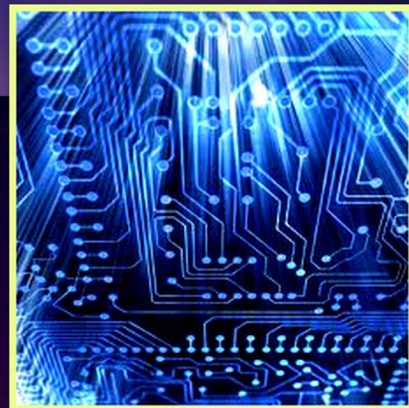
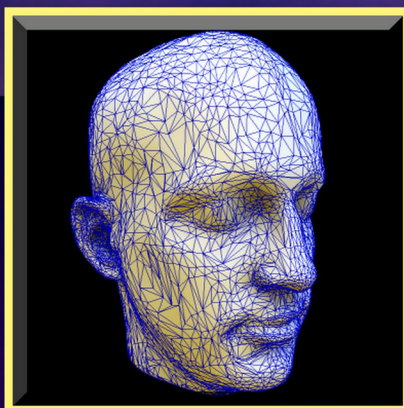
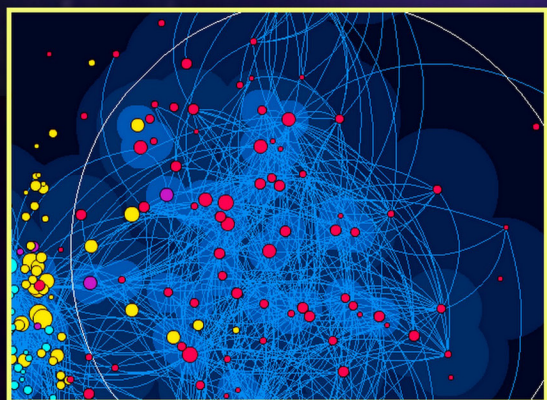
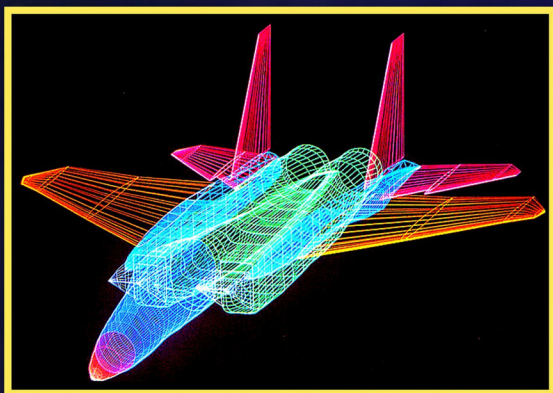




DEPARTMENT OF
COMPUTER SCIENCE
AND ENGINEERING

2012-2013 Annual Report



CSE

A Treasure House of Knowledge!



The cover of this report was designed by a new Masters Graduate, **ARATI MAHIMANE.**

Arati is originally from India where she earned a Bachelor of Computer Engineering from Cummins College of Engineering, Pune, India in 2009. Before joining CSE in Autumn 2011, she worked as a Software Engineer for Persistent Systems Ltd., Pune. While at CSE, her adviser was Jayashree Ramanathan and she worked on Enterprise Architecture.

Currently, Arati is a Software Developer at Rackspace in Austin, TX. She is working on Rackspace cloud products and plans to continue her journey in the field of Cloud Computing. During her free time, she likes to draw and paint. She says, “I created the Annual Report cover design in order to give something back to the department before I graduate.”

And the Department Of Computer Science And Engineering appreciates her efforts.

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WELCOME FROM THE CHAIR'S OFFICE

Dear Colleagues, Alumni, Friends, and Parents,

We present to you a copy of 2012-2013 Annual Report of the Department of Computer Science and Engineering at Ohio State. The report provides archival data of the department in education and research in the last year and in the last 10 years, giving you a quantitative insights into the progress of the department in a long term. We also selectively present achievements and activities of our students, faculty, and alumni in the last year. I would like to highlight some of them in my introduction.

- Four new assistant professors will join the department: Spryos Blanas from University of Wisconsin (in databases), Chunyi Peng from UCLA (in networking), Alan Ritter from Carnegie Mellon University and University of Washington (in natural language processing), and Anastasios Sidiropoulos from MIT and University of Illinois (in computer science theory).
- Three CSE assistant professors received the NSF Career Awards: Michael Bond in programming language and software engineering, Kannan Srinivasan in wireless networks, and Radu Teodorescu in computer architecture. CSE Alum Sriram Chellappan (Ph.D.'07, Assistant Professor of Computer Science at Missouri University of Science and Technology) was also honored by an NSF Career Award. CSE alumni Pavan Balaji (Ph.D.'06) received a Career Award from the U.S. Department of Energy.
- Two senior CSE family members have been named ACM Fellows: Ahmed Elmagarmid (Ph.D.'85, Executive Director of Qatar Computing Research Institute, and Professor of Computer Science at Purdue University, and Xiaodong Zhang (CSE Chair).
- Professor Bruce Weide received Ruth and Joel Spiral Excellence in Teaching Award.
- Emeritus Professor Stu Zweben received the Linton E. Grinter Distinguished Service Award from the Accreditation Board for Engineering and Technology (ABET).
- I would like to congratulate Jim Davis and Dong Xuan for their promotions to the rank of full professors. Same congratulation goes to Feng Qin for his promotion to the rank of associate professor with tenure.

In the coming year, I look forward to presenting new progress and more accomplishments via our web site, social media and the next annual report.

Cordially yours

Xiaodong Zhang

Chairperson

Robert M. Critchfield Professor



NEWS AND HIGHLIGHTS

THREE TRAILBLAZING FACULTY NAMED AMONG TOP SCHOLARS

Three junior faculty members earned one of the nation's most prestigious scientific awards - the National Science Foundation Faculty Early Career Development (CAREER) award. Given each year to the nation's top scholars, the CAREER award supports junior faculty who exemplify the role of teacher-scholars.

MIKE BOND joined Ohio State in 2011 with the goal of making modern computer systems reliable and efficient. Achieving this goal presents serious challenges as chip manufacturers make processors faster by adding more and more cores; this trend makes it notoriously difficult for programmers to develop and debug software that is both accurate and fast.

As part of his current project, "Practical Language and System Support for Reliable Concurrent Software," Professor Bond will work closely with graduate and undergraduate students in his research group, Programming Languages and Software Systems (PLaSS), to design and implement the first practical approaches for guaranteeing reliable parallel execution without sacrificing performance. These innovations will ultimately help parallel software systems overcome existing challenges and address society's growing computing needs.

KANNAN SRINIVASAN studies and develops wireless network and communication systems with the aim of improving performance, reliability, and security. He joined the university in 2011 and during that time has investigated everything from networking protocols to measurements to wireless nodes.

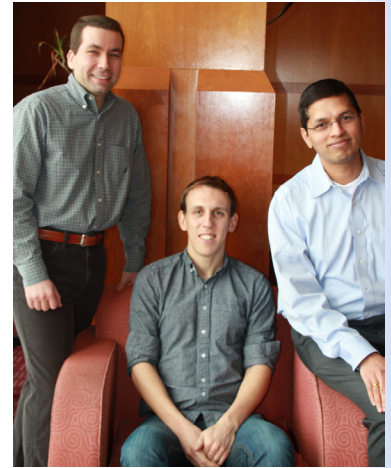
The specific proposal that earned him the CAREER award was "Together We Rise: A Unified MIMO - Full Duplex Network Architecture." It aims to find a solution for one of the field's most pressing problems: the need for higher capacity wireless networks. In the past, wireless networks have relied on a system that uses either all of its antennas for transmission or for reception; or, uses half of them for transmission and the other half for reception. Working closely with students and researchers, Professor Srinivasan will develop more flexible radios that can dynamically choose the number of antennas to transmit and receive, greatly increasing their capacity. Such a flexible radio can be used for optimizing reliability, security, or capacity. After development, he plans to work closely with Ohio State's Technology Commercialization Office to patent and market the fully redesigned system.

RADU TEODORESCU leads Ohio State's Architecture Research Lab, a group focused on computer architecture, power management, and the impact of technology scaling on microprocessor design. Since joining the faculty in 2008, Professor Teodorescu's research has centered on improving the energy efficiency of computing devices.

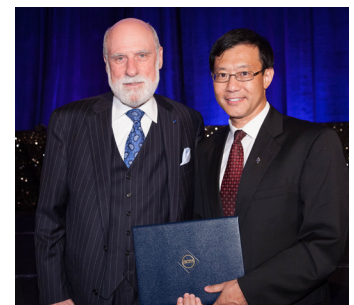
His primary project, "An Integrated Treatment of Voltage Noise and Process Variability in Many-core and GPU Systems with Microarchitectural Solutions," aims to develop a new class of microprocessors that dynamically adapt to their environment and the applications they run, reducing energy usage. These systems are essential for big data centers, as well as personal gadgets such as mobile phones and portable devices, both of which are experiencing an increased demand for faster, more energy efficient computing. A unique aspect of this work, Teodorescu will partner closely with the Metro Early College High School, recruiting minority and female students as part of the project.

XIAODONG ZHANG NAMED ACM FELLOW

XIAODONG ZHANG, is one of the 52 the leading computer scientists worldwide named as Fellows by the Association of Computing Machinery (ACM). ACM recognized Zhang "for his contributions to data and memory management in distributed systems." ACM, the world's largest scientific and educational computing society, bestows their Fellow awards to a small and elite group of ACM



Left to right: Radu Teodorescu, Mike Bond, and Kannan Srinivasan.



Dr. Vint Cerf, the ACM President presented the ACM Fellow certificate to Xiaodong Zhang in the ACM Award Banquet on June 15, 2013 in San Francisco.

members for their outstanding accomplishments in computing and information technology and in the large computing community.

Xiaodong Zhang is the Robert M. Chritchfield Professor in Engineering, and Chair of the Computer Science and Engineering Department at The Ohio State University. In addition to his busy administrative and professional service duties, Zhang continues to maintain a high profile research program. While the intellectual pursuit still maintains prominence in his research, Xiadong also strives to transfer his work into advanced technology to impact general-purpose computing systems in both hardware and software. Several technical innovations and research results from his research group have been widely adopted in commercial processors, major operating systems and databases, and distributed systems.

Zhang joined Ohio State as the CSE Department Chair in 2006 from the College of William and Mary, where he was Lattie P. Evans Professor and Chair of the Computer Science Department. He was named as IEEE Fellow for his contributions in computer memory systems in 2008. He received his Ph.D. in Computer Science from University of Colorado at Boulder, where he received a Distinguished Engineering Alumni Award in 2011.



WANG AWARDED \$1.8M TO IMPROVE SPEECH UNDERSTANDING

Professor **DELIANG (LEON) WANG** will lead a five-year \$1.8 million research grant from the National Institute on Deafness and Other Communication Disorders (NIDCD), one of the institutes that comprises the National Institutes of Health (NIH), to develop an algorithm to improve speech reception in noise by hearing-impaired listeners.

Wang, in collaboration with co-investigator Eric Healy (OSU Dept. of Speech and Hearing Science) and graduate students Sarah Yoho and Yuxuan Wang, recently provided the first demonstration of speech intelligibility improvements by hearing-impaired listeners. All

listeners in their study demonstrated improvements in sentence recognition following algorithm processing. These improvements were often quite substantial, as many listeners who were unable to understand any speech showed near-perfect recognition after processing.

This NIH project has the potential to revolutionize our treatment of hearing loss.

Wang received his BS and MS degrees from Peking University in Beijing. He then went on to receive a PhD in computer science from the University of Southern California. His research interests include machine perception and neurodynamics. In 2008, he won the Helmholtz Award from the International Neural Network Society. He is an IEEE Fellow, and currently serves as the co-editor-in-chief of Neural Networks, a premier journal in the field.

WEIDE RECEIVES LUTRON ELECTRONICS AWARD

Lutron Electronics gave Dr. **BRUCE WEIDE** their esteemed Ruth and Joel Spira Excellence in Teaching Award. This award is given to an individual who excels in teaching and inspiring students and has made significant contributions to field of education. Ruth and Joel Spira founded Lutron Electronics in 1961, two years after Joel invented the solid state dimmer switch.

Dr. Weide, who retired in June 2013 after teaching and leading for 35 years, has advised or co-advised 28 PhD graduates although he is equally known for his enduring connection to many undergraduates. Though humble concerning his impact, Bruce is no stranger to awards. His excellent work with students garnered recognition from the Institute of Electrical and Electronics Engineers (IEEE) Computer Society. In 2000, he was one of the first educators to receive their Computer Science and Engineering Undergraduate Teaching Award, which he received jointly with his recently retired friend and colleague Tim Long. He and Dr. Long also earned the Ohio State College of Engineering Boyer Teaching Award. Individually, he was given the CSE Teaching Award three times and CSE Service Award twice.



Dr. Weide (left) receives congratulations from Will Howe from Lutron.

ZWEBEN RECEIVES ABET'S HIGHEST HONOR

The Accreditation Board for Engineering and Technology (ABET) bestowed the 2012 Linton E. Grinter Distinguished Service Award on Dr. **STUART (STU) ZWEBEN**, Professor Emeritus and former CSE Chairperson. He received this recognition for “outstanding leadership in computing accreditation world-wide, including more than 27 years of service to ABET and CSAB, and for being a catalyst behind the growth of computing accreditation in the United States over the last 25 years.” It is the highest award ABET gives and is named for engineering and engineering technology education pioneer Linton E. Grinter.



Stu Zweben is pictured above on the left with Larry Kaye, then ABET President.

From the beginning of his career, Dr. Zweben has been involved in computing program accreditation. In the early 80's, he was influential in the Association for Computing Machinery's decision to join with the IEEE Computer Society to form the Computing Sciences Accreditation Board, now CSAB, an organization he lead as President in 1989-1991. After CSAB merged with ABET in the late 1990's, Stu was a essential framer of the Computing Accreditation Commission (CAC), initially as a member and later as its 2007-2008 Chair.

Subsequently to his time with the CAC, Zweben served ABET as a member of the organization's Accreditation Council for five years, including as the council's Chair for 2009-11. Currently, he is a member of its Global Council.

Stu joined CSE in 1974, leading the Department as Chair for 11 years. He then move to the OSU's College of Engineering where he was Associate Dean for Academic Affairs and Administration for six years before he retiring in 2011.

He is a Fellow of ABET, ACM, and CSAB.

NARAYANAN AWARDED SBC PRESIDENTIAL FELLOWSHIP

ARUN NARAYANAN, a 5th year CSE PhD candidate in Artificial Intelligence with concentration in computational audition and machine learning, received an SBC Presidential Fellowship. The Presidential Fellowship is the most prestigious award given by The Ohio State University Graduate School to recognize the outstanding scholarly accomplishments and potential of graduate students. Arun joins 16 others in winning the autumn 2012 competition, and this is the first time a CSE graduate student has received this honor in several years.

The goal of Arun's research is to improve the performance of automatic speech recognition systems in the presence of background noise by utilizing both the low-level acoustic properties of speech and the learned top-down models of phonetic units and time-frequency masks. The fellowship will fund 12 months of his study towards the completion of a doctoral dissertation.

Prior to joining Ohio State, Arun earned an undergraduate degree in Computer Science and Engineering from the University of Kerala, India. Afterwards, Arun worked at IBM India for three years until beginning his graduate program in 2008.

NEW CSE RESEARCH SCIENTIST EARNS MENTORSHIP RECOGNITION

The Undergraduate Research Office awarded **MICHAEL MANDEL**, CSE Research Scientist, an Outstanding Research Mentor award. This award, part of the Denman Undergraduate Research Forum is given “to recognize the clinical & research faculty, lecturers, post-doctoral researchers, and graduate students who also contribute extraordinary guidance to the undergraduate students who work with them.” To receive the award Michael had to be nominated by an undergraduate(s) participating in the Denman Undergraduate Research Forum, and must demonstrate excellence in teaching and mentorship.

In this year's Denman, Michael advised Jordan Hawkins, a senior in Electrical and Computer Engineering, for his undergraduate honors thesis. The project was to replicate certain tasks that DJs do manually, via software

processing it automatically. Specifically, he built systems that will smoothly transition between tracks in a playlist and create 'mashups' by combining parts of other songs.

Dr. Mandel joined Computer Science and Engineering in Autumn 2012. Prior to that he earned his BSc in Computer Science from the Massachusetts Institute of Technology in 2004 and his MS and PhD with distinction in Electrical Engineering from Columbia University in 2006 and 2010 as a Fu Foundation School of Engineering and Applied Sciences Presidential Scholar. From 2009 to 2010 he was an FQRNT Postdoctoral Research Fellow in the Machine Learning laboratory at the Université de Montréal. From 2010 to 2012 he was an Algorithm Developer at Audience Inc, a company that has shipped millions of noise suppression chips for cell phones.

FACULTY PROMOTIONS

The Ohio State University Board of trustees approved all three faculty nominations for promotion. Drs., **JAMES W. DAVIS** and **DONG XUAN** will become Full Professor effective October 2013. At the same time, Dr. **FENG QIN** will join the ranks of Associate Professors.

REWARDS TO THE BRAVE



Dr. **STEVE MAY** (BS '90, MA '92, PhD '98), Chief Technology Officer at Pixar, and his team won an Oscar for the animated feature film, Brave. This is the fourth Oscar winning production May has worked since the 2002 establishment of the category.

Dr. May is solidly a Buckeye having earned a bachelor's in 1990, master's in 1992, and PhD in 1998, all in Computer and Information Science.

For Brave, which opened at No. 1, May oversaw and developed technology used in the film; ensured the movie lined up with the director's creative vision; and supervised animators.

ALUM RECOGNIZED FOR PROFESSIONAL ACHIEVEMENT

MATT DESCH (BS '80) received a 2012 Alumni Association Award for Professional Achievement. The Professional Achievement Award is presented to alumni who have superb records of distinguished career accomplishments and who have made outstanding contributions to their professions. No more than three individuals will be selected in any one year for this award.

Matt is Chairman and CEO of Iridium Communications, Inc. in Washington, D.C. The company provides voice and data services to ships, corporate aircraft, the U.S. military and for machine-to-machine applications like asset tracking. Matt serves as a member of the President's National Security Telecommunications Advisory Committee and on a number of boards in the high tech and telecom industry including as the Chairman of the Board of Airspan Networks (a public supplier of WiMAX infrastructure).

FORTIN RECEIVES DISTINGUISHED ALUM AWARD

The College of Engineering named Dr. **MICHAEL FORTIN** (MS '87; PhD '91) a 2012 Distinguished Alumni for his contributions to computer science.

Dr. Fortin is a Distinguished Engineer in the Windows Core Operating Systems Division at Microsoft. He began his career at Microsoft in 1997, where he worked on Windows 2000 doing development on tools to aid in improving system and application performance.



Mike Fortin with College of Engineering Dean Williams at the award luncheon.

ALUM CHELLAPPAN'S CAREER PROGRESSING

CSE alumnus, **SRIRAM CHELLAPPAN** (PhD '07) received a CAREER award from the National Science Foundation. Titled "Human Behavior Assessment from Internet Usage: Foundations, Applications and Algorithms," this research improves upon current self-reporting studies in cyber-psychology that are limited in reliability. The goal is to establish private, passive and unobtrusive internet applications to monitor mental health care, improve online socializing, enhance cyber security and detect cyber bullying. The data collected from these applications, in tandem with behavioral psychology will be analyzed by classification

algorithms; the research will ultimately demonstrate the application's potential to achieve significant insights and conclusions in assessing human behavior through internet usage data. The research is currently tested with college-aged students but Chellappan will also collaborate with K-12 schools to further enhance project outreach.

Dr. Chellappan, currently an assistant professor in the Department of Computer Science at the Missouri University of Science and Technology, was advised by CSE Professor Dong Xuan. His other degrees include a MS earned from The Ohio-State University in 2006 and a M.S. in Electrical Engineering also from The Ohio State University in 2002. He received a BE from the University of Madras, Chennai, India in 1999.

DEPARTMENT OF ENERGY MOVES BALAJI'S CAREER

The DOE granted Dr. **PAVAN BALAJI** (PhD '06) a CAREER award for his work on efficient communication systems for supercomputers equipped with complex computational and memory hierarchies, including heavily hierarchical processing units and complex heterogeneous architectures such as integrated or discrete accelerators.

Balaji was chosen by Crain's as one of Chicago's "40 Under 40" individuals who are on the rise and worth watching. Currently his research is being done at Argonne National Laboratories.



COMPUTER SCIENCE RESEARCH AT OHIO STATE MAKES IMPACT IN APPLE'S HYBRID STORAGE PRODUCT

In October 2012, Apple Inc. announced its new storage product called Fusion Drive that combines a small solid state drive (SSD) and a large hard drive. This integrated storage is managed by Apple's operating system, Mac OS X Mountain Lion, in a single logical space. This product can significantly accelerate data accesses in a cost-effective way for widely used Apple products, including iMac and Mac Mini.

The product's untold story is its close relationship with a research project conducted at The Ohio State University by former CSE PhD student **FENG CHEN** and his advisor **XIAODONG ZHANG**, in collaboration with Intel Labs research scientist David Koufaty. The three researchers published and presented a paper entitled "Hystor: Making the Best Use of Solid State Drives In High Performance Storage Systems" in the 25th ACM International Conference on Supercomputing (ICS 2011) in May 2011. This work presents a hybrid storage system framework called Hystor with a small SSD and a large hard drive. The high performance and cost-effectiveness of the Hystor framework comes from three basic system components. First, instead of using the SSD as a hard drive cache, Hystor logically merges the SSD and the hard disk into a single block device managed by the operating system. Second, Hystor is driven by a set of algorithms that decide in which device (SSD or hard drive) the data should be stored and accessed. Finally, to provide sustained data processing performance, Hystor adaptively and timely migrates and retains data in the most suitable devices for users by storing smaller, more frequently accessed data in the SSD drive and larger, less used data in the hard drive.

The Hystor paper received the Best Paper Award in ICS 2011. Following the paper's publication, the Apple Fusion Drive group had detailed discussions with the authors of the paper. A senior software engineer of Apple made the following comment on the Hystor paper:

Hystor is a well-designed system, and its paper discussed several key systems trade-offs in details. The Apple software engineers had carefully and systematically evaluated Hystor. This work had a significant influence in the design of Apple's Fusion Drive. Some design elements and algorithms in Hystor have been directly used in Apple's Fusion Drive.

Feng Chen completed his PhD in CSE at Ohio State in 2010, where he received a Graduate Research Award. He joined the Intel Labs as a research scientist after his graduation.

DK PANDA AND TEAM ADVANCES IN MULTIPLE AREAS

Dr. **DHABALESWAR PANDA**'s software MVAPICH fueled "Stampede," National Science Foundation's powerful new supercomputer, to 7th Place on Top500. This is particularly exciting for all the teams involved in the Stampede system, as at the time it was still half operational (the complete system became operational around Jan '13). Built at the Texas Advanced Computing Center at The University of Texas at Austin, it has 204,900 cores and is currently delivering 2.66 Petaflop performance using MVAPICH2. This system uses InfiniBand FDR and the new Intel MIC accelerators.

Stampede is one of the world's most powerful supercomputers. At its initial peak performance, it processes at 10 petaflops, contains 272 terabytes (272,000 gigabytes) of total memory, and handles 14 petabytes (14 million gigabytes) of disk storage. Eventually, Intel will be adding new generations of MIC processors which will then allow Stampede to clock at 15 petaflops.

Dr. D. K. Panda has proudly noted that the software MVAPICH, developed in his Network Based Computing Lab (NOWLAB), has helped power faster computers on the TOP500 list. This showing marks the highest entrance yet. MVAPICH/MVAPICH2 (pronounced em-va-pich) software delivers best performance, scalability and fault tolerance for high-end computing systems and servers using InfiniBand, 10GigE/iWARP and RoCE networking technologies. All components of Stampede will be integrated with InfiniBand FDR 56G/bs network. MVAPICH improves the processing by connecting traditional supercomputing software with innovative networking technologies and protocols, thus increasing the data flow speed in a significant manner.

In support of research into supercomputer connectivity, the Intel Corporation gave Dr. Dhableswar Panda \$50,000. These funds will be used in the development for projects including "Stampede."

In addition to his work with Supercomputers, Dr. Panda is participating in the development of a "Science DMZ." The Ohio State University is leading the establishment of a "sub-Internet" which will allow scientists the opportunity to collaborate across the cloud with little interference from each institution's security. This "demilitarized zone" will presumably put an end to the information bottlenecks that occur when encountering an organization's firewalls.

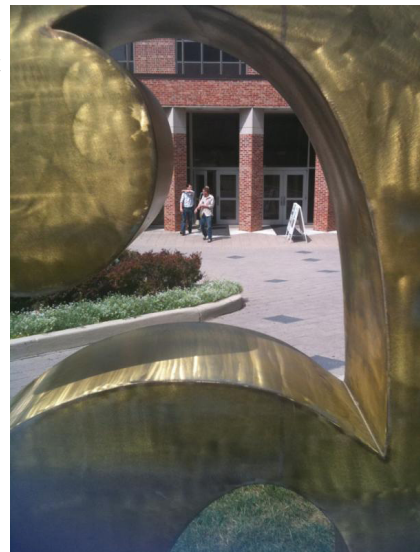
Funded from a \$1 million grant from the National Science Foundation, Carol Whitacre, OSU vice president for research, heads up the team for the next two years. This team will consist of members from Ohio State, the University of Missouri and the Ohio Technology Consortium's Research and Innovation Center. Locally, the team members will include D. K. Panda and his lab, the Ohio Academic Resources Network (OARnet), as well as the computational and storage resources of the Ohio Supercomputer Center, Umit Catalyurek, professor of Biomedical Informatics, and Datta Gaitonde, professor of Mechanical and Aerospace Engineering.

As a part of this project, Prof. Panda and his team will be designing high-performance networking protocols and middlewares (such as Grid-FTP) using RDMA-based mechanisms. In his lab, two different networking technologies, RDMA over Converged Enhanced Ethernet (RoCE) and Internet Wire RDMA Protocol (iWARP), will be used. The new protocols and middlewares will be experimented to support high-throughput data transfer between end computing/storage nodes across the campus and also over the 100Gbps networking infrastructure.

"In the Six."

Looking through the gold number six in the Garden of Constants, we see the newly renamed Enarson Hall, formerly Central Classrooms.

Photo by Graphic Designer, Ann; courtesy of Ohio State Image of the Day.



BEST PAPER & POSTER AWARDS

BEST STUDENT PAPER AT INTERSPEECH 2012

PREETHI JYOTHI, CSE Graduate Student, earned a Best Student Paper recognition at the 13th Annual Conference of the International Speech Communication Association (Interspeech 2012).

The paper, titled “Discriminatively Learning Factorized Finite State Pronunciation Models From Dynamic Bayesian Networks” is joint work with Dr. **ERIC FOSLER-LUSSIER** (Jyothi’s advisor) and Karen Livescu of Toyota Technological Institute at Chicago. The work involves spoken language, especially conversational speech, as it is characterized by a large amount of pronunciation variability and words often do not conform to dictionary pronunciations. This makes the task of recognizing conversational speech particularly challenging for automatic speech recognition (ASR) systems. The work explores one such model that uses a machine learning framework called dynamic Bayesian networks (DBN) to relate the movements of a speaker’s articulators (i.e lips, tongue, etc) to sounds produced in the form of loosely coupled streams. The researchers present a general approach to transform such DBN models into a finite state representation that allows for more flexible models that can be further trained to improve the accuracy of the recognizer. Their experimental results on an isolated word task show that the proposed approach performs significantly better than the original DBN model.

OPTIMAL SCHEDULING EARNS “BEST” RECOGNITION

At IEEE International Symposium on Modeling and Optimization in Mobile, Ad Hoc Wireless Networks (WiOPT) 2012, **WENZHUO OUYANG**, took the Best Student Paper Award for his paper Low-complexity Optimal Scheduling Over Correlated Fading Channels with ARQ Feedback. Ouyang is a PhD student working in information processing systems with CSE Professor **NESS SHROFF** and OSU Electrical and Computer Engineering Professor Atilla Eryilmaz. The paper investigates the downlink scheduling problem under Markovian ON/OFF fading channels, where the instantaneous channel state information is not directly accessible, but is revealed via ARQ-type feedback. Ouyang’s

research shows that under an average number of transmissions constraint, a low-complexity index policy is throughput-optimal.

CCGRID CHOOSES RAVI FOR BEST PAPER

CSE Graduate Student **VIGNESH RAVI** was lead author for the Best Student Paper winning work at The 12th IEEE/ ACM International Symposium on Cluster, Cloud and Grid Computing for his paper Scheduling Concurrent Applications on a cluster of CPU-GPU Nodes. The paper, in collaboration with his advisor CSE Professor **GAGAN AGRAWAL** and alumni **DAVID CHIU** and **WENJING MA**, tackles the problem that supercomputers and cloud environments commonly employ a combination of multi-core CPUs and GPUs, and are concurrently used by various users. State of the art practical schedulers for independent jobs lack features and policies that are desirable today and in the future. Exploiting portability offered by OpenCL, their novel scheduling policies significantly improve the throughput by allowing dynamic mapping of jobs to resources and minimizing the resource idle times.

STUDENT, PROFESSOR AND INDUSTRY COLLABORATORS GET BEST PAPER

BIN REN, CSE PhD candidate, was awarded a Best Paper Award at CGO 2013 for his paper “SIMD Parallelization of Applications that Traverse Irregular Data Structures,” with authors CSE Professor **GAGAN AGRAWAL**, James R. Larus (Microsoft Research), Todd Mytkowicz (Microsoft Research), Tomi Poutanen (Milq Inc.), and Wolfram Schulte (Microsoft Research). SIMD parallelism is becoming more commonplace, but so far has only been used for regular applications. This paper describes methods that allow irregular, pointer-traversal based applications to be parallelized on SIMD hardware.

VISION TRACK AWARD GOES TO ASSISTANT PROFESSOR

ARNAB NANDI, CSE Assistant Professor, won the Vision Track Best Paper award at the 2013 Conference on Innovative Data Systems Research in Asilomar, California. His paper “Querying Without Keyboards,” outlines a vision for database system architectures in the age of keyboardless

computing devices such as tablets, smartphones, and Kinects.

PH.D. STUDENTS & FACULTY AWARDED BEST PAPER AT IEEE MASS 2012.

JING LI, CSE PhD candidate, received a best paper award for “Achievable Throughput in Duty-Cycled Wireless Networks,” authored by Li, **WENJIE ZENG** (CSE Graduate Student) and **ANISH ARORA** (CSE Professor), at IEEE MASS 2012 in Las Vegas, Nevada. The paper presents throughput capacity bounds in wireless networks whose radios must alternately wake-up and sleep to conserve energy. The research examines canonical classes of existing duty in terms of the capacity they achieve, and shows that the class of “receiver-centric, synchronous” MACs achieve capacity that is closest to a certain theoretically optimal (but not easily implemented) duty-cycled MAC scheduler.

SADAYAPPAN AND POUCHET AWARDED BEST PAPER AT 21ST ACM/SIGDA SYMPOSIUM

“Polyhedral-Based Data Reuse Optimization for Configurable Computing,” authored by **LOUIS-NOEL POUCHET** (former post-doctoral researcher in CSE), with co-authors Peng Zhang and Jason Cong, UCLA, and **P. SADAYAPPAN**, CSE, received the best paper award at the 21st ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA 2013). The paper describes a new tool called PolyOpt/HLS that can automatically and simultaneously perform loop transformations on-chip memory buffering, off-chip data access re-ordering, and design-space exploration that frequently outperforms hand-coded Register Transfer Logic design. Pouchet is now a visiting research professor at UCLA.

KURT AND AGRAWAL AWARDED BEST PAPER AT HiPC 2012

CSE Graduate Student **MEHMET CAN KURT** and Professor **GAGAN AGRAWAL** received a best paper award from HiPC 2012, for their paper “A Fault-Tolerant Environment for Large-Scale Query Processing.” This paper focuses on making a large data store fault-tolerant, by strategically replicating data. The foundation of the paper is storage

and query processing in a cluster environment where data from scientific experiments are stored. The goal is to provide not only high fault-tolerance, but also load balancing both in absence and presence of failures.

GRAVITY REACHES OUT AND EARNS TOP AWARD

The GRAVITY research group received a best poster award and an honorable mention for best paper award at the IEEE Scientific Visualization conference (SciVis) and the Symposium for Large-Scale Data Analysis and Visualization (LDAV), respectively. While both works focus on large-scale flow visualization, they address two different challenges. The poster entitled “Exploring Flow Fields Using Fractal Analysis of Field Lines,” authored by **ABON CHAUDHURI**, **TENG-YOK LEE** (Alum and Research Scientist), **HAN-WEI SHEN** (CSE Professor), **MARC KHOURY** (Alumnus) and **REPHAEL WENGER** (CSE Associate Professor), presented a fractal theory based method of visually exploring large data without becoming tedious and ineffective to the user. The paper “Flow-guided File Layout for Out-of-core Pathline Computation,” authored by **CHUN-MING CHEN**, **BOONTHANOME NOUANESENGSY**, **TENG-YOK LEE** and **HAN-WEI SHEN**, provided a novel algorithm that allows efficient computation of pathlines from large-scale timevarying flow fields.



*Ohio Stadium commencement Spring 2013.
Photo courtesy of Yi Liu.*

NEW FACULTY HIRES STARTING IN 2013-2014

SPRYOS BLANAS



Joining the Systems Group in the area of Big Data is Dr. Spyros Blanas, a newly minted doctor from the University of Wisconsin--Madison. Spyros aims to make data management more efficient by exploring how software can better interact with hardware. The goal of his research is to make data-rich applications use less energy and become more responsive. His dissertation work explored how to improve the performance of data processing if main memory becomes the primary storage medium for data. Part of his dissertation work is being commercialized in Microsoft's flagship data management product, SQL Server 2014. Spyros looks forward to arriving on campus in January 2014.

CHUNYI PENG



Joining the CSE department in Autumn 2013, Dr. Peng will become part of the Networking group. Chunyi's research has primarily been in the areas of networking, systems, and security support for mobile applications with additional work in data center networking and cognitive radio networking. This work, done at the University of California, Los Angeles culminated in her attaining the coveted UCLA Fellowship with the Chancellor's Prize as well as an IBM Ph.D. Fellowship.

ALAN RITTER



Dr. Alan Ritter's arrival in Columbus will be delayed till Autumn 2014 as he will be researching in a year's post-doctoral position with Carnegie Mellon. His research into information extraction and natural language processing in social media, particularly in extracting meaning from large user-generated text streams, will benefit the Artificial Intelligence area. Ritter will also be doing extensive work with CSE's collaborative partners in Biomedical Informatics. Alan received his Ph.D. from the University of Washington

ANASTASIOS SIDIROPOULOS



In a joint position with the Department of Mathematics, Dr. Sidiropoulos will join CSE after leaving the University of Illinois at Urbana-Champaign where he worked as a post-doctoral researcher. His research interests have been focused on theoretical computer science, with an emphasis on algorithms. Anastasios's papers have appeared at SODA and FOCS. He received his Ph.D. from the Massachusetts Institute of Technology in 2008.

ANNUAL DEPARTMENTAL AWARDS

SCHOLARSHIPS

*Central Ohio Chapter of Association
of Computing Machinery (ACM)*

Maxwell Roseman

Crowe Horwath, LLP & Marathon Oil Co.

Cory Dahlstrand

Harris Corporation

Jeremy Villa

*Ernest William Leggett, Jr. Scholarship
The Leggett Family Award*

Ian Freshwater

Zachary Knickerbocker

Michael McNamara

Grace Wannemacher

Matt J. Desch & Ann M. Murphy Award

Elizabeth Burl

Jeremy LeDonne

The O'Connell Family Award

Brandon Mills

Raytheon Corporation

Alan Thornburg

Zachary Wein

*B. Chandrasekaran & Sandy Mamrak
Scholarship*

Olga Benson

Jeffrey Tornwall

Mike Liu Scholarship

Brett Dickson

Adam Wheeler

Jimmy Yi

CSE Undergraduate Scholarships

Arathi Mani

Ashley Biales-Wise

Tyler Leonhardt

Claude Mbemba

Brandon Rogers

Jacob Shields

DEPARTMENT AWARDS

Outstanding Teaching Award

Paolo Bucci

Bruce Weide

*B. Chandrasekaran & Sandra Mamrak
Graduate Fellowship*

Krishna Kandalla

Mike Liu Graduate Fellowship Award

Hari Subramoni

Jin Teng

Eleanor Quinlan Memorial Award

Diego Zaccai

Outstanding Service Award

Carrie Stein

Kathryn "Kitty" Reeves

Founders Recognitions

Roy Reeves



Jacob Shields and his mother, Connie.



Colleagues and good friends Bruce Weide and Stu Zweben share a moment as Stu presents Bruce with the Outstanding Teaching Award.

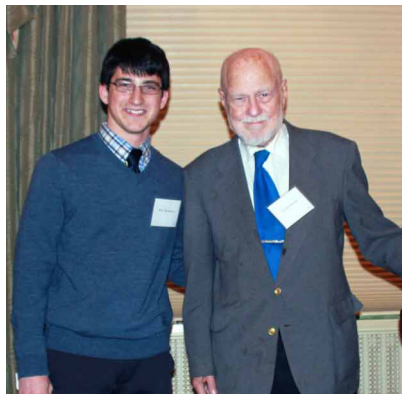


One of the many tables at the banquet. Left to right, Brandon Mills, Neelam Soundarajan, Kit Kniesley, Brandon Rogers, Jeff Rogers, Arathi Mani and Ram Mani.



Left, Young Ellen Stein is all smiles with pride for her mom, Carrie, who received her second Outstanding Service Award.

Right, Arnab Nandi presents Corey Dahlstrand with his scholarship certificate.



ACM Scholarship recipient, Maxwell Roseman with Associate Professor Emeritus, Dr. Clint Foulk.



Diego Zaccai, Eleanor Quinlan Award winner, (2nd from left) shares the evening with friends (l to r) Paloma Choroco, S. M. Faisal, David Fuhry, and June Kaewprag.

RESEARCH HIGHLIGHTS

COMPUTATIONAL TOPOLOGY AND ITS APPLICATION TO SHAPE AND DATA PROCESSING

Computational topology is an area that emerged in the late 90's to address various topological issues encountered while processing shapes and data with computational tools. Rooted both in theory and practice, the area grew out of a synergy between classical mathematics such as algebraic and differential topology and the computational disciplines such as geometry processing, data analysis, and algorithms in general. **TAMAL DEY** has played a significant role in developing this area from his early years in research. In fact, he is credited with some of the earliest papers in the field and a very influential survey titled "Computational Topology" written with two other co-authors in 1998.

In the past decade or so, Dey and his Jyamiti group focused mainly on processing shapes in three dimensions that invariably required topological concepts while developing various algorithms. Among these, they have focused mainly on two problems: (i) surface reconstruction, and (ii) mesh generation. Lately, he has become more engaged into understanding data from topological view point, which brings the third problem into our discussion, namely, (iii) topological data analysis.

Reconstruction: Modeling a shape from a point sample has become an ubiquitous problem in many applications in science and engineering. The conversion of the point data into a polygonal surface is the Surface Reconstruction problem. For this problem, Prof. Dey and his group developed a suite of solutions called Cocone algorithms along with 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. One of the main hallmarks of this research is that the algorithms guarantee topological equivalence (homeomorphism) of the output approximation with the sampled surface. The Cocone software has gained a considerable popularity over the years which is evident from its routine downloads. Figure 1 shows an example reconstruction by Cocone and also the title page of a book published by Cambridge University Press in 2007 in which Prof. Dey summarized the recent developments in provable surface reconstruction algorithm designs.

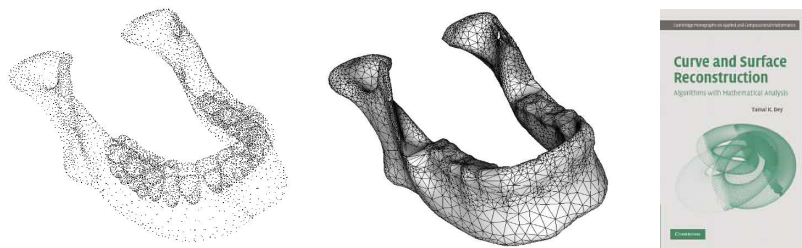


Figure 1: Modeling a jaw bone from sample with Cocone software; The reconstruction book.

Mesh Generation: In this problem, one is given a shape such as a surface or volume represented by a polygonal approximation, or by an implicit equation. The task is to produce a triangular decomposition in case of a surface and a tetrahedral decomposition in case of a volume. The difficulty here is to produce these meshes with mathematical guarantees about topology and geometry for a variety of input ranging from smooth

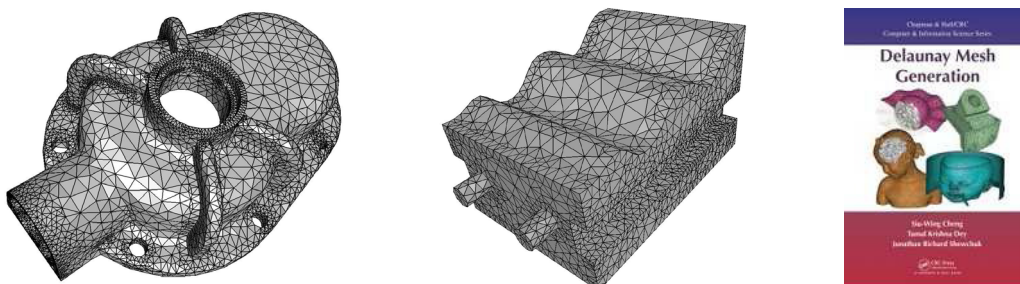


Figure 2: Two output of DelPSC software and the Delaunay Mesh Generation book.

surfaces and volumes to non-smooth domains such as polyhedra, piecewise smooth surfaces, and non-manifolds. The Jyamiti group focused on how to generate these meshes with a versatile technique called Delaunay refinement. In fact, Dey and his group provided the first viable solution for the difficult problem of meshing piecewise smooth complexes that include a wide variety of input. The theoretical guarantee draws heavily upon concepts developed in computational topology. A software called DelPSC (<http://www.cse.ohio-state.edu/~tamaldey/delpsc.html>) has been released based on this work. Dey collaborated with Siu-Wing Cheng from HKUST and Jonathan Shewchuk from U. of California, Berkeley to write a book titled “Delaunay Mesh Generation” that got published in December, 2012 by CRC press.

Topological Data Analysis: After working on algorithm/software design for shape representation and shape analysis mainly for three dimensional geometries, Prof. Dey focused on the generalization of these problems in higher dimensions. In particular, he aimed at applying his experience and expertise in computational topology to the problem of data analysis which deals with point data in high dimensions. This direction of research is a part of an emerging area called topological data analysis that concerns with extracting topological information from point data presumably sampled from a hidden space. Figure 3 shows an example where important cycles have been detected in a point data sampled from a double torus.

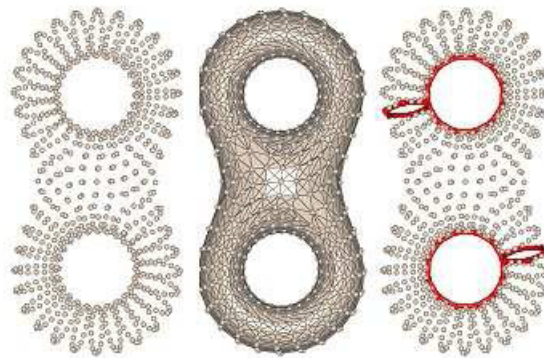


Figure 3: A point data from a double torus, a complex connecting them, four detected cycles.

In some of his recent works, Dey 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, one main challenge is to tame the curse of the dimension. Often, the complex built on the data to extract topological information is too huge in size to be processed effectively. Recently, Dey and his colleague Yusu Wang and their student Fengtao Fan have shown that a sub-sampling strategy merged with techniques from computational topology can provide a much sparsified complex called ‘Graph Induced Complex’ which can be useful for topological inference. While working on this problem, they also realized that persistent homology which is a widely used tool in topological data analysis needs to be extended further to enhance its scope. They devised a new topological persistence algorithm for this purpose.

The potential of data analysis has already been demonstrated in data mining and machine learning. Can the topological data analysis complement and enhance the existing approaches that are built mostly on statistical techniques? The hope is that, examining the data from a topological view perhaps will reveal more global properties and thereby enhance the robustness against noise. Prof. Dey wants to pursue this direction further in future research.

APPROACHING BIG DATA FROM A HIGH PERFORMANCE COMPUTING FOCUS

Recently there has been a lot of interest in ‘big data’ problems, i.e., dealing with increasing volumes, velocity, and variety of data. **GAGAN AGRAWAL’S** research group has been working on these problems for a number of years, applying his background in high performance computing to develop innovative solutions. Just as a background, for several decades, much of the existing (commercial) data was managed through structured (relational) databases. Unfortunately, structured databases did not handle increasing data volumes and velocity too well, in terms of providing required scalability, fault-tolerance, flexibility, and speed of data ingestion. This has led to a NoSQL movement, with systems like MapReduce (and its variants) and key-value stores being used to store and process massive data. While relational databases were very efficient and parallelized effectively, the team has observed that popular implementations of MapReduce and other recent data processing solutions do not use parallel systems very efficiently.

With the research team’s extensive background in high performance computing, they have been developing alternative solutions which address performance as well as the following other limitations of existing MapReduce implementations:

- 1) require that data be loaded into a specialized file-system, which is simply not feasible while working with massive scientific datasets,
- 2) cannot allow algorithm specification to be portable across use of different data formats, which is often the case in many scientific domains.
- 3) cannot support use of accelerators and/or other modern many-core architectures, and
- 4) are not optimized for use of cloud-based data storage services.

Their system is referred to as MATE (MapReduce with an Alternate API) and demonstrated a variant of the original MapReduce API, which still allows ease specification of parallel algorithms, but eliminates the shuffling/grouping/sorting overheads. The generalized reduction API supported by the MATE system integrates map, combine, and reduce together while processing each element. Because the updates to the reduction object are performed directly after processing, the team avoids intermediate memory overheads. Their earlier work showed that MATE can outperform Hadoop by a factor of 10-20 on several standard data mining algorithms, and the specific improvement from the use of this API itself is a factor of 1.5 or higher. More recently, they have shown that by implicitly managing a reduction object, their implementation approach can also support the original MapReduce API more efficiently. One of the results of this work is the fastest known implementation of MapReduce on GPUs.

Another direction related to ‘big data’ has been data management, i.e, providing basic database like functionality on massive datasets. In many applications, the volume of data limits the ability to load data into a traditional database. At the same time, basic database-like query processing ability is desired. We have developed an approach we refer to as automatic data virtualization. This approach automatically generates data services to support a simple virtual view of the data, while keeping the data in the original format. It allows users to specify subsets and aggregations of interest with such a virtual view, using a high-level language like SQL. Agrawal’s research team has developed implementations of these approaches on popular scientific data formats, like NetCDF and HDF5. A recent emphasis has been adding indexing as a service to work in conjunction with data virtualization. The motivation is as follows. Indexing has been one of the main advantages of conventional data management solutions. However, popular indexing techniques require that data be reorganized, and index be built during the data ingestion phase. With massive volume and/or velocity of data, this approach is not feasible. They have developed a variant of the bitmap approach, where index can be built on top of an existing multi-dimensional dataset, and used to optimize query processing. The team is also exploring services based on these indices, such as sampling using bitmaps, processing of data with missing values, and others.

Agrawal and his associates’ research continues to work on traditional high performance computing problems as well. Their main emphasis has been use of accelerators such as GPUs. In fact, many aspects of their work

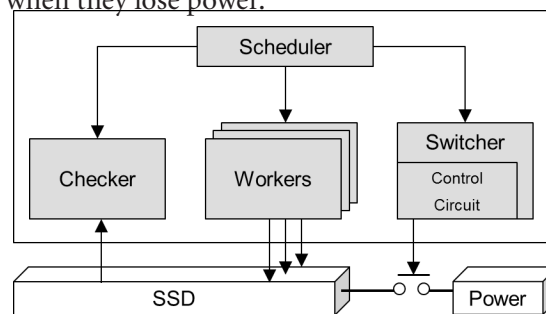
has been driven by insights we have gained from working on big data problems. For example, they are taking a “communication pattern” driven approach, i.e. showing how one can automate the generation of efficient code by considering different application patterns. This work can be viewed as a generalization of the MapReduce approach that has been applied to big data problems. So far, this work has considered irregular reductions and stencil computations as other possible patterns. By developing simple APIs specific to these computations, the team has shown that they can execute efficient code on GPUs as well as a multi-core CPU and a GPU together, for both discrete and fused GPUs.

Dr. Agrawal notes, “I have been very fortunate to work with a number of excellent PhD students at Ohio State. Fourteen Ph.D.s have graduated under my supervision in the last nine years and I am currently working with another eleven students. Mentoring of these students is the most rewarding aspect of this research, and the associated human capital development likely the biggest impact.”

SSDs UNDER POWER FAULTS ?!

Can SSDs really provide non-volatility? What would happen if there are unexpected power faults? Modern storage technology (SSDs, No-SQL databases, commoditized RAID hardware, etc.) brings new reliability challenges to the already complicated storage stack. Among other things, the behavior of these new components during power faults – which happen relatively frequently in datacenters – is an important yet mostly ignored issue in this dependability-critical area. Understanding how new storage components behave under power faults is the first step towards designing new robust storage systems.

Together with his collaborators and students, **DR. FENG QIN** has recently studied the behavior of flash-based solid-state disks (SSDs) under power faults. As SSDs are replacing spinning disk as the non-volatile component of computer systems, the extent to which they are actually non-volatile is of interest. Although loss of power seems like an easy fault to prevent, recent experiences show that a simple loss of power is still a distressingly frequent occurrence even for sophisticated datacenter operators like Amazon. If even well prepared and experienced datacenter operators cannot ensure continuous power, it becomes critical that one understand how the non-volatile components behave when they lose power.



In this project, Dr. Qin’s research group worked with HP Labs to create an automatic failure testing framework (shown in the accompanying figure). In particular, the team devised and built hardware to directly inject power faults into block devices. Furthermore, they purposely used a side channel to communicate with the customized power cutting hardware, so none of the OS, device driver, bus controller, or the block device itself has an opportunity to perform a clean shutdown. With the capability of direct power cutting, the testing framework coordinates a specially-crafted workload that is stressful to a device while allowing efficient consistency checking after fault recovery. Their record format includes features to allow easy detection of a wide variety of failure types with a minimum of overhead. Their consistency checker detects and classifies both standard “local” failures (e.g., bit corruption, flying writes, and shorn writes) as well as “global” failures such as lack of serializability.

With the implementation of the testing framework, the team subjected 15 commercially available SSDs and 2 spinning disks from 7 different vendors to more than three thousand fault injection cycles in total. The experimental results show that SSDs have counter-intuitive behavior under power faults: of the tested devices, only

two SSDs (of the same model) and one enterprise-grade spinning disk adhered strictly to the expected semantics of behavior under power fault.

In addition to the recent study on the reliability issues of SSDs, Dr. Qin has mainly focused his research on efficient and effective system mechanisms for improving software reliability and availability for the past decade. More specifically, he has proposed and developed various approaches for safely surviving and preventing software bugs during production runs, efficiently detecting software bugs at runtime, and effectively exposing hidden software bugs. The proposed methods exploit the support from operating systems, runtime systems, existing hardware features, static compiler analysis, and/or dynamic instrumentation.

RESEARCH GRANTS, AWARDS & GIFTS

NEW GRANTS ESTABLISHED JULY 2012 - JUNE 2013

Grant Funding Source

Title

- Primary Investigator (CSE Names are in **BOLD**)
- Co-Investigators (when applicable)

Dates of Funding Amount of Grant

Air Force Research Laboratory

CATR Task 0006

• **JAMES W. DAVIS**

11/16/10 – 9/28/14 \$50,000

Defense Advanced Research Projects Agency (DARPA)

Parameter Variations At Near Threshold Voltage: The Power Efficiency Versus Resilience Trade-Off

• **RADU TEODORESCU**

9/25/12 – 3/24/18 \$941,240

Department of Energy (DOE)

Domain Specific Language Support for Exascale

• **P. SADAYAPPAN**

- **ATANAS ROUNTEV**

9/1/12 – 8/31/15 \$880,907

Department of Defense National Security Agency (DOD NSA)

Information Assurance Scholarship Program

• **NEELAM SOUNDARAJAN**

8/22/12 – 8/21/13 \$30,885

Building a Practical Wireless In-Band Full Duplex System Existing Awards

• **KANNAN SRINIVASAN**

7/12/12 – 7/11/14 \$722,011

Hewlett Packard Co.

Exploring the Behavior of Modern Storage Systems under Failure

• **FENG QIN**

9/1/12 – 5/31/14 \$35,000

Institute of Education Sciences

Reducing Special Education/Reading Risk Through An Oral Reading Fluency Intervention For Urban Learners

• Gwendolyn Cartledge (College of Education & Human Ecology)

- **ERIC FOSLER-LUSSIER, RAJIV RAMNATH**, Erin Kathleen Gallant (College of Education & Human Ecology), Gardner

7/1/12 – 6/30/13 \$479,053

Mellanox Technologies

High Performance and Scalable Design of HDFS over InfiniBand

• **D. K. PANDA**

8/15/12 – 8/14/13 \$200,000

Research on High Performance and Scalable MPI over InfiniBand.

• **D. K. PANDA**

8/22/12 – 8/14/13 \$181,264

National Board of Medical Examiners

Virtual Patients Simulations to Assess Data-Gathering and Clinical Reasoning

• Douglas R. Danforth (Dept. of Obstetrics & Gynecology)

- **ERIC FOSLER- LUSSIER**

7/1/12 – 6/30/13 \$149,861

National Institutes of Health

Speech Segregation to Improve Intelligibility of Noisy Speech

• **DELIANG WANG**

- Eric Healy (Dept. of Linguistics)

1/1/13 – 12/31/17 \$1,791,143

National Institutes of Health (NIH) National Library of Medicine

An Information Fusion Approach To Longitudinal Health Records

• **ALBERT LAI** (Dept. of SBS-Biomedical Informatics)

- **ERIC FOSLER- LUSSIER**, Peter Embi (Dept. of SBS-Biomedical Informatics)

9/1/12 – 8/31/17 \$1,536,793

National Science Foundation

CAREER: Practical Language and System Support for Reliable Concurrent Software

• **MICHAEL BOND**

3/1/13 – 2/28/18 \$535,143

CSR: Small: Making Software Transactional Memory More Than A Research Toy

• **MICHAEL BOND**

9/1/12 – 8/31/15 \$400,000

II-EN: Infrastructure To Support Desktop Virtualization Experiments For Research and Education

• Prasad Calyam (Ohio Supercomputer Center/

OARnet)

- **JAY RAMANATHAN, ALBERT LAI (SBS-DEPT. OF BIOMEDICAL INFORMATICS)**

6/1/12 -5/31/15 \$396,311

RI: Small: Hard Clustering via Bayesian Nonparameters

• **BRIAN KULIS**

6/1/12 – 5/31/15 \$439,689

Large-Scale Computation of the Phonon Boltzmann Transport Equation

• Sandip Mazumder (Dept. of Mechanical & Aerospace Engineering)

- **P. SADAYAPPAN**

09/15/12 – 08/31/15 \$400,000

SHF: Large: Collaborative Research: Unified Runtime for Supporting Hybrid Programming Models on Heterogeneous Architecture

• **D. K. PANDA**

- Karen Tomko (Ohio Supercomputer Center)

7/1/12 – 6/30/15 \$1,045,822

SI2-SSI: Collaborative Research: A Comprehensive Performance Tuning Framework for the MPI Stack

• **D. K. PANDA**

- Karen Tomko (Ohio Supercomputer Center)

6/1/12 – 5/31/15 \$1,251,374

CCF: EAGER: Collaborative research: Scalable Graph Mining and Clustering On Desktop Supercomputers

• **SRINIVASAN PARTHASARATHY**

9/1/12 – 8/31/13 \$75,000

SHF: Small: Collaborative research: Elastic Fidelity: Trading-Off Computational Accuracy For Energy Reduction

• **SRINIVASAN PARTHASARATHY**

8/1/12 – 7/31/15 \$182,000

SHF: CSR: Small: Collaborative research: Automated Model Synthesis Of Library And System Functions For Program-Environment Co-Analysis

• **FENG QIN**

9/1/12 – 8/31/13 \$90,000

EAGER: WideSpot: Enabling Predictable Wide-Area Coverage Over Scattered Hotspots

• **PRASUN SINHA**

9/15/12 – 8/31/13 \$100,000

NeTS: Medium: Collaborative Research: Enabling Cellular Services over Unplanned Femto-Cell Deployments: From Theory to Implementation

• **PRASUN SINHA**

6/1/12 – 5/31/15 \$380,000

CAREER: Together We Rise: A Unified Multi-Input Multi-Output (Mimo) - Full Duplex Network Architecture

• **KANNAN SRINIVASAN**

3/1/13 – 2/28/18 \$546,604

EAGER: Design and Implementation of a Renewable Adaptive Cluster

• **CHRISTOPHER STEWART**

7/1/12 – 6/30/14 \$200,000

CAREER: An Integrated Treatment Of Voltage Noise And Process Variability In Many-Core and Gpu Systems With Microarchitectural Solutions

• **RADU TEODORESCU**

2/1/13 – 1/31/18 \$520,000

CC-NIE Integration II: Innovations To Transition A Campus Core Cyberinfrastructure To Serve Diverse and Emerging Researcher Needs

• Caroline Whitacre (Dept. of Internal Medicine)

- **D. K. PANDA**, Umit Catalyurek (Dept. of SBS-Biomedical Informatics), Paul Schopis (OARnet)

10/1/12 – 9/30/14 \$997,357

Toward Efficient and Distributed Cyber-Physical Systems Design for the Smart Electric Power Grid

• Cathy Xia (Dept. of Integrated Systems Engineering)

- **NESS B. SHROFF**

9/1/12 – 8/31/15 \$396,222

NeTS: Small: Integrating Electronic And Visual Signals For Accurate Localization

• **DONG XUAN**

- Yuan F. Zheng (Dept. Electrical and Computer Engineering)

7/1/12 – 6/3/15 \$430,000

U.S.-China Workshop On Environmental Monitoring for Public Health and Disaster Recovery

• **DONG XUAN**

5/15/12 – 4/30/13 \$60,558

CSR: Medium: Collaborative research: On Closed-Loop And Cross-Layer Design And Implementation Of Data Storage Systems Utilizing Extremely Scaled Nand Flash Memory Technologies

• **XIAODONG ZHANG**

7/1/12 – 6/30/14 \$225,000

Travel support for the 33rd IEEE International Conference on Distributed Computing Systems

• **XIAODONG ZHANG**

5/1/13 – 4/30/14 \$10,000

National Science Foundation (University of Illinois subaward)

Enhanced Intellectual Services- Direct PRAC support- Super instruction Architecture For Petascale Computing

• **P. SADAYAPPAN**

7/1/12 – 9/30/13 \$34,597

Ohio Department of Health

Stage 1: Application For Asthma Management And Education (AAME)

• **RAJIV RAMNATH**

7/9/12 – 5/31/13 \$34,000

Patient Centered Outcomes Research Institute Pilot Grants Program

A Low-cost Virtual Reality Gaming Platform for Neurorehabilitation of Hemiparesis

• Lynne Gauthier (Dept. of Physical Medicine & Rehabilitation)

- **ROGER CRAWFIS**, Linda Lowes (Dept. of Health & Rehabilitation Sciences), Lise Worthen-Chaudhari (Dept. of Physical Medicine & Rehabilitation)

6/1/12-5/31/14 \$653,014

Public Works and Government Services, Canada

Compendium Interface

• **MIKHAIL BELKIN**

5/10/13 – 8/31/13 \$28,459

Qatar University

Information Theory Enabled Secure Wireless Networking: Scaling Laws, Network Control, and Implementation

• Can Emre Koksall (Dept. of Electrical & Computer Engineering)

- **NESS B. SHROFF**

11/15/12-11/14/15 \$279,890

RNET Technologies

Scalable Multi-tiered CFD and CSD Codes for Kestrel

• **P. SADAYAPPAN**

- Jack McNamara (Dept. of Mechanical and Aerospace Engineering)

1/1/13 – 12/31/14 \$320,000

University of Texas at Austin (National Science Foundation subaward)

Enabling, Enhancing and Extending Petascale Computing for Science and Engineering

• **D. K. PANDA**

3/1/13 – 2/28/17 \$600,000

Aquilent, Inc. (National Library of Medicine subaward)

A Comprehensive Workflow for Robust Characterization of Microstructure for Cancer Studies

• **RAGHU MACHIRAJU**

- Kun Huang (Dept. of SBS-Biomedical Informatics)

4/1/11 – 9/24/12 \$150,000

Army Research Office: Multidisciplinary University Research Initiative

Multivariate Heavy-Tail Phenomena: Modeling and Diagnostics

• **NESS B. SHROFF**

6/1/12 – 5/31/17 \$600,000

Stochastic Control of Multi-Scale Networks: Modeling, Analysis And Algorithms

• **NESS B. SHROFF**

5/1/08 – 03/28/14 \$6,456,625

GRANTS ESTABLISHED PRIOR TO JULY 1, 2012

Funding Source

Grant Title

Primary Investigator

Co-Investigators (when applicable)

Dates of Funding

Amount of Grant

Capstone Partners

Capstone Partnerships

• **RAJIV RAMNATH**

1/1/11 – 6/30/13 \$30,500

Department of Defense National Security Agency (DOD NSA)

DoD Information Assurance Scholarship Program

• **NEELAM SOUNDARAJAN**

8/23/11 – 6/22/13 \$31,489

Department of Energy

Programming Models For Scalable Parallel Computing

• **D. K. PANDA**

9/15/06-09/15/12 \$1,000,000

A Polyhedral Transformation Framework For Compiler Optimization

• **P. SADAYAPPAN**

- **ATANAS ROUNTEV**

9/1/10 – 8/31/13 \$399,842

A Fault-Oblivious Extreme Scale Execution Environment

• **P. SADAYAPPAN**

9/1/10 – 8/31/13 \$469,254

Programming Models For Scalable Parallel Computing

• **P. SADAYAPPAN**

9/15/06-8/31/12 \$500,000

Air Force Office of Scientific Research (AFOSR)

Internet Attack Traceback-Cross-Validation And Pebble-Trace

• **TEN-HWANG LAI**

4/1/09 – 11/30/12 \$500,000

Speech Segregation Based On Binary Classification

• **DELIANG WANG**

5/1/12 – 4/30/16 \$932,284

Air Force Research Laboratory

CATR Task 0006

• **ANISH ARORA**

11/16/10 – 11/19/12 \$125,000

CATR Task 0006

• **JAMES W. DAVIS**

11/16/10 – 9/28/14 \$293,000

CATR Task 0002

• **JAMES W. DAVIS**

5/1/10 – 9/30/12 \$44,000

Scalable Fault Tolerant Runtime Technology For Petascale Computers

• **P. SADAYAPPAN**

8/1/08 - 7/31/12 \$375,820

Scalable Data-Management, Analysis, and Visualization (SDAV) Institute

• **HAN- WEI SHEN**

02/15/12 – 02/14/17 \$750,000

Very Large 3d Flow Field Visual Analysis

• **HAN- WEI SHEN**

10/28/10 – 9/30/13 \$461,074

An Information Framework For Enabling Extreme-Scale Science Discovery

• **HAN- WEI SHEN**

9/1/10 – 8/31/13 \$462,095

SciDAC Institute For Ultrascale Visualization

• **HAN- WEI SHEN**

9/26/07-8/31/12 \$750,000

Department of Energy Small Business Technology Transfer (STTR) Phase II (with RNET Technologies)

Creating Petascale File Systems Using Application-Aware Network Offloading

• **D. K. PANDA**

9/15/09 – 06/30/12 \$275,000

HPC Application Energy Measurement And Optimization

• **D. K. PANDA**

02/15/12 – 02/14/14 \$325,000

Hewlett Packard

Energy and Labor Efficient Sensor Networking For Underground Data Acquisition

• **NESS B. SHROFF**

- Can Emre Koksall (Dept. of Electrical and Computing Engineering)

09/01/12 – 08/31/15 \$300,000

Honda

Contextual Resolution Of Locational References In Human-Computer Dialogue

• **ERIC FOSLER-LUSSIER**

01/01/12 – 06/30/12 \$59,329

International Computer Science Institute (ICSI) (Intelligence Advanced Research Projects Activity (IARPA) subcontract)

SWORDFISH: Spoken Wordsearch With Rapid Development and Frugal Variant Subword Hierarchies

• **ERIC FOSLER-LUSSIER**

03/05/12 – 06/30/14 \$819,764

JP Morgan Chase

Enterprise Systems Research

• **RAJIV RAMNATH**

09/01/11 – 06/30/12 \$32,000

Kitware, Inc. (Department of Energy SBIR)

Cloud Computing And Visualization Tools For Kbase Kun Huang (SBS-Biomedical Informatics)

• **RAGHU MACHIRAJU**

2/1/12 – 10/31/12 \$49,532

Kuzer Co.

Air Force Office of Scientific Research Small Business Technology Transfer (STTR) (AFOSR STTR)

An Auditory Scene Analysis Approach To Speech Segregation

• **DELIANG WANG**

01/01/12 – 12/31/13 \$300,000

An Auditory Scene Analysis Approach To Speech Segregation

• **DELIANG WANG**

7/1/10 – 09/30/12 \$40,000

Mellanox Technologies, Inc:

Research on High Performance And Scalable MPI Over Infiniband.

• **D. K. PANDA**

4/4/04-8/14/13 \$1,141,957

National Library of Medicine

A Comprehensive Workflow for Large Histology Segmentation and Visualization

• **RAGHU MACHIRAJU**

- Kun Huang (Dept. of SBS-Biomedical Informatics) and Lisa Lee

6/25/10 – 6/24/12 \$150,000

National Science Foundation

A Language Independent Framework For Compiling Data-Intensive Applications On Highly Parallel Systems

• **GAGAN AGRAWAL**

9/1/08 – 08/31/12 \$502,000

DC: Small: Data Intensive Computing Solutions For Neuroimage Analysis

• **GAGAN AGRAWAL**
- **RAGHU MACHIRAJU**

9/15/09-8/31/13 \$488,000

EXP: GeoGames – A Virtual Simulation Workbench For Teaching and Learning Through a Real-World Spatial Perspective

• Karl Ola Ahlqvist (Dept. of Geography)
- **RAJIV RAMNATH**, Kathryn Plank (University Center for the Advancement of Teaching)
10/01/11 – 09/30/13 \$374,772

PC3: Collaborative Research: Wireless Sensor Networks For Protecting Wildlife And Humans

• **ANISH ARORA**
10/01/11 – 09/30/13 \$178,209

CPS: Small: Collaborative Research: Localization and System Services For Spatiotemporal Actions In Cyber-Physical Systems

• **ANISH ARORA**
9/15/09-8/31/12 \$200,001

Career: Geometry and High-Dimensional Inference

• **MIKHAIL BELKIN**
10/01/07 – 12/31/012 \$498,972

RI: Small: Algebraic And Spectral Structure Of Data In High Dimension

MIKHAIL BELKIN
7/1/11 – 06/30/14 \$450,000

AF: Medium: Collaborative Research: Optimality In Homology – Algorithms And Applications

• **TAMAL DEY**
08/01/11 – 07/31/15 \$352,896

AF: Small: Analyzing Spaces And Scalar Fields Via Point Clouds

• **TAMAL DEY**
- **YUSU WANG**
08/01/11 – 07/31/14 \$499,761

MCS: Reconstructing And Inferring Topology And Geometry From Point To Point Cloud Data

• **TAMAL DEY**
- Dan Burghlea (Dept. of Mathematics)
9/1/09-8/31/12 \$462,000

AF: Small: Analyzing Spaces And Scalar Fields Via Point Clouds

• **TAMAL DEY**
- **YUSU WANG**
08/01/11 – 07/31/14 \$499,761

CI-P: Collaborative Research: The Speech Recognition Virtual Kitchen

• **ERIC FOSLER-LUSSIER**
6/1/12 – 05/31/13 \$48,509

Collaborative Research: Ri: Medium: Explicit Articulatory Models Of Spoken Language, With Application To Automatic Speech Recognition

• **ERIC FOSLER-LUSSIER**
7/1/09-6/30/13 \$334,469

CAREER: Breaking The Phonetic Code: Novel Acoustic-Lexical Modeling Techniques For Robust Automatic Speech Recognition

• **ERIC FOSLER-LUSSIER**
12/15/06-11/30/12 \$502,952

CPATH T Newpath: Nurturing, Through Entrepreneurship, IT World Leaders

• David Lee
- **BRUCE WEIDE**, **RAJIV RAMNATH**, **NEELAM SOUNDARAJAN**, **DONG XUAN**, **HAN-WEI SHEN**, Waleed Ali Muhanna (Fisher College of Business), Eylem Ekici (Dept. of Electrical and Computer Engineering), Stephen Camp (Center for Entrepreneurship)
7/1/07 – 6/30/14 \$622,822

G&V: Medium: Collaborative Research: Large Data Visualization Using An Interactive Machine Learning Framework

• **RAGHU MACHIRAJU**
- **HAN-WEI SHEN**
6/1/11 – 5/31/14 \$542,002

CPS: Medium: Autonomous Driving In Mixed-Traffic Urban Environments

• Ümit Özgüner (Dept. of Electrical and Computer Engineering)
- **BRUCE WEIDE**, **PAUL SIVILOTTI**, Ashok Kumar Krishnamurthy (Dept. of Electrical and Computer Engineering), Füsün Özgüner (Dept. of Electrical and Computer Engineering)
9/1/09-8/31/13 \$1,296,683

Collaborative Research: Dynamic Staging Architecture For Accelerating I/O Pipelines

• **D. K. PANDA**
5/1/10 – 4/30/13 \$90,000

Topology-aware MPI Collectives And Scheduling For Petascale Systems With Infiniband

• **D. K. PANDA**
09/15/06-09/30/13 \$920,000

SHF: Small: Designing Qos-Aware Mpi And File Systems Protocols For Infiniband Clusters

• **D. K. PANDA**

09/01/09 – 08/31/12 \$491,570

EAGER: Towards New Scalable Stochastic Flow Algorithms

• **SRINIVASAN PARTHASARATHY**

08/01/11 – 07/31/12 \$150,000

Collaborative Research: Serious Play In Synthetic Worlds: Social Media Enhanced Organized Sensemaking In Emergency Response

• **SRINIVASAN PARTHASARATHY**

09/01/11 – 08/31/14 \$270,000

Global Graphs: A Middleware For Data Intensive Computing

• **SRINIVASAN PARTHASARATHY**

- **P. SADAYAPPAN**

9/1/09-8/31/13 \$515,997

CAREER: Building Immunity To Memory Management Bugs During Production Runs

• **FENG QIN**

3/1/10-2/28/15 \$420,000

SHF: Small: Algorithms For Dynamic Analysis Of Run-Time Bloat

• **RAJIV RAMNATH**

- **JAY RAMANATHAN, NEELAM SOUNDARAJAN, Jerome D'Agostino (OSU-CoEHE Quantative Research, Evaluation, and Measurement)**

9/1/09 – 8/31/12 \$149,981

CETI IUCRC Memberships

• **JAY RAMANATHAN**

- **RAJIV RAMNATH**

10/1/06 – 04/30/12 \$790,104

Center for Experimental Research In Computer Systems- Research Site

• **JAY RAMANATHAN**

- **RAJIV RAMNATH**

5/1/08 – 4/30/13 \$240,000

Curriculum for Accelerated Services Engineering (CASE)

• **ATANAS ROUNTEV**

9/15/10 – 8/31/13 \$356,531

CAREER: Dataflow Analysis For Modern Software Systems

• **ATANAS ROUNTEV**

9/15/06-8/14/12 \$407,000

Customizable Domain-Specific Computing

• **P. SADAYAPPAN**

- **ATANAS ROUNTEV**

9/1/09-8/31/14 \$749,998

Collaborative Research: An Environment For High-Productivity High-Performancy Computing Using Gpus/Accelerators

• **P. SADAYAPPAN**

9/15/09-8/31/13 \$468,492

Collaborative Research: Petascale Simulations Of Quantum Systems By Stochastic Methods

• **P. SADAYAPPAN**

9/1/09-8/31/13 \$639,952

G&V: Small: Collaborative Research: An Information Theoretic Framework For Large-Scale Data Analysis And Visualization

• **HAN- WEI SHEN**

9/1/10 – 8/31/13 \$292,147

CT-ISG: Collaborative Research: Router Models And Downscaling Tools For Scalable Security Experiments

NESS B. SHROFF

10/1/08 – 9/30/12 \$125,000

NeTS-NECO: a New Resource Management Paradigm For Sensor Networks With Energy Replenishment

• **NESS B. SHROFF**

- **PRASUN SINHA** and Can Emre Koksall (Dept. of Electrical and Computer Engineering)

9/1/08 – 8/31/13 \$500,000

Networking Technology and Systems (NeTS): Medium: Collaborative Research: Mobile Content Sharing: Networks: Theory To Implementation

• **NESS B. SHROFF**

- **DONG XUAN**

7/1/11 – 6/30/15 \$628,946

Networking Technology and Systems (NeTS): Large: Collaborative Research: Foundations For Network Cooperation At Signal Scale

• **NESS B. SHROFF**

07/01/2010 – 06/30/2015 \$330,000

Networking Technology and Systems (NeTS) -Medium:

Collaborative Research: Unifying Network Coding And Cross-Layer Optimization For Wireless Mesh Networks: From Theory To Distributed Algorithms To Implementation

• **NESS B. SHROFF**

09/01/09 – 08/31/13 \$350,000

Collaborative Proposal: NOSS: Doing More With Less: Tracking Movements Using A Sparse Sensor Network

• **PRASUN SINHA**

9/1/07 – 8/31/12 \$216,017

SHF: Small: GOALI: Addressing The Challenges Of Parameter Variation In The Design Of Ultra-Low Power Chip Multiprocessors Using Near-Threshold Technology

• **RADU TEODORESCU**

- Khalil Waleed (Dept. of Electrical and Computer Engineering)

7/1/11 – 06/30/14 \$400,000

AF: EAGER: Collaborative Research: Integration Of Computational Geometry And Statistical Learning For Modern Data Analysis

• **YUSU WANG**

- **MIKHAIL BELKIN**

09/01/10 - 08/31/12 \$196,000

CAREER: Geometric And Topological Methods In Shape Analysis, With Applications In Molecular Biology

• **YUSU WANG**

2/1/08 – 1/31/13 \$420,000

Automated Support For Developing Logical Reasoning Skills In Discrete Mathematics Courses

• **BRUCE WEIDE**

- Harvey Friedman (Dept. of Mathematics), Dennis Pearl (Dept. of Statistics)

3/1/10-8/31/12 \$199,775

CPA-SEL: Collaborative Research: Continuing Progress Toward Verified Software

• **BRUCE WEIDE**

- Harvey Friedman (Dept. of Mathematics)

9/1/08 – 02/28/13 \$232,591 \$279,107

NeTS: Small: Connected Coverage Of Wireless Sensor Networks In Theoretical And Practical Settings

• **DONG XUAN**

- **TEN-HWANG LAI**

9/1/09-8/31/12 \$400,000

SI2-SSE: A Unified Software Environment To Best Utilize Cache And Memory Systems On Multicores

• **XIAODONG ZHANG**

6/1/12 – 5/31/15 \$500,000

Travel Support For The 32nd IEEE International Conference On Distributed Computing Systems

• **XIAODONG ZHANG**

04/01/12 – 03/31/13 \$10,000

Basic Research For Developing SSD-Based Caching And Hybrid Storage Systems

• **XIAODONG ZHANG**

8/1/09-7/31/13 \$400,000

Collaborative Research: CSR-PSCE, TM: Effective Resource Sharing And Coordination Inside Multicore Processors For High Throughput Computing

• **XIAODONG ZHANG**

9/1/08 – 8/31/12 \$330,000

Nile University:

Educational Support For Nile University In The Area Of Wireless Communications

• **NESS B. SHROFF**

3/1/10 – 8/31/12 \$15,000

NVIDIA Corporation

High-Performance MPI Design For Infiniband Clusters With GPUS

• **D. K. PANDA**

07/01/11 – 03/31/13 \$115,237

Pennsylvania State University (Army Office of Research Multidisciplinary University Research Initiative (ARO MURI) Subaward)

Design Of Urban Sensor Networks

• **NESS B. SHROFF**

6/15/07 – 05/19/13 \$300,000

Raytheon BBN Technologies

GENI Educational Kits for Wireless Sensor Networks

• **ANISH ARORA**

- **RAJIV RAMNATH**

10/01/11 – 09/30/14 \$204,884

RNET (Air Force Office of Scientific Research Small Business Technology Transfer Program [AFOSR STTR])

Highly-Scalable Computational-Based Engineering Algorithms for Emerging Parallel Machine Architectures

• **P. SADAYAPPAN**

- Co-PI: Sandip Mazumder (Dept. of Mechanical and Aerospace Engineering)

01/01/12 – 09/30/12 \$47,097

RNET Technologies
(Department of Energy Small Business Technology Transfer Program [DOE STTR])

Catalytic Converter Modeling on Emerging Personal Computers and Small Clusters

Sandip Mazumder (Dept. of Mechanical and Aerospace Engineering)

• **P. SADAYAPPAN**

2/20/12 – 11/19/12 \$46,428

Accelerating Parallel Numerical Libraries to Petascale and Beyond

• **P. SADAYAPPAN**

8/15/10 – 8/31/12 \$245,000

Uniformed Services University Health Sciences
– Tri-Service Nursing:

Effectiveness and Benefit of Two STI Prevention Delivery Methods for Military Women

• Nancy Ryan-Wenger (College of Nursing)
 - Co-PI: Elizabeth Barker (College of Nursing), Maria Palazzi (Advance Center for Computer Art and Design), **RAJIV RAMNATH**, Victoria Von Sadovszky (College of Nursing)

8/1/11 – 7/31/14 \$660,959

University of Texas at Austin
(National Science Foundation subaward)

World-class Science Through World Leadership in HPC

• **D. K. PANDA**

10/1/10 – 9/30/13 \$172,616

Xerox Corporation

Customization and Individualization Of Reading Materials for an Individual or Group

• **ERIC FOSLER-LUSSIER**

7/1/11 – 08/31/12 \$98,468

Yale University
(National Institute of Health (NIH) Subaward)

Acute Coronary Syndrome and Care-Seeking Delay: A Web Based Behavioral Study

• **RAJIV RAMNATH**

- Curtis Haugtvedt (Dept. of Marketing and Logistics)

9/1/07 – 4/30/12 \$228,239

2012 - 2013 GIFTS RECEIVED

ARNAB NANDI

NEC Research Gift

\$20,000

ARNAB NANDI & SRINIVASAN PARTHASARATHY

Google Award Gift

\$49,003.04

D. K. PANDA

NVIDIA Corporation

\$115,000

D. K. PANDA

Intel

\$50,000

RAJIV RAMNATH

Maarg

\$14,000

PRASUN SINHA

Toyota

\$10,000

XIAODONG ZHANG

IBM Faculty Award

\$25,000

XIAODONG ZHANG

IBM

\$20,000

PUBLICATIONS

ARTIFICIAL INTELLIGENCE

J. Hamm, B. Stone, **M. BELKIN**, and S. Dennis. “Automatic Annotation of Daily Activity from Smartphone-Based Multisensory Streams.” *Proceedings of 4th International Conference Mobile Computing, Applications, and Services* (MobiCASE 2012). pp. 328-342. Seattle, WA, USA. October 11-12, 2012

Y. Zhuang, **M. BELKIN**, and S. Dennis. “Metric Based Automatic Event Segmentation.” *Proceedings of 4th International Conference Mobile Computing, Applications, and Services* (MobiCASE 2012). pp. 129-148. Seattle, WA, USA. October 11-12.

K. Sankaranarayanan and **J. DAVIS**. “One-Class Multiple Instance Learning and Applications to Target Tracking.” *Proceedings of the 11th Asian Conference on Computer Vision* (ACCV ’12). Daejeon, Korea. November 5-9, 2012.

K. Sankaranarayanan and **J. DAVIS**. “Segmentation and Scene Modeling for MIL-based Target Localization.” *Proceedings of 21st International Conference on Pattern Recognition* (ICPR ’12). Tsukuba Science City, Japan. November 11-15, 2012.

R. Prabhavalkar, K. Livescu, **E. FOSLER-LUSSIER**, and J. Keshet. “Discriminative Articulatory Models for Spoken Term Detection.” *2013 IEEE International Conference on Acoustics, Speech and Signal Processing* (ICASSP 2013). Vancouver, Canada. May 26-31, 2013.

P. Jyothi, **E. FOSLER-LUSSIER**, and K. Livescu. “Discriminatively Learning Factorized Finite State Pronunciation Models From Dynamic Bayesian Networks.” *Proceedings of the 13th Annual Conference of the International Speech Communication Association* (Interspeech 2012). pp. 1063-1066. Portland, Oregon, USA. September 9-13, 2012.

W. Hartmann and **E. FOSLER-LUSSIER**. “Improved Model Selection for the ASR-Driven Binary Mask.” *Proceedings of the 13th Annual Conference of the International Speech Communication Association* (Interspeech 2012). pp. 1203-1206. Portland, Oregon, USA. September 9-13, 2012.

P. Raghavan, **E. FOSLER-LUSSIER**, and **A. LAI**. “Inter-Annotator Reliability of Medical Events, Coreferences and Temporal Relations in Clinical Narratives by Annotators with Varying Levels of Clinical Expertise.” *Proceedings of the the American Medical Informatics Association Annual Symposium* (AMIA 2012). pp. 1366-1374. Chicago, Illinois, USA. November 3-7, 2012.

P. Raghavan, **E. FOSLER-LUSSIER** and **A. LAI**. “Learning to Temporally Order Medical Events In Clinical Text.” *Proceedings of the 50th Annual Meeting of the Association for Computational Linguistics: Short Papers-Vol. 2. Association for Computational Linguistics*. pp. 70-74. Jeju Island, Korea. July 8-14, 2012.

M. Gales, S. Watanabe, and **E. FOSLER-LUSSIER**. “Structured Discriminative Models For Speech Recognition: An Overview.” *Signal Processing Magazine, IEEE*. Vol. 29, no. 6, pp. 70-81. November 2012.

K. Livescu, **E. FOSLER-LUSSIER**, and F. Metze. “Subword Modeling for Automatic Speech Recognition: Past, Present, and Emerging Approaches.” *Signal Processing Magazine, IEEE*. Vol. 29, no. 6, pp. 44-57. November 2012.

J. Hoffman, **B. KULIS**, K. Saenko, and T. Darrell. “Discovering Latent Domains for Multisource Domain Adaptation.” *Proceedings of 12th European Conference on Computer Vision* (ECCV ’12). pp. 702-715. Florence, Italy. October 7-13, 2012.

B. KULIS and K. Grauman. “Kernelized Locality-Sensitive Hashing.” *IEEE Transactions On Pattern Analysis And Machine Intelligence*. Vol. 34, no. 6; pp. 1092-1104. 2012.

B. KULIS and M. Jordan. “Revisiting k-means: New Algorithms via Bayesian Nonparametrics.” *Proceedings of The 29th International Conference on Machine Learning* (ICML 2012). pp. 513-520. Edinburgh, Scotland. June 26–July 1, 2012.

K. Jiang, **B. KULIS**, and M. Jordan. "Small-Variance Asymptotics for Exponential Family Dirichlet Process Mixture Models." *Proceeding of Neural Information Processing Systems 2012 (NIPS '12)*. pp. 3158-3166. Lake Tahoe, Nevada, USA. December 3-6, 2012.

N. ROMAN and J. Woodruff. "Ideal Binary Masking In Reverberation." *Proceedings of the 20th European Signal Processing Conference (EUSIPCO 2012)*. IEEE Computer Society. 2012. Los Alamitos, California, USA. pp. 629-633. Bucharest, Romania. August 27-31 2012

A. Narayanan and **D.L. WANG**. "A CASA based System For Long-Term SNR Estimation." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 20, pp. 2518-2527. 2012.

K. Han and **D.L. WANG**. "A Classification Based Approach To Speech Segregation." *Journal of the Acoustical Society of America*. Vol. 132, pp. 3475-3483. 2012.

C.-L. Hsu, **D.L. WANG**, J.-S.R. Jang, and K.Hu. "A Tandem Algorithm for Singing Pitch Extraction and Voice Separation from Music Accompaniment." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 20, pp. 1482-1491. 2012.

K. Hu and **D.L. WANG**. "An Unsupervised Approach To Cochannel Speech Separation." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 21, pp. 120-129. 2013.

J. Woodruff and **D.L. WANG**. "Binaural Detection, Localization, and Segregation In Reverberant Environments Based On Joint Pitch and Azimuth Cues." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 21, pp. 806-815. 2013.

J. Woodruff and **D.L. WANG**. "Binaural Localization of Multiple Sources in Reverberant and Noisy Environments." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 20, pp. 1503-1512. 2012.

X. Zhao, Y. Shao, and **D.L. WANG**. "CASA-based Robust Speaker Identification." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 20, pp. 1608-1616. 2012.

K. Han and **D.L. WANG**. "Towards Generalizing Classification Based Speech Separation." *IEEE Transactions on Audio, Speech, and Language Processing*. pp. 166-175. 2013.

Y. Wang and **D.L. WANG**. "Cocktail Party Processing Via Structured Prediction." *Proceedings of Neural Information Processing Systems 2012 (NIPS '12)*. pp. 224-232. Lake Tahoe, Nevada, USA. December 3-6, 2012.

Y. Wang, K. Han, and **D.L. WANG**. "Exploring Monaural Features For Classification-Based Speech Segregation." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 21, pp. 270-279. 2013.

Y. Wang and **D.L. WANG**. "Towards Scaling Up Classification-Based Speech Separation." *IEEE Transactions on Audio, Speech, and Language Processing*. Vol. 21, pp. 1381-1390. 2013.

GRAPHICS

R. CRAWFIS. "Defining Fun." Keynote talk. *Proceedings of The IADIS Computer Graphics, Visualization, Computer Vision and Image Processing 2012 (CGVCVIP '12)*. Lisbon, Portugal. July 21, 2012.

D. Maung, **R. CRAWFIS**, L. Gauthier, L. Worthen-Chaudhari, L. Lowes, A. Borstad, and R. McPherson. "Games for Therapy: Defining a Grammar and Implementation for the Recognition of Therapeutic Gestures." *Proceedings of the 8th International Conference on the Foundations of Digital Games (FDG 2013)*. Chania, Crete, Greece. May 2013.

Y. Shi and **R. CRAWFIS**. "Optimal Cover Placement Against Static Enemy Positions." *Proceedings of the 8th International Conference on the Foundations of Digital Games (FDG 2013)*. Chania, Crete, Greece. May 2013.

D. Maung, Y. Shi, and **R. CRAWFIS**. "Procedural Textures Using Tilings With Perlin Noise." *Proceedings of the 17th International Conference on Computer Games 2012 (CGAMES '12)*. Louisville, Kentucky, USA. July 30 – August 1, 2012. BEST PAPER.

O. Busaryev, **T. K. DEY**, **H. WANG**, and R. Zhong. "Animating Bubble Interactions in a Liquid Foam." *Proceedings of SIGGRAPH 2012*. Vol. 31, no. 4, pp. 63:1-63:8. Singapore, Singapore; November 28 - December 01, 2012.

- S.-W. Cheng, **T. K. DEY**, and J. Shewchuk. *Delaunay Mesh Generation*. 1st ed. Boca Raton: CRC Press, 2012.
- T. K. DEY**, P. Ranjan, and **Y. WANG**. “Eigen Deformation of 3D Models.” *Proceedings of Conference on the Computer Graphics International (CGI)*. Vol. 28. (2012); pp. 585-595; Bournemouth, U.K.; June 12-15, 2013
- T. K. DEY**, X. Ge, Q. Que, I. Safa, L. Wang, and **Y. WANG**. “Feature-Preserving Reconstruction of Singular Surfaces.” *Computer Graphics Forum*. Vol. 31, no. 5; pp. 1787-1796. 2012.
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THEORY

L. **RADEMACHER** and N. Goyal. “Lower Bounds for the Smoothed no. of Pareto Optima.” *Proceedings of the IARCS Annual Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 2012)*. pp. 58-69. Hyderabad, India. December 15-17, 2012.



Mirror Lake in Autumn (above) and in Winter (right).

FACULTY SERVICE: JOURNALS & CONFERENCES

GAGAN AGRAWAL

Associate Editor

IEEE Transactions on Cloud Computing

International Journal of Next Generation Computing (IJNGC)

ANISH ARORA

Journal Editor

New Generation Computing

Real Time Systems

Editor

Journal of Self Computing. (Journal).

MIKHAIL BELKIN

Associate Editor

The Journal of Machine Learning Research.

IEEE Transactions on Pattern Analysis and Machine Intelligence.

TAMAL DEY

Journal Editorial Board

Discrete & Computational Geometry

Journal of Computational Geometry

Journal Associate Editor

Graphical Models

ERIC FOSLER-LUSSIER

Journal Editorial Board

Journal of Experimental Linguistics.

Journal Associate Editor

ACM Transactions on Speech and Language Processing

Transactions of the Association for Computational Linguistics

Confernece Leadership

Program Chair, North American Association for Computational Linguistics Human Language Technologies Conference (NAACL HLT)

Area Chair (3 yr term), IEEE ICASSP, IEEE International Conference on Acoustics, Speech, and Signal Processing,

TEN-HWANG LAI

Editor

ACM/Springer Wireless Networks

International Journal of Ad Hoc and Ubiquitous Computing

International Journal of Sensor Networks

Confernece Leadership

Co-General Chair, 2012 IEEE 32nd International

Conference on Distributed Computing Systems

RAGHU MACHIRAJU

Associate Editor

IEEE Transactions on Visualization and Computer Graphics

IEEE Transactions of Visualization and Graphics

D. K. PANDA

Associate Editor

IEEE Transactions on Computers

Subject Area Editor

Journal of Parallel and Distributed Computing

Confernece Leadership

Program Chair, International Symposium on High Performance Computing (HiPC)

SRINIVASAN PARTHASARATHY

Associate Editor or Action Editor

ACM Transactions on Knowledge Discovery and Data Mining

Data Mining and Knowledge Discovery: An International Journal

Distributed and Parallel Databases

Journal of Parallel and Distributed Computing

IEEE Transactions on Knowledge and Data Engineering

SIGKDD Newsletter

Confernece Leadership

Chair of the Steering Committee for the SIAM Data Mining Conference

ATANAS ROUNTEV

Editorial Board

Journal of Information and Software Technology

Journal of Object Technology

HAN-WEI SHEN

Manuscript Guest Editor

IEEE Transactions on Visualization and Computer Graphics: Special Issue on Pacific Vis

IEEE Computer Graphics and Applications, Special Issue On Extreme Scale Visual Analytics

2012 IEEE Computer Graphics and Applications Special Issue On Extreme Scale Visual Analytics

Associate Editor

Journal of Visualization

Journal of Computer Science and Technology

NESS B. SHROFF

Technical Editor

IEEE Network Magazine
Editorial board
Network Science Journal
Associate Editor
Computer Networks

PRASUN SINHA
Journal Editorial Board
IEEE Transactions on Mobile Computing (TMC)
Guest Editor
Special Section on ICDCN, Pervasive and Mobile Computing (PMC),

CHRISTOPHER STEWART
Chief Editor
"IEEE Sustainable Computing Register." IEEE Special Technical Committee on Sustainable Computing Newsletter

DELIANG WANG
Co-Editor-in-Chief
Neural Networks
Editor
Cognitive Neurodynamics
EURASIP Journal on Audio, Speech, & Music Processing
Neural Computing & Applications
IEEE Transactions on Audio, Speech, and Language Processing
Cognitive Computation

YUSU WANG
Associate Editor
Journal of Computational Geometry.

DONG XUAN
Journal Editor
IEEE Transactions on Distributed and Parallel Systems (TPDS)
Journal of Ad Hoc & Sensor Wireless Networks

XIAODONG ZHANG
Editorial Board
IEEE Micro
Journal of Parallel and Distributed Computing

COLLOQUIUMS

Distinguished Guest Lecturers

CHANDRAJIT BAJAJ
Multi-Component Assembly Prediction : 3D Jigsaw Puzzles

The University of Texas - Austin

RENÉE J. MILLER
On Schema Discovery

University of Toronto

RICHARD STALLMAN
Free Software and Your Freedom

Free Software Foundation

Guest Speakers

AZZA ABOUZIED
Solving the Scalability, Flexibility and Usability Challenges of Database Systems

Yale University

DANIELLE BASSETT
Distilling Predictive Network Structure in Complex Biological Systems

University of California, Santa Barbara

SPYROS BLANAS
High-Performance Main-Memory Data Management

University of Wisconsin, Madison

- CEREN BUDAK** University of California, Santa Barbara
Understanding and Managing the Diffusion of Information in Online Social Networks
- MICHAEL DINITZ** The Weizmann Institute of Science
Approximating Spanners via Convex Relaxations
- MARK HARRIS** NVIDIA
CUDA 5 and Beyond
- JEFF HUANG** University of Washington
Big Data in Search and Beyond: By People, For People
- DR. HYUN-WOOK JIN** Konkuk University, Seoul, Korea
OS Support for High-Performance Networking over Multi-Core Processors
- MARC KHOURY** Microsoft Research
Progressive Graphs for Large Graph Visualization
- K. RUSTAN M. LEINO** Microsoft Research
Dafny: a Programming System for Program Correctness
- JENNIFER NEVILLE** Purdue University
Prediction in Complex Networks: The Impact of Structure on Learning and Inference
- ADAM O'NEILL** Boston University
Efficiently Searchable Encryption: A Practical Foundation for Privacy in Outsourced Databases
- CHUNYI PENG** University of California, Los Angeles
Network Support for Mobile Devices and Applications: Infrastructural Limitations and Solutions
- DON SHEEHY** INRIA Saclay
A New Approach to Output-Sensitive Voronoi Diagrams and Delaunay Triangulations
- ANASTASIOS SIDIROPOULOS** University of Illinois, Urbana-Champaign
Simplification of Metric Spaces and Its Algorithmic Applications
- STEFANO TESSARO** Massachusetts Institute of Technology
Theoretical Foundations for Practical Cryptography
- TAO ZHANG** Starkey Laboratories, Inc.
Signal Processing Research for Digital Hearing Aids: Challenges, Solutions and Future Directions
- Guest Speakers Presented jointly with Biomedical Informatics**
- SHAY COHEN** Columbia University
Improving the Accuracy, Efficiency and Data Use for Natural Language Parsing
- HENG JI** Queens College, City University of New York
Cross-source Information Extraction and Knowledge Base Population
- YANJUN QI** NEC Labs, America
Machine Learning in Biomedical Informatics
- ALAN RITTER** University of Washington
Extracting Knowledge from Informal Text
- FENG YUE** University of California, San Diego
Comprehensive Analysis of the cis-Regulatory Elements in the Mammalian Genome

STUDENTS

TEN YEAR STATISTICAL HISTORY

	AU 2002	AU 2003	AU 2004	AU 2005	AU 2006	AU 2007	AU 2008	AU 2009	AU 2010	AU 2011	AU 2012
Faculty	29	31	31	32	33	35	35	35	36	36	34
Course Enrollment/ Autumn Qtr.	4,076	3,650	3,125	3,187	3,238	3,386	3,702	3,943	4,075	4,609	5,737
	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
Students Taught	13,878	12,208	10,623	10,844	10,641	11,185	12,209	12,689	13,744	14,523	12,457

THE GRADUATE PROGRAM

The 2012 – 2013 academic year brought a major change to The Ohio State University as we moved from a quarters timeline to semesters. All courses were re-designed and updated to suit the new 14 week class time. It was a massive undertaking requiring three years of preparation. In the final analysis, it is found to be a success and should help drive the Department Of Computer Science And Engineering to even greater heights.

The Graduate program continues to excel. Autumn 2012 gave us our 500th Doctorate graduate, Justin Holewinski. This give us an average of 11 Ph.D. graduates per year. Our Masters program continues to grow and gain in popularity.

	AU 2002	AU 2003	AU 2004	AU 2005	AU 2006	AU 2007	AU 2008	AU 2009	AU 2010	AU 2011	AU 2012
Graduate Students Enrolled	164	174	169	188	184	235	239	303	304	339	305
	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
Graduate Student Applications	1,508	712	589	694	619	705	677	817	1,031	1,190	1,196
Graduate Students Supported	156	149	158	163	135	135	132	182	218	209	222
M.S. Degrees Awarded	30	31	27	21	33	37	39	64	40	37	86
Ph.D. Degrees Awarded	7	7	11	18	17	32	26	19	20	14	19
Ph.D. Degrees (cumulative)	325	332	343	361	378	410	436	455	475	489	508

DOCTORATES GRANTED

GRADUATE Dissertation Title Vita	Advisor	Home Post-Graduation Destination
MATTHEW BOGGUS <i>Modeling, Evaluation, Editing, and Illumination of Three Dimensional Mazes and Caves for Computer Games</i> B.A., Hiram College	Dr. Roger Crawfis	Toledo, Ohio, USA Senior Lecturer, The Ohio State University
OLEKSIY BUSARYEV <i>On Computing and Tracking Geometrical and Topological Features</i> Diploma, Odessa National Polytechnic University; M.S., The Ohio State University	Dr. Tamal Dey	Odessa, Ukraine Google, Inc., Mountain View, California, USA
BOXUAN GU <i>Context-Aware Malicious Code Detection</i> Bachelor's, Southeast University; M.S., University of Kentucky; M.S., The Ohio State University	Dr. Dong Xuan	Nanjing, China A10 Networks, Sunnyvale, California, USA
WILLIAM HARVEY <i>Understanding High-Dimensional Data Using Reeb Graphs</i> B.A., B.S., University of Washington; M.S., The Ohio State University	Dr. Yusu Wang	Columbus, Ohio, USA Nationwide Childrens' Hospital; Columbus, Ohio, USA
JUSTIN HOLEWINSKI <i>Automatic Code Generation for Stencil Computations on GPU Architectures</i> B.S.Cptr.Sci.Eng., The Ohio State University; M.S., The Ohio State University	Dr. P. Sadayappan	Columbus, Ohio, USA NVIDIA, Corp., Durham, North Carolina, USA
KE HU <i>Speech Segregation in Background Noise and Competing Speech</i> B.Eng., Master's, University of Science and Technology China	Dr. DeLiang Wang	Pengzhou, China Kuzer, Inc.
WEI JIANG <i>A Map-Reduce-Like System for Programming and Optimizing Data-Intensive Computations on Emerging Parallel Architectures</i> B.S., Nankai University; M.S., The Ohio State University	Dr. Gagan Agrawal	Tianmen, China Cluster R&D, Quantcast, San Francisco, California, USA
TAEWOO KWON <i>Reasoning About Wireless Protocol Behavior</i> B.S., Yonsei University; M.S., University of Massachusetts, Amherst	Dr. Anish Arora	Columbus, Ohio, USA Scientific Forming Technologies, Corp.
JING LI <i>Translational Research of Suramin as a Chemosensitizer in Pancreatic Cancer</i> Bachelor's, Hefei University of Technology; Master's, University of Science and Technology of China; M.S., The Ohio State University	Dr. Anish Arora	Hefei, China Siemens Technology, Beijing, China
SHUANG LI	Dr. Ness Shroff	Shiyan, Hubei, China

TANTAN LIU

Dr. Gagan Agrawal

Huaiyang, Zhoukou, China

Data Mining over Hidden Data Sources

B.Engr., University of Science and Technology of China; Mech.Engr., Chinese Academy of Sciences; M.Appl.
Stats., The Ohio State University Google, Inc., Mountain View, California, USA

STEVEN MARTIN

Dr. Han-Wei Shen

New York City, New York, USA

Scalable Data Transformations for Low-Latency Large-Scale Data Analysis

B.S., Rensselaer Polytechnic University; M.S., The Ohio State University
Two Sigma Investment, New York City, NY, USA

BOONTHANOME NOUANESENGSY

Dr. Han-Wei Shen

Fort Smith, Arkansas, USA

High-Concurrency Visualization on Supercomputers

B.S. Civil Eng., University of Arkansas Los Alamos National Laboratory, Los Alamos, New Mexico, USA

SUNDARESAN RAMAN

Dr. Raghu Machiraju

Chennai, India

Phenotypical Analysis of Tumor Microenvironment

B.Engr., Birla Institute of Technology and Science; M.S., The Ohio State University
Birla Institute of Technology and Science - Pilani, Pilani, Rajasthan, India

PAWAS RANJAN

Dr. Tamal Dey

Mumbai, India

Discrete Laplace Operator: Theory and Applications

B.Tech., Dr. Babasaheb Ambedkar Technological University Conviva, San Mateo, California, USA

ENHUA TAN

Dr. Xiaodong Zhang

Jiujiang, China

B.Engr., University of Science and Technology of China; Master's, Chinese Academy of Science; M.S.,
The Ohio State University LinkedIn Corp., Mountain View, California, USA

YING TU

Dr. Han-Wei Shen

Yichun, China

Focus-Based Interactive Visualization For Structured Data

B.Engr., Zhejiang University; M.S., The Ohio State University Microsoft Inc., Redmond, Washington, USA

XINTIAN YANG

Dr. Srinivasan Parthasarathy

Harbin, China

Towards Large-Scale Network Analytics

B.Engr., Harbin Institute of Technology; M.S., The Ohio State University
Google, Inc., Mountain View, California, USA

WENJIE ZENG

Dr. Anish Arora

Columbus, Ohio, USA

Topics in Energy Efficiency of Low-Power Wireless Sensor Networks

B.Engr., Shanghai Jiao Ton University; M.S., The Ohio State University
Google, Inc., Seattle, Washington, USA



Masters grad Yi Liu (2nd right) and friends.

MASTERS GRADUATES

Name
Advisor
Home
Vita

UZMA ARJUMAN

Gagan Agrawal
Bareilly, India
B.Engr., University of Pune

PRASEEDA BADAMI

Atanas Rountev
Upper Arlington, Ohio, USA
B.S.Cptr.Sci.Engr., The Ohio State University

SUBHA BALARAMAN

Rajiv Ramnath
Chennai, India
B.Engr., Anna University

DEEPAN BALASUBRAMANIAN

P. Sadayappan
Chennai, India
B.Tech., Anna University

NARENDHIRA RAM CHANDRASEHARAN

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Columbus, Ohio, USA
Bachelor's, Regional Engineering College,
Bharathidasan University

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B.S., M.P.H., National Taiwan University

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B.Engr., Shanghai University

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B.Engr., Anna University

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Bachelor's, Anna University

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B.Tech., National Institutes of Technology, India

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B.Tech., University of Pune

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Bachelor's, Visveswaraiah Technological University

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DANIEL ZIEMBA

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B.S.Cptr.Sci.Engr., The Ohio State University

THE UNDERGRADUATE PROGRAM

	AU 2002	AU 2003	AU 2004	AU 2005	AU 2006	AU 2007	AU 2008	AU 2009	AU 2010	AU 2011	AU 2012
Undergrad Students Enrolled	1217	990	817	800	795	817	877	871	971	1,102	1,287
	02-03	03-04	04-05	05-06	06-07	07-08	08-09	09-10	10-11	11-12	12-13
B.A., B.S. Degrees Awarded	335	274	192	124	140	142	138	127	152	213	229

The 2012-2013 academic year was a true challenge for the Undergraduate Advising Office. The retirement of Peg Steele meant understaffing for a brief time, but with Nikki Strader moving into Peg's position and with the addition of Chelsea Norris, the office was soon back up to speed. With the change to semesters, the Advising Office was one of the busiest places in Dreese Labs. The lines were long, but students were patient and understanding, and generally everyone went away satisfied.

The Advising Office, working with new Associate Chair Neelam Soundarajan, continues to respond to the needs of the students. The popularity of the Computer Science majors is once again on the rise, requiring enrollment management, so the minimum GPA increased from 2.0 to 2.5 in January 2013 and will increase again to 3.0 effective May 2014.

Students have 3 options for a Computer Science major: a B.S. from the College of Engineering (BSCSE); a B.S. from the College of Arts and Sciences (BSCIS); or a B.A. from the College of Arts and Sciences (BACIS). The most popular of the three is the BSCSE, but the BSCIS and BACIS are growing as well.

PEG STEELE, Coordinator of Academic Advisement, retired at the end of October 2012. She was the coordinator of academic advising for the department for 14 years. Peg was an active advocate for academic advising locally at Ohio State and nationally through NACADA (National Academic Advising Association), for which she is completing a three-year tenure on the Board of Directors. Peg has received many accolades including "Outstanding Advisor" from NACADA in 2004 and twice from ACADAOS (Academic Advising Association at Ohio State) during her career.

NIKKI STRADER, formerly Academic Advisor & Staff Assistant and now Academic Advising Coordinator, has been with the department since 2003. She is an active member of ACADAOS (Academic Advising Association at Ohio State), for which she was President from 2006 to 2008 and from which she received one of two "Outstanding Advisor" awards in 2007. She is also a musicologist, having presented and written about the composer Benjamin Britten, the subject of her dissertation.

CHELSEA NORRIS, Academic Advisor. Chelsea is new to OSU and began advising in CSE in January. She was previously working as an advisor at Ohio University after earning her Masters of Arts in Higher Education and Student Affairs. Starting this summer, she will serve as the primary contact for all first year pre-CSE students, instructor for CSE survey classes and facilitator for orientation.

MARY JO DEERWESTER, Academic Advisor & Staff Assistant. Mary Jo graduated from OSU in 1971 with a Bachelor of Science degree in Education. (Major: English; Minor: Psychology) She followed that in 1983 with a Master's Degree in Guidance and Counseling. Mary Jo previously worked as an Academic Advisor at Columbus State Community College and as an Academic Advisor/Staff Assistant for the OSU College of Engineering.

JEFF WALSH, Graduate Advising Assistant. He is working on his Master's degree in Computer Science & Engineering, with a focus on computer graphics, and he intends to graduate after Spring semester 2014.

COLLEGE OF ARTS & SCIENCES -UNDERGRADUATE DEGREES ACHIEVED

Name Degree
Honors
Home

DONALD LEE BACHAROWSKI; BS
Columbus, Ohio, USA

MATTHEW DAVID BEAR; BS
Powell, Ohio, USA

SHOSHANA LYNN BERLEANT; BS
Summa Cum Laude
with Honors in the Arts and Sciences
Little Rock, Arkansas, USA

DANIEL JAMES BIBYK; BS
Columbus, Ohio, USA

NATHAN WISE BLACKSTONE; BS
Cum Laude
with Honors in Arts and Sciences
Columbus, Ohio, USA

ANDREW WALLACE BUELOW; BS
Centerville, Ohio, USA

TIMOTHY ELLIS CARPENTER; BS
Westerville, Ohio, USA

MATTHEW GARRETT EBERTS; BS
Hamden, Ohio, USA

MOUSTAFA HOSNI EID; BS
Cum Laude
Columbus, Ohio, USA

JUSTIN JAMES FRYE; BS
Liberty Center, Ohio, USA

SIMEON PANDOV GEORGIEV; BS
Cincinnati, Ohio, USA

MARK SAMUEL GUTENTAG; BA
Lewis Center, Ohio, USA

ALEXANDER CHRISTOPHER HECK; BA
Lebanon, Ohio, USA

ERIC JOSHUA HILL; BS
Avon Lake, Ohio, USA

JAY FRANCIS HINES; BS
Upper Artlington, Ohio, USA

TREVOR DOUGLAS HOLL; BS
Chardon, Ohio, USA

CAMERON PATRICK JETT; BA
Dayton, Ohio, USA

FRANS RAHARJA KURNIAWAN; BS
Indonesia

DAVID CHARLES LASHOCK; BS
Columbia Station, Ohio, USA

BENJAMIN ELLIOTT MORRIS; BS
Marion, Ohio, USA

JASON RICHARD MOTZ; BS
Bath, Ohio, USA

THUAN NGUYEN; BA
Columbus, Ohio, USA

EDWARD DESSLOCH POWELL; BS
Selkirk, New York, USA

CHRISTOPHER ALLEN PRICE; BS
Hilliard, Ohio, USA

PHILIP JOSEPH ROSS; BS
Canton, Ohio, USA

STEVEN WILLIAM RUIZ; BS
West Chester, Ohio, USA

BREAWN DARNAY SCHOUN; BA
Hilliard, Ohio, USA

IAN J. SHORTRIDGE; BS
Toledo, Ohio, USA

DRAKE ALLEN SIGLER; BS
Logan, Ohio, USA

BRIAN JAMES SOMMERS; BS
Brooklyn, Ohio, USA

DAVID RICHARD SPETZ; BS
Cleveland, Ohio, USA

CHARLES MATTHEW STOCKTON; BS
Eaton, Ohio, USA

DANIEL LOWE TEDDER; BS
Columbus, Ohio, USA

JAMISON MICHAEL TREFZGER; BS
Westerville, Ohio, USA

SANJAY VERMA; BS
Columbus, Ohio, USA

ZEYA JACK WANG; BA
Cincinnati, Ohio, USA

MAX RENAUD WEINBERG; BS
Bexley, Ohio, USA

STEVEN DAVID WILSON; BS
Cambridge, Ohio, USA

JIANAN ZHENG; BS
Dalian, China

ADAM CHRISTOPHER ZIMMERMAN; BS
Hilliard, Ohio, USA

COLLEGE OF ENGINEERING UNDERGRADUATES

Name
Honors
Home

JESSE MITCHELL AKERS
Powell, Ohio, USA

SOFYA OLEGOVNA AKHMAMETYEVA
Novosibirsk, Russia

DAVID LAWRENCE ALBERT
Magna Cum Laude
Dublin, Ohio, USA

KYLE DAVID ALBERT
Magna Cum Laude
Brook Park, Ohio, USA

BOYAN ALEXANDROV
Sofia, Bulgaria

MIHIR A. AMIN
Cum Laude
Dublin, Ohio, USA

CHRISTOPHER NICHOLAS ASHTON
Cincinnati, Ohio, USA

SAMUAL JAMES BANTNER
Pataskala, Ohio, USA

LOWELL CLIFFORD BATEMAN
Cincinnati, Ohio, USA

SCOTT ALLEN BEABER
Columbus, Ohio, USA

VISHAL BHATNAGAR
Mason, Ohio, USA

TIFFANY ESTHER ELINE BOGANTZ
Magna Cum Laude
Johnstown, Ohio, USA

SERGIY BORYSOV
Topeka, Kansas, USA

NATHAN LEE BRAID
Pickerington, Ohio, USA

RYAN WILLIAM BROWN
Dublin, Ohio, USA

DAVID OLIVER BURL
with Honors Research Distinction in Computer Science and Engineering
Chagrin Falls, Ohio, USA

KEVIN JAMES CANTWELL
Westlake, Ohio, USA

STEPHEN JACOB CASSIDY
Aurora, Ohio, USA

LAP HOU CHAN
Macau, China

HAOCHI CHEN
Columbus, Ohio, USA

JOSEPH STEVEN CHIRICO
Avon Lake, Ohio, USA

SAGAR KANTILAL CHOPDA
Nasik, India

JAHI ASA SEDALE CROUCH
Columbus, Ohio, USA

GRANT EDWARD CURELL
Centerville, Ohio, USA

RYAN T. CUTLER
Cum Laude
Strongsville, Ohio, USA

ANDREW DAVID DAUGHTERS
Columbus, Ohio, USA

KEVIN PAUL DAVID
Cum Laude
with Honors in Engineering
Sylvania, Ohio, USA

EVAN MICHAEL DAWSON

Lancaster, Ohio, USA

WILLIAM ALAN DAZEY, JR.

Canton, Ohio, USA

CHRISTOPHER LEE DEAN

Summa Cum Laude

with Honors in Engineering

with Honors Research Distinction in Electrical and Computer Engineering

Columbus, Ohio, USA

JEFFREY RYAN DEPASSIO

Columbus, Ohio, USA

MICHAEL DETWILER

Hilliard, Ohio, USA

SADA YERO DIALLO

Columbus, Ohio, USA

NATHANIEL PHILIP DIKEMAN

Magna Cum Laude

Cincinnati, Ohio, USA

CONOR DOCKRY

Youngstown, Ohio, USA

COLIN FRANCIS DRAKE

Bellbrook, Ohio, USA

MAXWELL LAND ELLIOTT

Worthington, Ohio, USA

OSCAR FLORES

Tehuixtlera, Mexico

VINCE LEE FONTE

Waynesburg, Ohio, USA

JOEL DAVID FRIEDLY

Miamisburg, Ohio, USA

JEREMY HEATH GARDNER

Worthington, Ohio, USA

CALVIN MATTHEW GOODMAN

Summa Cum Laude

Columbus, Ohio, USA

MICHAEL ANDREW GRISCOM

Summa Cum Laude

with Honors in Engineering

with Honors Research Distinction in Computer Science and Engineering

Reynoldsburg, Ohio, USA

DANIEL JAMES HAASER

Cincinnati, Ohio, USA

JUSTIN LAWRENCE HARRISON

Cum Laude

Akron, Ohio, USA

BRAD HARTSHORN

Magna Cum Laude

Hamilton, Ohio, USA

HITOE HAYASAKA

Dublin, Ohio, USA

GREGORY CARL HERMACK

Summa Cum Laude

Toms River, New Jersey, USA

ANDREW SCOTT HERMAN

Austin, Texas, USA

DAVID SCOTT HEWITT

Summa Cum Laude

Loveland, Ohio, USA

JAMES CHANDLER HICKMAN

Liberty Township, Ohio, USA

JONATHON MURRAY HICKMAN

Magna Cum Laude

Liberty Township, Ohio, USA

ROBERT ALAN HOLBERT

Columbus, Ohio, USA

NICHOLAS SCOTT HUNTER

Springboro, Ohio, USA

DAVID HUYNH

Cincinnati, Ohio, USA

ZHIXUAN JIA

Cum Laude

Baotou, China

ALI AHMED JIRAKI

Cleveland, Ohio, USA

MIKE THOMAS JOHNSON

Hillsboro, Ohio, USA

NEIL MARTIN JOHNSON

Dublin, Ohio, USA

JASON JAY KAO

Cincinnati, Ohio, USA

RYAN ALAN KARASON

Amherst, Ohio, USA

BASHEER KAYALI

Columbus, Ohio, USA

WILLIAM NICHOLAS KENTRIS

Cum Laude

Fostoria, Ohio, USA

YAMAN ISLAM KHAN
Strongsville, Ohio, USA

JOSEPH RUSSELL KINZIG
Beavercreek, Ohio, USA

DAVID MATTHEW KLIMEK
Cum Laude
West Chester, Ohio, USA

LISA ANN KRAUSS
Naperville, Ohio, USA

JAN ALEXANDER KUMOR
Centreville, Ohio, USA

KYLE ANTHONY KYNARD
Toledo, Ohio, USA

KEVIN JOHNATHON LANDERS
Magna Cum Laude
with Honors in Engineering
Liberty Township, Ohio, USA

LEI LI
Cum Laude
Barberton, Ohio, USA

THOMAS WILLIAM LOGAN
Columbus, Ohio, USA

AUSTIN ROBERT LOHR
Cincinnati, Ohio, USA

YIRAN LUO
Magna Cum Laude
Nanjing, China

MICHAEL ANDREW MALINOWSKI
Eastlake, Ohio, USA

CLAYTON JAMES MALLORY
Columbus, Ohio, USA

MOHAMMAD IBRAHIM MANDOURAH
Mandourah, Jeddah, Saudi Arabia

JONATHAN DAVID MARTIN
Birmingham, Alabama, USA

MARK DANIEL MATHIS
West Chester, Ohio, USA

JACOB McCONNELL
Lakewood, Ohio, USA

RYAN VINCENT MCGOWAN
Magna Cum Laude
Columbus, Ohio, USA

TIMOTHY McLEAN
Magna Cum Laude
Port Clinton, Ohio, USA

MATTHEW JAMES MEADE
Magna Cum Laude
West Chester, Ohio, USA

JOSHUA PAUL MEEK
Cum Laude
Shadyside, Ohio, USA

YI QUN MEI
Brooklyn, Ohio, USA

ARTHUR YEN BIN MO
Dublin, Ohio, USA

BASHIIR MIRE MOHAMED
Columbus, Ohio, USA

SHANE LOUIS MYERS
Toronto, Ohio, USA

MEGAN ELIZABETH NAFZIGER
Westerville, Ohio, USA

ALEXANDER PAUL NOTWELL
Columbus, Ohio, USA

EVERLY CHINEM OKORJI
Summa Cum Laude
Port Harcourt, Nigeria

JOSHUA FRANK OWUSU-DEKYI
Indianapolis, Indiana, USA

SHITIANYU PAN
Nanjing, China

DEVEN RAMESH PANDYA
North Olmstead, Ohio, USA

JACOB M. PEDDICORD
Cum Laude
Delaware, Ohio, USA

ADAM GENE PERKS
Springfield, Ohio, USA

DMITRIY PILIPENKO
Solon, Ohio, USA

CHRISTOPHER DAVID POWERS
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Columbus, Ohio, USA

STEPHEN POWERS
Columbus, Ohio, USA

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TIMOTHY JOSEPH RAPHAEL
Magna Cum Laude
Cincinnati, Ohio, USA

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Grand Blanc, Michigan, USA

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Cum Laude
Perrysburg, Ohio, USA

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Sandusky, Ohio, USA

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Cum Laude
Cleveland, Ohio, USA

WILLIAM W. ROSE, IV
Massillon, Ohio, USA

NICHOLAS TAYLOR ROTONDA
Marysville, Ohio, USA

AARON D. RYAN
Dublin, Ohio, USA

KRIT SAEFANG
Cum Laude
Bangkok, Thailand

KYLE RICHARD SALBERG
Magna Cum Laude
with Honors in Engineering
Rocky River, Ohio, USA

CHRISTOPHER ANDREW SEDAR
Stow, Ohio, USA

MATTHEW ERIC SEFFERNICK
Cum Laude
with Honors in Engineering
with Honors Research Distinction in Computer Science and Engineering
Celina, Ohio, USA

GREGORY PHILIP SHAYKO
Cleveland, Ohio, USA

AARON WILLIAM SHORTRIDGE
Toledo, Ohio, USA

CARL ANDREW SHOTWELL
Medina, Ohio, USA

DAVID WILLIAM SMELSER
Columbus, Ohio, USA

ALEXANDER RICHARD SMITH
Hudson, Ohio, USA

STEPHEN JEFFREY SMITH
New London, North Carolina, USA

EBLE ALBERT JUSTIN SMITH
Third Lake, Illinois, USA

ZACHARY CHARLES SMITH
Cum Laude
Dublin, Ohio, USA

JAMES OYEDELE SOSAN, JR.
Solon, Ohio, USA

RYAN MICHAEL SOUTHARD
Mentor, Ohio, USA

ANDREW JOSEPH STROMINGER
Bexley, Ohio, USA

BRYAN WESLEY STUMP
Aurora, Ohio, USA

ADAM MICHAEL STUTZ
Beavercreek, Ohio, USA

JENNIFER LEIGH SULC
Auburn, Ohio, USA

TROY A. SULLIVAN
Cum Laude
Dublin, Ohio, USA

DREW DAVID SWITZER
Ashland, Ohio, USA

TIAN TAN
Magna Cum Laude
Chengdu, China

TIFFANY NICOLE TERDAN
Cum Laude
with Honors in Engineering
Median, Ohio, USA

DANIEL RICHARD THIERY
Strongsville, Ohio, USA

MICHAEL JOSEPH TIMKO, III
Kirtland, Ohio, USA

EVAN MICHAEL TODD
Magna Cum Laude
Columbus, Ohio, USA

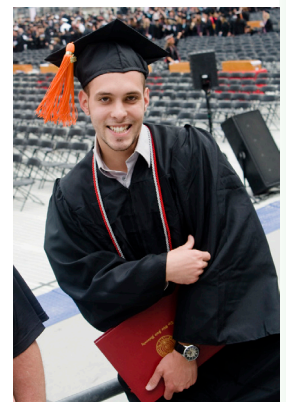
CHAD MICHAEL TRAVIS
Marion, Ohio, USA

BENJAMIN MICHAEL TRIVETT
Pataskala, Ohio, USA

DANIEL JORDAN TUCHOLSKI
Magna Cum Laude
Garfield Heights, Ohio, USA

DREW DAVID VALENTINE
Celina, Ohio, USA

CHASE CAMERON VIOLET
Lima, Ohio, USA



CSE Honors grad Daniel Tucholski.

Photo courtesy of Tracy Tucholski

BHAVYA DEEPAK VYAS

Summa Cum Laude
Rajkot, India

STEVEN DANIEL WARE

Bellbrook, Ohio, USA

STEPHEN D. WARTON

Columbus, Ohio, USA

CHRISTOPHER THOMPSON WEEKS

Dublin, Ohio, USA

DAVID JAMES WELLING

Liberty Township, Ohio, USA

PAUL GERARD WISNIEWSKI, JR.

Westlake, Ohio, USA

ROSI MOLIANINGRUM WYAN

Jakarta, Indonesia

JINGWEI XU

Magna Cum Laude
Taizhou, China

MICHAEL E. ZAZON

Columbus, Ohio, USA

SHAO Q. ZHENG

Dayton, Ohio, USA

ANTHONY MICHAEL ZUCCARELLI

Magna Cum Laude
Reynoldsburg, Ohio, USA



CSE Honors graduate Rosi Wyan and OSU President E. Gordon Gee.

*President Barack Obama speaking to graduates,
friends and families at the Spring 2013 commencement.
Photo courtesy of Tracy Tucholski*



*We must walk consciously only part way
toward our goal, and then leap in the
dark to our success.
Henry David Thoreau*

*Tarun Sasikumar (left most),
Karthik Tunga,
Vineet Nair,
Chaitanya Solapurkar,
Yogesh Chidambarnathan (hidden
behind Chaitanya),
Ananth Mahadevan,
Prasanth Jayachandran,
Abhishek Dharmapurikar (right most)*

Photo courtesy of Manas Agrawal

FACULTY, SCIENTISTS, & STAFF

TENURED & TENURE TRACK FACULTY



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: High Performance Computing and Big Data Issues, Programming Models, Fault-Tolerance, Cloud Computing and Data 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; Cyberphysical Systems; Fault-tolerant, Secure And Timely Computing; Distributed Systems and Networks; Component-Based Design; Formal Methods; Concurrency Semantics.



MIKHAIL BELKIN *Associate 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; Theoretical analysis of algorithms, particularly in high dimension; Connections to Human Cognition.



MICHAEL BOND *Assistant Professor*

B.S., Computer Science, University of Illinois at Urbana-Champaign, 2002; M.C.S., Computer Science, University of Illinois at Urbana-Champaign, 2003; Ph.D., Computer Sciences, The University of Texas at Austin, 2008

Department Research Area: SOFTWARE ENGINEERING AND PROGRAMMING LANGUAGES

Interests: Developing Program Analyses and Software Systems that make Complex, Concurrent Software Reliable, Scalable, and Secure. Programming Languages, Software Systems, Runtime Systems, Program Analysis, Compilers, Security.



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; Serious Games; Scientific Visualization; Medical Imaging; and Volume Rendering..



JAMES W. DAVIS *Associate Professor*

B.S., Computer Science, University of Central Florida, 1994; M.S., Media Laboratory, Massachusetts Institute of Technology, 1996; Ph.D., Media Laboratory, Massachusetts Institute of Technology, 2000.

Department Research Area: ARTIFICIAL INTELLIGENCE

Interests: Computer Vision; Automatic Visual Surveillance and Monitoring; Human Activity Recognition; Video Understanding; and Human-Computer Interaction.



TAMAL K. DEY *Full Professor*

B.E., Electronics, Jadavpur University, 1985; M.Tech., Computer Science, Indian Institute of Science-Bangalore, 1987; Ph.D., Computer Science, Purdue University, 1991.

Department Research Area: THEORY, GRAPHICS

Interests: Computational Geometry; Computational Topology; Geometric Modeling; Meshing; Data Analysis.



ERIC FOSLER-LUSSIER *Associate Professor*

B.A., Linguistics, University of Pennsylvania, 1993; B.A.S., Computer and Cognitive Science, University of Pennsylvania; 1993; Ph.D., Computer Science, University of California, Berkeley, 1999

Department Research Area: ARTIFICIAL INTELLIGENCE

Interests: Automatic Speech Recognition; Computational Linguistics; Machine Learning.



BRIAN KULIS *Assistant Professor*

B.A., Computer Science and Mathematics, Cornell University; Ph.D., Computer Science University of Texas at Austin, 2008.

Department Research Area: ARTIFICIAL INTELLIGENCE

Interests: Machine Learning, Statistics, Large-Scale Data Analysis, Numerical Optimization, Data Mining, Computer Vision.

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: NETWORKING

Interests: Cryptography; Network Security; and Parallel and Distributed Computing.



RAGHU MACHIRAJU *Full 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: Data Visualization; Imaging; Bioinformatics; Computational Biology.



ARNAB NANDI *Assistant Professor*

Bachelors in Information Science, University of Delhi, India, 2005; M.S., University of Michigan, Ann Arbor, 2007; Ph.D., University of Michigan, Ann Arbor, 2011.

Department Research Area: SYSTEMS

Interests: Structured Search and Large-scale Data Analysis Efficient Interaction with Databases and the Management of Large, Diverse Data Collections..



DHABALESWAR K. (D. K.) PANDA *Full Professor*

B.S., Electrical Engineering, Indian Institute of Technology, Kanpur, India, 1984; M.S., Electrical and Computing Engineering, Indian Institute of Science, Bangalore, India, 1986; Ph.D., Computer Engineering, University of Southern California, Los Angeles, 1991.

Department Research Area: SYSTEMS

Interests: Parallel Computer Architecture; High Performance Networking; Network-Based Computing; Cluster Computing; High Performance File/Storage Systems; Lan-Wan Interfacing and Communication; and Resource Management.



SRINIVASAN PARTHASARATHY *Full 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; Database Systems; Network Analysis; Bioinformatics; High Performance Computing Systems.





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.



LUIS RADEMACHER *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: THEORETICAL COMPUTER SCIENCE

Interests: High Dimensional Geometry; Random Structures; Matrix Approximation; Optimization.

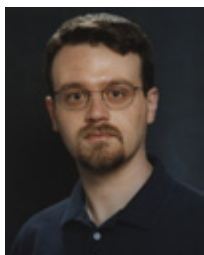


NICOLETA ROMAN *Assistant Professor, Lima Campus*

B.S., Computer Science, University of Bucharest, Romania, 1996; M.S., Computer Science, University of Bucharest, Romania, 1997; Ph.D., Computer Science and Engineering, The Ohio State University, Columbus, Ohio, 2005.

Department Research Area: ARTIFICIAL INTELLIGENCE

Research interests: Computational Auditory Scene Analysis; Binaural sound localization and separation; Automatic Speech Recognition; Machine Learning.



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 AND PROGRAMMING LANGUAGES

Interests: Static and Dynamic Program Analysis; Programming Languages and Compilers; Software Understanding and Testing; High-Performance Computing.



PONNUSWAMY (SADAY) SADAYAPPAN *Full Professor*

B.S., Electrical Engineering, Indian Institute of Technology, Madras, India, 1977; M.S., Electrical Engineering, State of University of New York, Stony Brook, 1978; Ph.D., Electrical Engineering, State of University of New York, Stony Brook, 1983.

Department Research Area: SYSTEMS

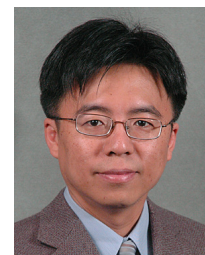
Interests: Compiler/Runtime Systems For High-Performance Computing; Performance Optimization; High-Productivity, High-Performance Scientific Computing.

HAN-WEI SHEN *Full 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.

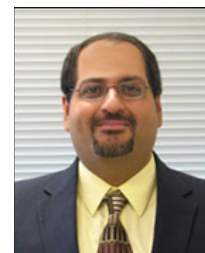


NESS B. SHROFF *Ohio Eminent Scholar of Networking and Communications
Endowed Chaired Professor*

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 Networks; Next Generation Internet; Sensor Networks; Cloud Computing; Network Optimization; Network Design and Dimensioning; Network Security; Information Theoretic Security; Queueing Theory; Dynamic Control; Network Coding; Scaling Laws; Distributed Algorithms; Complexity and Approximability; Game Theory; Pricing.



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 AND PROGRAMMING
LANGUAGES

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



NEELAM SOUNDARAJAN *Associate Professor and Associate Chairperson
(effective January 2013)*

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 AND PROGRAMMING
LANGUAGES

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





KANNAN SRINIVASAN *Assistant Professor*

B.S., Electronics & Communications Engineering, University of Madras, Chennai, India, 2000; M.S., Electrical & Computer Engineering, Oklahoma State University, 2002; Ph.D., Electrical Engineering, Stanford University, Stanford, CA, USA, 2010

Department Research Area: SYSTEMS

Interests: Wireless Networking, Low Power Wireless Systems, Communication Systems, Smartgrids and Wireless Security.



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

Interests: Operating Systems; Distributed Systems; Performance Management; and Power Management.



KENNETH J. SUROWIT *Associate Professor*

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

Department Research Area: THEORETICAL COMPUTER SCIENCE

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

Interests: Computer Architecture, with a Focus On Designing Energy Efficient and Reliable Microprocessors and 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

HUAMIN WANG *Assistant Professor*

B.Eng., Computer Science and Engineering, Zhejiang University Hangzhou, China, 2002; M.S., Computer Science, Stanford University Stanford, CA, USA, 2004; Ph.D. in Computer Science Georgia Institute of Technology Atlanta, GA, USA, 2009

Department Research Area: GRAPHICS

Computer Graphics, GPU Programming for High-performance Graphics and General-purpose Computation, Computer Vision, Feature Tracking, Optical Flow, 3D Reconstruction, Finite Element Method, Numerical Integration, Model Reduction, Motion Control and Design, Efficient Data Structures.



YUSU WANG *Associate Professor*

B.S., Computer Science, Tsinghua University (P. R. China), 1998; M.S., Computer Science, Duke University, 2000; Ph.D., Computer Science, Duke University, 2004.

Department Research Area: GRAPHICS

Interests: Computational Geometry, Algorithms, Computational Biology, Computational Topology, Graphics, Modeling, And Visualization.



BRUCE W. WEIDE *Full Professor and Associate Chairperson
(effective through December 2012)*

B.S.E.E., Electrical Engineering, University of Toledo, 1974; Ph.D., Carnegie Mellon University, 1978.

Department Research Area: SOFTWARE ENGINEERING AND PROGRAMMING LANGUAGES

Interests: Component-Based Software; Verified Software.



REPHAEL WENGER *Associate Professor*

B.S.E., Computer Science, Princeton University, 1984; Ph.D., Computer Science, McGill University, 1988.

Department Research Area: 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

CLINICAL FACULTY



JAY RAMANATHAN *Research Associate Professor*
Director of Research of Center for Experimental Research in Computer Systems

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

Research Interests: Analysis and Engineering of the Complex Adaptive Environments to achieve overall objectives, performance and Business-IT alignment. Related applications include Serious Gaming and technology-mediated collaborative platforms. Tools and methods of interest include knowledge mining, complexity theory, autonomic computing; technologies such as OWL, Middleware, Workflow, Mobile Computing, and Web Services.



RAJIV RAMNATH *Associate 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

Research Interests: Foundations of Adaptive Complex Enterprises, Enterprise Architecture and Engineering, Business-IT Alignment, Workflow and Work-Management Systems Enterprise Software Engineering and Computer Science Education, Wireless Sensor Network and Pervasive Computing Enterprise Applications, e-Government.

EMERITUS APPOINTMENTS

Professor Emeritus

BALAKRISHNAN CHANDRASEKARAN

CHARLES A. CSURI

MING-TSAN (MIKE) LIU

SANDY MAMRAK

MERVIN E. MULLER

STUART ZWEBEN

Associate Professor Emeritus

CLINTON R. FOULK

DOUGLAS S. KERR

TIMOTHY LONG

WILLIAM F. OGDEN

ANTHONY E. PETRARCA

COURTESY APPOINTMENTS

WAYNE CARLSON

Chair, Industrial Design

HARVEY M. FRIEDMAN

Mathematics

KUN HUANG

Biomedical Informatics

FURRUKH KHAN

Electrical and Computer
Engineering

MICHAEL KNOPP

Chair, Radiology

ALBERT M. LAI

Biomedical Informatics

VIRGINIA NIVAR

Davis Heart & Lung Research
Institute

ALAN SAALFELD

Geodetic Science

CATHY HONGHUI XIA

Integrated Systems
Engineering

TAO SHI

Statistics

ALPER YILMAZ

Civil, Environmental
Engineering & Geodetic
Science

ADJUNCT FACULTY

KIKUO FUJIMURA

RESEARCH SCIENTISTS



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: Artificial Intelligence and Cognitive Science, specifically Knowledge Systems, Diagrammatic Reasoning, Cognitive Architecture, and Decision Support Systems.



LEI GUO *Research Scientist*

Bachelor in Space Physics, University of Science and Technology of China; Masters in Computer Science, University of Science and Technology of China; Ph.D. in Computer Science and Engineering, The Ohio State University.

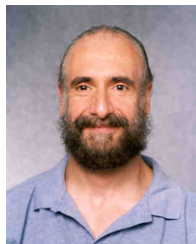
Research Interests: Distributed Systems, Measurement and Modeling Of Internet Services, and Big Data Analytics.



JIHUN HAMM *Research Scientist*

B.S. Computer Science and Engineering, Massachusetts Institute of Technology, 2004; M.S. Electrical Engineering, Columbia University, 2006; M.Ph. Electrical Engineering, Columbia University, 2008; Ph.D. Electrical Engineering, Columbia University, 2010.

Research Interests: Machine Listening, Signal Processing, Machine Learning, Speech Recognition, Psychoacoustics



JOHN JOSEPHSON *Research Scientist*

B.S., Mathematics, The Ohio State University 1968; M.S., Mathematics, The Ohio State University, 1970; Ph.D., Philosophy, The Ohio State University, 1982

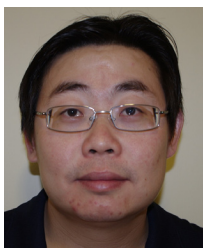
Research Interests: Artificial Intelligence; Computational Epistemology, Abductive Inference, Causal Reasoning, Multiple Criteria Decision Making, Perception, Information Fusion, Diagnosis, Theory Formation, Logic of Investigation and Foundations of Science



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



RUBAO LI *Research Scientist*

B.S., Mechatronics, Jingdezhen Ceramic Institute, 2000; M.S., Computer Science, Beijing University of Technology, 2003; Ph.D., Computer Science, Chinese Academy of Sciences, 2008.

Research Interests: Distributed and Parallel Computing Systems, Database Systems and Data Integration Systems, Computer Architecture and Storage Systems.



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B.S. Computer Science and Engineering, Massachusetts Institute of Technology, 2004; M.S. Electrical Engineering, Columbia University, 2006; M.Ph. Electrical Engineering, Columbia University, 2008; Ph.D. Electrical Engineering, Columbia University, 2010.

Research Interests: Machine Listening, Signal Processing, Machine Learning, Speech Recognition, Psychoacoustics.

POST-DOCTORATE RESEARCHERS

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Louis Noel Pouchet

Teng-Yok Lee

Kevin T. Streib

Xiaoyi Lu

Jerome Vienne

Hao Wang

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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.



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B.S., Business Administration, University of Phoenix, 1987; M.B.A., University of Denver, 1992.



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Laurea in Scienze Dell' Informazione, Università 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.



MATTHEW BOGGUS *Senior Lecturer*

B.A., Computer Science and Mathematics, Hiram College, 2006; Ph.D., Computer Science and Engineering, The Ohio State University, 2012.



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B. S., Computer and Information Science, The Ohio State University, 1979; M. S., Computer Science and Engineering, The Ohio State University, 1981.



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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.



PERUMEL "KRISH" KRISHNASWAMY *Lecturer*

Master's, Mathematics, Madras University; M.S., Computer Science, The Ohio State University.



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B.A., Psychology, The Ohio State University, 1991; M.S. Social Work, The Ohio State University, 1999.



RAYMOND MCDOWELL *Senior Lecturer*

S.B., in Computer Science and Engineering, Massachusetts Institute of Technology, 1986; S.M., in Computer Science and Engineering, Massachusetts Institute of Technology, 1986; Ph.D., Computer and Information Science, University of Pennsylvania, 1997



JEREMY MORRIS *Senior Lecturer*

B.S., Mathematics and Computer Science, Bowling Green State University, 1996; M.A., Education, The Ohio State University, 1998; M.S., Computer Science and Engineering, The Ohio State University, 2007; Ph.D., Computer Science and Engineering, The Ohio State University, 2010.



KATHRYN REEVES *Lecturer*

BCPE, Computer Engineering, Auburn University, 1986; M. S., Computer Science, Auburn University, 1991.



LORI A. RICE *Lecturer*

B.S., Information Systems, Ohio Dominican College; M.A., Workforce Development and Education, The Ohio State University.



NAEEM SHAREEF *Senior Lecturer*

B.S., Applied Mathematics & Computer Science, Carnegie Mellon University, 1990; M.S., Computer & Information Science, The Ohio State University, 1992; Ph.D., Computer Science & Engineering, The Ohio State University, 2005.



KATHERINE WENGER *Lecturer*

B.S., Computer Science, University of Kentucky, 2001.



ANATALA T. WOLF *Lecturer*

B.A., Psychology, University of Illinois, Springfield; B.S., Computer Science, The Ohio State University; M.S., The Ohio State University, 2013.

PART-TIME LECTURERS

Senior Lecturers

Thomas Bihari
Moez Chaabouni
Matt Curtin

Lecturers

Michael H. Burkhardt	Laura M. Moses
Peter J. Dohm	Bhuvaramur Narasimhan
Charles Giles	Perumal N. Ramasamy
Steve Gomori	Steven Romig
Cindy L. Grimme	Issam Ibrahim Safa
Igor Malkiman	David J. Stucki
William Thomas Martin	Al Stutz
Robert Mathis	John Thomas
G. Beth McGrath	

ADMINISTRATIVE STAFF

Catrena Collins: Human Resources Officer

Tamera Cramer: Public Relations Coordinator.

Don Havard: Fiscal Officer

Z. Lynn Lyons: Graduate Admissions and Graduate Studies Coordinator.

Meg Murnane: Information Associate

Kitty Reeves: Academic Program Administrator

Carrie Stein: Grants Administrator

COMPUTING SERVICES STAFF

Joseph Coe -- Operations Specialist

Michael Compton -- Director, Computing Services

Aaron Jenkins -- Systems Manager

Bob Joseph-- Systems Developer/Engineer, DBA

Tami King -- Sr. Systems Developer/Engineer

Dave Kneisly -- Systems Administrator

Todd Lucal -- Systems Administrator

Jeff Moser -- Windows Administrator

Shaun Rowland -- Manager, Software Support and Development

Ted Welch -- Systems Administrator

A CELEBRATION OF A CAREER WELL DONE

2013 brought the retirement of Professor and Associate Chairperson Bruce Weide.



Dr. Weide with his family (l-r): Son, Alan, Bruce, daughter Lauren and wife, Jane.



A number of colleagues paid tribute to working with Bruce.



Clockwise starting left: Ken Supowit, Neelam Soundarajan, DeLiang Wang and Anish Arora.

Dr. Weide made a difference beyond the walls of Dreese Labs. Drs. Linda Lobao and Enrico Bonello, colleagues from the University Faculty Senate, stopped by to wish Weide well.





DEPARTMENT OF
COMPUTER SCIENCE
AND ENGINEERING

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