ECE)
  - 2/26/07 - 2/25/10 $190,000

#### Hakan Ferhatosmanoglu

- **CAREER: Exploration of Dynamic Sequences in Scientific Databases**
  - National Science Foundation (NSF)
  - 07/15/06-07/14/11 $455,000

#### Eric Fosler-Lussier

- **CAREER: Breaking the Phonetic Code: Novel Acoustic-Lexical Modeling Techniques for Robust Automatic Speech Recognition**
  - National Science Foundation (NSF)
  - 12/15/06-11/30/11 $502,952

- **ITR: Automatic Speech Attribute Transcription (ASAT): A Collaborative Speech Research Paradigm and Cyberinfrastructure with Applications to Automatic Speech Recognition (ASR)**
  - Georgia Institute of Technology (National Science Foundation (NSF) Subcontract)
  - 10/01/04-08/31/08 $461,000

#### Emre Ertin (ECE)

- **Sected Antenna-based MAC Protocol for WNSs - Year 2**
  - Anish Arora, Umit Ozguner (OSU-ECE)
  - 1/1/08-12/31/08 $130,471

#### Michael Belkin

- **CAREER: Geometry and High-Dimensional Inference**
  - National Science Foundation (NSF)
  - 1/1/07 - 12/31/11 $498,972

#### Chris Brew

- **Third Workshop On Issues In Teaching Computational Linguistics**
  - National Science Foundation (NSF)
  - 6/1/08 – 5/31/09 $13,160

- **CAREER: Hybrid methods for acquisition and tuning of lexical information**
  - National Science Foundation (NSF)
  - 2/1/04 – 1/31/09 $500,000

#### Mary Beckman (OSU - Linguistics)

- **DHBCollaborative Research: Using Machine Learning to Model the Interplay of Production Dynamics and Perception Dynamics in Phonological Acquisition**
  - National Science Foundation (NSF)
  - Eric Fosler-Lussier
  - 1/15/08-12/31/10 $273,284
MARK PITT, (LINGUISTICS)
- Recognizing Phonological Variants of Spoken Words
  National Institute for Deafness & Other Communication Disorders
  **ERIC FOSLER-LUSSIER**
  07/01/04-06/30/09  $702,746

DAVID LEE
- CPATH T: NEWPATH: Nurturing, Through Entrepreneurship, IT World Leaders
  National Science Foundation (NSF)
  Stephen Camp (OSU-COB), Eylem Ekici (OSU-ECE), Walleed Muhanna (OSU-COB), **RAJIV RAMNATH, HAN-WEI SHEN, NEELAM SOUNDARAJAN, BRUCE WEIDE, DONG XUAN**
  7/1/07-6/30/12  $606,822

RAJHU MACHIRAJU
- ITR/NGS: A Framework for Discovery, Exploration, and Analysis of Evolutionary Simulation Data (DEAS)
  National Science Foundation
  **SRINIVASA PARTHASARATHY**, John Wilkins, (OSU-Physics)
  09/15/03-08/31/08  $616,600

D.K. PANDA
- Coordinated Fault Tolerance for High Performance Computing
  Department of Energy (DoE)
  9/15/06-9/14/11  $1,000,000

- Research on High Performance and Scalable MPI Over InfiniBand
  Mellanox Technologies
  4/1/08-3/31/09  $ 112,599

- High-end computing and networking research testbed for next generation data driven, interaction applications
  National Science Foundation
  **GAGAN AGRAWAL, P. SADAYAPPAN, JOEL SALTZ, HAN-WEI SHEN**
  09/15/04-08/31/09  $1,529,997

- Performance Evaluation of Cluster Networking and I/O Technologies (PECNIT)
  Avetec
  07/01/06-12/31/08  $749,996

- CPA: Designing next Generation Communication and I/P Subsystems with Multi-Core Architecture
  National Science Foundation (NSF)
  07/01/07-06/30/10  $375,000

DK PANDA & P. SADAYAPPAN
- Programming Models for Scalable Parallel Computing
  Department of Energy (DoE)
  9/15/06-9/14/11  $1,500,000

SRINIVASA PARTHASARATHY
- CAREER: A Scalable Framework for Mining Scientific and Biomedical Data
  National Science Foundation (NSF)
  01/15/04-12/31/08  $288,082

- SGER: An Event-Driven Approach for Analyzing Interaction Networks
  National Science Foundation (NSF)
  8/1/07-7/31/08  $58,408

- NGS: A Services-Oriented Framework for Next Generation Data Analysis Centers
  National Science Foundation
  Tahsin Kurc, (OSU-BMI), Joel Saltz
  08/01/04-07/31/08  $300,000

- Scalable Data Analysis: An Architecture Conscious Approach
  National Science Foundation (NSF)
  06/01/07-05/31/10  $325,000

JAY RAMANATHAN
- eGOV Server Migration/Hosting, Content Management, Security and BPM
  City of Columbus
  **RAJIV RAMNATH**
  12/6/07-4/30/09  $50,000

- Center for Experimental Research in Computer Systems- Research Site
  National Science Foundation (NSF)
  **RAJIV RAMNATH**
  5/1/08-4/30/13  $150,000

FRANCIS HOLZHAUER (OSU-COPH)
- Training of Public Health Personnel and Public Health Partners in the “Planning P Process” for a Type 3 Incident
  Ohio Department of Health
  Anand Desai (OSU-PPM), Joann Pearsol (OSU-COPH), **RAJIV RAMNATH**
  4/21/08-8/8/08  $110,206

STEVEN GORDON (OSC)
- Improving American Competitiveness through Workforce Education in Cyberinfrastructure Applications
  National Science Foundation (NSF)
  Cathleen Carey (OSU-OLN), Jose Castro (OSU-IWSE) Steven Gordon (OSC) Ashok Krrishnamurthy (OSC), **RAJIV RAMNATH**
  4/1/08-3/31/11  $999,942
P. SADAYAPPAN

- Enhancements to Disk Resident Arrays Library
  Pacific Northwest National Laboratory  
  02/03-04/09-30/08 $327,014

- SOFTWARE: Job Scheduling
  National Science Foundation (NSF)
  Umit Catalyurek (OSU-BMI), Tahsin Kurc, (OSU-BMI), Pete Wyckoff (OSC), Joel Saltz
  09/15-04/08/31/08 $300,167

HAN-WEI SHEN

- SciDAC Institute for Ultra scale Visualization
  Department of Energy (DoE)  
  8/15-06-9/14/11 $750,000

- CAREER: Toward Effective Visualization of Large Scale Time-Varying Data
  National Science Foundation (NSF)  
  02/15-04-01/31/09 $428,178

DONALD STREDNEY (OSC)

- Validation/Dissemination Virtual Temporal Bone Dissection
  Children's Research Institute Columbus  
  Bradley Clymer, (OSU-ECE), Ashok Krishnamoorthy, (OSC), Petra Schmalbrock, (OSU-Radiology), HAN-WEI SHEN, Janet Weisenberger, (OSU-Speech & Hearing)
  07/01-06-06/30/07 $135,343

NESS SHROFF

- Collaborative research: Towards an Analytic Foundation for Network Architectures
  National Science Foundation (NSF)  
  11/1/07 – 9/30/08 $58,786.12

- NeTS – NBD: A high performance control plane for mesh networks: Theory and implementation
  National Science Foundation (NSF)  
  10/1/07 – 8/31/09 $316,438

  National Science Foundation (NSF)  
  7/1/07 – 7/31/09 $91,875

- NeTS-NOS: Robust sensor network architecture through neighborhood monitoring and isolation
  National Science Foundation (NSF)  
  7/1/07 – 8/31/09 $132,4775

- Design of Urban Sensor Networks (MURI)
  Purdue University  
  6/15/07 – 11/14/10 $400,000

PRASUN SINGHA

- CAREER: On-The-Fly Protocols for Data Dissemination in Wireless Mesh Networks
  National Science Foundation (NSF)  
  0/15-06-12/31/11 $412,000

- NeTS-NOSs: Collaborative research: Energy-Efficient Distributed Sensor Network Control: Theory to Implementation
  National Science Foundation (NSF)
  NESS SHROFF
  9/1/07-8/31/10 $204,017.00

  National Science Foundation (NSF)  
  9/1/08-8/31/10 $467,661.00

DELIANG WANG

- Collaborative Research: Separating Speech from Noise to Improve Intelligibility
  National Science Foundation (NSF)  
  1/15/06-12/31/08 $144,914

- Study of Speech and NonSpeech Separation in Aging
  Veterans Administration  
  04/01-06/03/31/11 $500,00

- Sequential Organization and Room Reverberation in Speech Segregation
  Air Force Office of Scientific Research (AFOSR)  
  2/1/08-11/30/13 $874,369.00

RONGXING LI (OSU-CEEGS)

- Biologically-Inspired Target Recognition Methods for Multispectral/Hyperspectral and Multiplatform Image Analysis
  National Geospatial Intelligence Agency
  DELIANG WANG
  8/15-07-5/14/09 $450,000.00

YUSU WANG

- Feature Extraction, Characterization, and Visualization for Protein Interaction via Geometric and Topological Methods
  Department of Energy Young Investigator Award (DoE)  
  8/15/06-8/14/09 $300,000

- CAREER: Geometric and Topological Methods in Shape Analysis, With Applications in Molecular Biology
  National Science Foundation (NSF) CAREER  
  2/1/08-1/31/13 $420,000
**Bruce Weide**
Collaborative Research: Logical Support for Formal Verification
National Science Foundation (NSF)
Harvey Friedman (OSU-Mathematics)
9/1/07-8/31/08 $75,000

**Dong Xuan**
- **Defending Against Physical Attacks in Sensor Networks**
  Army Research Office
  Anish Arora, Steve Lai
  03/15/07-03/14/10 $280,000
- **CAREER: Algorithm Design for Optimization Problems in Network Over-Provisioning**
  National Science Foundation (NSF)
  12/15/05-11/30/11 $400,060

**Xiaodong Zhang**
- **Algorithms Design and Systems Implementation to Improve Buffer Management for Fast I/O Data Accesses**
  National Science Foundation (NSF)
  06/01/07-05/31/10 $275,000
- **Collaborative Research: CSR-EHS: System Research on Media Streaming to Heterogeneous Mobile Devices**
  National Science Foundation (NSF)
  09/15/06-08/30/08 $119,314
- **Memory Caching And Prefetching to Improve I/O Performance in High-End Systems**
  National Science Foundation (NSF)
  10/1/06-9/30/08 $93,999
- **Collaborative Research: Next Generation Internet Proxy Systems**
  National Science Foundation (NSF)
  11/1/05-8/31/08 $130,000
- **Collaborative Research: LEAPNET: NOSS: Self-Adaptable All Terrain Sensor Networks**
  National Science Foundation (NSF)
  9/1/07-8/31/09 $141,139.00

**Stuart Zweben**
- **Wright Center of Innovation in Advanced Data Management and Analysis: Kansei**
  Wright State University (subcontract with Ohio Department of Development)
  Anish Arora
  10/01/03-06/30/08 $222,797
- **Wright Center of Innovation in Advanced Data Management and Analysis: Large-Scale Sensor Network Management and Analysis for Security and Monitory**
  Wright State University (subcontract with Ohio Department of Development)
  James Davis
  10/01/03-06/30/08 $7,000
- **Wright Center of Innovation in Advanced Data Management and Analysis: Audio-Based Analysis and Surveillance**
  Wright State University (subcontract with Ohio Department of Development)
  Deliang Wang
  10/01/03-06/30/08 $18,000
- **Wright Center of Innovation in Advanced Data Management and Analysis: Large Format Stereoscopic Projection System**
  Wright State University (subcontract with Ohio Department of Development)
  Han-Wei Shen
  10/01/03-06/30/08 $122,600
- **Wright Center of Innovation in Advanced Data Management and Analysis: High Performance and Scalable Data-Centers with Multi-Core Architectures and Emerging Networking Technologies**
  Wright State University (subcontract with Ohio Department of Development)
  DK Panda
  10/01/03-06/30/08 $600,000
Faculty Service
Journal Editorial Boards & Major Conference Chair Positions

Gagan Agrawal
- IEEE Transactions on Parallel and Distributed Systems

Anish Arora
- ACM Transactions on Sensor Networking
- Journal of Real Time Systems
- Journal of New Generation Computing

Chris Brew
- Journal of Artificial Intelligence Research

James Davis
- Journal of Machine Vision and Applications

Tamal Dey
- Journal of Discrete and Computational Geometry
- Executive Board of the Social Modeling Association

Ten-Hwang (Steve) Lai
- ACM/Springer Journal of Wireless Networks
- Journal of Information Science and Engineering
- Journal of Real Time Systems
- Journal of New Generation Computing
- Encyclopedia of Computer Science and Engineering

David Lee
- IEEE Journal of Selected Areas in Communications (Senior Editor)
- I/S: A Journal of Law and Policy for the Information Society
- Chair of Executive Committee, International Conference of Network Protocols (ICNP)
- Chair of Steering Committee, International Conference of Network Protocols (ICNP)

Ming T. Liu
- International Journal of Communication Systems
- Chair of Steering Committee, International Conference on Distributed Computing Systems (ICDCS)
- Co-Chair, Steering Committee, International Conference on Parallel Computing (ICPP)

Raghu Machiraju
- Co-General Chair IEEE Visualization 2009

D. K. Panda
- Journal of Parallel and Distributed Computing
- Co-Chair of Program Committee, ACM/IEEE Annual Conference of Supercomputing (SC ’08)

Richard Parent
- IEEE Transactions on Visualization on Visualization and Computer Graphics
- The Visual Computer

Srinivasan Parthasarathy
- IEEE Intelligent System
- Journal of Data Mining and Bioinformatics
- Encyclopedia on Geographical Information Sciences
- Data Mining and Knowledge Discovery, an International Journal
- Co-General Chair, 2009 SIAM International Conference on Data Mining

Atanas (Nasko) Rountev
- International Journal of Information and Software Technology

Han-Wei Shen
- IEEE Transactions on Visualization and Computer Graphics
- Co-Chair of Program Committee, IEEE Visualization 2009

Ness Shroff
- Computer Networks
- IEEE/ACM Transactions and Networks
- Co-Chair of Program Committee, 8th ACM International Symposium on Mobile AdHoc Networking and Computing (MobiHoc ’08)

DeLiang (Leon) Wang
- Journal Cognitive Neurodynamics
- EURASIP Journal on Audio, Speech, and Music Processing
- Journal of Neurocomputing
- IEEE/ACM Transactions and Networks
- Governing Board, International Neural Network Society

Xiaodong Zhang
- IEEE Transactions on Parallel and Distributed Systems (Associate Editor-in-Chief)
- IEEE Transactions on Computers
- IEEE Micro
- Journal of Parallel and Distributed Computing
- Journal of Computer and Science and Technology (Executive Editor-in-Chief)
- Chair of Program Committee 29th International Conference on Distributed Computing Systems (ICDCS 2009)

Dr. Prasun Sinha (right), with grad student research assistants Xhixue Lu (left) and Zizhan Zheng (center), reviews data received during a test of his wide area assured data service research. Details may be found at www.cse.ohio-state.edu/~prasun. There is also an article in the Spring 2009 edition of the Buckeye Blog which may be found the Department’s website.
VISITING SPEAKERS

Distinguished Guest Lecturer

John Makhoul  
*BBN Technologies*  
*A Model-Based Approach to Speech and Language Processing*

M. Tamer Özsu  
Cheriton School of Computer Science, University of Waterloo  
*Distributed XML Processing*

Distinguished Guest Lecturer:  
Jointly Hosted with the OSU - Department of Statistics

John Lafferty  
Carnegie Mellon University  
*Estimating High Dimensional Graphs*

Guest Speaker

Shivani Agarwal  
Massachusetts Institute of Technology  
*Learning to Rank*

Sami Ayyorgun  
Los Alamos National Laboratory  
*Is There a Communication Strategy Solving the “Rubik Cube” of Wireless Adhoc/Sensor Networks?*

Pavan Balaji  
Argonne National Laboratory  
*Message Passing for a Million Processes*

Abhishek Chandra  
University of Minnesota-Twin Cities  
*Achieving Predictability in Large-Scale Distributed Systems*

Daniel Golovin  
Carnegie Mellon University  
*Online Maximization of Submodular Functions*

Du Li  
Nokia Research Center  
*Building Collaboration Services on Cellular Phones*

Luis Rademacher  
Georgia Institute of Technology  
*Random Spanning Trees, Expanders, and Routing on Networks*

Christopher Ré  
University of Washington  
*Managing Large-scale Probabilistic Databases*

Lawrence J. Rosenblum  
National Science Foundation  
*NSF’s New Initiatives and Proposal Evaluation*

Cynthia Rudin  
Columbia University  
*Supervised Ranking for Manhole Event Mitigation*

Jagan Sankaranarayanan  
University of Maryland  
*A Road Map to Understanding, Organizing, and Querying Spatial Information*

Tao Shi  
Dept. of Statistics, The Ohio State University  
*Data Spectroscopy: Eigenspace of Convolution Operators and Clustering*

Christopher Stewart  
University of Rochester  
*Foundations for the Cloud*
**Special Presentation**

Hosted with Nationwide Insurance, OSU-CSE and OpenSource Student Organization

**Damian Conway**  
Thoughtstream  
Associate Professor, Monash University, Australia  

*Fun with Dead Languages*

---

**Focus on Faculty: CSE Faculty Presentations**

**Raghu Machiraju**  
*Imaging the Body and Disease - A Perspective for the Computer Scientist*

**Ness Shroff**  
*Cross-Layer Design for Multi-Hop Wireless Networks: A Loose Coupling Perspective*

**Yusu Wang**  
*Computing Discrete Laplace Operator: From Point Clouds to Meshes and Back to Point Clouds*

**Radu Teodorescu**  
*Variation Aware Application Scheduling and Power Management for Chip Multiprocessors*

**Atanas (Nasko) Rountev**  
*Precise Memory Leak Detection for Java Software Using Container Profiling*

**Dhabaleswar K. (DK) Panda**  
*High Performance Computing with Virtual Machines*

**Tamal Dey**  
*Computing Handle and Tunnel Loops on Surfaces : A SIGGRAPH paper*

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Everyone catches Buckeye fever and ends helping to spell out Ohio, even folks from down under! Special Guest, Damian Conway takes the position of ‘H,’ while Jim Dinan (CSE Grad Student) is the first ‘O,’ Heath Bair of Nationwide enthusiastically portrays the ‘I’ and Aarron Joseph (CSE Undergrad) rounds out the name in the final ‘O’ position.
### Students

#### Teaching Ten Year Statistical History

<table>
<thead>
<tr>
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<tr>
<td>Faculty</td>
<td>30</td>
<td>28.5</td>
<td>29</td>
<td>30</td>
<td>29</td>
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<td>31</td>
<td>32</td>
<td>33</td>
<td>35</td>
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<td>Course Enrollment/Autumn Qtr.</td>
<td>4,124</td>
<td>3,693</td>
<td>3,977</td>
<td>4,103</td>
<td>4,076</td>
<td>3,650</td>
<td>3,125</td>
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<td>03-04</td>
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<td>05-06</td>
<td>06-07</td>
<td>07-08</td>
<td>08-09</td>
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<tr>
<td>Students Taught</td>
<td>14,230</td>
<td>14,278</td>
<td>14,278</td>
<td>14,006</td>
<td>13,878</td>
<td>12,208</td>
<td>10,623</td>
<td>10,844</td>
<td>10,641.</td>
<td>11,185</td>
<td>12,209</td>
</tr>
</tbody>
</table>

#### Graduate Program

Every year through its graduate program, Computer Science and Engineering mentors and educates tomorrow’s leaders in our field. Our former students lead in the areas of research, education and industry. They can be found in corporate offices, research labs and university classrooms. Students have the options to obtain either a Master’s degree or Doctorate or both. The program admits about sixty new students each year. Masters and Doctorate degrees are offered with an emphasis on specialized research areas, including a dual masters degree in CIS and Biomedical Communications.

Admission to the CSE Graduate Program continues to be highly competitive. During the 2008-2009 academic year, we received 677 applications for graduate admissions to the Autumn 2009 quarter.

<table>
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<tr>
<td>Graduate Students Enrolled</td>
<td>169</td>
<td>160</td>
<td>157</td>
<td>159</td>
<td>164</td>
<td>174</td>
<td>169</td>
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<td>Graduate Student Applications</td>
<td>703</td>
<td>857</td>
<td>940</td>
<td>1,542</td>
<td>1,508</td>
<td>712</td>
<td>589</td>
<td>694</td>
<td>619</td>
<td>705</td>
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<td>Graduate Students Supported</td>
<td>119</td>
<td>111</td>
<td>130</td>
<td>175</td>
<td>156</td>
<td>149</td>
<td>158</td>
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<td>M.S. Degrees Awarded</td>
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<td>36</td>
<td>19</td>
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<td>27</td>
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<tr>
<td>Ph.D. Degrees (cumulative)</td>
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<td>307</td>
<td>314</td>
<td>318</td>
<td>325</td>
<td>332</td>
<td>343</td>
<td>361</td>
<td>378</td>
<td>410</td>
<td>436</td>
</tr>
</tbody>
</table>
DOCTORATES BESTOWED 2008-2009

Legend

- Graduate Name
- Advisor
- Education History
- Post Graduate Professional Destination
- (Careers in Academia highlighted with an *)
- Dissertation Title

Tan Apydin
Dr. Hakan Ferhatosmanoglu
Bucak, Burdur, Turkey
B.S., Bilkent Universitesi; M.S., The Ohio State University
Epic Systems, Madison, Wisconsin
Query Support for Multi-Dimensional and Dynamic Databases

Sitaram Asur
Dr. Srinivasan Parthasarathy
Bangalore, India
B.Engr., Visvesvariah Technological University; M.S., The Ohio State University
CRA-CIFellow at Hewlett Packard Labs
A Framework for the Static and Dynamic Analysis of Interaction Graphs

Uday Kumar Reddy Bondhugula
Dr. P. Sadyayappan
Hyderabad, India
B.Tech., Indian Institute of Technology, Madras, India; M.S., The Ohio State University
IBM T.J. Watson Research Center, Yorktown Heights, New York
Effective Automatic Parallelization and Locality Optimization using the Polyhedral Model

Guadalupe Canahunete
Dr. Hakan Ferhatosmanoglu
Columbus, Ohio, USA
Engineer, Pontificia Universidad Católica Madre y Maestra, Dominican Republic; M.S., The Ohio State University
University of Iowa
Enhanced Bitmap Indexes for Large Scale Data Management

Lei Chai
Dr. D.K. Panda
Qingdao, P.R.C.
B.Engr., Zhejiang University; M.S., The Ohio State University
VMware, Palo Alto, California
High-Performance and Scalable MPI Intra-Node Communication Middleware for Multi-Core Clusters

Michael Gibas
Dr. Hakan Ferhatosmanoglu
Bellbrook, Ohio, USA
B.S.E.E., M.S., The Ohio State University
Teradata, Los Angeles, California
Improving Query Performance through Application-Driven Processing and Retrieval

Leonid Glimcher
Dr. Gagan Agrawal
Columbus, Ohio, USA
B.S., M.S., The Ohio State University
Cisco Systems, Raleigh, North Carolina
FREERIDE-6: A Middleware for Remote Data Analysis

Wei Huang
Dr. D.K. Panda
Hangzhou, P.R.C.
B.Engr., Zhejiang University; M.S., The Ohio State University
VMware, Palo Alto, California
High Performance Network I/O in Virtual Machines Over Modern Interconnects

Mohammad Kamrul Islam
Dr. P. Sadyayappan
Westerville, Ohio, USA
B.S., Bangladesh University of Engineering and Technology; M.S., Wright State University; M.S., The Ohio State University
Yahoo!, Sunnyvale, California
*QoS In Parallel Job Scheduling*

Gaurav Khanna
Dr. P. Sadyayappan
New Delhi, India
B.Engr., University of Delhi; M.S., The Ohio State University
Intel Corporation, Hillsboro, Oregon
*A Data-Locality Aware Mapping and Scheduling Framework for Data-Intensive Computing*

Matthew Jon Koop
Dr. D.K. Panda
Grand Rapids, Michigan, USA
B.S., Calvin College
NASA Goddard Space Flight Center, Greenbelt, Maryland
High-Performance Multi-Transport MPI Design for Ultra-Scale Infiniband Clusters

Matthew A. Lang
Dr. Paul Sivilotti
Cleveland, Ohio, USA
B.S., Indiana University of Pennsylvania; M.S., The Ohio State University
Moravian College
Maximality: Modular Verification and Implementability

Qingda Lu
Dr. P. Sadyayappan
Hefei, P.R.C.
B.Engr., Beijing Institute of Technology; M.S., Peking University; M.S., The Ohio State University
Intel Corporation, Hillsboro, Oregon
Data Layout Optimization Techniques for Modern and Emerging Architectures

Amith Rajith Mamidala
Dr. D.K. Panda
Hyderabad, India
B.Tech., Indian Institute of Technology, Madras; M.S., The Ohio State University
IBM TJ Watson Research Center, NY
Scalable and High Performance Collective Communication for Next Generation Multicore Infiniband Clusters

Sivarmakrishnan Narayanan
Dr. Joel Saltz
Chennai, India
B.Engr., Birla Institute of Technology and Science, Pilani, India
Greenplum Inc, San Mateo, CA
Efficient Virtualization of Scientific Data

Sundeepr Narravula
Dr. D.K. Panda
Hyderabad, India
B.Tech., Indian Institute of Technology, Madras, India; M.S., The Ohio State University
Yahoo!, Sunnyvale, California, USA
Designing High-Performance and Scalable Distributed Datacenter Services Over Modern Interconnects
Ranjit Noronha  
Dr. D.K. Panda  
Newburgh, New York, USA  
B.S., University of Mumbai, India; M.S., State University of New York at Binghamton, M.S., The Ohio State University  
Icilion Systems, Seattle, Washington  
Designing High-Performance and Scalable Clustered Network Attached Storage with Infiniband

Aleksandar Pantaleev  
Dr. Atanas Rountev  
Rousse, Bulgaria  
B.A., American University of Bulgaria, Blagoevgrad, India; M.S., The Ohio State University  
State University of New York at Oswego  
Dynamic Analyses for Understanding and Optimization of Enterprise Java Applications

Rajkiran Panuganti  
Dr. P. Sadayappan  
Columbus, Ohio, USA  
B.Tech., Indian Institute of Technology, Bombay; M.S., The Ohio State University  
Microsoft, Redmond, WA  
A High Productivity Framework for Parallel Data Intensive Computing in MATLAB

Shansi Ren  
Dr. Xiaodong Zhang  
Jingzhou, P.R.C.  
B.S., University of Science and Technology, Hefei, China; M.S., Bowling Green State University; M.S., The Ohio State University  
Microsoft, Redmond, Washington  
Analysis and Implementation of Topology-Aware Overlay Systems on The Internet

Gopalakrishnan Santhanaraman  
Dr. D.K. Panda  
Chennai, India  
B.Tech., Banaras Hindu University, Varanasi, India; M.S., University of South Carolina at Columbia, South Carolina, USA  
NCSA (National Center for Supercomputing Applications), Urbana-Champaign, Illinois, USA  
Designing Scalable and High Performance One Sided Communication Middleware For Modern Interconnects

Ambriish Tyagi  
Dr. James W. Davis  
New Delhi, India  
B.Engr., University of Delhi; M.S., The Ohio State University  
Omrion Scientific Technologies, Inc., Fremont, CA  
Layered Tracker Switching for Visual Surveillance

Jonathan Woodring  
Dr. Han-Wei Shen  
Delta, Ohio, USA  
B.S., M.S., The Ohio State University  
Los Alamos National Laboratory, Los Alamos, NM  
Visualization of Time-Varying Scientific Data Through Comparative Fusion and Temporal Behavior Analysis

Daiqing Xue  
Dr. Roger A. Crawfis  
Wuhu, P.R.C.  
B.Engr., Zhejiang University; M.S., Nankai University, Tianjin, P.R.C.  
Intel VCG, Austin, Texas  
Volume Visualization Using Advanced Graphics Hardware Shaders

Xuan Zhang  
Dr. Gagan Agrawal  
Beijing, P.R.C.  
B.S., Tsinghua University, China; Tsinghua University, China  
Supporting On-The-Fly Data Integration for Bioinformatics

Youding Zhu  
Dr. Richard Parent  
Ningbo, P.R.C.  
B.Engr., M.S., Tongji University, Shanghai, P.R.C.  
Honda Research  
Model-Based Human Pose Estimation with Spatio-Temporal Inferencing

Spring 2009, Sitaram Asur, in his commencement robes, poses with his mentor, Srinivasan Parthasarathy.

At the Winter 2009 commencement (from left to right): Xiaodong Zhang (CSE Chair and Ren’s advisor) and Gordon Gee (President of The Ohio State University), pose with new Doctor of Philosophy, Shansi Ren.
Nirmal Shravanth Kagolanu  
Dr. Paul Sivilotti  
Vijayawada, India  
B.S., Nagajrana University, India

Nipun Kalra  
Dr. Prasun Sinha  
Stamford, Connecticut, USA  
B.Tech., Uttar Pradesh Technical University, India

Jason Kirschenbaum  
Dr. Bruce Weide  
Shaker Heights, Ohio, USA  
B.S., B.S., The Ohio State University, USA

Aman Kumar  
Dr. Rajiv Ramnath  
Ambala, India  
B.Tech., Maharishi Dayanand University, India

Rahul Kumar  
Dr. D.K. Panda  
Madhubani, India  
B.Tech., University of Roorkee, India

Darrell Brian Larkins  
Dr. P. Sadayappan  
Columbus, Ohio, USA  
B.S.C.I.S., The Ohio State University, USA

Hsing-Jung Lee  
Dr. Gagan Agrawal  
Taipei City, Taiwan  
B.B.A., National Central University, P.R.C.

Omkar Mukund Lele  
Dr. B. Chandrasekaran  
Pune, India  
B.Engr., University of Pune, India

Na Li  
Dr. David Lee  
Nanchang, P.R.C.  
B.S., Zhongshan University, P.R.C.; Masters, Chinese Academy of Science, P.R.C.; M.Appl.Stat., The Ohio State University

Prateeti Mohapatra  
Dr. Eric Fosler-Lussier  
West Lafayette, Indiana, USA  
B.Engr., Birla Institute of Technology, Mesra, Ranchi, India; M.S., University of Massachusetts at Dartmouth, USA

Madhavi Marigold Muppala  
Dr. Richard Parent  
Hyderabad, Andra Pradesh, India  
B.S., Birla Institute of Technology and Science, India

Deepak Nagaraj  
Dr. Gagan Agrawal  
Bangalore, India  
B.Engr., Visveswariah Technological University, India

Bhargavi Rajaraman  
Dr. D.K. Panda  
Villupuram, India  
B.Tech., Birla Institute of Technology and Science, India

Lifeng Sang  
Dr. Anish Arora  
Hanzhou, P.R.C.  
B.Engr., M.S., Zhejiang University, P.R.C.

Kaushik Sinha  
Dr. Mikhail Belkin  
Burwan, India  
B.Tech., Kakatiya University, India; M.Tech., Indian Institute of Technology, India
Welcome to the 2009 Graduate Student Research Poster Exhibition.

Chair Xiaodong Zhang presents the "Best in Show" winner, Ben Schroeder with his certificate of achievement.

Guests and students discuss the research presented.
### 2009 Graduate Student Research Poster Exhibit

The 3rd Graduate Student Research Poster Exhibit was a third success. Below are the participants with their advisors names and poster titles.

<table>
<thead>
<tr>
<th>Name</th>
<th>Advisor</th>
<th>Title</th>
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<tbody>
<tr>
<td>Bruce M. Adcock</td>
<td>Bruce Weide</td>
<td>The End of Debugging as We Know It</td>
</tr>
<tr>
<td>Michael Andereck</td>
<td>Rick Parent</td>
<td>Interactive Smoothed Particle Hydrodynamics</td>
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<tr>
<td>Xiaole Bai</td>
<td>Dong Xuan</td>
<td>Authentication in Malicious Environments</td>
</tr>
<tr>
<td>Muthu Manikandan Baskaran</td>
<td>P. Sadayappan</td>
<td>Automatic Parallelization and Optimizations for Modern Multi-core Architectures</td>
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<td>Matt Boggus</td>
<td>Roger Crawford</td>
<td>Procedural Creation of Three Dimensional Caves</td>
</tr>
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<td>Ai Chen</td>
<td>Ten-Hwang (Steve) Lai</td>
<td>Measuring and Guaranteeing Quality of Barrier-Coverage in Wireless Sensor Networks</td>
</tr>
<tr>
<td>Feng Chen</td>
<td>Xiaodong Zhang</td>
<td>Hystor: A Hybrid Storage System Delivering SSD Performance at HDD Cost</td>
</tr>
<tr>
<td>Xiaoning Ding</td>
<td>Xiaodong Zhang</td>
<td>BP-Wrapper: A System Framework Making Any Replacement Algorithms (Almost) Lock Contention Free</td>
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<tr>
<td>Lei Ding</td>
<td>Mikhail Belkin</td>
<td>Object Segmentation and Recognition from Images</td>
</tr>
<tr>
<td>Jonathan Eisenmann</td>
<td>Rick Parent with Matt Lewis</td>
<td>Interactive Evolutionary Design for Motion Variety</td>
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<tr>
<td>Qi Gao</td>
<td>Feng Qin</td>
<td>First-Aid: Surviving and Preventing Memory Management Bugs during Production Runs</td>
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<tr>
<td>Mark Keck</td>
<td>James Davis</td>
<td>On Finding Static Occluding Structures with Few Views</td>
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<tr>
<td>Jason Kirschenbaum</td>
<td>Bruce Weide</td>
<td>Investigations in Tuning Proof Assistants for Program Verification</td>
</tr>
<tr>
<td>Matthew Koop</td>
<td>D.K. Panda</td>
<td>Network-Aware Messaging for Ultrascale Supercomputes</td>
</tr>
<tr>
<td>Matthew Lang</td>
<td>Paul Sivilotti</td>
<td>Modular Verification of Maximality Properties</td>
</tr>
<tr>
<td>Brian Larkins</td>
<td>P. Sadayappan</td>
<td>Global Trees: A Framework for Linked Data Structures on Distributed Memory Parallel Systems</td>
</tr>
<tr>
<td>Teng-Yok Lee</td>
<td>Han-Wei Shen</td>
<td>Visualizing Time-Varying Features with TAC-based Distance Field</td>
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<td>Na Li</td>
<td>David Lee</td>
<td>Malicious Node Conviction in Untrustworthy Distributed Network</td>
</tr>
<tr>
<td>Ren-Shiou Liu</td>
<td>Prasun Sinha</td>
<td>Distributed Routing and Rate Control in Perpetual Sensor Networks</td>
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<tr>
<td>Timothy Miller</td>
<td>Radu Teodorescu</td>
<td>Flexible Redundancy in Robust Processor Architecture</td>
</tr>
<tr>
<td>Jeremy Morris</td>
<td>Eric Fosler-Lussier</td>
<td>Automatic Speech Recognition using Conditional Random Fields</td>
</tr>
<tr>
<td>Shanshi Ren &amp; Enhua Tan</td>
<td>Xiaodong Zhang</td>
<td>Design, Implementation, and Evaluation of a Topology-Aware and Infrastructure-Independent BitTorrent Client</td>
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<tr>
<td>Issam Safa &amp; Chun-jiang Luo</td>
<td>Yusu Wang</td>
<td>Gradiant Estimation in Eigen Space</td>
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<td>Lifeng Sang</td>
<td>Anish Arora</td>
<td>Dialog Codes for Secure Wireless Communications</td>
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<tr>
<td>Gopalakrishnan Santhanaraman</td>
<td>D.K. Panda</td>
<td>Designing High Performance and Scalable One-Sided Communication Middleware on Modern Interconnects</td>
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<tr>
<td>Venu Satuluri</td>
<td>Srinivasan Parthasarathy</td>
<td>Scalable Graph Clustering Using Flows</td>
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<tr>
<td>Benjamin Schroeder</td>
<td>Rick Parent with Marc Ainger</td>
<td>Real-time Sounding Plates for Rigid Body Simulations</td>
</tr>
<tr>
<td>Kaushik Sinha</td>
<td>Mikhail Belkin</td>
<td>Semi-Supervised Learning with Sparse Eigenfunction Bases</td>
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<tr>
<td>Mukundan Sridharan</td>
<td>Anish Arora</td>
<td>Virtualization in Sensor Networks</td>
</tr>
<tr>
<td>Kelly Yackovich</td>
<td>Jay Ramanathan</td>
<td>Dynamic CitiScapes Architecture for Service Composition within Complex Systems</td>
</tr>
<tr>
<td>Zhimin Yang</td>
<td>Dong Xuan</td>
<td>E-SmallTalker: A System for Mobile Social Networking in Physical Proximity</td>
</tr>
<tr>
<td>Zizhan Zheng</td>
<td>Prasun Sinha</td>
<td>Alpha Coverage: Bounding the Interconnection Gap for Vehicular Internet Access</td>
</tr>
<tr>
<td>Youding Zhu</td>
<td>Rick Parent</td>
<td>Online Transfer of Human Motion to Humanoids</td>
</tr>
<tr>
<td>Qian Zhu</td>
<td>Gagan Agrawal</td>
<td>Support Time-Critical Event Handling in Distributed Environments</td>
</tr>
</tbody>
</table>
Undergraduate Program

Overview

In these recessionary times, a college education can appear to be a luxury, but in today’s job market, it is a necessity more than ever. The Bureau of Labor Statistics estimations continue showing computing graduates as the most in demand. More companies have begun to see the need for students with not just the technical skills but also the ability to adapt to new responsibilities and move in areas beyond the computer program requiring organizational, communication and interpersonal abilities. OSU-CSE diligently works to generate exceptional candidates who can fill these roles.

The Department strives to meet these needs with three multi-focused undergraduate degrees from either the College of Engineering or the College of Arts and Sciences. Each of these degrees programs is carefully tailored to provide the perspective on computing appropriate to the college in which it is offered. Students from any college may also earn a minor in Computer and Information Science (CIS).

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<tbody>
<tr>
<td>B.A., B.S. Degrees Awarded</td>
<td>259</td>
<td>296</td>
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<td>192</td>
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<td>138</td>
</tr>
</tbody>
</table>

These figures have been adjusted to reflect a change in reporting definitions.

Undergraduate Office for Academic Advising

The Undergraduate Office for Academic Advising is likely the busiest office in the Department. There is a seemingly unending queue of students seeking assistance with class schedules, career options, and many aspects of their academic careers.

The office is staffed by three highly professional team members.

**Peg Steele**, Coordinator of Academic Advisement. 2009 is another banner year for Ms. Steele. The National Academic Advising Association gave her the 2009 NACADA Service to Commission Award for her work on the Engineering & Science Advising Commission. In 2004, NACADA named Ms. Steele “Outstanding Advisor” and twice she received the same recognition from the local OSU chapter.

**Nikki Strader**, Academic Advisor & Staff Assistant. From 2006 through 2008, Nikki served as the President of the Academic Advising Association of Ohio State (ACADAOS), and in May 2007, was named one of two Outstanding Advisors at Ohio State by ACADAOS. She is the primary contact for all freshman pre-CSE students.

This year saw the departure of Graduate Administrative Assistant in Advising, **Jason Sawin**. Jason will continue in the academic field as an Assistant Professor at the University of Puget Sound in Tacoma, Washington. Filling his hard to fit shoes will be **Michael McGrath**, a graduate student working Dr. Rajiv Ramnath.
BACHELORS GRADUATES 2008-2009

College of Arts and Sciences

- **Katie Leigh Adams (BS)**
  Cincinnati, OH USA
- **Kenda Marettta Albertson (BA)**
  Magna cum Laude
  Sunbury, OH USA
- **Chris James Anderson (BS)**
  Powell, OH USA
- **Stephen Michael Arthur (BS)**
  Cincinnati, OH USA
- **Nicholas Perkins Brown (BA)**
  Columbus, OH USA
- **Chris N. Fabian (BS)**
  Hilliard, OH USA
- **Elise Faubel-Ravel (BS)**
  With Honors in the Arts & Sciences
  Columbus, OH USA
- **Warren James Francis (BS)**
  Summa cum Laude with Honors in the Arts & Sciences
  Marysville, OH USA
- **Jeffrey David Freeman (BS)**
  Statesville, OH USA
- **Jeremy Byron George* (BS)**
  Magna cum Laude with Honors in the Art & Sciences
  Waverly, OH USA
- **Charles Patrick Goins (BS)**
  Columbus, OH USA
- **David Hague (BS)**
  Columbus, OH USA
- **Hiroshi Hayashi (BS)**
  Pickerington, OH USA
- **Nicholas Fredrick Hickman (BS)**
  Elmore, OH USA
- **Keith Harrison Hill (BA)**
  Columbus, OH USA
- **Zachary John Howard (BS)**
  Cum Laude
  Medina, OH USA
- **Nathan Andrew Howes (BS)**
  Grove Port, OH USA
- **Christopher George James (BS)**
  Rochdale, England

- **Joshua David James (BS)**
  Belle Center, OH USA
- **Brian Ellis Jones (BS)**
  Mentor, OH USA
- **Andrew James Allan Keller (BA)**
  Cum Laude
  Twinsburg, OH USA
- **Yoon-Ho Kim (BS)**
  Columbus, OH USA
- **Ryan Adam Klein (BS)**
  West Chester, OH USA
- **Joshua Edward Kossoff (BS)**
  Cum Laude
  Solon, OH USA
- **Stacey Ann Laugel (BS)**
  With Honors in the Arts & Sciences
  West Chester, OH USA
- **Daniel Marcel Mack (BS)**
  Akron, OH USA
- **Thomas Scott Mitro (BS)**
  Cum Laude with Honors in the Arts & Sciences
  Westlake, OH USA
- **Jessie James Morris (BS)**
  Amanda, OH USA
- **Aleksandra Obrazcova (BS)**
  Daugavpils, Latvia
- **Hyun Seuk Park (BS)**
  Columbus, OH USA
- **Lauren Elizabeth Reichenbacher (BS)**
  Columbus, OH USA
- **Benjamin Richard Rhine (BS)**
  Greenwich, OH USA
- **Derek G. Richardson (BS)**
  Columbus, NC USA
- **Anthony John Rickelman (BS)**
  Macedonia, OH USA
- **Shinta Salim (BS)**
  Magna Cum Laude
  Jakarta, Indonesia
- **Ajay Sampat (BS)**
  Columbus, OH USA
- **Ryan Edward Sanders (BS)**
  Fayetteville, OH USA

*presented posthumously
- **Young Sok Shin** (BS)
  Columbus, OH USA
- **Joshua Michael Taylor** (BS)
  Magna Cum Laude
  Lebanon, OH USA
- **Kyle Joseph Tolle** (BS)
  Summa Cum Laude with Honors in the Arts & Sciences
  Springfield, OH USA
- **Edward F. Van Loon** (BS)
  Ashley, OH USA
- **Kurt Richard Weimer** (BA)
  Centreville, VA USA
- **Michael James White** (BS)
  Dublin, OH USA
- **Michael Shawn White** (BS)
  Columbus, OH USA
- **Adam Jai Wiggins** (BS)
  Canton, OH USA
- **Jonathan David Yeagley** (BA)
  Ashtabula, OH USA
- **Chun-Min Yu** (BS)
  Taoyuan, Taiwan, R.O.C.

**College of Engineering**

- **Stephen Michael Arthur**
  Cincinnati, OH USA
- **John Atkinson**
  Whitehall, OH USA
- **Brian Wade Bain**
  Columbus, OH USA
- **Joseph Barkawi**
  Mason, OH USA
- **Ryan Edward Bauman**
  Cum laude
  Cleveland, OH USA
- **Richard Forest Bilderback**
  Pickerington, OH USA
- **Pete Terence Bohman**
  Summa cum laude
  Versailles, OH USA
- **Daniel Aaron Brooks**
  Findlay, OH USA
- **Jamall J. Brown**
  Summa Cum Laude
  North Olmsted, OH USA
- **Nicholas Perkins Brown**
  Columbus, OH USA
- **Sean Robert Carrick**
  Cum Laude
  Hanoverton, OH USA
- **Kevin Paul Casey**
  Elida, OH USA
- **Daniel William Charnigo**
  Medina, OH USA
- **Prabhjyotsin Ramindersing Chawla**
  Summa Cum Laude with Distinction in Computer and Science Engineering
  Chawla, Vadodara India
- **Eddy Cheung**
  Wickliffe, OH USA
- **Nicholas Eugene Chihil**
  Tipp City, OH USA
- **Gau Young Choi**
  Seoul, South Korea
- **Brad Nicholas Condo**
  Sardinia, OH USA

A very happy Prabhjyotsin Chawla waves to the crowd after receiving his diploma.
<table>
<thead>
<tr>
<th>Name</th>
<th>Degree</th>
<th>City</th>
<th>Country</th>
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</thead>
<tbody>
<tr>
<td>Matthew James Nedrich</td>
<td>Cum Laude</td>
<td>North Royalton, OH USA</td>
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<tr>
<td>Jin Seuk Park</td>
<td>Cum Laude</td>
<td>Incheon, South Korea</td>
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<tr>
<td>Jeffrey Kenneth Patterson</td>
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<td>West Carrollton, OH USA</td>
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<td>Robert Lee Quick</td>
<td>Cum Laude</td>
<td>Canal Winchester, OH USA</td>
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<td>Jennifer Rajadhyaksha</td>
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<td>Columbus, OH USA</td>
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<tr>
<td>Praveenkumar Jothi Ramalingam</td>
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<tr>
<td>Timothy James Raptoulis</td>
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<td>Christopher William Reiner</td>
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<td>Jeffrey Harland Ridenbaugh</td>
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<tr>
<td>Jason Kyle Rosser</td>
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<td>Cincinnati, OH USA</td>
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<tr>
<td>Karl T. Salva</td>
<td>Cum Laude</td>
<td>Fredericstown, OH USA</td>
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<tr>
<td>Tyler Jacob Scheerens</td>
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<td>Westerville, OH USA</td>
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<td>Janeen Carlee Simon</td>
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<td>Beavercreek, OH USA</td>
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<td>Christopher Charles Snodgrass</td>
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<td>Jonathan Chad Solove</td>
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<td>Blacklick, OH USA</td>
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<tr>
<td>Chad David Sowald</td>
<td>Magna cum Laude with Distinction in Computer Science and Engineering</td>
<td>Centerville, OH USA</td>
<td></td>
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<tr>
<td>Karl Staas, Jr.</td>
<td></td>
<td>Willoughby, OH USA</td>
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<td>Kevin Alan Stock</td>
<td>Magna Cum Laude</td>
<td>Upper Arlington, OH USA</td>
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<td>Christopher Charles Suran</td>
<td>Cum Laude</td>
<td>Concord, OH USA</td>
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<tr>
<td>Daniel B. Thomas</td>
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<td>Vermilion, OH USA</td>
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<tr>
<td>Katherine Elizabeth Watson</td>
<td>Cum Laude</td>
<td>Cincinnati, OH USA</td>
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<td>Steve Carl Wohlwend</td>
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<td>Edward J. Yee</td>
<td></td>
<td>Westerville, OH USA</td>
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<tr>
<td>Diego Sebastian Zaccari</td>
<td>Magna Cum Laude</td>
<td>Buenos Aires, Argentina</td>
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<tr>
<td>Theresa Anne Zajkowski</td>
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<td>Uniontown, OH USA</td>
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<tr>
<td>William Norbert Zeitler</td>
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<td>Columbus, OH USA</td>
<td></td>
</tr>
</tbody>
</table>
Gagan Agrawal  Full Professor
B.S., Computer Science & Engineering, Indian Institute of Technology, Kanpur, India, 1991; M.S., Computer Science, University of Maryland, College Park, Maryland, 1994; Ph.D., Computer Science, University of Maryland, College Park, Maryland, 1996
Department Research Area: SYSTEMS
Interests: System Software for Parallel and Distributed Environments; Compiler and Runtime Support for Data Intensive Computing, Middleware for Grid and Cloud Environments, Data Integration and Deep web mining.

Anish Arora  Full Professor
B. Tech., Computer Science and Engineering, Indian Institute of Technology, New Delhi, 1986; M.S., Computer Science, University of Texas, Austin, 1988; Ph.D., Computer Science, University of Texas, Austin, 1992.
Department Research Area: NETWORKING
Interests: Wireless Sensor Networks; Fault-tolerant, Secure And Timely Computing; Distributed Systems and Networks; Embedded Systems; Component-Based Design; Formal Methods; Concurrency Semantics.

Mikhail Belkin  Assistant Professor
Hon.B.Sc. with High Distinction, Mathematics, University of Toronto, 1995; M.S., Mathematics, University of Chicago, 1997; Ph.D., Mathematics, University of Chicago, 2003.
Department Research Area: ARTIFICIAL INTELLIGENCE
Interests: Machine Learning And Statistical Analysis Of Natural Data; Manifold And Spectral Methods For Machine Learning; Algorithms For Semi-Supervised Learning And Clustering; Understanding The Value Of Unlabeled Data In Pattern Recognition; Data Mining And Applications To Areas With Abundant Unlabeled Data

Christopher Brew  Associate Professor
Associate Professor of Linguistics and Cognitive Science
B.Sc in Chemistry, University of Bristol, 1980; M.Sc in Experimental Psychology, University of Sussex, 1985; D.Phil, Computational Approaches to Parsing in Dialogue, University of Sussex, 1991.
Department Research Area: ARTIFICIAL INTELLIGENCE
Interests: Statistical Natural Language Processing, particularly Corpus-based Methods for Lexical Acquisition; Data-driven Speech Synthesis and Spoken Language Generation; Infrastructure for Statistical NLP Corpus Creation, Annotation, Indexing and Processing.

Roger Crawfis  Associate Professor
B.S., Computer Science and Applied Mathematics, Purdue University, 1984; M.S., Computer Science, University of California, Davis, 1989; Ph.D., Computer Science, University of California, Davis, 1995.
Department Research Area: GRAPHICS
Interests: Computer Graphics; Video Game Technology; Scientific Visualizations; Medical Imaging; and Volume Rendering.
ERIK FOSLER-LUSSIER Assistant Professor
B.A., Linguistics, University of Pennsylvania, 1993; B.A.S., Cognitive Science, University of Pennsylvania; 1993; Ph.D., Computer Science, University of California, Berkeley, 1999
Department Research Area:
ARTIFICIAL INTELLIGENCE
Interests: Automatic Speech Recognition, Corpus-based Computational Linguistics, Spoken Dialogue Systems, Semantics of Path Planning

EITAN M. GURAR Associate Professor
B.S., Physics, Technion-Israel Institute of Technology, Israel, 1971; M.S., Computer Science, Technion-Israel Institute of Technology, Israel, 1974; Ph.D., Computer Science, University of Minnesota, 1978.
Department Research Area:
SOFTWARE ENGINEERING
Interests: Hypertext Processing and Braille Production
**Ten-Hwang (Steve) Lai** Full Professor

*B.S., Mathematics, Fu-Jen University, Taiwan, 1972; M.S., Mathematics, Fordham University, 1976; Ph.D., Computer Science, University of Minnesota, 1982.*

Department Research Area:
SOFTWARE ENGINEERING

Interests: Wireless Networks; Mobile Computing; and Parallel and Distributed Computing.

---

**David Lee** Full Professor

*M.A., Mathematics, Hunter College, City University of New York, 1982; M.S. and Ph.D., Computer Sciences, Columbia University, 1985*

Department Research Area:
NETWORKING

Interests: Communications and network protocol security and reliability

---

**Ming-Tsan (Mike) Liu** Full Professor


Department Research Area:
NETWORKING

Interests: Computer Architecture and Networking; Parallel and Distributed Computing; Wireless and Mobile Computing; and Protocol Engineering and Design.

---

**Timothy J. Long** Associate Professor

*B.S., Education, University of Cincinnati, 1972; B.A., Mathematics, University of Cincinnati, 1972; M.S., Computer & Information Science, The Ohio State University, 1974; Ph.D., Computer Science, Purdue University, 1978.*

Department Research Area:
SOFTWARE ENGINEERING

Interests: Design, Implementation, Verification, Testing and Application of Reusable Software Components.

---

**Raghu Machiraju** Associate Professor

*B.Sc., Electrical Engineering, Delhi University, 1982; M.S., Automation, Indian Institute of Science, Bangalore, 1984; Ph.D., Computer Science, The Ohio State University, 1996.*

Department Research Area:
GRAPHICS

Interests: Scientific and Medical Visualization; Visualization; Image Analysis; Scientific Computing; Graphics
FENG QIN Assistant Professor

B.E., University of Science and Technology of China, 1998; M.E., Chinese Academy of Sciences, 2001; Ph.D., the University of Illinois, Urbana-Champaign, 2006.

Department Research Area:
SYSTEMS

Interests: Operating Systems, Software Reliability, Security and Distributed Systems

RICHARD E. PARENT Full Professor

B.S., Computer Science and Mathematics, University of Dayton, 1972; M.S., Computer Science, The Ohio State University, 1973; Ph.D., Computer Science, The Ohio State University, 1977.

Department Research Area:
GRAPHICS

Interests: Computer Graphics; Computer Animation; Modeling and Animating Human Figure; Tracking Human Figures in Video; Perception of Synthetic Imagery.

SRINIVASAN PARTHASARATHY Associate Professor

B.E., Electrical Engineering, University of Roorkee, India, 1992; M.S., Electrical Engineering, University of Cincinnati, 1994; M.S., Computer Science, University of Rochester, 1996; Ph.D., Computer Science, University of Rochester, 2000.

Department Research Area:
SYSTEMS

Interests: Data Mining; Parallel and Distributed Computing and Systems; Bioinformatics.

DHABALESWAR K. (DK) PANDA Full Professor


Department Research Area:
SYSTEMS


ATANAS (NASKO) ROUNTEV Associate Professor

B.S., Computer Science & Engineering, Technical University, Sofia, Bulgaria, 1995; M.S., Computer Science, Rutgers University, 1999; Ph.D., Computer Science, Rutgers University, 2002.

Department Research Area:
SOFTWARE ENGINEERING

Interests: Static and Dynamic Program Analysis; Programming Languages and Compilers; Software Understanding and Evolution; Software Testing; High-Performance Computing
**PONNUSWAMY (SADAY) SADAYAPPAN** Full Professor


Department Research Area:

NETWORkING

Interests: Wireless and Wireline Communication Networks; Network Optimization; Network Design and Dimensioning; Network Security; Queueing Theory; Dynamic Control; Network Coding; Performance Limits; Distributed Algorithms; Complexity and Approximability; Pricing; Network Information Theory

---

**Ness B. Shroff** Ohio Eminent Scholar

Full Professor

*B.S., University of Southern California, 1988; M.S.E. University of Pennsylvania, 1990; M.Phil, Columbia University, 1993; Ph.D., Columbia University, 1994.*

Department Research Area:

NETWORkING

Interests: Wireless and Wireline Communication Networks; Network Optimization; Network Design and Dimensioning; Network Security; Queueing Theory; Dynamic Control; Network Coding; Performance Limits; Distributed Algorithms; Complexity and Approximability; Pricing; Network Information Theory

---

**Han-Wei Shen** Associate Professor

*B.S., Computer Science, National Taiwan University, 1988; M.S., Computer Science, State University of New York, Stony Brook, 1992; Ph.D., Computer Science, University of Utah, 1998.*

Department Research Area:

GRAPHICS

Interests: Computer Graphics, Information Visualization, Parallel Visualization Scientific Visualization, Visual Analytics.

---

**Prasun Sinha** Associate Professor

*B.Tech., Computer Science and Engineering, Indian Institute of Technology, Delhi, India, 1995; MS, Computer Science, Michigan State University, 1997; PhD, Computer Science, University of Illinois, Urbana-Champaign, 2001.*

Department Research Area:

NETWORkING

Interests: Sensor Networking; Ad-hoc Networking; Mobile Computing; Wireless Networking

---

**Paul A.G. Sivilotti** Associate Professor

*B.Sc.H., Computing Science, Mathematics & Biochemistry, Queen’s University, Ontario, Canada, 1991; M.S., Computer Science, California Institute of Technology, 1993; Ph.D., Computer Science, California Institute of Technology, 1998.*

Department Research Area:

SOFTWARE ENGINEERING

Interests: Distributed Systems; Software Engineering; and Tool-based Support for Testing Component Implementations.
Neelam Soundarajan  Associate Professor

B.S., Physics, Bombay University, India, 1970; M.S., Physics, Bombay University, India, 1972; Ph.D., Computer Science, Bombay University, India, 1978.

Department Research Area: SOFTWARE ENGINEERING

Interests: Software Engineering; Reasoning about Program Behavior; Specification; Verification; Testing; Issues in Engineering Education.

Kenneth J. Supowit  Associate Professor

A.B., Linguistics, Cornell University, 1978; Ph.D., Computer Science, University of Illinois, 1981.

Department Research Area: SOFTWARE ENGINEERING

Interests: Combinational Algorithms.

Radu Teodorescu  Assistant Professor

Dipl. Eng. in Computer Science, Technical University of Cluj-Napoca, Romania, 2002; M.S., Computer Science, University of Illinois at Urbana-Champaign, 2005; Ph.D., Computer Science, University of Illinois at Urbana-Champaign, 2008.

Department Research Area: SYSTEMS


DeLiang (Leon) Wang  Full Professor

B.S., Computer Science, Beijing University, 1983; M.S., Computer Science, Beijing University, 1986; Ph.D., Computer Science, University of Southern California, Los Angeles, 1991.

Department Research Area: ARTIFICIAL INTELLIGENCE

Interests: Machine Perception and Neurodynamics.

Yusu Wang  Assistant Professor


Department Research Area: GRAPHICS

BRUCE W. WEIDE  Associate Chairperson
Full Professor
B.S.E.E., Electrical Engineering, University of Toledo, 1974; Ph.D., Carnegie Mellon University, 1978.
Department Research Area:
SOFTWARE ENGINEERING
Interests: Component-Based Software; Verified Software.

REPAHIEL WENGER  Associate Professor
B.S.E., Computer Science, Princeton University, 1984; Ph.D., Computer Science, McGill University, 1988.
Department Research Area:
COMPUTER GRAPHICS
Interests: Computational Geometry; Computer Visualization; Isosurface Reconstruction; and Image Processing.

DONG XUAN  Associate Professor
B.S., Electronic Engineering, Shanghai Jiao Tong University, China, 1990; M.S., Electronic Engineering, Shanghai Jiao Tong University, 1993; Ph.D., Computer Engineering, Texas A&M University, 2001.
Department Research Area:
NETWORKING
Interests: Distributed Computing, Computer Networks and Cyber Space Security

XIAODONG ZHANG  Chairperson of Computer Science & Engineering
Robert M. Critchfield Professor
B.S., Electrical Engineering, Beijing University of Technology, 1982; M.S., Computer Science, University of Colorado at Boulder, 1985; Ph.D., Computer Science, University of Colorado at Boulder, 1989.
Department Research Area:
SYSTEMS
Interests: Distributed and High Performance Systems

STUART H. ZWEBEN  Associate Dean - College of Engineering
Full Professor
B.S., Mathematics, City College of New York, 1968; M.S., Statistics and Computer Science, Purdue University, 1971; PhD., Computer Science, Purdue University, 1974.
Department Research Area:
SOFTWARE ENGINEERING
Interests: Reusable Software; Quality Evaluation; and Engineering Education.
**Clinical Faculty**

**Rajiv Ramnath** Assistant Professor of Practice  
Director, Collaborative for Enterprise Transformation and Innovation (C.E.T.I.)

B.Tech., Indian Institute of Technology, New Delhi, India, 1981; M.S., Computer & Information Science, The Ohio State University, 1983; Ph.D., Computer & Information Science, The Ohio State University, 1988  

---

**Adjunct Faculty**

**Kikuo Fujimura**

**Courtesy Appointments**

**Wayne Carlson** Chair, Industrial Design  
**Harvey M. Friedman** Mathematics  
**Kun Huang** Biomedical Informatics  
**Furruk Khan** Electrical and Computer Engineering  
**Michael Knopp** Chair, Radiology  
**Albert M. Lai** Biomedical Informatics  
**Alan Saalfeld** Geodetic Science  
**Cathy Honghui Xia** Integrated Systems Engineering  
**Tao Shi** Statistics

---

**Emeritus Appointments**

**Professor Emeritus**

**Balakrishnan Chandrasekaran**

**Charles A. Csuri**

**Sandy Mamrak**

**Mervin E. Muller**

---

**New Faculty Arriving Autumn 2009**

**Luis Rudemacher** Assistant Professor  
Bachelor in Engineering Sciences, Mathematics, Universidad de Chile, Santiago, Chile, 2002; Mathematical Engineering Title (Masters Equivalent) Universidad de Chile, Santiago, Chile, 2002; Ph.D., Applied Mathematics, Massachusetts Institute of Technology, 2007.  
Department Research Area: Graphics  
Interests: Algorithmic convex geometry, random structures, computational complexity theory, matrix approximation, game theory, mathematical economics, optimization.

**Christopher Stewart** Assistant Professor  
B.S., Computer Science, Morehouse College, 2003; M.S., Computer Science, University of Rochester, 2005; Ph.D., Computer Science, University of Rochester, 2008  
Department Research Area: Systems  
**Balakrishnan Chandrasekaran**  Professor Emeritus  
Senior Research Scientist  

*B.E., Electrical Engineering, Madras University, India, 1963; Ph.D., Electrical Engineering, University of Pennsylvania, 1967*

Research Interests:  

---

**Jay Ramanathan**  Senior Research Scientist  
Director, Collaborative for Enterprise Transformation and Innovation (C.E.T.I.)  

*B.S., Computer Science, Purdue University, 1970; M.S. in Computer Science, Purdue University, 1972; Ph.D. Computer Science, Rice University, 1977.*

Research Interests:  

---

**John Josephson**  Research Scientist  

*B.S., Mathematics, The Ohio State University 1966; M.S., Mathematics, The Ohio State University, 1970; Ph.D., Philosophy, The Ohio State University, 1982*

Research Interests:  
Artificial Intelligence; Computational Epistemology, Abductive Inference, Causal Reasoning, Multiple Criteria Decision Making, Perception, Information Fusion, Diagnosis, Theory Formation, Logic of Investigation and Foundations of Science

---

**William M. Leal**  Research Scientist  

*B.A. Mathematics, University of California, Berkeley, 1969; M.S. Computer Science, University of South Alabama, Mobile, 1994; M.S. Computer Science, The Ohio State University, 2001; Ph.D., Computer Science, The Ohio State University, 2001.*

Research Interests:  
Wireless Sensor Networks, Dynamic Resource Management, Compositional Stabilization
S E N I O R  L E C T U R E R S

GOJKO BABIC
B.S., Electric Engineering, University of Sarajevo, 1972; M.S., Computer Science, Florida Institute of Technology, 1975; Ph.D., Computer Science, The Ohio State University, 1978.
Research Interests: Computer Networking and Security.

BETTINA BAIR
Research Interests: Women in Computing; Effects of Technology on Business and Culture; and Computer Education

PAOLO BUCCI
Laurea in Scienze Dell’ Informazione, Universita’ Degli Studi di Milano, Italy, 1986; M.S., Computer & Information Science, The Ohio State University, 1989; Ph.D., Computer & Information Science, The Ohio State University, 1997.
Research Interests: Software Engineering; Computer Science Education

DEBBY GROSS
Research Interests: Business Technology and Applications.

WAYNE HEYM
B.Phil., Miami University, 1978; M.S., Cornell University, 1980; M.S., Computer & Information Science, The Ohio State University, 1989; Ph.D., Computer & Information Science, The Ohio State University, 1995.
Research Interests: Software Engineering and Computing Education

H. DAVID MATHIAS
B.S., Computer Science, University of Delaware, 1991; M.S., Computer Science, Washington University, 1993; D.Sc., Computer Science, Washington University, 1996.
Research Interests: Computational Learning Theory.
### Part-Time Lecturers

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<tr>
<td>Moez Chaabouni</td>
<td>Perumal Krishnasamy</td>
<td>Steven Romig</td>
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<td>Michael Compton</td>
<td>Igor Malkiman</td>
<td>Ron Salyers</td>
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<td>Matt Curtin</td>
<td>Michelle Mallon</td>
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<td>Charles Giles</td>
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<td>Steve Gomori</td>
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<td>Robert Joseph</td>
<td>Doyt Perry</td>
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### Administrative Staff

- **Carrie Casto**: Grants Administrator.
- **Catrena Collins**: Human Resources Officer
- **Tamera Cramer**: Public Relations Coordinator.
- **Tom Fletcher**: Office Support Associate
- **Don Havard**: Fiscal Officer
- **Z. Lynn Lyons**: Graduate Admissions and Graduate Studies Coordinator.
- **Kitty Reeves**: Academic Program Administrator

### Computing Services Staff

- **Michael Compton** -- Director, Computing Services
- **Chris Jackson** -- Systems Administrator
- **Aaron Jenkins** – Systems Manager
- **Bob Joseph** -- Systems Developer/Engineer, DBA
- **Tami King** -- Sr. Systems Developer/Engineer
- **Dave Kneisly** -- Systems Administrator
- **Todd Lucall** -- Systems Administrator
- **Shaun Rowland** -- Manager, Software Support and Development
- **Ted Welch** -- Systems Administrator
- **Kat Wenger** -- Systems Manager
SELECT FACULTY PUBLICATIONS

ARTIFICIAL INTELLIGENCE


COMPUTER GRAPHICS

Visualization and Graphics


**Computational Geometry**


**T. Dey** and K. Li. “Cut Locus and Topology from Point Data.” *Proceedings of 25th Symposium on Computational Geometry* (SoCG09), 281—290.


**Computer Networking**


**Software Engineering**


**Systems**

**Data Mining and Data Bases**


Selected Faculty Publications - 51


High-end and Core Systems


M. Koop, W. Huang, K. Gopalakrishnan and D.K. Panda, “Performance Analysis and Evaluation of PCIe 2.0 and Quad-Data Rate InfiniBand.” Int’l Symposium on Hot Interconnects (HotI), Aug. 2008


X. Ding, H. Huang, Y. Ruan, A. Shaikh, and X. Zhang, “Automatic Software Fault Diagnosis By Exploiting Application Signatures.” *Proceedings of 22nd USENIX Conference on Large Installation System and System Administration* (LISA’08), San Diego, California, November 9-14, 2008.


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