

# Spring

# 2011


## Missouri University of Science and Technology Computer Science Department

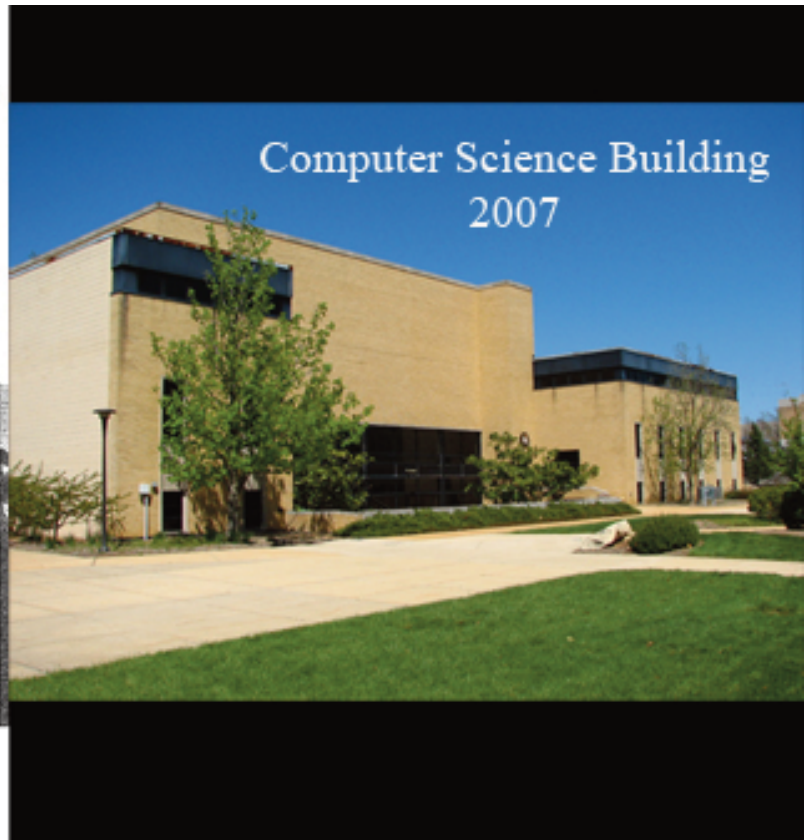
# Newsletter

DEDICATION  
OF THE  
MATHEMATICS –  
COMPUTER SCIENCE  
BUILDING

OCTOBER 27, 1972



 University of Missouri - Rolla



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**2011  
PHONATHON  
DATES:  
March 15, 16, 17,  
20, 21, 22, 23, 24  
&  
April 3, 2011**



## CHAIR'S MESSAGE

Dear friends of the CS department,

Greetings from Missouri S&T's Department of Computer Science and welcome to the spring 2011 edition of the CS Newsletter. This letter is my third formal interaction with you as I start my fourth year at Missouri S&T. The 2010 calendar year has been another exciting period and another successful

milestone for the CS department.

To remain compatible with our engineering programs at a science and technology institution like S&T, successful ABET visitations have been very important to us. In last year's newsletter, I informed you about our ABET visitation in fall 2009. However, I was not at liberty to share its outcome with you at the time. Now, after having received the formal ABET report in summer 2010, I am in a position to share the outcome with you all: thanks to the collective efforts of the faculty members, staff, and our ABET committee, we have had an extremely successful ABET visit which is another testament to the seeds of success that we planted a few years ago.

This year was also marked with some frustration due to the bad economy. The 5.1% budget cut imposed on higher education was a consequence of the state's revenue shortfall. Thanks to the efforts of the campus administration at Missouri S&T, the departmental budget reduction was much less than the aforementioned percentage. However, we are still very concerned, since it is anticipated that next year's budget cut will be much deeper. Nevertheless, in spite of the budget cuts and economic hardships, we have continued and remain committed to continuing to follow our path to success, mainly due to the efforts and sacrifices of the CS faculty members.

In October 2010, we had our annual faculty retreat. As part of the retreat, we reviewed the department's achievements during the past five years. I am extremely pleased to report that all performance indicators such as productivity, research expenditures, students' satisfaction, and students' teaching evaluations, are indicating improvement at a fast pace.

A. Enrollment: Student enrollment in the CS department grew at a faster rate than the university. Relative to fall 2008, in spite of raising the admission and degree requirements, enrollments at the BS and PhD levels grew 29% and 400% respectively.

B. Course offerings: In spite of offering an increased number of upper level courses in support of our expanding graduate programs, almost all lower level courses are now offered by faculty members without sacrificing their offering frequency.

C. Productivity and scholarly activities: Our research productivity in terms of funded research and publications continues to grow. Relative to the 2006 calendar year, the research expenditures of the department for the 2009 calendar year grew more than 500%. At the moment, our faculty members are involved in 30 funded research projects supported by the National Science Foundation (NSF), U.S. Department of Education (DOE), U.S. Air Force, U.S. Army, U.S. Department of Defense (DOD), Oak Ridge National Laboratory, the Computing Research Association (CRA), Boeing, and the University of Missouri System. More than 80% of our PhD students and a significant number of our MS students are financially supported through

# CHAIR'S MESSAGE continued

these efforts.

D. Status of our short term goals: Last year, I informed you of three efforts:

1. Establishing an annual distinguished lecture series,
2. Establishing three Ph.D. Fellowships, and finally
3. Building a multipurpose multimedia technology space.

Our CS academy is actively engaged in making the distinguished lecture series a reality. We are also modifying our graduate degree requirements in order to make the lecture series a sustainable program. The university has already approved the construction of the CS multipurpose multimedia technology space with a construction cost of \$310,000.00. The construction is planned to start early May 2011. In spite of the economic hardship, the university has committed a total of \$200,000 to the construction and I am looking for generous contributions from our Alumni to make it a reality. The so called "China program" and a new certificate program entitled "Systems and Software Architecture" are in their final stages of approval; we developed them to further boost our graduate and distance programs while generating significant support for our graduate programs and students.

Five outstanding alumni joined our computer science academy and advisory boards: Thomas J. DePauw and Dick Lenz from Caterpillar, John M. McNally from Energy Solutions Group, and Michael Vahle from Sandia National Laboratories were inducted into the Missouri S&T Academy of Computer Science (ACS), and Craig Walters from Monsanto became a member of the Missouri S&T Computer Science Advisory Board. I would like to welcome them and I am looking forward to their active contributions to the department. The 2010 CS academy meetings were held on April 22 and September 30, the 2010 CS student award banquet was held on April 19, the 2010 CS advisory board meeting was held on April 16, and finally, the 2010 CS picnic was held on September 18.

Finally, the computer science department is humbled by, and deeply grateful for, the financial support of its alumni and corporate partners.

As always, we are eager to hear from you. In particular, if you are one of our alumni, then please take a moment to complete the Alumni Survey at: [http://cs.mst.edu/alumnicorporationsandpartners/Alumni\\_Survey.html](http://cs.mst.edu/alumnicorporationsandpartners/Alumni_Survey.html).

If you are an employer of our graduates, we would be grateful if you filled out the Employer Survey at: [http://cs.mst.edu/alumnicorporationsandpartners/Employer\\_Survey.html](http://cs.mst.edu/alumnicorporationsandpartners/Employer_Survey.html).



Ali Hurson  
Department Chair, Professor

# Four inducted into Missouri S&T's Academy of Computer Science

Four Missouri University of Science and Technology alumni were inducted as members into the Missouri S&T Academy of Computer Science in 2010.

The academy honors outstanding computer scientists for their contributions to the profession and their involvement with Missouri S&T students and faculty. The academy also serves as an advisory group to the computer science department. The web site for the Missouri S&T academy is: <http://cs.mst.edu/csacademy/>.

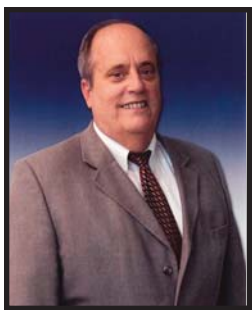
## New members are:



**Thomas J. (Tom) DePauw** is Marketing Services Manager for Nashville-based Caterpillar Financial Services Corporation, a wholly owned subsidiary of Caterpillar Inc. After joining Caterpillar Inc. in 1973, DePauw held positions in Information Technology and Marketing before becoming part of Cat Financial during its formation in 1981. He had administrative responsibilities for two of Cat Financials regional offices in the U.S. before becoming Chief information Officer in 1998. He held the CIO position until the end of 2003. DePauw holds a B.S. degree in Computer Science from the Missouri University of Science and Technology (formally UMR). Cat Financial offers a wide range of financing alternatives for Caterpillar® machinery and engines and Solar® gas turbines, as well as other equipment and marine vessels. The company has more than 1,300 employees in offices located throughout the Americas, Asia, Australia, and Europe.



**Richard (Dick) Lenz** currently serves as Information Technology Strategist for Caterpillar Financial Services Corp., a wholly owned subsidiary of Caterpillar Inc., headquartered in Nashville, TN. He is responsible for the long term strategic design of the global business systems supporting company operations. Prior to this assignment, Lenz has been responsible for the development and adoption of several leading-edge technologies and systems, such as CatUsed.com, a web site listing over \$1B of used Cat and other brand equipment for sale by Caterpillar Financial Services and Caterpillar dealers worldwide. He also initiated the use of the Oracle RDBMS at Caterpillar in 1986, now the standard for non-mainframe databases, used widely throughout the corporation. Dick earned a Bachelor of Science degree in Computer Science from Missouri S&T in Dec. 1974, after completing a co-op program with McDonnell Douglas Corp. He has spent his entire 35 year career at Cat, encompassing most types of computer technology, from mainframes to minis to workstations to PCs, COBOL to telecommunications systems and relational database systems to web sites. His wife, Sandy, also attended Missouri S&T, earning a Bachelor of Arts degree in Psychology in Dec. 1974. They are members of the Order of the Golden Shillelagh at Missouri S&T. Dick and Sandy now live in Brentwood, Tenn. Their two daughters, Christy and Katie, are married and living in Killeen, TX, and Indianapolis, IN.



**Michael Vahle** is the Director of the Systems Mission Engineering Center at Sandia National Laboratories, which is responsible for the design and development of satellite ground stations and remote sensing technologies and is the Program Director for Space Mission Program. Mr. Vahle manages a center of 350 personnel, with advanced degrees in engineering and science. The organization specializes in advanced systems pioneering new capability, developing both complex hardware and software systems.

Prior to this assignment, Michael was a Program Director in the Nuclear Weapons Program at Sandia where he had responsibilities for the \$200M Simulation-Enabled Product Realization Program including, among other elements, the Advanced Simulation and Computing Program and the Nuclear Weapons Information Environment Initiative. Mr. Vahle led this program during the development of a massively parallel high performance computing platform which scored on the top ten machines worldwide. He also led the development of advanced simulation tools for modeling of extreme environments with significant increase in model fidelity.



# Missouri S&T's Academy of Computer Science (continued)

Before that he was the Director of the Computing and Network Center at Sandia National Laboratories, where he was responsible for the development and implementation of networking and communications infrastructure, the operation and support of the corporate information delivery systems and scientific computers, and the management of the computer security program, all in support of the network for a laboratory of approximately 10,000 personnel with multiple levels of security.

Mr. Vahle serves on the Innovation Leadership Advisory Board at the University of Illinois, Urbana-Champaign.

Prior to joining Sandia, Michael was an officer in the United States Air Force where he developed and programmed command and control systems for the Strategic Air Command.

Michael received both his Bachelors and Masters degrees in Mathematics from the University of Missouri-Rolla, in 1971 and 1973, respectively.

Michael and his wife Tamara live in Albuquerque, NM where they raised their three children Patricia, Kayleen, and Aaron.



**John M. McNally** (BSCS 1983 Univ of MO-Rolla, MBA 2000 Fontbonne University) has served as Director of Systems and Software for A123 Systems, Inc. Energy Solutions Group since joining the Company in April of 2008.

After graduating from UMR in 1983, Mr. McNally joined McDonnell-Douglas Corporation in their Flight Simulation Laboratories, working on the Navy's Advanced Tactical Aircraft (ATA) program. In 1987 he left McDonnell-Douglas to form CompuSci, Inc., a software development concern, with fellow UMR alumnus, Christopher J. Musial, where the company invented PowerMon® power monitoring software for servers and workstations. After selling CompuSci to Systems Enhancement Corporation in 1995, John joined SEC as Vice President of Engineering and remained with SEC after its acquisition by

American Power Conversion (APC) in 1997. At APC, John was Director of Engineering for the Availability Enhancements Group, responsible for networking software and connectivity products development.

In 2006, John joined Panduit Corporation, a global supplier of networking connectivity equipment and software as Vice President of Business Development, where he spearheaded development of Panduit's Physical Infrastructure Manager® software and hardware products.

Mr. McNally has 7 patents and pending patents related to power distribution and physical network infrastructure security.

John resides in Chicago with his wife, Megan, and their children.

# Computer Science Advisory Board

This year, the Advisory Board meeting and the traditional CS Awards banquet were held on April 16 and 19, 2010, respectively. Vehbi Tasar from “Persysent Technology Corp.” was our keynote speaker. He delivered an inspiring talk entitled “The Career of an Itinerant Engineer”. As he put it, the talk was about his life and engineering career of almost 40 years. It was very pleasant to have both Vehbi and Omur Tasar on campus after almost 30 years.

During the banquet, many scholarships and a number of door prizes were awarded to students. We wish to extend our sincere thanks to the CS Advisory Board members, CS alumni, and corporations for sponsoring tables, providing scholarships, and door prizes for this event.

The Board meeting had a full agenda ranging from the state of the department, research activities in the department, and expanding the distance program. The discussion topics included: (i) Certificate and advanced degree in software architecture for Lockheed Martin, (ii) Distance MS degree in China, (iii) PERCEPOLIS: Pervasive Cyber-infrastructure for Personalized eLearning and Instructional Support, (iv) remodeling and strategic planning. The board members made many practical suggestions and unanimously endorsed our quest for excellence.

We appreciate the time and dedication of the Board members in contributing to our continuous efforts to improve the quality of education in the Department. Their perspectives provide valuable insights to the Department as we develop and revise our academic and research programs. If you are interested in serving on the CS Advisory Board, please send us an e-mail at [csdept@mst.edu](mailto:csdept@mst.edu), along with a short bio.

CS Advisory Board Members (2010-11): Amand Mechlin (Cerner), Robert (Bob) Perry (MasterCard), Craig Walters (Monsanto), Curt Schroeder (AT&T), Jeff Herzog (Maryville), Jim Lahm (Reliv International), Jim Leonard, (Boeing), John Brown (Purina), John Stone (University of Illinois), Ken Brenneke (Boeing), Kent Lynn (Verizon), Matt Dissinger (Garmin), and Robert Byrne (Boeing).

The Advisory board website is: <http://cs.mst.edu/alumnicorporationsandpartners/industryadvisorycomm.html>.



# Computer Science Awards Banquet

The Ninth Annual Missouri S&T Computer Science Department Awards Banquet held on April 19, 2010 brought students, faculty, staff, alumni, and friends together for an evening of food, fun, and awards. A short reception preceded the banquet. Following a delicious meal, Mr. Vehbi Tasar, Manager of Professional Programs International Information Systems Security Certification Consortium (ISC)<sup>2</sup>, and a CS Alumni, presented a talk entitled "The Career Adventures of an Itinerant Engineer". The evening concluded with the distribution of fabulous door prizes donated by several of the banquet sponsors. In addition to door prizes, banquet sponsors purchased tables for the event. The money from table purchases made it possible for all Computer Science majors to attend the banquet free of charge. The 2011 Computer Science Awards Banquet is scheduled for April 7, 2011. If you are in the area, we would be delighted to have you join us. If you and/or your company would like to participate in the 2011 banquet, please contact Rhonda Grayson at [rhondag@mst.edu](mailto:rhondag@mst.edu) or Dawn Davis at [dawnd@mst.edu](mailto:dawnd@mst.edu). Additional information about the banquet can be found at: <http://cs.mst.edu/departments/csbasket/CSawardsBanquet.html>.

Sponsors for the event included:

A Slice of Pie  
Blossom Basket  
Boeing  
Coachlite Lanes  
Dairy Queen  
Garmin  
Huddle House  
Imo's Pizza

Kent Jewelry  
Keys Sport  
Lee's  
Maid Rite  
Matt's Steak House  
Panera's  
Pizza Inn  
Shoney's

Something Special  
Sonic  
Steak 'n Shake  
The Hickory Pit  
TradeBot  
Missouri S&T Bookstore  
University Bookstore





## **The Third Annual Computer Science Department “Friends and Family Picnic” Made Possible by Garmin**

Thank-you to everyone who came out to this year’s picnic! We had a great time! Thanks to support from Garmin and great weather we were able to pull off another fun-filled Saturday at Schuman Park. Dawn Davis did a wonderful job organizing the event by arranging all of our reservations and food orders. Rhonda Grayson sealed the deal on the morning of the picnic day by pulling together all of these resources so that all of our food and games were ready when everyone arrived. Matt Buechler was really disappointed that he wasn’t able to fully compete in this year’s kickball game due to a neck injury, but everyone else seemed just fine playing without him! The game was tied for 5 innings before an in-the-park homerun (pictured above) finished the game in the 10th inning. We hope to see all of you there next year!







# Alumni News

**Michael Hillhouse, CS '75**, my oldest son, David, was married in November 2009 to Lisa Herbst in Downers Grove, IL outside Chicago.

**Curtis Schroeder, CS '88, MS '91**, joined Antycip Simulation Ltd., a subsidiary of ST Electronics, as senior software engineer for its European team. He is also a member of S&T's computer science advisory board.

**Laura (Brave) Odicino, CS '98**, and her husband, Carlo, had a boy, Roman Alexander, in September 2009.

**Carlo Filippelli, CS '03**, and Emma Filippelli, had a girl, Mia Grace, in April 2009.

**Catherine (Jabusch) Rafferty, CS '92**, and her husband, Tom, had a girl, Morgan Gabrielle, in April 2009. She joins brother Aidan, 2.

**Jimmy Townsend, CS '06**, and his wife, Maren, had a boy, Jard Patrick, in March 2009.

**John M. "Jack" McNally, CS '83**, is director of research for A123 Systems Inc. He lives with his wife and children in Chicago.

**Manish Gupta, CS '06**, married Rashi in February 2009. The couple lives in Woburn, MA.

**Aaron Jackson, CS '07**, married Courtney Privett in June 2009, in Olathe, KS.

**Marc Smith Jr., CS '76**, joined AMX International Inc. to lead its risk management and business continuity practice.

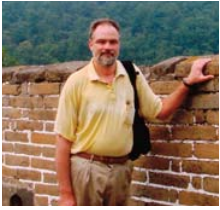
**Stan B. Lindesmith, CS '90**, is a software engineer in the conservation solutions division of Sensus USA. He makes enterprise software to help people save energy with their utility companies.

**Brian Booth, CS '97**, recently received the William Fraering Award for Alumni Service from Delta Tau Delta International Fraternity.

**Chan Fong, CS '96**, and his wife, Ida, had a girl, Jouyee, on July 21, 2009.

**Susan Rothschild, CS '74**, began her two-year term as president of the Miner Alumni Association in October 2010.

# Professors win IEEE Awards



Dr. Bruce McMillin, professor of computer science at S&T, recently received the Outstanding Contribution Award for his 20 years of outstanding service to the IEEE Computer Society. The award was presented on July 20, 2010 at the annual IEEE Computer Society Signature Conference on Computers, Software and Applications in Seoul, Korea.



Dr. Donald Wunsch, professor of electrical and computer engineering with a joint appointment in the computer science department at S&T, Dr. Rui Xu, post doctoral fellow in electrical and computer engineering at S&T, and Dr. Jie Xu of United Airlines won the Best Overall Paper Award for 2010 at the IEEE Conference on Evolutionary Computation in the World Congress on Computational Intelligence held in Barcelona, Spain. The award was presented on July 21, 2010.

## Three Computer Science Faculty Received Awards

Three computer science faculty members at Missouri S&T received awards for their achievements in research, service or teaching for 2009 during an awards ceremony on Monday, Feb. 1, 2010.

The awards are given annually to recognize outstanding faculty. Each winner receives a \$1,000 stipend funded by industry and alumni contributions.

Receiving the 2009 Research Awards are:

- Dr. Sanjay Madria, associate professor of computer science

Receiving the 2009 Teaching Awards are:

- Dr. Ralph Wilkerson, professor of computer science

Receiving the 2009 Achievement Award

- Clayton Price, lecturer of computer science



## Congratulations to Joanna Kovarik

A CS major, for being named to the 2010 ESPN the Magazine College Division All-District 7 First Team for the second season in a row.



## Outstanding Student Advisor Award

During the 2010 homecoming events, Matt Buechler was honored with the Outstanding Student Advisor Award. Matt is a BS CS 03, MS CS 05 graduate and lecturer in the computer science department.

## 2009-2010 Committee for Effective Teaching Outstanding Teaching Award

- Dr. Ralph Wilkerson, professor of computer science
- Matt Buechler, lecturer of computer science
- Randy Canis, adjunct professor of computer science

# Congratulations to All!

# KEEPING IN TOUCH

**MATT BUECHLER** “picked lent from his socks and did some other things that weren’t nearly as exciting.”

This last year has been very good to Matt. He is both sad and proud to see that his first group of academic advisees will be graduating this May. It has been a wild and fulfilling ride, and as much fun as it has been watching them grow from young students into professionals; he is just as excited to see what they will accomplish in the next five years as their careers prosper and they go off to start families of their own. Additionally, Matt has been working with Clayton Price on an eLearning grant. The purpose of this project is to build an online version of our introductory C++ coursework. So now, anyone in the world can enjoy the torture of having Clayton explain the intricacies of learning to program via YouTube!

Matt’s first year of marriage is about ready to wrap up. He and Nikki will be taking a trip to the Galapagos islands to celebrate their anniversary. Nikki intends to enjoy scuba diving and snorkeling amongst some of the earth’s rarest and most unique marine species, while Matt plans on staying as far into the middle of the boat as possible so none of those freak monster creatures can eat him. Outside of being a victim to Nikki’s adventures, Matt has had a great summer volunteering as a lumberjack and trail maintainer for the US Forest Service, and is having a blast coaching a first grade girls soccer team.

**DR. SRIRAM CHELLAPPAN** is busy conducting research on various aspects of networking and security of Internet, Sensor Networks and Vehicular Networks. His research is funded by Army Research Office, Missouri Research Board, University Transportation Center. He is also busy advising his new Ph.D. and Masters students on various research topics. He enjoys teaching courses in Operating Systems, Computer Networking and Advanced Network Security.

**DR. MAGGIE CHENG** is working on network performance optimization and fault diagnosis. She still serves on the technical program committees of several major conferences in computer networks and communications, including INFOCOM, ICC and Globecom. She teaches Algorithm Analysis class and Computer Networks class this fall. She will be on sabbatical leave for Spring 2011.

**DR. FIKRET ERCAL** is collaborating with faculty from Environmental Engineering and Biological Sciences and conducting research in the area of Bioinformatics. He continues to teach undergraduate and graduate classes in Parallel Processing, Operating Systems, Algorithms, and Numerical Methods and publish research articles in the Bioinformatics area. Dr. Ercal is also co-supervising a Ph.D. student in the area of Mobile Sensor Networks.

**DR. ALI HURSON** Looking back, he’s wondering how he survived during the last calendar year: International trips to Oman, Germany, Canada, South Korea, Kuwait, and Hong Kong, domestic trips to Hawaii, State college, Denver, Seattle, Knoxville, Washington DC, Atlanta; endless administrative duties; teaching, publishing, writing proposals, and finally research.

He offered two courses with distance components in the CS curriculums, namely: “Heterogeneous and mobile databases” and “Introduction to High Performance Computer Architecture” in spring and fall semesters, respectively.

He is continuing part of his research at Penn State in the area of “active sensor networks and interoperability of sensor networks”. At Missouri S&T, he recruited two additional PhD students. He received two additional grants from Department of Education and Oak Ridge National Lab.

He is continuing to work with his students at Penn State University on his \$2,220,076 NSF Pervasively Secure Infrastructures project. One of his PhD students successfully defended his dissertation entitled, “MANAGING SYBIL IDENTITY IN DISTRIBUTED NETWORKS”.

**DR. WEI JIANG** came to Missouri S&T in 2008. Currently, he has two Ph.D. students and serves on several Ph.D. thesis committees. He usually teaches distributed systems and information security related courses.

# KEEPING IN TOUCH

His research has been funded by the University of Missouri Research Board and the National Science Foundation in areas of secure data analysis and text sanitization.

**DR. JENNIFER LEOPOLD** is teaching the Compiler Construction, Programming Languages & Translators, and Intro to Database courses. Her current research interests are ontologies and automated spatial reasoning in 3D.

**DR. DAN LIN** has been in Missouri S&T for two years now. She is not only interested in core database techniques, but also has extended her research on access control to address security issues in the emerging cloud computing and privacy concerns in social network. She works happily with her PhD and master students and published several interesting papers this year. She continues serving as faculty advisor of two student associations: IEEE computer society student branch and ACM-W (women in computing). She is particularly proud of the IEEE CS student branch which has grown to about 50 members since it was established one year ago.

**DR. FRANK LIU** continues to develop a web-based argumentation and collaborative decision support system., which is ranked as a one of top sites in GOOGLE search in this area. It may find applications in many domains, such as collaborative software development. He also works on a couple of sponsored projects in the area of software applications: such as “advanced landmine detection simulator” sponsored by Leonard Wood Institute, “a low-cost motion tracking system for virtual reality”, sponsored by Rockwell Collins, and “CAD model based simulation of manufacturing operations using dynamic data configuration and real-time motion capture applications” sponsored by Boeing Co.. In addition to conducting research, he teaches software testing and quality assurance, software requirements engineering, and advanced software engineering classes, which attract many distant learning graduate students.

**DR. SANJAY MADRIA** is directing the W2C (Web and Wireless Computing) Lab, and is currently supervising 6 PhD and 7 MS thesis students in the area of mobile and secure sensor networks. He graduated 1 PhD and 2 MS theses students in 2010. He continues to teach 238, 338, 437, and 467 classes in the area of databases, web and wireless computing which continuously receiving overwhelming responses from graduate and undergraduate students. He is more busier than ever before with his research, teaching and service. He served as general co-chair for mobile data management conference for 2010 and has been appointed as PC co-chair for IEEE Intl Conference on Software Reliability in Distributed Systems for 2011.

**DR. BRUCE McMILLIN** McMillin continues to work on advanced models of computer security for cyber physical systems (such as the smart grid – see article in this issue). He and his wife, Lorie, live in Rolla but Lorie commutes to St. Louis. Both their daughters are in college this year.

**DAVE MENTIS** is still teaching the introductory C++ service course and labs (CS 74 & CS 78) as well as the FORTRAN service course and lab (CS 73 & CS 77). Dave’s looking at replacing CS 74’s with a new course or two, that are currently undecided.

Dave’s wife, Doyla, is finally retired from teaching, both public schools and Missouri S&T. Dave’s daughter, Dava, is starting her senior year at S&T in chemistry with emphasis in pre-med. Dava’s considering staying on at S&T to pursue graduate studies. Dave’s grandson, Layton, is still helping with the farming operation and also likes to hunt.

**CLAYTON PRICE** the 2010-2011 academic year promises to be a successful one for Clayton Price. His teaching load is back to normal, but he finds himself perpetually busy with the production of an on-line version of his CS 53 course. Working in conjunction with Mr. Matt Buechler, the project has great promise to give the students of the UM system an alternative venue for learning how to program in C++. Price and Buechler were granted a request for funding from the UM system for the “blended learning” course cluster of CS 53/54 and CS 74/78, the only such grant in the system this year. Price spends nights and weekends writing material, while Buechler spends his time taking care of the technical aspects of the presentation for the course. It’s a great team!

Besides teaching Cs 53, he keeps busy with his Object-Oriented Numerical Modeling course in the spring, and recruit-



# KEEPING IN TOUCH

ing and committee work throughout the year. Life on the farm is as busy as usual with a large and productive garden and farm livestock, large and small. Additionally, Price has managed to put the engine back into his MG and has it on the road once again.

On the home front, Clayton has completed several projects on the house including a refit of all the windows and a complete rebuilding of a much more expansive deck. His butchering efforts have expanded to include lambs once a year, accompanying the annual beef processing with close friends. He has been raising his own untainted beef and garden vegetables for 30 years now.

**DR. CHAMAN SABHARWAL** continues to teach Graphics (CS358), Robotics (CS 345), Java GUI, Visualization (CS 342). This fall 2009 he taught Programming Languages and Translators (CS258). In the spring of 2010, he will teach a course: Numerical Methods (CS 228). He was the Multimedia & Visualization track Chair of ACM Symposium on Applied Computing 2008 in Brazil. Dr. Sabharwal still commutes back and forth from St. Louis.

**DR. JAGANNATHAN (JAG) SARANGAPANI** Rutledge-Emerson Distinguished Professor of Electrical and Computer Engineering, holds a joint appointment with CS. Dr. Sarangapani's students have been working on the development of indoor localization algorithms and routing protocols for regular and cognitive networks. He directs the Embedded Systems and Networking Laboratory where the students gain hands-on experience with networking protocols and Missouri S&T Mote hardware for wireless ad hoc and sensor networks. These Motes have been successfully deployed and evaluated on a number of industrial applications. He is also Director of NSF Industry/University Cooperative Research Center Site at Missouri S&T where the Mote hardware and smart algorithms are used to detect and predict component and system failures. There are over 9 company members in the Center Site. His team of faculty has received funding from the Army Research Laboratory to work on localization and tracking of threats and network security. His recent research focus has been on the topic of secure networked control systems with cyber-physical systems being the ultimate goal. His overall funding for the past 10 years has exceeded \$12 Million. He has co-authored 82 juried articles (mostly IEEE Transactions with his students), over 150 IEEE Conference publications, several book chapters, 3 text books, and holds 18 patents. He has advised 26 M.S and 14 doctoral students with several in the pipeline.

**DR. SAHRA SEDIGH** is an assistant professor in Electrical and Computer Engineering, and joined the Computer Science Department on a joint appointment in Aug. 2009. The goal of her research is to understand how complex systems fail, and to use this information to make these systems more reliable. Critical infrastructure systems such as smart (power) grids and intelligent water distribution networks are among the complex systems studied by her group. They also design and deploy wireless systems that monitor bridges and alert authorities of inclement weather conditions or structural hazards. Her most recent research investigates methods for using technology to make better use of class time and personalize and improve the learning experience for students. In her free time, she enjoys painting, reading books that have nothing to do with engineering, and catching up on lost sleep. She will be very happy if she finds a way to do all three concurrently.

**DR. DANIEL TAURITZ** or just Dr. T as the students call him, continues to enthusiastically teach his two-course sequence on Evolutionary Computing, his course on Artificial Intelligence, and a section of the freshman course on Discrete Mathematics. He ran the 10th S&T Artificial Intelligence Tournament in spring 2010 (see article) and is already in the planning stages for the 11th S&T Artificial Intelligence Tournament in spring 2011. He will also be teaching the advanced topics in Artificial Intelligence course in spring 2011.

In addition to chairing the department's publicity committee, he is for a second consecutive year chairing S&T's Discipline Specific Curriculum Committee for the Sciences and in early November was elected chair of S&T's Campus Curricula Committee, the standing committee of S&T's Faculty Senate which handles all curricular matters. He was also proud to serve as Late Breaking Papers Chair for the 2010 Genetic and Evolutionary Computation Conference, the largest conference series in the field of Evolutionary Computing.

He is enjoying his ninth year as the Missouri S&T ACM Student Chapter SIG Security advisor (see article). Since December 2004 he has been the Missouri S&T coordinator for Sandia National Laboratories' Center for Cyber Defenders

# KEEPING IN TOUCH

(CCD); during summer 2005 he brought a team of outstanding students (three from CS, one from CpE) to the CCD as summer interns, and sent new teams every summer since. On the research front, Dr. Tauritz continues to lead the NC-LAB whose main focus is developing novel evolutionary algorithms and applying them to real-world problems from a diverse set of domains including Critical Infrastructure Protection, Automated Software Engineering, and Social Computing (see NC-LAB article for details). He is currently supervising three Ph.D. students, one of whom was awarded a prestigious NSF Graduate Research Fellowship.

**DR. THOMAS WEIGERT** In 2010, Dr. Thomas Weigert focused his efforts on creating two new distance programs for Computer Science. He had proposed a curriculum for a Software and Systems Architect Certificate Program to Lockheed Martin. S&T was one of four successful universities selected to deliver this program which has launched in fall 2010. Courses will be delivered jointly by Comp Sci and Sys Eng. His second effort is on launching a M.S. program via distance learning in Shanghai, China. We plan to offer an S&T degree taught directly from the US via distance following existing academic standards, admission and degree requirements, and procedures. We will leverage a local university experienced in distance education for marketing and delivery support only; the academic ownership of the programs lies exclusively with S&T. The local partner will provide logistical and marketing support, facilitate delivery of the course program, and provide local support for students.

He has started joint work with Dr. Madria's team on a novel method for compiling collection operations. He continued his research collaborations with University of Ottawa on developing effective languages for representing the functional requirements of software systems, with New York University, Stony Brook, on implementing a code generation system for incrementalization of collection operations, with St. Petersburg Polytechnical University on developing test case generation techniques, with the Glushkov Institute of Cybernetics of the Academy of Science of Ukraine on algorithms for the verification of large scale industrial requirements specifications, and with Istanbul Technical University on the parallelization of software systems based on the analysis of static structure diagrams. He further established a new research collaboration with the University of Toronto on the use of artificial neural networks in the development of energy storage devices.

**DR. DONALD WUNSCH** continues to serve as the International Neural Networks Society Senior Fellow, Chair of the INNS College of Fellows. This year he has two new books: Neural Networks and Micromechanics, with Ernst Kussul and Tatiana Maidyk, Springer; and Unified Computational Intelligence for Complex Systems: Adaptation, Learning and Optimization, with John Seiffertt, Springer. He is co-PI (with Venayagamoorthy) on a \$2 million NSF grant entitled: EFRI-COPN: Neuroscience and Neural Networks for Engineering the Future Intelligent Electric Power Grid. He is PI, with Venayagamoorthy and Tauritz, of the Army Research Office Grant entitled: DURIP: A GPU-based High Performance Computing Cluster for Multiple Military Modeling Capabilities. He is also PI of the NSF grant: Computer Go -- A Proxy for Key Open Challenges and Opportunities in Computational Intelligence. He gave several plenary talks this year, a tutorial on Clustering at the IEEE World Congress on Computational Intelligence and, with Rui Xu and Jie Xu, won "Overall Best Paper" at the IEEE Conference on Evolutionary Computation.

**DAWN DAVIS** is ending another wonderful year with the Computer Science Department. She still enjoys the challenges that come each day and says that she really enjoys working with the faculty, students, and everyone on the Missouri S&T campus. In her spare time she enjoys spending time with her husband, Rick, of 20 wonderful years, and her daughter, Kayla, OMG who is now 16, going to cattle shows with her daughter & husband, camping, fishing, hunting, gardening, going to Antique Malls and just being outdoors. Hope next year is as good or better than this year was.

**RHONDA GRAYSON** cannot believe that another year has already gone! It has been yet another busy year with the department and Rhonda has had a busy summer as well, going to auctions, camping, fishing, and attending rodeos. She also spent time with her son Coy, getting to watch him ride bulls is still her favorite activity. Rhonda, and her husband William, spent a week over the summer vacationing with Coy. They went to the Wisconsin State Fair and Wisconsin Dells and they hope to do it again next year. Rhonda is looking forward to another busy, exciting year and cannot wait to see what the future has in store.

# Memorials

## Dr. Ann Miller



Dr. Ann Miller was born in 1947 in East St. Louis, Ill. She graduated from Notre Dame High School in Bellevue, Ill., in 1964, and continued her education at Saint Louis University, earning her bachelor's, master's and Ph.D. degrees in mathematics.

Her professional career encompassed industry, government and academia. She served on the faculty of Southern Illinois University at Carbondale, Michigan Technological University, and the University of New Mexico. She held various positions within Motorola, Inc., culminating as a manager of the Technology Center for the Motorola Land Mobile Products Sector. From 1997-1999, she was at the Department of Defense. For more than a year of that time, she was the deputy assistant secretary of the Navy for command, control, communications, computing, intelligence, electronic warfare and space [DASN(C4I/EW/Space)] and was the Department of the Navy CIO for part of that period.

She joined S&T as the Cynthia Tang Missouri Distinguished Professor of Computer Engineering in 1999. Her research interests were in trustworthy computer systems, including computer and network security.

Her service experience included serving as an associate editor-in-chief for IEEE Software and a member of the Administrative Committee of the IEEE Reliability Society. Recently, she served multiple years as a member of the National Academies Study Board for U.S. Department of Navy, Information Assurance for Network-Centric Operations; as a member of the NATO Information Systems Technology Panel; and as a member of the NATO Task Group on Dual Use of High Assurance Techniques. From 2001-2004, she chaired the NATO Information Systems Technology Panel, and from 2003-2004 she served on the National Academies Study Board on FORCEnet. Previously, she chaired the IEEE GLOBECOM 2005 conference and the NATO Task Group on Validation, Verification, and Certification of Embedded Systems, participated in a NATO Special Workshop on Combating Terrorism, and was general chair of the NATO Symposium on Real-Time Intrusion Detection.

Dr. Miller was dedicated to student learning and was one of the first faculty members to regularly teach distance-education courses and incorporate technology into the classroom. She was determined to help students learn the material in spite of the diminished personal interaction.

She was a champion of diversity, from prospective undergraduate students to Ph.D. graduate students, and to those outside of S&T. Through the U.S. Dept of Education GAANN student fellowship program grant, she increased the number of ECE female graduate students. As chair of GLOBECOM 2005, she led the effort to fund junior and senior high school students and teachers to attend the conference and to be exposed to engineering. She presented at local high schools and represented ECE at Transfer Advising days and at

campus open houses. She helped during National Engineers Week in St Louis and UMR Day at the Engineers Club. She spoke with the Chancellor's Leadership Program and at numerous UMR Society of Women Engineers panels. She served as one of the Eta Kappa Nu advisors. Outside of Rolla, she increased the participation of women in the NATO Information Systems Technology Panel that she chaired, as well as on NATO Task Groups which report to the panel. She was the first woman elected chair in all the panels.

Dr. Miller died on Friday, Dec. 10, 2010, at St. Luke's Hospital in Chesterfield, Mo. She is survived by her parents, Elwood and Virginia Miller; one brother, Scott Miller and wife Beta, Chesterfield; a niece; two grand-nephews; and friends.

Memorials are suggested to the Endangered Wolf Center, the AKC Museum of the Dog, or a charity of your choice.

## Ralph E. Lee

Ralph Edward Lee passed away April 13, 2010, at the age of 88. He was born near Gilliam, MO, on July 1, 1921. His parents, Russell and Norena (Heinzler) Lee and his wife of 62 years, Ann Lee preceded him in death. Ralph is survived by: his five children, Randy Lee, Terry Lee, Julia Lee, Tim Lee and wife, Rhonda, and Nancy (Lee) Duncan and husband, Keith. He is also survived by: his grandchildren, Ryan Lee and wife, Susan, Alison (Lee) Peterson and husband, Ken, Michael Lee and his wife, Kelly, Shannon Lee, Katherine Lee and Maggie Duncan; great-granddaughter, Alyssa Lee; and brother-in-law, Sam Snoddy.

Ralph grew up in rural Gilliam, MO. During WWII, he served in the Army Signal Corps with the 3187th. Three weeks after being discharged from the Army, Ralph joined the faculty of the Missouri School of Mines in January, 1946 to teach mathematics. During the summer of 1956, Professor Lee worked as a Senior Research Mathematician for North American Aviation on the use of computer methods to solve ballistic missile problems. That experience convinced him to develop a course on computers for MSM. In 1957, he taught the first computer science course at the University of Missouri. In 1959, Ralph was one of the 12 chosen to attend a National Bureau of Standards program on teaching other professors how to use the computer. That fall he received a \$30,000 grant from the National Science Foundation to purchase the university's first computer in 1960.

By the mid 1960's as Director of the Computer Science Center, he was given the responsibility to develop and administrate the first M.S. degree program in Computer Science at UMR and University of Missouri. As interest in this popular degree grew, the Computer Science Department was organized at UMR in 1970. In 1985, after 40 years with the university, Ralph retired from the University of Missouri at Rolla, as a professor emeritus of computer science and mathematics and director emeritus of what then was called the computer center.

# 2009-2010 Professional Degrees Recipients

**Don D. Finfrock** of Gainesville, Ga., is a retired programmer, analyst and manager for NCR Corp. Finfrock earned a Bachelor of Arts degree in mathematics from Ohio Northern University in 1966. He then earned a Master of Science degree in Computer Science from Missouri S&T in 1968. He went to work for NCR in 1968 as a systems engineer, and then served for three years as a programmer analyst in the Space Computation Center for Systems Development Corp. in Colorado Springs, Colo. He returned to NCR and was based in Cambridge, Ohio, until his retirement in 2004. He holds six patents.

**Kent W. Lynn** of Washington, D.C., is a client executive for IBM Corp. Lynn earned a Bachelor of Science degree in Civil Engineering from Missouri S&T in 1985. He holds an MBA from the University of Nebraska. Lynn began work with IBM following graduation as an account systems engineer and has worked his way through the ranks to his current position. An admissions ambassador for S&T, Lynn is a past president of Adventuring.org, a Washington D.C. area outdoor group. He is a member of the Victory Fund cabinet, the WAMU-FM Leadership Circle, and a volunteer reader for the Metropolitan Washington Ear. Lynn is a member of the Kappa Alpha fraternity and S&T's Order of the Golden Shillelagh donor society.

**Terry Bollinger** of Ashburn, Va., is a chief scientist for the U.S. Department of Defense's DeVenCI program, which connects innovative private sector companies with potential federal customers. Bollinger is a recipient of the IEEE Millennium Medal from the Institute of Electrical and Electronics Engineers and has served as editor of IEEE Software. He earned a Bachelor's and Master's degree in Computer Science from Missouri S&T in 1977 and 1980, respectively. Bollinger's main hobby is researching and explaining quantum mechanics, and he has been quoted in the Russian press for his explanation of how ordinary concepts of time are stretched by a phenomenon known as quantum entanglement.

**Daniel A. Reed** is Corporate Vice President of Technology Policy and Strategy and leader of the eXtreme Computing Group (XCG) for Microsoft. Reed helps shape Microsoft's long-term vision and strategy for technology innovations. He is responsible for research and development on the cutting edge of parallel and ultra-fast computing. He also directs Microsoft's cloud computing research. Before joining Microsoft, he was a chaired professor of Computer Science at the University of Illinois, where he was director of the National Center for Supercomputing Applications. He was also a professor at the University of North Carolina at Chapel Hill. Reed earned a Bachelor of Science degree in Computer Science from Missouri S&T in 1978. He also has a Master's degree and a Ph.D. from Purdue University.

**Adonica D. Randall** is president and CEO of Abaxent LLC., a business consulting and information technology company in Wisconsin. Randall specializes in business process improvement and the development of new services. She has experience in a variety of industries, including healthcare, insurance, manufacturing, and distribution. She previously served in technical, sales, and management positions at General Motors, GE Health Systems, and IBM. Randall earned a Bachelor of Science degree in Computer Science from Missouri S&T in 1975. She also has a Master's Degree from Marquette University. For the past fifteen years, she has taught, developed curriculum, and has been the department coordinator at Alverno College as an associate professor in the Computer and Information Technology Department.



# 2009-2010 Professional Degrees Recipients

**Karen Squires-Foelsch** earned a bachelor of science degree in computer science from Missouri S&T in 1989. Foelsch is senior vice president of digital fulfillment services for the assessment and information group of Pearson, the global leader in education and education technology. Her work spans services for K-16 assessment planning, editorial support, digital content development and product requirements, and delivery management. Foelsch provides overall financial and business management of test, measurement and research services (TMRS) and brings more than 20 years of business management experience to a team of more than 500 people. She is responsible for the TMRS budget, organizational structure, staffing levels, recruitment and development of business processes. Foelsch, who is based in Iowa City, Iowa, is past president of S&T's Academy of Computer Science.

## 30 under 30 CS Winner

Nathan Eloë, CSci'10, Phys'10, spent his summer working for Google – from Rolla, Mo.

Eloë was one of 1,026 students from 69 countries accepted into Google Summer of Code, a global program that offers student developers stipends to write code for various open-source software projects. Thousands of students from all over the world apply and Eloë was fortunate enough to be selected for the program.

“Google Summer of Code was a great experience for me,” Eloë says. “I was able to build a project based around my interests and the needs of an organization. The project that emerged ended up being a combination of things I worked on as an undergraduate tutor and grader.”

Eloë isn't the typical S&T alum. At age 16, the University of Dayton's information technology group hired him. During college, he spent his summers doing research at Missouri S&T and Wright-Patterson Air Force Base. But he still found a way to earn two majors and two minors, including S&T's new theatre minor, in just four years. Eloë is back on the Rolla campus now, pursuing a Ph.D. in computer science.

Away from the computer, he enjoys singing, acting, and playing piano. Next spring, he'll even direct an on-campus production of *Godspell*. “In high school I was able to participate in the show as a chorus member, and I absolutely fell in love with it,” he says.



photo by B.A. Ruper

# Scholarships and Special Awards

## CS Department Special Awards

### Distinguished Speaker Award

Vehbi Tasari

### CS Leadership Award

Ravi Akella

### CS Mentor Award

Matthew Nuckolls

### CS Ambassador Award

Zach Zeman

### Outstanding Computer Science

#### GTA Award

Josh Wilkerson

## Scholarships

### Accenture Scholarship

Peter Tushar

Timothy Preall

### John W. Hamblen Computer Science Scholarship

Samuel Smithey

### Ellen M. Hodges Memorial Scholarship

Tabitha Jarvis

Jayne Frey

Kate Baue

### Rex Widmer - RWS - Software Archaeology Computer Science Scholar

Jordan Tryon

### Daniel C. St. Clair Scholars & Fellows

Benjamin Campbell-Bradley

### Mark X. Stratman Scholarship

Tyler Morrow, Michael Virag,  
Donald Halsted

### Garmin Scholarship

Kyle Ensign

Joseph Hawkes-Cates

### CS Alumni Scholarships

Vincent Pizzo

Dennis Holt

Sahil Majumdar

Christopher Webb

Justin Clementz

David Costello

Jacob Alyea

Ian Kottman

Jared Simon

Seth Green

Omar Rivera

Jake Bielefeldt

Jonathon Carter

Chris Jones

## CS Academic Achievement Award 4.0

### Freshman

Katherine Baue

Jordan Denny

Rachel Lefiore

### Junior

Jacob Gardner

Thomas Reese

William Reynolds

### Senior

Janet Guntly

Jacob Pennington

Thomas Roth

Michelle Vaughn

### Masters

Jonathan Blount

Lekshmi Chidambaram

Patrick Edgett

Raghavendra Kotikalapudi

Bradley Lewis

Swathi Rothu

### Ph.D.

Li Feng

Thoshitha Gamage

Lisa Guntly

Sheela Surisetty

Thomas Szalapski

Renjie Wang



# Congratulations to S&T's 2010 Computer Science Degree Recipients

## May 2010

### *Bachelor of Science*

Jeff Arneson Jr.  
Jeffrey Louis Augustin  
Edward Belanger IV  
Stephen Bongner  
Andrew Bozzay  
Arthur Chambers  
Navish Dadighat  
Dylan Delamore  
Nathan Web Eloe  
Matthew Entrekina  
Jeremy Forster  
Janet Guntly  
Matthew Hercules  
Stephen Jackson  
Andrew Jones  
Christopher Lincoln  
Robert Merterns  
Stephen Mues  
Travis Near  
Matthew Nuckolls  
Kenneth Perry  
Wilhelmus Poelma  
Charissa (Mathis) Ponzer  
George Daniel Rush  
Jacob Sapp  
Brian Serniak  
Senad Sopovic  
Kyle Steinert  
Daniel Swan  
Michael Van Horn

Michelle Vaughn  
Thomas Walters

### *Master of Science*

Mansour Abdulaziz  
Venkata Bhagavatula  
Joshua Eads  
Raj Rohit Gottipolu  
Sushma Paladugu  
Pavitra

### *Doctor of Philosophy*

David Cape

## July 2010

### *Bachelor of Science*

Brian Goldman  
Justin Voss

### *Master of Science*

Jason Cook  
Divya Kanakanala  
Swathi Routhu  
Rubal Wanchoo

### *Doctor of Philosophy*

Cyriac Kandath

## December 2010

### *Bachelor of Science*

Mark Baumgartner  
Mark Bryan  
Michael Hall  
Joseph Henson  
Stephen Jackson  
Joanna Kovarik  
Dustin McCurley  
Matthew Mitchell  
Michelle Patz  
Jessica Randle

### *Master of Science*

Prabhu Angajala  
Gaganraghavareddy  
Annamreddy  
Nathanael Dickerson  
Patrick Edgett  
Kenneth Fletcher  
Vijay Karjala  
Nishant Modi  
Maithili Satyavolu  
Aaron Taylor  
Yibo Xu

### *Doctor of Philosophy*

Leong Lee  
Waraporn Viyanon



# Computer Science Department 2010 Colloquium Series



## **On the Art and Practice of Internet Forensics**

**Dr. Hal Berghel, Univ. of Nevada**

**Feb 4th**

**Abstract** - For the past decade, Internet Forensics has been subsumed under the rubric of Computer Forensics. Typically, Internet forensics is buried in the latter chapters of Computer Forensics books - usually between "the Criminal Justice System" and "Conclusion". In this talk, I will show why Internet Forensics should be considered an art in its own right.

While Computer Forensics is older and more mature, it is a very different activity requiring very different skills. Internet Forensics is more about eternal vigilance than search-and-seizure. Several aspects of Internet Forensics will be discussed, including packet crafting, Denial of Service attacks, stimulus-response theory, malware, packet analysis, intrusion detection, fragmentation theory, and protocol bending, to name but a few.



## **Intelligent Agent Applications in Virtual Experimentation**

**Grant Degenhardt, The Boeing Company**

**Feb 25th**

**Abstract** - Advances in technology have sparked the expectation of modeling the real world with much greater fidelity and accuracy. The military and corporate industries see the need to use these "emulations of the real world" to perform predictions and analysis of alternatives much better than ever before and ultimately improve their business or service. But to attain these "emulations of the real world" many challenges in modeling and simulation

will need to be overcome that have yet to be considered due to the nature of complex adaptive systems. This presentation addresses the needs and challenges inherent in creating, managing and evaluating complex adaptive systems in the context of virtual experimentation with a focus on how intelligent agents that learn and adapt are a major part of the solution.

Intelligent agents that learn and adapt are ideal for evaluating complex adaptive systems because they are modeled after humans, who successfully traverse and navigate the real world; the largest complex adaptive system. These adaptive intelligent agents do not need to be logically complete or consistent. Families of agents that are each different, but all similar, will be "bootstrapped" with rules and strategies obtained from subject matter experts (SMEs). Agents will learn and adapt to the environment to optimize attainment of goals and satisfaction of other metrics.

The generic inference framework needed to develop and train intelligent agents that behave and learn much like humans will also be discussed. This architecture, which utilizes a hybrid of computational and connectionist frameworks and standard mechanisms of artificial intelligence, possesses both the power of rule-based logic programming systems and the flexibility and adaptability of machine learning systems. Elements of the generic inference framework will be described: the multi-hypothesis algorithm, the distributed agent architecture, the Hoare rule system, and more. The Predicate Constraint Language (PCL), a general purpose development language and a hybrid of relational database, functional programming and logic programming on which the architecture is constructed will also be introduced along with its essential features for learning and adaptation.



# Computer Science Department 2010

## Colloquium Series



### **Computational Intelligence Techniques in Information Retrieval**

**Henry Nyongesa, University of the Western Cape**

**Mar 4th**

**Abstract** - The volume and variety of information sources available in digital online sources, such as, the Internet presents increasing difficulty with respect to obtaining information that accurately matches user information needs. An information need is a state in which available information is insufficient to satisfy an information demand. Two factors affect the relationship between an information need and the information retrieved from information sources - also known as information retrieval effectiveness. Firstly, information seekers are often not able to formulate an optimal representation of their information need. Secondly, relevance, the measure of the degree to which retrieved information matches the information need is highly subjective between different information seekers. This seminar presentation will present recent research in information needs modelling as an approach for improvement of information retrieval effectiveness in heterogeneous environments. Computational intelligence techniques are applied for interactive reinforcement learning of information need models, in order to improve overall retrieval effectiveness. The approach combines qualitative (subjective) user relevance feedback with quantitative (algorithmic) measures of relevance. Comparative results are given of retrieval effectiveness using conventional relevance feedback against the computational intelligence approach. A discussion of a developing real-world application platform is also given.



### **Evolution of Identity Management Systems and Challenges**

**Abhilasha Bhargav-Spantzel, Intel Corporation**

**Apr 16th**

**Abstract** - To support emerging activities within the digital information infrastructure, such as enterprise IT management, commerce, healthcare, entertainment, online social and scientific collaboration, it is increasingly important to understand the evolving concept of digital identity. In this talk I will present the basic concepts underlying digital identity, the fundamental challenges and desired properties of digital identity attributes. Furthermore we will explore some of the new types of digital identity which are emerging with the growing technological innovations. We will see how digital identity management technology is becoming fundamental in customizing user experience, protecting privacy, underpinning accountability and compliance in today's world and preparing us for secure usage of the technologies of tomorrow.



### **Software Product-Line Engineering for Sustainable, Long-lived Systems**

**Robyn Lutz, Iowa State University**

**Apr 16th**

**Abstract** - This presentation describes the current state of software engineering for software product lines and proposes directions for needed work. It first gives a snapshot of central ideas and accomplishments in several key research areas for software product lines. It then describes some problems that are important and feasible to solve in the next decade, where results will be used to good effect in actual systems. We then focus more specifically on autonomous and safety-critical software product lines that must evolve over time, and discuss what recent research results mean for designing sustainable, long-lived systems.

# Computer Science Department 2010 Colloquium Series



## **Malicious Transactions in Mobile Database Systems**

**Vijay Kumar, Univ. of Missouri @ Kansas City**

**Sep 14th**

Abstract - Securing the database from the effects of malicious activities and maintaining data consistency have never been easy. This task becomes significantly more complex in Mobile Database Systems (MDS) because of the unique demands it imposes on data processing activity. The characteristics of a malicious transaction have been discussed in many papers; however, a formal definition seems to be missing. Such definition is very useful, rather essential to investigate its interaction with MDS and to develop schemes for its management. In this seminar, we ponder over and discuss a few things about malicious transactions and its interactions with MDS. In particular, we first try to develop a formal definition of malicious transaction, explain our reference architecture of a mobile database system, define the structure and processing of mobile transactions, and investigate interaction of malicious transactions with mobile database systems. Finally, we present an outline of a scheme, which we call "Location Signature", to identify the attack of malicious transactions on mobile database systems. The work which we present here is still on going. Therefore, one of our aims here is to gather your useful comments and suggestions to revise, improve, and possibly modify our approach for the management of mobile malicious transactions.



## **Improving Software Usability Through User Characteristics**

**Leslie Miller, Iowa State University**

**Sep 21st**

Abstract - In general, a wide variety of users need to interact with software programs. Government agencies, like the Census Bureau, hire tens of thousands of short term employees to complete tasks such as capturing the addresses of housing units. The abilities of such users can vary widely.

The presentation will look at both physical and cognitive user characteristics and their impact on user performance. The issues associated with employing adaptive or adaptable user interfaces will be discussed. Finally, we will look at the results of our studies targeted at testing ways of taking both physical and cognitive user characteristics into account when designing software.



## **A New Scheduling Paradigm for Internet-Based Computing**

**Dr. Arnold Rosenberg, Colorado State University**

**Oct 5th**

Abstract - Technological and economic developments have made the Internet a viable platform for a new, "collaborative" modality of Internet-based computing (IC, for short). Within this modality, the owner of a large, typically compute-intensive, computation enlists remote clients to collaborate in performing the computation. When the computation comprises only independent tasks, the temporal unpredictability of IC-- communication is over the Internet; computing is by clients who arrive at unpredictable times and who are typically not dedicated to the computation-- is at worst an annoying source of slowdown. But when the computation's tasks have interdependencies that prioritized their execution, then the temporal unpredictability can confute attempts to ben-

# Computer Science Department 2010 Colloquium Series

efit from parallel execution of tasks and can lead to a form of gridlock wherein no new tasks can be allocated to remote clients pending completion of already allocated tasks. In recent papers, we have proposed a new scheduling paradigm that aims to respond to the new challenges of IC. Faced with the impossibility of scheduling to accommodate critical paths in a computation, we seek to schedule in a way that always renders as many tasks as possible eligible for allocation to remote clients. This has the dual goal of maximizing the utilization of available clients and minimizing the likelihood of gridlock. We have formalized this scheduling problem and, under idealized assumptions, have developed the rudiments of an algorithmic theory of how to schedule complex computations for IC.

I begin this talk with the concepts underlying the theory and the algorithms that emerge from them. I then describe several familiar computations and computational paradigms that the nascent theory can schedule optimally. I finally describe simulation experiments whose results suggest that the theory's schedules have a measurable benign effect on "real" Internet-based computing.



## **Can Biometrics Improve Security?**

**Nalini Ratha, IBM**

**Nov 30th**

**Abstract** - It is commonly believed that biometrics when introduced in an authentication system can improve the overall security of the system. Based on a pattern recognition model of biometrics-based authentication system, we argue that when properly designed a biometrics-based authentication system can be highly secure. We identify several attack points in a biometrics-based authentication system and propose counter measures

to thwart the attacks. With the improved awareness of the possible attacks, systems incorporating biometrics can be built with higher security.



## **2011 PHONATHON DATES:**

**March 15, 16, 17,  
20, 21, 22, 23, 24  
& April 3, 2011**



# Effort seeks to diversify cyber-security field

In an effort to increase the number of women and minorities in the field of cyber-security, Missouri University of Science and Technology is working with the University of Arkansas at Pine Bluff to develop a new program for undergraduate students.

The partnership builds on Missouri S&T's leadership role in information assurance education, says Dr. Bruce McMillin, professor of computer science at Missouri S&T.

Information assurance is a niche of computer science, engineering, and information technology that addresses ways to improve security of computer and electronic networks. In 2007, the U.S. National Security Agency (NSA) and the Department of Homeland Security designated Missouri S&T as Missouri's first National Center of Academic Excellence in Information Assurance Education. The designation means Missouri S&T meets the federal government's criteria for providing educational and research opportunities in cyber-security, says McMillin, who is also the center's director.

Funded through a \$115,000 grant from the U.S. Department of Defense, the NSA's home department, McMillin and his colleagues at Missouri S&T and UAPB have developed a three-semester program for UAPB computer science undergraduates interested in the information assurance field. Students completing the coursework – known as SAIA, for Southern Arkansas Information Assurance – will be eligible for a minor in information assurance.

Working with McMillin are Dr. Jesse J. Walker, coordinator of computer science at UAPB, and Missouri S&T faculty members Dr. Daniel Tauritz, associate professor of computer science, Dr. Sahra Sedigh, assistant professor of electrical and computer engineering, and Dr. Ann Miller, the Cynthia Tang Professor of Computer Engineering.

Graduates from the SAIA program interested in further study may then apply at Missouri S&T to pursue master's or Ph.D. computer science degrees with an emphasis in information assurance. They also may be eligible for graduate fellowships from the NSA, McMillin says.

Experts in cyber-security are in high demand nationwide, McMillin says.

"Nationally, the NSA and intelligence community is looking to hire a thousand Ph.D.'s the next few years due to the increasing demand," McMillin says.

Minorities and women make up only 3 percent to 5 percent of the work force in this specialized field, a situation that SAIA seeks to remedy.

As the only public university in Arkansas designated as a Historically Black College and University (HBCU), UAPB provides "a conduit to get more African Americans into the information security work force," McMillin says.

By funneling more students into graduate programs (including at S&T's), SAIA will open doors to more research opportunities for women and minorities, McMillin says. The NSA fellowships are especially attractive to students interested in the field, he says.

"If you want to do research in security, the NSA is the place to be, because you have security clearance all the way to the top," McMillin says. "You'll know what the leading edge is."



# Keeping the smart grid secure



**The old power system is being transformed into a “smart grid,” which will integrate renewable energy generated from wind turbines and solar panels housed in homes and businesses into the existing grid through the internet.**

**WE OFTEN USE THE INTERNET** to manage key aspects of our lives — our finances, health, relationships — so the thought of also managing our home’s energy supply online may not seem scary. But as our nation’s outdated power grid goes digital, the implications of opening up yet another area of our lives to the online world has some people worried.

The old power system is being transformed into a “smart grid,” which will integrate renewable energy generated from wind turbines and solar panels housed in homes and businesses into the existing grid. Appliances will communicate with each other to decide when they should run, and any excess energy will be sold back to power companies.

While these new infrastructures will certainly be more efficient, the massive amounts of data exchanged will also increase our vulnerability to security breaches. Information about our daily habits — when we’re home, when we’re on the computer, when our appliances run — might be accessed by a third party. It could be the bored teenaged hacker down the street, or someone or something more sinister.

Another challenge is ensuring participants in this new system play fair and don’t hold back their renewable energy to sell at peak hours and premium prices — thus helping their own bank accounts but hurting everyone else’s.

Bruce McMillin, professor of computer science at Missouri S&T, is working on solutions to these challenges. By using information flow analysis, born in computer science, he is working to develop security measures for these new distributed systems.

“This is a new application of information flow analysis,” he says. “We’re using it to reveal design and implementation issues that would compromise the system’s confidentiality.” In this instance, confidentiality is considered violated when information flows from one domain to another domain (such as inside a house to outside the house).

McMillin is working with the National Science Foundation’s Energy Research Center for Future Renewable Electric Energy Delivery and Management (FREEDM) Systems. Missouri S&T is one of seven universities in the United States and Europe involved in the program. Computer Science students graduate students Ravi Akella, Derek Ditch & Thoshitha Gamage and undergraduate students Stephen Jackson and Thomas Roth are working on projects within the Center. Five members of the S&T electrical and computer engineering faculty are also part of the FREEDM team, including site director Mariesa Crow and co-investigators Badrul Chowdhury, Keith Corzine, Mehdi Ferdowsi and Jonathan Kimball.

“We’re looking to use distributed grid intelligence (DGI) to manage the smart grid,” says McMillin. DGI would allow software to manage a home’s energy usage and would detect, isolate and correct any problems that might occur, while fully coordinating with other systems in the home.

McMillin says smart grid systems couple intelligent cyber action with physical operation, which makes determining the information flow much more complex.

“It’s a fundamentally different security challenge because parts of these renewable technologies are visible to anyone,” he says. “You can see if the sun is shining, if the wind is blowing. There is no absolute secrecy.”

McMillin is applying confidentiality properties such as non-deducibility to this future infrastructure. A system is considered as non-deducibility secure if information does not flow from one protected domain to another, lower-level domain. This ensures that the lower-level user cannot deduce any information about the system. In a non-deducibility secure system, observing that the sun is shining on a solar panel does not tell the observer anything about how the collected energy is used, nor anything about the internal information of the DGI — thus limiting a potential attacker’s information.



Bruce McMillin —  
professor of  
computer science

# Nintendo Wii Remotes Utilized to Improve Manufacturing Processes

At Missouri S&T, faculty and students have ample opportunity to become involved in research. Specific research can be funded by companies or the government in order to develop or discover new processes, materials, technology and methods: other times research topics originate in the minds of curious students and are realized with the help of the university and a professor or advisor.

Dr. Ming Leu, the director of the Center for Aerospace Manufacturing Technologies (CAMT) at S&T, is involved in a number of interdisciplinary research projects aimed at improving workplace efficiency and creating and developing new, cost efficient, technology for, among others, the aerospace industry.

One particular project Dr. Leu and the CAMT is working on uses multiple Nintendo Wii remotes (unofficially dubbed “Wiimotes”) together with Light Emitting Diodes (LEDs) to develop software capable of “tracking the movement of the tools, the work pieces, and the people” involved in assembly processes.

The research being carried out by Dr. Leu and his constituents aims to improve the efficiency of manufacturing processes and the training of workers. Using the inexpensive Wiimotes and carefully placed LEDs, data about the movement of functional components within the assembly process can be obtained and from the data, software can be developed which will simulate an assembly plant environment. Within the simulation, processes can be identified as inefficient, unsafe, or capable of producing a better product. Using the simulation, new workers can be more effectively and efficiently trained to assemble aircraft components.

As Dr. Leu put it, “Now imagine, using these CAD (Computer Aided Design) models to represent objects. Now I’m able to view a real assembly operation. I can track the movements of the parts, the tools, or even the people, depending on what I want to focus on.

Once you have the CAD models, you can study how to improve the existing operations, and also you can reuse some of the simulation software. People [that would use the software] can design new assembly operations that are, basically, very similar to a previous one, but with some variations. So you can take what you have in the previous one and be able to modify the simulation for the new operations.

“[Our research] has a lot of advantages in terms of training and for improvement of assembly operations, as well as for planning of new and varied assembly operations,” said Leu.

Funding for this specific technological research was led by Boeing, the Air Force Research Laboratory (AFRL), the Leonard Wood Institute through a subcontract with the Advanced Military Equipment Corporation, and the other members of the CAMT’s Industrial Consortium.

Participants in this research include: Dr. Ming Leu (ME), Dr. Frank Liu (CS), post-doctoral researcher Wenjuan Zhu (ME), Ph.D students Hui He (ME) and Sheela Surisetty (CS), and graduate students Anup Vader (ME) and Abhinav Chadda (CS).

Once this technology and its value are realized, new markets may be sought. A primary application for this developing technology includes observing and cataloging experienced workers’ complex movements, so that the value of the experiential knowledge can be passed on to a new worker.

The Wiimote has several unique capabilities, including accelerometer hardware to recognize that you’re swinging or moving the Wiimote, and optical sensory hardware to be able to point and move a cursor on the screen. Dr. Leu’s research utilizes the optical sensor technology included with every standard Wii remote to create movement recognition software for use in industry assembly processes.

When the infrared detecting camera on the remote is used in conjunction with the Nintendo Wii, the Wii remote determines its position relative to the position bar to give you a moving point on the screen. The position bar has two infrared lights on either end and when the Wiimote is moved relative to these two lights, the console’s computer interprets the data generated by the Wiimote.

The research being conducted uses stationary Wiimotes and moving LED lights. Wiimotes are utilized in this stage of the development process because of their cost relative to commercially available optical sensors. Several Wiimotes are used together to create data in the three dimensions.

The initial research and a functional application is expected to be ready in as much as two years. For more information on this and other topics being researched by S&T’s Center for Advanced Manufacturing Technologies, please visit <http://campus.mst.edu/camt/>.

# Graduate Research Showcase winners announced

The 2010 Graduate Research Showcase, organized by the Counsel of Graduate Students (CGS), was held on April 12 at the Havener Center. Graduate students from University of Missouri-Columbia also participated in the event. The following S&T students were honored.

- Session 1 - 1st place: Wei Yuan, material science, 2nd place: Bismark Osei, mining engineering, 3rd place: Hao Zhang, geological sciences, 4th place: Yufeng Wang, material science.
- Session 2 - 1st place: Sheela Surisetty, computer science, mechanical engineering, 2nd place: Eungsoo Kim, civil engineering, 3rd place: Seth Lamble, environmental engineering.
- Session 3 - 1st place: Waraporn Viyanon, computer science, 2nd place: Thomas Szalapski, computer science.
- Session 4 - 1st place: Tanvi Joginapelly, information science and technology, 2nd place: Shristy Bashyal, business and information technology.

Photos from the event are available at <http://cgs.mst.edu/PhotoGallery/Showcase10/index.htm>.





# Computer Science Student Organizations

## Missouri S&T IEEE Computer Society Student Branch

A piece of happy news about IEEE-CS is that it has been officially recognized by IEEE. With all the efforts devoted by the student officers, Thoshitha, Scott, William, Jing, etc., this young organization has now about 50 members. In early October, IEEE-CS had its first election and welcomed a new team of student officers. Carrying the same hardworking spirit from our former officers, our new president Ravi Arvapally has successfully organized IEEE Xtreme programming competition and raised about \$1000 funds in a short term since he was elected. He and new officers have also planned various events for 2011. We are expecting another fruitful year!

## Association for Computing Machinery (ACM)

Led by their fearless president, Kyle Ensign, the Missouri S&T Student Chapter of the Association for Computing Machinery (ACM) is the largest and most active computing organization on campus. Backing Kyle in leading the organization to success are his fellow officers: Nathan Jarus (Vice President), Matt Martin (Secretary), Doug McGeehan (System Admin), Sarah Jameson (Treasurer), and Dr. Wei Jiang (Faculty Advisor). This semester has been a great success. With over 70 members, Missouri S&T ACM has grown tremendously this last Fall Semester.

ACM hosts various events during the school year. These events are geared towards students who would like to learn more and have fun in their college career. This Fall 2010 Semester, ACM has hosted variety of events: Graphics on the Grass, ACM Career Fair Dinner, Trip to UIUC for Artificial Intelligence Competition, Megaminer (our very own AI competition), and MinerLAN (our very own LAN Event). ACM also works on several projects that may be featured in the Computer Science building. We are finally finishing up the ever cumbersome ACM Soda Machine where you can vend a soda from anywhere, as long as you are on school network. Our Arcade Machine is still entertaining many students with the likes of Metal Slug, Sonic, and Street Fighter.

Next semester will feature over 16 meetings, more projects for students to get involved with, and more fun! However, none of this would be possible without our sponsors, TradeBot Systems, Lockheed Martin, GE Aviation, Cerner Corporation, and Express Scripts. We would like to thank everyone for helping support our organization.

## Association for Computing Machinery-Women (ACM-W)

After Charissa graduated, the ACM-W is now lead by our new president Arej Muhammed. Arej is a girl full of enthusiasm and she brought energy to ACM-W. Among the many exciting events to be mentioned, we had a chance to get to know life in Oman through the talk given by Fatma Alshamli (a visiting scholar); we successfully hosted the CRA-W distinguish lecture series. Besides and no doubt, we always have our traditional peer advising each semester, which is loved by students. We will carry on our momentum in the coming year.



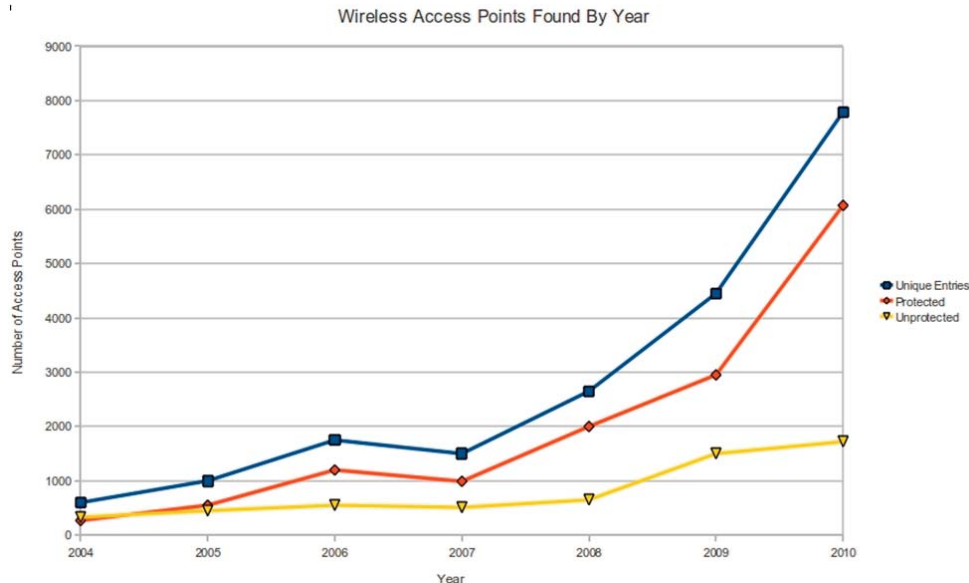
# Computer Science Student Organizations (continued)

## Association for Computing Machinery SIG-Security (ACM SIG-Sec)

The Missouri S&T Association for Computing Machinery (ACM) student branch Special Interest Group: Security (SIG Sec) is a student group focused on computer & network security. Founded eight years ago, the organization is currently chaired by Jon Blount and Jeff Shelburg, with Dr. Daniel Tauritz as faculty advisor. SIG Sec meetings are typically bi-weekly, featuring a wide variety of speakers on topics ranging from software vulnerabilities and real-world tools to security projects and research. The group also works on its own security projects, such as building cantennas (antennas made from soup, coffee or Pringles cans that increase the gain of wireless cards), wireless auditing (mapping open wireless access points so we can inform the owners), security auditing of student computers, and the SIG Sec computer security challenge (controlled environment competition where participants compete to be the first to penetrate a protected computer system).

Highlights of the 2010-2011 academic year so far:

- 7th Annual Rolla Wireless Security Audit  
Part 1: Cantenna Building Party led by the SIG Sec Officers  
Part 2: Wireless Security Audit Competition

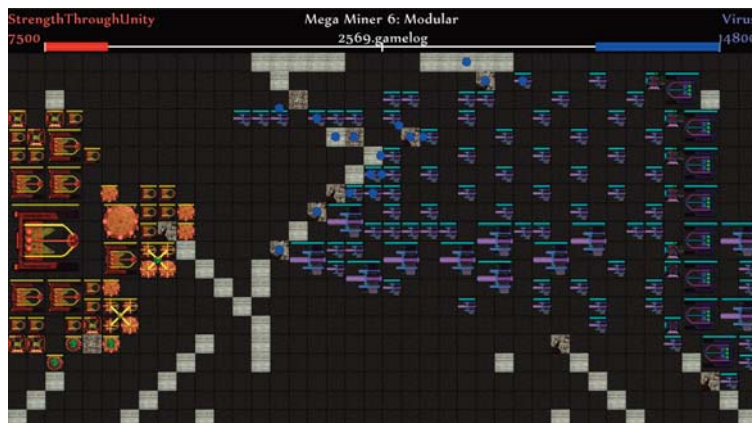


- A smorgasbord of mini-presentations by S&T students who interned over the summer at the Center for Cyber Defenders, Sandia National Laboratories, Albuquerque, NM.
- Presentation by a member of the technical staff of Sandia National Laboratories – who happen to be an alum of our department – on Wireless Security Assessment Techniques.
- Presentations from university staff covering the overall shifting landscape of information security threats and digital forensics techniques used in various types of information security situations

For more information see S&T's ACM SIG Security website at: <http://acm.device.mst.edu/security/>

# Computer Science Student Organizations (continued)

## Association for Computing Machinery SIG-Game (ACM SIG-Game)



SIG-Game is a student interest group that does much more than simply play games, we make them. Lead by the wacky, but experienced, Steven Wallace, this team is best known for developing and hosting MegaMiner, an Artificial Intelligence (AI) programming competition open to anyone who wishes to compete. Every semester a team of developers creates a unique game to be used in this competition and anyone who wishes to help out on the development is welcome to. After hours of slaving over keyboard, when the code is all hopefully working, the tournament is held. MegaMiner puts students head to head in a battle of intelligence, both human and artificial.

With only twenty-four hours to work, and knowing absolutely nothing about the game until the moment the com-

petition starts, competitors have to be adaptable, cunning, and creative if they hope to create an AI that can outperform the rest. Developers of the game circulate the room answering questions as team members try to fix their AIs and stay awake. Fortunately enough for the competitors, SIG-Game provides snack food and beverages to keep them churning out code and not sleeping on their keyboards. As the competition drives on teams can watch their fledgling AI fight for victory and glory in the Arena. Multiple screens placed around show competitors how well their AI performs as well as providing them with an insight to the opponent's game plan. As the competition time dwindles to its final seconds, teams frantically submit their code and prepare for the final showdown, ready to finally see their AI ascend the ladder to victory after a full day of coding.

The latest Megaminer tournament had a whopping sixteen teams of two or three participants each. In this tournament, titled "Megaminer 6: Modular", competitors developed AIs that controlled a self-replicating robot army with a diverse selection of robots, and as the competition made clear, dozens of effective strategies. These robots could combine together to form larger, more powerful beings to "serve the master in his Purpose." We watched as strategies evolved and morphed into more advanced and intelligent attack patterns. We saw everything from covering the entire playable area with builder units to creating a sixty-four part super robot. The map was randomly, but symmetrically, generated for each match; giving players a new battlefield and new obstacles for each encounter. No match was ever the same, but they were always a pleasure to watch.

The members of SIG-Game would like to congratulate Jason Iverson, Josh Vance, and Max Eisenbraun for taking home the gold; Caitlin Derr, Alex Smith, and Ian Lehmann for winning second place; and the team of Scott Page and Josiah Perisho for taking third. We would also like to thank everyone who competed for coming, and our sponsor Tradebot for generously contributing so that we could provide awesome prizes and shirts to the participants. If you would like your chance to compete, MegaMiner 7 will be held this spring. Only minimal coding experience is required. If you have taken CS 53 or 74 and think you have what it takes, then gather your friends and start preparing. Feel free to join our Google Group: [sig-game-grp@mst.edu](mailto:sig-game-grp@mst.edu), or watch our website for updates: MegaMinerAI.com to find out more information on our next competition.

SIG-GAME also assists with developing the games for CS 347, Introduction to AI, and is open to developing other games for other projects or just for fun. The team is currently in the process of developing a chess game for next semester's final project of the CS 347 class that will be able to pit not only AI versus AI against one another, but human versus AI, as well. These sorts of projects provide a great way for newcomers to get familiarized with what the team does and to give them a hands-on experience with game development. We're always taking new members of any background. Computer Science, Biology, or even English majors are all welcome to join the team.

SIG-Game is an amazing group with fun, supportive team members there to greet any new recruits with utmost kindness and help anyone achieve a goal of game creation. So if you have a passion for game development, the team is there to make that dream a reality. We encourage anyone who finds any of this interesting and wants to be a part of the Dev team to come to one of our meetings, every Tuesday in CS 209A at 5pm, or email Steven Wallace at [snw275@mst.edu](mailto:snw275@mst.edu) for additional information.

# **The Spring Semester Career Fair Dinner Made Possible by Tradebot**

Thanks to all that attended this year's ACM Career Fair Dinner. I also want to thank TradeBot who sponsored the dinner. We were also able to raise \$230 for the Make A Wish Foundation. This semester's dinner was held at Pizza Inn in Rolla and hosted over 40 undergraduate students and several representatives from Lockheed Martin and General Electric Aviation.

Thank you to everyone that attended!!!



# **The Fall Semester Career Fair Dinner Made Possible by GE Aviation**

The dinner was a success!!! First we would like to thank GE Aviation for covering the cost of the dinner. The Career Fair Dinner is held once a semester on the night of the Missouri S&T Career Fair. The purpose of this dinner is to provide an informal and relaxed atmosphere in which the students of the department can get together with the representatives of companies who are seeking to recruit them. This semester's dinner was held at Pizza Inn in Rolla and hosted over 40 undergraduate students and several representatives from Cerner, ADTRAN, Express Scripts, Nucor-Yamato, Garmin, TradeBot, Sandia National Labs, Softek Solutions, and Honeywell.

Thank you to everyone that attended!!!



# Missouri S&T

## 2010 AI Tournament

Winter Semester 2003 gave birth to a new S&T tradition: the Artificial Intelligence Tournament Series, created and organized by Dr. Daniel Tauritz and hosted by S&T's Department of Computer Science. This series follows a tradition of in-class tournaments in Computer Science course CS347 – Introduction to Artificial Intelligence, but aims to broaden that scope by inviting campus-wide participation in public tournaments and having formal awards ceremonies. This tournament gives students, faculty and staff a chance to test their skills in designing & implementing Artificial Intelligence by having their creations compete against each other and with human beings. Typically, each academic year a new challenge in the form of a (board) game, is chosen to be solved during that year's tournament(s). Three winners are chosen each tournament and presented with trophies & prizes. Each semester the name of the first place winner is engraved on a perpetual plaque and displayed in the glass trophy case on the second floor of the Computer Science Building.

Previous years have featured the board games Abalone, Chess, Othello, Backgammon, and Mancala. In spring 2010 the 11th tournament in the series was held, featuring the board game Backgammon, a special challenge because of the stochastic element added through the use of dice.

The winners were:

- First place – Jeremy Davidson for his computer player; Jeremy is a senior at S&T in Computer Science
- Second place – Ali Hurson as human player; Ali is professor and chair of the S&T Computer Science department
- Third place – Jason Iverson as human player; Jason is a dual major at S&T in Computer Science and Computer Engineering

Thanks to S&T's CS Department for sponsoring the tournament including prizes!

The next tournament is scheduled for Saturday April 23rd 2011 and tentatively the challenge will be Chess. Additional information on the AI Tournament Series can be found at <http://web.mst.edu/~tauritzd/AI-Tournament/>.

NOTE: Dr. Tauritz is always looking for (corporate) sponsors for the Artificial Intelligence Tournament Series (great publicity!). For more information, E-mail him at: [tauritzd@mst.edu](mailto:tauritzd@mst.edu)





# Departmental Research Labs

## Experimental Computation Laboratory (ECL)/FACTS Interaction Laboratory (FIL)

<http://filpower.mst.edu/>

**Mission:** This mission of the ECL is to explore experimental, cross-disciplinary approaches to problems primarily in distributed, embedded systems management and security. The FIL applies these approaches to the emerging smart grid.

**Faculty Researchers:** Bruce McMillin (Director) and Sriram Chellappan (CS), Mariesa Crow, Sahra Sedigh and Jonathan Kimball (ECE)

**Student Researchers:** Ravi Akella (Ph.D), Derek Ditch (Ph.D), Thoshitha Gamage (Ph.D), Stephen Jackson (B.S.), Anik Sinha (B.S.), Tom Roth (B.S.)

### Current Projects:

- National Science Foundation Engineering Research Center: Future Renewable Electric Energy Delivery and Management (FREEDM) System
- Advanced military installations that integrate renewable energy and advanced energy storage technologies.
- Common Correctness for Protecting Confidentiality of Critical Infrastructure Systems
- GAANN: Information and System Assurance for Critical Infrastructures
- Information Flow Models for Cyber-Physical Infrastructures
- CPS Small: Foundations: Reliability Models of Cyber-Physical Infrastructures

### Current Funding Sources:

- National Science Foundation(NSF)
- Air Force Research Laboratory (AFRL)
- Leonard Wood Institute
- Department of Defense/National Security Agency (DoD/NSA)
- Missouri S&T Intelligent Systems Center
- Missouri S&T Energy Research and Development Center.

## Natural Computation Laboratory (NC-LAB)

<http://web.mst.edu/~tauritzd/nc-lab/>

**Mission:** The mission of the NC-LAB is to develop novel types of computational problem solving methods inspired by nature which are both more powerful and user-friendlier than the current state-of-the-art, and to apply them to real-world problem solving. Since the lab's founding in 2002, its computational problem solving method of choice has been Evolutionary Computing.

**Faculty Researchers:** Dr. Daniel Tauritz (Director), Dr. Bruce McMillin, Dr. Thomas Weigert, Dr. Mariesa Crow (Department of Electrical & Computer Engineering), Dr. Matt Insall (Department of Mathematics & Statistics), Dr. Ray Luechtefeld (Department of Organizational Leadership, University of La Verne)

# Departmental Research Labs (continued)

**Student Researchers:** Josh Wilkerson (Ph.D.), Matthew Nuckolls (Ph.D.), Lisa Guntly (Ph.D.), Brian Goldman (M.S.), Ajith Cherukad Jose (M.S.), Jonathan Blount (M.S.), Timothy Coalson (M.S.), Swathi Sambaraj (M.S.), Jeffery Shelburg (B.S.), Michael Wisely (B.S.), Jared Simon (B.S.), Michael Virag (B.S.)

## **Current Projects:**

- Coevolutionary Automated Software Correction
- Self-Configuring Evolutionary Algorithms
- Virtual Facilitator, Affective Entity-Relationship Modeling
- Automated Partial Credit Grader
- Malware Detection

## **Current Funding Sources:**

- National Science Foundation (NSF)
- Sandia National Laboratories (SNL)
- Oak Ridge National Laboratory (ORNL)
- S&T Intelligent Systems Center

## **Web and Wireless Computing Laboratory**

<http://web.mst.edu/~cswebdb/about.html>

**Mission:** The W2C lab, started in 2001, is designed to carry out research in the area of Web data management and wireless computing including sensor networks. Our focus is on scientific research to advance the state of art in these two areas. The current projects are supported by NSF, DOE, AFRL, ARL, UM System, Hengsoft and others. The current researchers are pursuing their PhD/MS/BS degree in different areas of interest to W2C lab. The lab is well-equipped with over 25 3.2 Ghz PCs, 5 Dell Servers, linux machines, laptops etc. The lab has a wireless sensor network test-bed consists of Crossbow sensor motes. Lab has graduated 5 PhD and 16 MS thesis students and currently 6 PhD, 7 MS thesis and 3 BS students are doing their research in the lab.

**Faculty Researchers:** Sanjay K Madria (Director) and Sriram Chellappan

**Research Collaborators from S&T:** Fikret Ercal, Thomas Weigert, Sriram Chellappan, Maggie Cheng, Jag Sarangapani and Maciej Jan Zawodniok

**External Collaborators:** Takahiro Hara (Osaka University) and Mark Linderman (AFRL)

**Student Researchers:** Nayot Poolsappasit (Post-Doctoral), Dylan McDonald (Ph.D.), Tommy Szalapski (Ph.D.), Vimal Kumar (Ph.D.), Roy Cabaniss (Ph.D.), Daniel Hirsch (Ph.D.), Mukund Krishnan, Neelanjana Dutta (Ph.D.), Mark Snyder (Ph.D.), Venkata Nerella (M.S.), Swetha Surapaneni (M.S.), Hemanth Meka (M.S.), Lekshmi Manian Chidambaram (M.S.), Brijesh Kashyap (M.S.), Sri Harsha Chitturi (M.S.), Makarand Bhonsle (M.S.), Ryan Michael Birmingham (B.S.), James Michael Bridges (B.S.), Joshua Patrick McCarville-Schueths (B.S.) and Abhinav Saxena (B.S.)

# Departmental Research Labs (continued)

## Current Projects:

- Sensor Computing
  - Secure Data Aggregation in Wireless Sensor Networks
  - Dynamic Social Grouping in Wireless Sensor Networks
  - Outlier Detection in Wireless Sensor Networks
  - Wireless Sensor Network Infrastructure & Protocols for mine safety
  - Data Characteristic Guided Compression for Stream-Based Systems
  - Defending against Location Disclosure Attacks
- Mobile Computing
  - An incentive based routing protocol in MANET'S
  - Privacy Ensured Service Discovery in Pervasive Computing Environment
  - P2P Collaborative Information Management
  - A Resource-Efficient Adaptive Caching Scheme for Mobile Ad-Hoc Networks
- Web Computing
  - Incrementalisation and Caching in Java Query Language
  - XML join based on content and structure for XML data integration

## Current Funding Sources:

- National Science Foundation (NSF)
- Department of Energy (DOE)
- Air Force Research Laboratory (AFRL)
- University of Missouri Research Board (UMRB)

## Pervasive and Mobile Computing Laboratory

**Mission:** Pervasive computing explores the task of integrating technology into an environment, such that a multitude of computing devices are available to proactively perform services for users, thereby lightening the users' workload. The emergence of pervasive systems has been characterized as the third wave in computing, after the mainframe era (one computer, many users) and the personal computer era (one computer, one user). Pervasive computing is the next natural step, as a single user is in control of numerous computing elements.

The terms "ubiquitous computing" and "pervasive computing" have been used somewhat interchangeably in the literature. We draw a distinction between the two: "pervasiveness" refers to invisibility and proactiveness - where the computer dissolves into the fabric of the surroundings and requires minimal stimulus from the user, while "ubiquity" characterizes availability. In other words, ubiquitous computing facilitates pervasive computing. Advances in mobile computing have been pivotal to pervasive computing, as mobile devices provide users with continual access to computing resources. To be truly pervasive, computing should be seamlessly and invisibly integrated into the lives of its users, necessitating computational intelligence that predicts the needs and desires of the user and can independently carry out services for the user, based on surrounding context. Pervasive computing also leverages distributed computing, to delegate computational tasks to remote and/or heterogeneous computing resources.

# Departmental Research Labs (continued)

These areas of computing can be leveraged in concert to achieve the goal of pervasive computing: balancing proactiveness of services and transparency of operation to saturate an environment with computing agents that automate the trivial daily tasks of life, e.g., transferring lecture notes from a PDA to a workstation; leaving humans free to focus on high-level tasks, e.g., delivering a lecture. In other words, the focus of the user's actions is allowed and intended to be the high-level task, rather than the technology enabling the task.

Notwithstanding the availability of the required technology, truly pervasive computing environments have not yet been realized; only prototypes and theoretical designs have been developed by the research community. A major open field is related a delicate issue faced by pervasive computing: which choices can be delegated to the system (in the form of local clients, neighboring peers, or a central server) and which must be performed by the user. It is evident that the goal of pervasive computing is to maximize the former and minimize the latter. This often demands more intelligent algorithms, architectures and technologies than are presently available. In order to create a system that proactively carries out tasks, yet remains mostly transparent to the user, the following two challenges should be addressed:

- The computing agents need to be able to predict the user's intent based on history and context-awareness.
- A reliable method for integrating all the computing agents into a seamless entity needs to be designed.

The scope of these challenges is very broad. In the Pervasive and Mobile Computing laboratory, our focus is on two specific areas that are crucial to the design of a proactive yet transparent system:

- Techniques for resource management in a pervasive environment, considering the practical constraint that proactive issue of tasks may exhaust available resources and/or distract the user.
- Security and privacy in discovery and authentication of users and services, again focusing on solutions that minimize human-machine interaction, yet provide the required level of security.

**Faculty Researchers:** Ali Hurson (Lab Director), Dan Lin, Sanjay Madria, and Sahra Sedigh

**Student Researchers:** Amir Bahmani (PhD), Roy Cabaniss (PhD), Lekshmi Manian Chidambaram (MS), Sashi Gurung (PhD), Lasanthi Heendaliya (PhD), Brijesh Kashyap (MS), Vimal Kumar (PhD), Hemanth Meka (MS), Kimarley Mowatt (PhD), Tommy Szalapski (PhD), Shaun Wagner (PhD), and Lu Xiao (PhD).

## **Current Projects:**

- Privacy-preserving location information publishing
- Constraint-based indexing and querying of moving objects
- Active sensor networks and interoperability of sensor networks
- Mobile agent security
- Data broadcasting in traffic control
- Pervasive cyberinfrastructure for personalized learning and instructional support (PERCEPOLIS)
- Secure data aggregation in wireless sensor networks
- Dynamic social grouping in wireless sensor networks
- An incentive based routing protocol in MANET
- A resource-efficient adaptive caching scheme for mobile ad-hoc networks
- wireless sensor network infrastructure & protocols for mine safety
- secure data Aggregation in wireless sensor networks.



# Departmental Research Labs (continued)

## Current Funding Sources:

- National Science Foundation (NDSF)
- Department of Education (DOE)
- Oak Ridge National Laboratory (ORNL)
- Missouri University of Science and Technology

## McDonnell Douglas Foundation Software Engineering Laboratory

<http://web.mst.edu/~fliu/selab.html>

**Mission:** McDonnell Douglas Foundation Software Engineering Laboratory was established in 1996 to enhance the capabilities for teaching and conducting research in software engineering at Missouri University of Science & Technology.

**Faculty Researchers:** Prof. Frank Liu, Thomas Weigert, Bruce McMillin

**Student Researchers:** Ravi Santosh Arvapally (PhD), Eric Barnes (MS), Maithili Satyavolu (MS), Kenneth Fletcher (MS), Abhinav Chadda (MS)

## Current Projects:

- Advanced Landmine Detection Simulator.
- Ergonomic Analysis Based on Assembly Simulation with Motion Capture.
- A Low-Cost Motion Tracking System for Virtual Reality Applications.
- Web-based Collaborative Decision Making based on Computational Argumentation and Its Application in Air Traffic Control.
- CAD Model Based Simulation of Manufacturing Operations Using Dynamic Data Configuration and Real-Time Motion Capture.

## Current Funding Sources:

- Leonard Wood Institute
- Boeing Co.
- Rockwell Collins Co.
- Spirit Aerospace Co.
- National University Transportation Center (Missouri University of Science and Technology)
- Intelligent Systems Center (Missouri University of Science and Technology)

# 2010 Publications by Research Area

## **Computational Intelligence, Control & Optimization, Bioinformatics, Computer Vision Faculty: Chellappan, Ercal, Jagannathan, Leopold, Lin, Liu, Madria, Sabharwal, Tauritz, Weigert, Wunsch**

J. Albath, J. Leopold, C. Sabharwal, and A. Maglia, "RCC-3D: Qualitative Spatial Reasoning in 3D," Proceedings of the 23rd International Conference on Computer Applications in Industry and Engineering (CAINE 2010), Las Vegas, NV, November 8-10, 2010.

J. Albath, J. Leopold, and C. Sabharwal, "Visualization of Spatio-Temporal Reasoning Over 3D Images," Proceedings of the 2010 International Workshop on Visual Languages and Computing (in conjunction with the 16th International Conference on Distributed Multimedia Systems (DMS'10)), Oak Brook, IL, October 14-16, 2010. (runner-up for Best Paper Award)

J. Albath, J. Leopold, C. Sabharwal, and K. Perry, "Efficient Reasoning with RCC-3D," Proceedings of the 4th International Conference on Knowledge Science, Engineering, and Management (KSEM 2010), Belfast, Ireland, September 1-3, 2010, pp. 470-481.

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**Faculty: Liu, McMillin, Tauritz, Weigert**

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# Donations From Alumni and Friends

## Less than \$100

Adelsberger, Edwina R	
Ahmad, Fawad	1995
Alexander, Gary R	1970
Anderson, Glenn R	1973
AuBuchon, F. Joseph	1983
Bardsley, David Scott	1984
Becker, Kathryn A	1976
Beckerle, Kelly Marie	1988
Beckerle, Timothy Gerard	1990
Beckmeyer, Russell R	1971
Bevans, Stanley Wayne	1985
Bhattacharyya, Surya Dipta	2005
Bier, Patrick K	1975
Biggs, Roger Earl	1987
Bilbrey, Randall Carl	1986
Birdsell, Clifford J	1982
Bischel, Pat Oscar	1987
Bohn, Ellen B	1974
Booth, Brian David	1997
Bowman, Charles S	1986
Brady, Amber Megann	1983
Brady, Kevin E	
Brand, Ann Maxine	1984
Brand, Joel Addison	1986
Breidert, Janice E	1973
Brenneke, Kenneth J	1978
Britson, Paula Jean	1985
Brown, Daniel J	1974
Buckley, Jared Roger	1996
Buehler, Douglas P	1979
Burgdorf, Erik D	1980
Butler, Ralph M	1981
Butler, Tracye Denton	1985
Byrd, Alicia Kathleen	1998
Byrd, Samuel Martin	1998
Chen, Dibo	1996
Clifton, Arlene K	1972
Cochran, Stephen Anthony	1992
Colter, Kim D	1973
Cordes, Glenn E	1960

Cothorn, Douglas K	1978
Court, Michael R	1973
Dagestad, Pamela S	1978
Daum, Marilyn S	1980
Debner, David E	1968
Doerer, Daniel Michael	1988
Drake, Michael Edward	1994
Drewes, Laurie Ann	1985
Drewes, Mark Kenneth	1985
Duncan, Junetta Alisa	1999
Duncan, Thomas Shearer	1990
Dunford, Randall B	1974
Eaton, Daryl Ann	1970
Edwards, Harry K	1964
Erickson, Rodney J	1983
Evans, Jesse D	1965
Farley, Mary Ann	1984
Ferrario, Patrick Christian	2005
Fieseler, Catherine N	1980
Fisher, Michael S	1971
Foehrweiser, Roger Keith	1987
Folta, Joseph E	1976
Frager, Alan R	1974
Galli, Donald H	1974
Gauss, Montie J	1973
Gavin, Darla Spencer	1986
Giana, Fiorella	2005
Goetz, Carl Evan	1984
Grose, Daniel W	1977
Grotefendt, Judith R	1974
Grotefendt, Rande H	1973
Hagedorn, Gerald Lynn	1996
Hammond, Patrick Lewis	2005
Hartman, Todd Warren	1997
Hayden, Bruce Jeffrey	1983
Hedgpeth, Jeffrey Joe	1996
Heo, Youn J	2003
Herman, Lynn Marie	1987
Hickman, Lewis Lee	1996
Hickman, Lisa Erika	1996

Hiebert, Gregory Lee	1982
Hiebert, Yoelit Hannah	1981
Hilleary, Cynthia S	1976
Hillhouse, Michael D	1975
Hughes, Jason Michael	1995
Johnson, Andrew J	1974
Kammer, Darren R	1991
Kelley, David D	1977
Kemp, Russell W	1970
Kester, Paul Allen	1999
Kinser, Colby Evan	1988
Kinser, Lynne D	1992
Kleikamp, David John	1986
Kopinski, Thomas T	1985
Krasner, Herbert C	1973
Kuebler, Kenneth L	1970
Lang, Stephen A	1979
Langer, Richard B	1983
Langford, Quinton M	2007
Laramie, Raymond F	1972
Laufman, Anne E	1983
Lawrence, Jackie L	1978
Lenz, Sandra M	1974
Lewis, Daniel Roy	2003
Li, Li-Jen	1989
Lindesmith, Lisa Chon	1990
Lindesmith, Stanley	1990
Livaudais, Joan Marie	1986
Livaudais, Ron Mark	1983
Loesch, Janet L	1980
Loesch, Terry L	1980
Ludwig, Karen S	1979
Ludwig, Michael F	1978
Martin, Bennie F	1986
Martin, Dennis Gerard	1984
Maurseth, Jerome A	1974
Maurseth, Vicky J	1974
Mausshardt, Charles	1983
Mausshardt, Denise Ann	1983
McBride, Gregory C	1975

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McCleary, Ronnie Neil	1973
McLaughlin, Ellen Couvillion	1989
McLaughlin, Matthew Kevin	1992
Meeks, Robert F	1987
Messmer, Kevin Michael	1988
Mike, Robar Thomas	1999
Miller, Gretchen Rose	2002
Miller, Ryan James	2009
Mills, Andy Ray	1989
Mitchell, John W.	1983
Moynihan, Kristen Louise	2007
Nagawiecki, Amy Lynn	1984
Nagawiecki, Gregory Edwin	1984
Nierengarten, John A	1970
Nolde, Keith A	1974
Novak, Stanley Frank	1986
Olmstead, Randall David	1985
Olmstead, Sheila M	1985
Omohundro, Warren C	1975
Ortbals, Robert J	1978
Ortiz, Pedro Julio	1983
Ott, James W	1975
Ott, Mary A	1977
Pace, Gary Glen	1984
Panapakkam, Anitha	1994
Pankey, Tina Marie	2006
Parish, Melissa Kae	2005
Parish, Ryan Joseph	2005
Parrett, Alan V	1984
Parrett, Minh T	1979
Parthasarathy, Murali	1995
Pickler, Diane	1986
Pickler, Lance W	1985
Pile, Thomas N	1979
Post, Mark K	1978
Pryor, Gary Alan	1995
Puhl, Joseph Albert	1982
Puhl, Lisa Joan	1982
Queern, John Kneedler	1981
Rafferty, Patrick V	1975

Rainey, Karen Lynn	1998
Randall, Harvey G	1974
Reed, Danny A	1978
Rehkop, Thomas G	1974
Reinhardt, James Gerard	1986
Ressler, James Louis	1986
Reunert, Philip Peter	1984
Richesson, Jennifer Jo	1994
Robertson, Kevin Dale	1997
Rose, Jeffrey L	1975
Santos, Carmela	1996
Schafale, Richard G	1973
Schaper, Gary E	1993
Schroeder, Curtis Michael	1988
Schuehler, David Vincent	1993
Schuessler, Dawn E	1974
Schuessler, Richard B	1972
Serban, Cristina	1993
Settle, Benjamin A	1983
Shaffer, Russell C	1969
Shi, Yuning	2000
Simon, Dennis M	1976
Simon, Kimberly M	1976
Simpson, John Lawrence	1997
Sims, Clayton Boyd	1985
Sinn, Elizabeth A	1976
Sinn, Larry F	1975
Sisko, Bruce Peter	1987
Smith, Paul Thomas	1984
Sorrell, David A	1979
Sorrell, Karen R	1980
Spors, Richard E	1968
Spradlin, Charles	1983
St. John, Charlotte Rose	2009
Stahl, Joseph W	1969
Stanley, Denise W.	1984
Steffan, Michael Roy	1969
Swisher, Dean O	1970
Taylor, Charles Ray	1973
Thoenen, James Joseph	2001

Thorsell, Carl W	1969
Timm, Gary A	1980
Treptow, Eric B	1981
Turley, Erica Lee	1995
Turley, Matthew Linwood	1992
Turner, Sherry L	1985
Umstead, Christopher	1985
Van De Mark, Michelle	2006
Vandergriff, Matthew Wayne	1998
Veden, Leonard S	1973
Vora, Chetan Bharat	1997
Wacker, Robert C	1977
Walker, John	1977
Walker, Rhonda A	1977
Wegman, John L	1975
White, James J	1974
Wieberg, Peggy A	1986
Wilkins, Arthur T	1978
Wolters, David J	1970
Work, Paul R	1990
Workman, J. Douglas	1971
Woytus, John Martin	1987
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Zenor, John J	1963



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Babb, Elaine Ye-Ling	1986
Backer, Brian David	1985
Bailey, Wayne P	1976
Bardsley, Jeannine M	1983
Beckmeyer, Margy A	1973
Bevans, Judy Kay	1985
Boecker, Mark S	1974
Bollinger, Terry B	1977
Bousman, W. Thomas	1968
Brandon, Dwight W	1983
Bremehr, Dan	1983
Brewer, David W	1969
Britson, Wayne Allan	1984
Brown, John M	1985
Bruhn, Kurtis Matthew	1987
Brune, William K	1973
Bryson, Dale M	1970
Burke, Terence Michael	1995
Cape, David Andrew	2006
Chen, Emy A-Mei	1974
Chrisman, George F	1969
Codespoti, Daniel J	1974
Cook, Thomas Edward	1985
Cox, Steven George	1998
Crane, Lynn Anne	1984
Crume, James L	1981
Danner, Mary B	1973
DePauw, Thomas J	1973
Demieville, Cory Alan	2006
Dodson, Christine	1984
Doerr, Jerry W	1967
Drake, Sandra Jo	1993
Dupont, Steven J	1974

Dvorak, Anthony Scott	2008
Eaton, William A	1970
Ellis, Michael E	1976
Fellows, William Joseph	1998
Fieseler, Wayne G	1981
Finrock, Don C	1968
Fischer, Thomas W	1976
Folta, Joseph E	1976
Ford, Raymond F	1970
Freese, Asher Dean	2003
Gaitros, Donald L	1966
Galper, Larry B	
Ganofsky, John R	1978
Gavin, James Douglas	1987
Geigel, Christopher	2000
Gentry, Timothy W	1977
George, John Scott	1972
Goertzen, Patrick H	1982
Graham, David Brian	1983
Graves, Kyle Eugene	1991
Hall, Allyson Taylor	1997
Hearst, Dale M.	1972
Herman, Bradley S	1981
Hicks, Richard Jay	1989
Hilleary, Alexander L	1976
Hilliard, Anthony Wayne	2000
Hock, John R	1982
Hoelscher, John C	1972
Huff, Donald Leroy	1993
James, David Loren	1985
Jeffries, Matthew S	1985
Jones, David S	1964
Jones, Roger M	1971
Kammer, Sally A	1991
Keep, Andrew William	1999
Kerns, Randy G	1974
Klemmer, Susan H	1966
Krupa, Andrea L	
Lang, Elizabeth A	1981
Lenz, Richard G	1974

Lietz, Carol Ann	1982
Lindsey, Regulah M	1982
Loesch, Janet L	1980
Loesch, Terry L	1980
Lorenzen, Stanley D	1975
Madras, Mark J	1978
Magee, Michael W	1978
Maxwell, Shonie	1994
McClanahan, Ronald D	1977
McClenning, John C.	1991
McMahon, Thomas	1995
McMillin, Bruce	
Meier, Curtis P	1983
Menke, Elaine A	1973
Menkel, Phillip Louis	1998
Mersinger, Rozann P	1981
Miller, Joseph Earl	2003
Montague, Michael W	1973
Muldoon, Mary Ellen	1991
Nau, Steven N	1970
Nekorchuk, Russell L	1970
Newcomer, John	1989
Nichols, Byron K	1973
Oellig, Galen R	1988
Oldroyd, Juanice E	1983
Owensby, Roger Wayne	1986
Phillips, William Anthony	1993
Phipps, Neil Alan	2001
Piper, Timothy Edward	1996
Potzmann, Kim J	1970
Randall, Adonica D	1975
Randazzo, Vincent A	1989
Reed, Danny A	1978
Reinhardt, Mary Jane	1986
Rider, Adam Clinton	1993
Roth, Michael G	1972
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Sigman, Scott Lee	1999
Sinn, Elizabeth A	1976
Sinn, Larry F	1975
Smith, Brian Lynn	1987
Smith, Houstin G	1981
Smith, Johanna Marie	1985
Smith, Neil S	1968
Smith, Todd Walker	1985
Snow, Bruce Floyd	1977
Squires Foelsch, Karen	1989
St. Clair, Mrs. Daniel (Jean)	1975
Stanek, Craig Steven	2004
Stark, John Evan	1989
Steffan, Cheryl A	1969
Stein, Michael S	1986
Stocking, Terry Lee	1989
Stone, John Edward	1994
Sullivan, Kevin Dennis	1995
Szygenda, Ralph James	1970
Tadda, George P	1989
Tang, Cynthia	1985
Taylor, Robert P	1987
Taylor, Timothy Topper	1987
Thompson, Ralph J	1969
Thornton, Jeffrey A	1980
Toombs, Howard L	1976
Trampe, Michael Ronald	1993
Vahle, Michael O	1971
Walker, Joseph D	1974
Wasleski, Steven Francis	1987
Watson, Lowell R	1979
Watson-Hajjar, Susan	1983
Wickey-Spence, Janet	1985
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Computer Science alumni pledged \$40,080 and the department received \$7,790 at the time of calling for a total of \$47,870 in gifts during the 2009-2010 fiscal year. ***Thank you for your generosity!*** We used your support last year to fund scholarships to undergraduate students. ***The students are the real beneficiaries of your phonathon gifts.*** Your gifts provide scholarship support, new laboratory equipment, new faculty development, and student activities. Your support makes a big difference on my ability to say yes to the students. This year, we will begin calling our alumni on March 15. When the phone rings, please take a moment to share some of your Rolla experiences with a current student, and say, "Yes," when asked for a pledge. Taxpayer support accounts for less than 30 percent of the university's revenue, making your contribution a vital ingredient in the revenue pie. ***Your gift continues to matter very much!*** Private funding helps distinguish Missouri S&T from other universities, increasing the value of our education. Any amount you give will be appreciated, and most importantly, your participation will help make us a leader in alumni giving among public universities.

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