

DEPARTMENT OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE

EECS NEWS



2007

THE UNIVERSITY OF KANSAS

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Cover Photo

Student Ambassadors promote the School of Engineering to prospective students by giving tours of Eaton Hall, leading student panel discussions, and building relationships with future Jayhawks. EECS Student Ambassadors Jamie Hines, Heather Owens, and Ankit Agarwal are in ascending order on the right side of the Jayhawk while James Waymire, Adam Chura, and Tom Dorsey are on the left.

Cover Design by Janene Synder

Cover Photo by Jill Hummels

EECS News

All EECS newsletters are available on the EECS Web site, www.eecs.ku.edu, with links for additional information.

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On behalf of the students, faculty, and staff of the Department of Electrical Engineering and Computer Science (EECS) at the University of Kansas, I am pleased to present to you our 2007 newsletter.

Perspective



Costas Tsatsoulis,
EECS Chair

This past year has been one of superlatives. In FY 2007, our research reached its greatest volume to date with expenditures of over \$7.3 million, 33% more than just two years ago. This increase in research activities has allowed us to expand our Ph.D. program. In Fall 2007, we had 70 Ph.D. students enrolled in our program, which makes it the largest class of EECS doctoral candidates.

In the research section, we highlight multiple awards from the National Science Foundation (NSF) and National Institutes of Health (NIH). Additionally, industry has sought out our innovative radio frequency identification (RFID) system, known as the KU-Tag. We also profile our growing computer systems design (CSD) laboratory, specifically research in embedded systems.

Formally named a focus area in 2004, CSD is thriving. Accordingly, we have hired a new faculty member who specializes in computer systems design. Dr. [Prasad Kulkarni](#) joined EECS in the Fall of 2007 after receiving his Ph.D. in

Computer Science from Florida State University. His research area encompasses compilers, virtual machines, and hardware/software co-design.

With the addition of Dr. Kulkarni, we now have 39 tenure-track faculty slots, the highest number in the Department's history. We are actively searching for six more faculty members, in disciplines ranging from bioinformatics to electromagnetics.

EECS faculty and student accomplishments further illustrate our banner year. Dr. [Ron Hui](#) continues serving as an NSF program manager. He is the fifth EECS faculty member to direct a federal program. Dr. [Jim Stiles](#) received a W.T. Kemper Fellowship for Teaching Excellence, the most prestigious teaching award given by KU. Dr. Stiles is the sixth EECS faculty member to receive the Kemper Award! Our undergraduate students captured "Best in Show" at the EXPO for the sixth time in seven years. EECS students also won the Cerner Corporation's Software Design Competition, in which they competed against universities from across the Midwest.

Most of the student activities, awards, and scholarships are financed by donations from our alumni. The newsletter has an Endowment form that will enable you to contribute to the Department and its many activities.

As we enter 2008, I am enthusiastic about the path we are following. EECS continues to offer excellent undergraduate and graduate education to our outstanding students. We have well-respected faculty and a vibrant research program. By adding facilities and faculty, the Department is expanding in new and exciting areas. I am confident that we are positioning ourselves to continue excelling in the classroom and the laboratory. ■

A handwritten signature in black ink, appearing to read "C. Tsatsoulis". The signature is written in a cursive, flowing style.

EECS Sums Up FY 2007

Undergraduate students

| | |
|------------------------|-----|
| Electrical Engineering | 129 |
| Computer Engineering | 108 |
| Computer Science | 165 |

402

Masters students

| | |
|------------------------|----|
| Electrical Engineering | 72 |
| Computer Engineering | 14 |
| Computer Science | 52 |
| Information Technology | 21 |

159

Ph.D. students

| | |
|------------------------|----|
| Electrical Engineering | 24 |
| Computer Science | 46 |

70

Bachelor degrees awarded

| | |
|------------------------|----|
| Electrical Engineering | 25 |
| Computer Engineering | 13 |
| Computer Science | 32 |

70

Masters degrees awarded

| | |
|------------------------|----|
| Electrical Engineering | 16 |
| Computer Engineering | 10 |
| Computer Science | 28 |

54

Ph.D. degrees awarded

| | |
|------------------------|---|
| Electrical Engineering | 4 |
| Computer Science | 2 |

6

Tenure Track Faculty

39

Research Expenditures

\$7,370,584

EECS Distinguished Professor and ITTC Director Victor Frost (left) explains the KU-Tag to FCC Commissioner Michael Copps. Copps learned about EECS research and toured ITTC after he spoke at the Rural Broadband Round Table Summit held at KU this summer.

Garmin Establishes Merit-Based Scholar Program

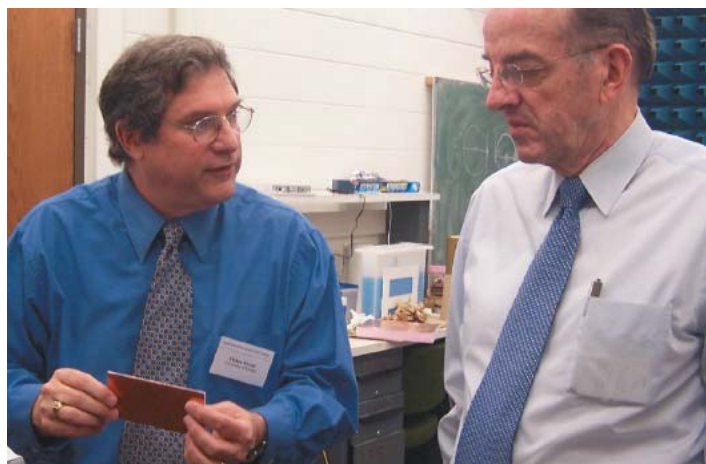
A long-time supporter of EECS, [Garmin International](#) has created the Garmin Scholar Program. Scholars will receive \$5,000 per year up to four years of undergraduate study provided they continue to satisfy scholarship criteria.

Starting in the fall of 2008, the program will award 15 scholarships.

All students, including international students and current scholarship holders, who meet the criteria are eligible.

Applicants must be electrical engineering or computer engineering majors. Current KU students need a minimum 3.8 cumulative GPA. Incoming freshmen must have minimum composite and mathematics ACT scores of 30 and 32, respectively, and a high school GPA of at least 3.8.

A leader in global positioning system (GPS) technology, Garmin has donated GPS receivers and equipment to EECS. Garmin also employs many EECS graduates at its world headquarters in Olathe, Kansas. ■



Information Assurance Courses Earn Recognition from Federal Government

The Department received federal certification for its information assurance (IA) curriculum. By successfully mapping EECS courses to government standards, the Department ensures that specific security concepts and practices are being taught. IA methods safeguard data and information systems that are critical to commercial, military, and intelligence activities.

EECS Distinguished Professor and KU Director of Research Information Technology [Joseph Evans](#) led the application process for designation from the Information Assurance Courseware Evaluation (IACE) program. Chaired by the Department of Defense and the Department of Homeland Security, the Committee on National Security Systems (CNSS) establishes the national IA standards.

IACE certified EECS for standards 4011 and 4013: the National Training Standard for Information Systems Security (INFOSEC) Professionals and the National Information Assurance Training Standard for System Administrators, respectively. ■

New Members Join EECS Industry Advisory Board



Photo by Jill Hummels

[Tim Johnson](#), [Leon Lake](#), [Farzad Tari](#) and [Ben Vos](#) are the newest members of the EECS Advisory Board, which helps guide the Department's educational and research initiatives. The Board is comprised of leaders in electronics and information technologies.

Front Row (From Left to Right): [Farzad Tari](#), Secure Computing Corporation; [Tim Johnson](#), Garmin International, Inc.; and [Leon Lake](#), Lockheed-Martin

Back Row (From Left to Right): [Ben Vos](#), Sprint; [Jeff Fuller](#), Honeywell FM&T/KCP; [Steve Ciccarelli](#), Qualcomm; [George Frazier](#), Cadence Design Systems; and [Mike Sobek](#), StoreFinancial ■



Joseph Evans, EECS distinguished professor and KU director of research information technology, examines a student's progress in class. Evans spearheaded the process of gaining federal certification for the EECS information assurance (IA) curriculum.

Photo Courtesy of University Relations

Industry Licenses New KU~Tag to Track Assets

Among a myriad of applications, radio frequency identification (RFID) systems can track assets in offices, warehouses, hospitals, and throughout supply chains. Such transparency allows organizations to more accurately and efficiently monitor their resources.

A RFID tag consists of a microchip with an antenna that “listens” for a radio query from an electronic reader. The tag then transmits its unique ID code and other information contained on the microchip. Deemed the next generation bar code, multiple tags can be scanned simultaneously over longer distances without readers needing to “see” the tags—advantages RFID has over traditional bar codes.

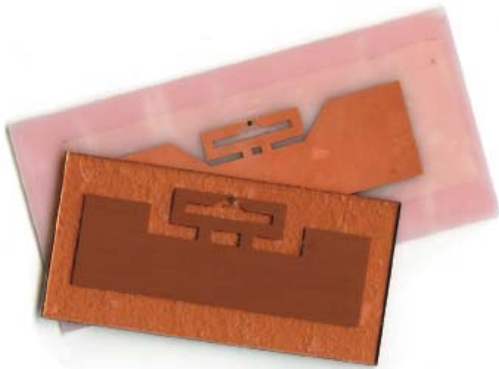
However, when RFID tags are placed on or near metal or liquids, performance degrades to the point where tags are no longer usable. Metals and liquids interfere with the operation of RFID tag antennas. ITTC Research Assistant Professor [Dan Deavours](#) developed the KU-Tag to solve this problem. It is one of the best-performing, least costly, and thinnest RFID systems specifically designed to work on metal or objects containing liquid.

“The KU-Tag provides a long-needed solution to the RFID industry,” says [Toby Rush](#), president of Rush Tracking Systems, an RFID systems integrator.



Dan Deavours, ITTC research assistant professor, explains the KU-Tag that he developed. The system is one of the best-performing, thinnest, and least costly radio frequency identification (RFID) tags specifically designed to work near metal or liquids.

Photo Courtesy of University Relations



Two prototypes of the KU-Tag are shown above. The tags will more accurately and efficiently monitor assets.

Photo by Megan E. Gannon

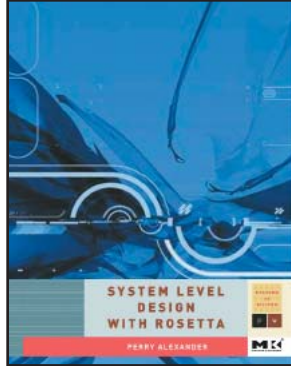
Two companies licensed the KU-Tag this spring. In March, Container Technology,

Inc., obtained the tag to improve monitoring of its liquid containers. The following month, Kansas City-based Starport Technologies, LLC, bought the right to manufacture and market the KU-Tag system. Starport recently signed a contract to produce 30,000 tags for a Fortune 500 company.

“The KU-Tag is another important tool in our expanding range of RFID solutions,” says [Jeff Nedblake](#), managing partner of Starport Technologies. “ITTC researchers found an innovative solution to address the metal/liquid problem, which is a common problem we keep hearing from customers.” ■

Faculty Achievements

EECS Professor [Perry Alexander](#) has written the textbook *System-Level Design With Rosetta*, published by Morgan Kaufmann. The book examines clear code examples and case studies of the system-level design language. A review of the book by *Electronic Design* can be found online at www.elecdesign.com/Articles/ArticleID/14417/.



EECS Distinguished Professor and KU's Director of Research Information Technology [Joseph Evans](#)' research was featured in the April 16, 2007, issue of *ComputerWorld* magazine. The article, "Future Watch: Wireless Wises Up," highlights Evans' development of wireless communication protocols for cognitive networks (CogNet).

The New America Foundation, a non-profit, non-partisan think tank, commissioned [Joseph Evans](#) to conduct a feasibility study on unlicensed devices operating in TV bands. This spring New America cited the study in comments submitted to the Federal Communications Commission's Proceedings on Unlicensed Operation in the TV Broadcast Bands.

The study, "Quantifying the Impact of Unlicensed Devices on Digital TV Receivers," can be found at www.newamerica.net/files/NAF%20Spectrum%20Technical%20Report%20_FINALSUBMITTED_0.pdf.

EECS Associate Professor [James Sterbenz](#) was selected as an IEEE Communications Society (ComSoc) Distinguished Lecturer. The Distinguished Lecturer Program (DLP) funds speaking tours, greatly increasing the number of technical experts accessible to local IEEE chapters around the world.

In the fall of 2007, the University of Kansas promoted [Ron Hui](#) to full professor. Hui joined EECS in 1997 as an assistant professor and was promoted to an associate professor in 2002. His innovative research has led to four U.S. patents. Additionally, Hui continues directing the National Science Foundation's Photonics and Device Technologies Program.

The Harry Talley Excellence in Teaching Award was given to EECS Professor [David Petr](#) at the EECS Banquet in May. Graduating seniors vote on the EECS faculty member who has contributed significantly to their education and developed a strong rapport with students. This is the second time for Petr to win the award.

Petr's previous awards include the W.T. Kemper Fellowship for Teaching Excellence and the Sharp Teaching Professorship.

In May, EECS Professor [Chris Allen](#) earned a KU Center for Teaching Excellence award for his graduate teaching. Allen's past awards include the Kemper Fellowship and the Sharp Teaching Professorship.



EECS Professor Chris Allen explains the answer to a radar systems problem to students. He won a 2007 KU Center for Teaching Excellence award.

Photo Courtesy of University Relations

Continued on Page 8

Continued from Page 7

EECS Professor [Jim Roberts](#) received a Distinguished Service Award for University Outreach and Continuing Education from KU Continuing Education in April. This spring he also was elected treasurer and member of the Board of Directors Executive Committee of the National Institute for Pharmaceutical Technology and Education, Inc. (NIPTE).

At the beginning of the 2007 fall semester, EECS Associate Professor [Jim Stiles](#) received a visit from the "Surprise Patrol." KU officials, including Chancellor [Robert Hemenway](#) and Provost and Executive Vice Chancellor [Richard Lariviere](#), presented Stiles and 19 others with W.T. Kemper Fellowships for Teaching Excellence and \$5,000 checks. A committee of KU students, faculty, and alumni selects the winners.

Stiles has earned two Harry Talley Excellence in Teaching Awards (2004 and 2000), which are voted upon by graduating EECS seniors. Stiles also garnered an Excellence in Teaching Award from KU's Center for Teaching Excellence in 2000.

Since 2001, EECS Professors [Perry Alexander](#), [Chris Allen](#), [Jerzy Gryzmala-Busse](#), and [David Petr](#) have won prestigious Kemper Fellowships.



EECS Associate Professor Jim Stiles (left) accepts congratulations from Provost and Executive Vice Chancellor Richard Lariviere. Stiles was surprised with a Kemper Fellowship for Teaching Excellence in the fall.

Photo Courtesy of University Relations



EECS graduate student Prashanth Chandran (left) and EECS Assistant Professor Erik Perrins pose next to the sign that announces Chandran's second-place finish in the graduate student division at the International Telemetering Conference (ITC) 2007.

[Erik Perrins](#), EECS assistant professor, was elected a senior member of IEEE. IEEE is the world's leading professional association for the advancement of technology. He was also asked to serve as an editor for IEEE Transactions on Communications. He will review articles within his area of expertise, modulation and signal design.

Additionally, Perrins' graduate student [Prashanth Chandran](#) won second place in the student paper contest at the International Telemetering Conference. (See above picture) Chandran's paper, "Symbol Timing Recovery for SOQPSK," examined research he conducted under the direction of Perrins.

EECS Chair and Professor [Costas Tsatsoulis](#) served as chair person of the Midwest Section of the American Society for Engineering Education (ASEE). Founded in 1893, ASEE is a nonprofit organization of individuals and institutions committed to furthering education in engineering and engineering technology. The Midwest Section of ASEE includes universities in Arkansas, Kansas, Missouri, Nebraska, and Oklahoma. ■

Chen Receives Prestigious NSF CAREER Award

EECS Assistant Professor [Xue-Wen Chen](#) earned a Faculty Early Career Development (CAREER) award from the National Science Foundation (NSF). The five-year award is the highest NSF honor given to new faculty. Recipients are selected based on the integration of research and education in their career development plans.

The CAREER program supports the early development of teachers and scholars who are likely to become academic leaders of the 21st century.

Chen is helping provide life-sciences researchers with an unprecedented “big picture” view of humans’ internal processes. Chen extracts patterns from massive biological data sets by using classification, statistical modeling, and other tools to create machine learning methods (MLMs). The efficiency and effectiveness of the advanced algorithms improve as MLMs “learn” from experience and observations.

MLMs have various applications within life sciences such as understanding genetic regulatory networks. In effect, genes have “on/off” switches, and life-sciences research examines what initially triggers these switches and how altered genes affect other molecules. For example with cancer, cells in tissues divide and grow without the usual controls on cell death and cell division. Chen is developing software that can help in the early detection of cancer. Additionally, he is developing technology to identify biomarkers, which are measured to detect a disease or to monitor the effects of treatment. EECS researchers will develop user-friendly software for applications within life sciences.

The NSF award gives Chen additional opportunities to provide EECS student research assistants with special training in bioinformatics. Before receiving the award, Chen created new EECS graduate courses in machine learning, protein bioinformatics, and statistical learning: Bayesian approach. ■



EECS Assistant Professor Xue-Wen Chen questions a student during a seminar presentation. He recently won an elite NSF CAREER award.

Gauches Leave University

In the spring, [Susan Gauch](#) accepted a position as Department Head and Rodger S. Kline Endowed Chair in Computer Science and Computer Engineering at the University of Arkansas. [John Gauch](#) accepted a position as professor in the same department. The Gauches had been at KU since 1993. ■

Faculty Spotlight

Meet Dr. Prasad Kulkarni, EECS Assistant Professor

What brought you to KU?

I came to KU mainly because of my dual interest in research and teaching. Also, it is a great University. When I came here for my interview, I talked to the faculty, and they seemed really nice.

Can you describe a specific challenge and how you overcame it?

Research problems crop up, and the solutions you have planned do not work out. This is my main challenge. Research is quite a bit of self motivation. When things do not work out, you tend to get frustrated. It is a major challenge to keep your motivation up, and keep faith in yourself and your research.

How do you keep your motivation?

I just keep working at it. I read and think about the problem. Talk to other researchers about it. Students should see what their advisor thinks about where their research is going. And I hope things work out.

Describe a typical day.

On a typical working day if I am not teaching in the morning, I will read papers and work on research problems. I will write down ideas. It is important to write down your ideas because you will forget them. If I am teaching, it is preparing course work and slides.

Can you think of any highlights you have had during your short time at KU?

I really like the town. Work wise, the Department is a highlight. The faculty has greeted me warmly, and EECS faculty members conduct outstanding research.

Tell us a little bit about your research.

My research is mainly in compilers, computer architecture, and embedded systems. Right now, I am just starting my research here. I think it will move more towards virtual machines and hardware/software codesign. ■



Arrived at KU: 2007

Ph.D.: Computer Science, Florida State University, 2007

Research: Compilers, Embedded Systems

Photo by Janene Snyder

EECS Faculty

2007-2008

ARVIN AGAH

Associate Professor and
Associate Chair for Graduate
Studies

Teaches: Artificial Intelligence,
Software Engineering, and Robotics

Ph.D., Computer Science, University
of Southern California, 1994



PERRY ALEXANDER

Professor

Teaches: Digital Systems Design,
Programming Language Semantics,
Formal Methods, and Compilers

Ph.D., Electrical Engineering,
University of Kansas, 1992



CHRISTOPHER ALLEN

Professor

Teaches: Electronic Circuits,
High-Speed Digital Circuit Design,
Microwave Remote Sensing, and
Radar Systems

Ph.D., Electrical Engineering,
University of Kansas, 1984



DAVID ANDREWS

Professor

Teaches: Computer Architecture,
Digital Designs, Embedded and Real-
Time Systems, and Reconfigurable
Computing

Ph.D., Computer Science,
Syracuse University, 1992



SHANNON BLUNT

Assistant Professor

Teaches: Digital Signal Processing
and Detection and Estimation Theory

Ph.D., Electrical Engineering,
University of Missouri, 2002



FRANK BROWN

Associate Professor

Teaches: Artificial Intelligence and
Programming Languages

Ph.D., Intelligientia Artificiosa,
University of Edinburgh, 1978



SWAPAN CHAKRABARTI

Associate Professor

Teaches: Digital Logic Design,
Microcomputer Applications,
Computer Architecture, and Neural
Networks and Fuzzy Systems

Ph.D., Electrical Engineering,
University of Nebraska, 1986



XUE-WEN CHEN

Assistant Professor

Teaches: Machine Learning,
Bioinformatics, and Statistical
Learning

Ph.D., Electrical & Computer
Engineering, Carnegie Mellon
University, 2001



PROFESSOR ANDREWS' RESEARCH
IS FEATURED ON PAGE 26 IN THE
COMPUTER SYSTEMS DESIGN
ARTICLE.

TERRY CLARK

Assistant Professor

Teaches: Bioinformatics,
Scientific Parallel Computing,
Computational Genomics, and
Compiler Construction

Ph.D., Computer Science,
University of Houston, 1996



KENNETH DEMAREST

Professor

Teaches: Circuits,
Electromagnetics, Fiber-Optic
Engineering, Microwave Systems,
Noise Reduction, Antennas, and
Radar Engineering

Ph.D., Electrical Engineering,
Ohio State University, 1980



JOSEPH EVANS

Deane E. Ackers

Distinguished Professor and
KU Director of Research
Information Technology

Teaches: Network Systems and
Internet Routing

Ph.D., Electrical Engineering,
Princeton University, 1989



VICTOR FROST

Dan F. Servey Distinguished
Professor and Director of
ITTC

Teaches: Communications and
Optical Networks, Signal Analysis,
and Communications Systems

Ph.D., Electrical Engineering,
University of Kansas, 1982



PRASAD GOGINENI

Deane E. Ackers Distinguished
Professor and Director of
CReSIS

Teaches: Electromagnetics,
Advanced Microwave Devices, and
Microwave Engineering

Ph.D., Electrical Engineering,
University of Kansas, 1984



JERZY GRZYMALA-BUSSE

Professor

Teaches: Data Mining, Expert
Systems, and Computer Architecture
and Organization

Ph.D., Engineering, Technical
University of Poznan, Poland, 1969



JUN HUAN

Assistant Professor

Teaches: Bioinformatics and
Mining Biological Data

Ph.D., Computer Science,
University of North Carolina, 2006



RONGQING HUI

Professor

Teaches: Microelectronic Circuits
I & II, Fiber-Optic Communications,
Advanced Optical Communications,
and Fiber-Optic Measurements and
Sensors

Ph.D., Electrical Engineering,
Politecnico di Torino, Italy, 1993



NANCY KINNERSLEY

Associate Professor

Teaches: Discrete Mathematics,
Data Structures, Formal Language
Theory, and Theory of Computing

Ph.D., Computer Science,
Washington State University, 1989



MAN KONG

Associate Professor

Teaches: Data Structures, Analysis
of Algorithms, Graph Algorithms, and
Programming Language Constructs

Ph.D., Computer Science,
University of Nebraska, 1986



PRASAD KULKARNI

Assistant Professor

Teaches: Computer Systems,
Compilers, and Virtual Machines

Ph.D., Computer Science, Florida
State University, 2007



CARLTON LEUSCHEN

Assistant Professor

Teaches: Electronic Circuits, Radar
Systems, and Remote Sensing

Ph.D., Electrical Engineering,
University of Kansas, 2001



JAMES MILLER

Associate Professor

Teaches: Programming I & II,
Introduction to Computer Graphics,
Advanced Computer Graphics,
Geometric Modeling, and
Visualization

Ph.D., Computer Science, Purdue University, 1979



GARY MINDEN

Professor

Teaches: Digital Systems Design,
Computer Architecture, and
Computer Engineering System
Design

Ph.D., Electrical Engineering,
University of Kansas, 1982



DOUGLAS NIEHAUS

Associate Professor

Teaches: Real-Time Systems,
Operating Systems, Software
Engineering, and Distributed
Systems

Ph.D., Computer Science,
University of Massachusetts, 1994



ERIK PERRINS

Assistant Professor

Teaches: Error Control Coding,
Digital Communications, Signals
and Systems, and Probability and
Statistics

Ph.D., Electrical Engineering/
Communication Theory,
Brigham Young University, 2005



DAVE PETR

Professor and Associate Chair
for Undergraduate Studies

Teaches: Circuit Analysis, Signals
and Systems, Communications,
Random Processes, Network
Performance Analysis, and
Optimization

Ph.D., Electrical Engineering,
University of Kansas, 1990



GLENN PRESCOTT

Professor

Teaches: Digital Signal Processing, Digital Communications, Electronic Design, Modulation and Coding, and Linear Systems

Ph.D., Electrical Engineering, Georgia Tech, 1984



JAMES ROBERTS

Professor

Teaches: Digital Communications, Information Theory and Coding, Wireless Communications, Detection and Estimation Theory, and Electromagnetics

Ph.D., Electrical Engineering, Santa Clara University, 1979



JAMES ROWLAND

Professor

Teaches: Control Systems, Circuits, and Probability and Statistics

Ph.D., Electrical Engineering, Purdue University, 1966



HOSSEIN SAIEDIAN

Professor and Associate Chair for Edwards Campus

Teaches: Information Security and Assurance and Software Quality Assurance

Ph.D., Computing and Information Sciences, Kansas State University, 1989



SAM SHANMUGAN

AT&T Distinguished Professor

Teaches: Wireless Communication Systems, Random Signals, Detection and Estimation, and Signals and Systems

Ph.D., Electrical Engineering, Oklahoma State University, 1970



JAMES STERBENZ

Associate Professor

Teaches: Resilient and Survivable Networking, Mobile Wireless Networking, and High-Performance Networking

D.Sc., Computer Science, Washington University, 1991



JAMES STILES

Associate Professor

Teaches: Electromagnetics, Electronic Circuits, Microwave Engineering, and Radio and Radar Systems

Ph.D., Electrical Engineering, University of Michigan, 1995



COSTAS TSATSOULIS

Professor and Chair

Teaches: Multiagent Systems, Artificial Intelligence, Knowledge-Based Systems, and Introduction to Database Systems

Ph.D., Electrical Engineering, Purdue University, 1987



EECS Banquet Awards

The following students were honored at the 2007 EECS Banquet on May 10.

Richard K. & Wilma S. Moore Thesis Award

This award is given in honor of Richard Moore, EECS distinguished professor emeritus. The best M.S. thesis and Ph.D. dissertation earn the honor. Presented to: [Jordan Guffey](#) (master's) and [John Paden](#) (Ph.D.)

Ellermeier Memorial Award

Robert Ellermeier was a former EE faculty member and associate dean of the Graduate School. A nontraditional student with outstanding scholastic achievement is the recipient of the award. First consideration is given to an EECS undergraduate student, then to an EECS graduate student, and then to students in other Engineering departments. Presented to: [Tyrian Phagan](#)

Everitt Awards

The International Engineering Consortium sponsors the Everitt Awards. The Awards are reserved for seniors majoring in EECS who are in the top 10 percent of their class. Winners must be interested in communications and computers and be active in outside activities. Presented to: [Ryan Hogan](#) and [Travis Case](#)

Paul F. Huebner Memorial Awards

Paul Huebner was a KU graduate with a B.S. in accounting, concentrating in computer science, and a M.S. in computer science. The award is offered to teaching assistants who best exemplify the role of a teacher. It is intended not only to reward good teaching but also to encourage students to consider teaching as a career. Presented to: [Matthew Jones](#), [Jonathan Kensler](#), [Benjamin Ewy](#), [Mei Liu](#), and [Alexander Senf](#)

Rummer Design Awards

Professor Emeritus Dale Rummer's dedication to engineering design was the impetus for this award. The awards are given for outstanding work done by senior students in the capstone design courses in electrical engineering and computer engineering. Presented to: [Woods Denny](#) and [Chris Coonts](#) (EE) and [Travis Case](#), [Mark King](#), and [Randy Rucker](#) (CoE)

Outstanding Senior Academic Achievement Award

Based on overall outstanding achievement, the award is presented to one graduating senior in each of the three majors (computer science, computer engineering, and electrical engineering). Presented to: [Joel Van Eenwyk](#) (CS), [Steven Tenny](#) (CoE), and [Cameron Lewis](#) (EE) ■



Moore award winner and Ph.D. student John Paden explains his radar research to a member of the KU Math and Science Center program. The program offers college preparatory activities for potential first-generation college students and/or low-income students. EECS students often have opportunities to conduct educational outreach.

Pierce Wins Poster Contest



Photo by Jill Hummels

In November 2006, [Levi Pierce](#) earned first place in the master's division of the KU Graduate Engineering Association (GEA) Research Poster Competition. In the above picture, Pierce is describing his poster, "Determining Contiguous Regions of DNA Response in Nucleosomes as a Foundation for a Computational Model," to a participant. The poster highlighted his research with EECS Assistant Professor [Terry Clark](#). ■

Robb Funds Support Travel

The goal of the David D. and Mildred H. Robb fund is to expose EECS graduate students to new, innovative ideas on the KU campus and elsewhere, with preference given to paper presentation, symposia, and seminar participation. All six Robb fund recipients presented papers at the conferences they attended.

[Pradeep Natarajan](#); 11th International Symposium on Robotics and Applications, Budapest, Hungary, July 2006.

[Rakesh Rajbanshi](#); Military Communications Conference, Washington, D.C., Oct. 2006.

[Afal Syed](#); IEEE International Conference on RFID, Grapevine, TX, March 2007.

[Rory Petty](#); IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN), Dublin, Ireland, April 2007.

[Ted Weidling](#); DySPAN, Dublin, April 2007.

[Sandhya Gabbur](#); 4th International Conference on Informatics in Control, Automation, and Robotics, Angers, France, May 2007. ■

Department Announces Scholarship Recipients

EECS presented \$166,170 in financial aid for the 2007-2008 academic year. These scholarships are generated from donations to KU Endowment that are specifically designated as EECS scholarship funds.

Deebu Abi, Samer Adra, Mohammed Alenazi, Joshua Allford, Saad Alnahedh, Earl Amerine, Joel Angelone, Austin Arnett, Evan Austin, [Matthew Beattie](#), Craig Berscheidt, Daniel Beuthien, Thomas Boettcher, Ramkumar Bommireddipalli, Matthew Booth, Henry Brown, Christopher K. Bubeck, [Thomas Carr](#), Matthew Casper, Julio Castillo-Rodriguez, Ryan Challacombe, Leung Chan, Michael Chatman, Cory Chermok, Kyler Colgrove, Matthew Cook, Michael Cribbs, [Gavin Davis](#), Patrick Dermeyer, Aaron Dickson, Thomas Dorsey, Devin Dougan, [Jacob Foiles](#), [Alvestegui Gomez Garcia](#), Margaret Grattan, Thomas Gregor, Morgan Grissum, Shannon Griswold, [Jesse Hall](#), Justin Hendricks, Marc Hess, Adam Hinkhouse, [Michael Jantz](#), James R. Johnson, [Ryan Kanoknukulchai](#), Karina Kervin, Ryan Kovar, Jason Kroge, Eric E. Kuch, [Melanie Luthi](#), Kristin Lynch, [Nicholas Mabry](#), Eric Meyer, Kristin Moody, Davis Morgan, Wesley Muessig, [Adam Nagle](#), Bowe Neuenschwander, Truc A. Nguyen, [Jacob Olson](#), Heather Owen, [Tyrian Phagan](#), Jorge Pizarro-Zapapa, Adam Powell, Stephen Prokopiak, Joel Pruett, Matthew Pruitt, [Kevin Quillen](#), [Arturo Ramos](#), Gino Rea Zanabria, Adam Riha, Lane Ryan, [Steven Sharp](#), Nathaniel Snyder, Venkatesh Sridhar, [David Tai](#), Zachary Taylor, Satyaurayayua Telikeypalli, Samuel Thompson, Ryan Trader, [Gideon Van De Liefvoort](#), Gianpierre Villagomez Saldana, [James Waymire](#), Brett Werling, Gregory Weseloh, John Wigner, Meizong Wu, [Matt Zeets](#), and Jeffrey Zila. ■

**Each name that begins a new letter is in blue.

Undergraduate Spotlight

Meet Heather Owen, EECS Senior

What are your tips for new students?

I would say get involved in your engineering major. Go to office hours and meet your professors, and find something fun outside of engineering that you like to do.

What is your fun thing to do?

Well, right now, I am taking two fun classes. I am taking basketball and kickboxing. I have one every day. They are great ways to relieve stress.

Can you describe a challenge that you encountered at KU and how you overcame it?

When I first came to KU, I had a little bit of trouble adjusting to being in college and being in a new situation. I think getting involved and meeting people through classes really helped me to get to know the School and the people here.

How did you become interested in EECS?

I really enjoyed math and physics in high school. I wanted to keep doing that, but I wanted to do something that was an application of math and physics. I decided to major in electrical engineering, and I have really liked it.

What has your overall experience as an EECS student been like?

The program is great here. You get a lot of hands-on experience with the labs. The teachers really care about the students and how we are doing. If you go and ask for help, there are tons of people who want to help. It is a part of a bigger university so you get all the fun sports teams that go along with it.

Will you be able to graduate in four years?

I came in with a lot of credit hours. I actually thought about graduating a semester early. I hope to be taking a few grad courses in the spring semester. I know it can be difficult to graduate in four years if you do not come in with any credit, but I think it is definitely doable.

Where's your favorite place to study?

On my bedroom floor.



Major: Electrical Engineering
Hometown: Leawood, Kansas
Anticipated Graduation: May 2008
Future Plans: Graduate School

Photo by Jill Hummels

EECS Designs Win in Cerner Competition

By Jill Hummels

In December 2006, EECS students earned first place in the Cerner Corporation Software Design Competition. KU students along with those from Kansas State University, the University of Iowa, and Purdue University presented software they had developed for a specialized PDA. The PDA would present, collect, and tie together patient information and other essential data needed by health care providers. Executives at the Kansas City-based health-care software development firm judged the semester-long projects.

EECS students [Samantha Cook](#), [John Heideman](#), [Jeff Unger](#), and [Jonathan VanEenwyk](#) received first place. Members of the winning team each received a PDA.

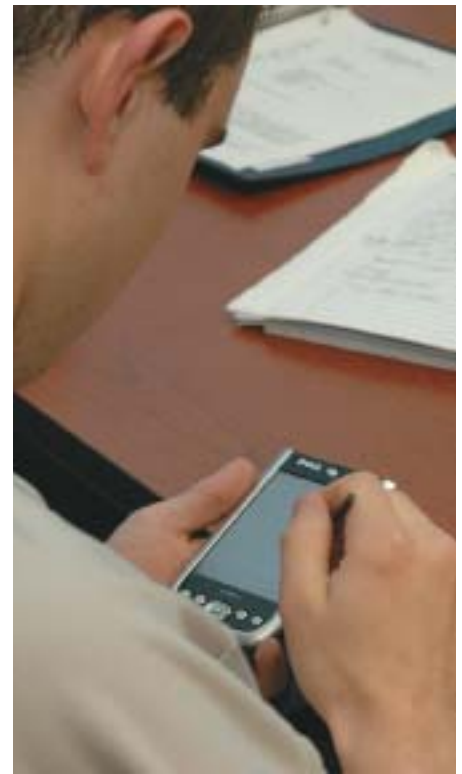
"The students did an outstanding job. I knew we had the potential to perform well in this challenge," says [Arvin Agah](#), EECS associate professor and instructor of the Software Development Lifecycle course. "From an engineering perspective, these are strong schools to compete against. All the students had to draw upon their best creative and technical skills in order to succeed."

Fourteen KU computer science and computer engineering students took part in the course, which employed a videoconference learning environment to connect students from the four universities with professionals at Cerner. The company provided each of the nine student teams with a PDA on which to build, test, and run their class project.

Just as in industry, students also learned the importance of planning.

"This course also teaches them project management," says Agah. "You can't be crisis driven. To be good, you have to plan."

According to [Stephen Smith](#), senior learning strategist with Cerner, Cerner's associates committed between 500 and 700 hours to developing and delivering the course, above and beyond their day-to-day responsibilities.



An EECS student tests software he developed on a PDA provided by Cerner. Teams developed software for a specialized PDA that would collect and present critical patient information.

Photo by Jill Hummels

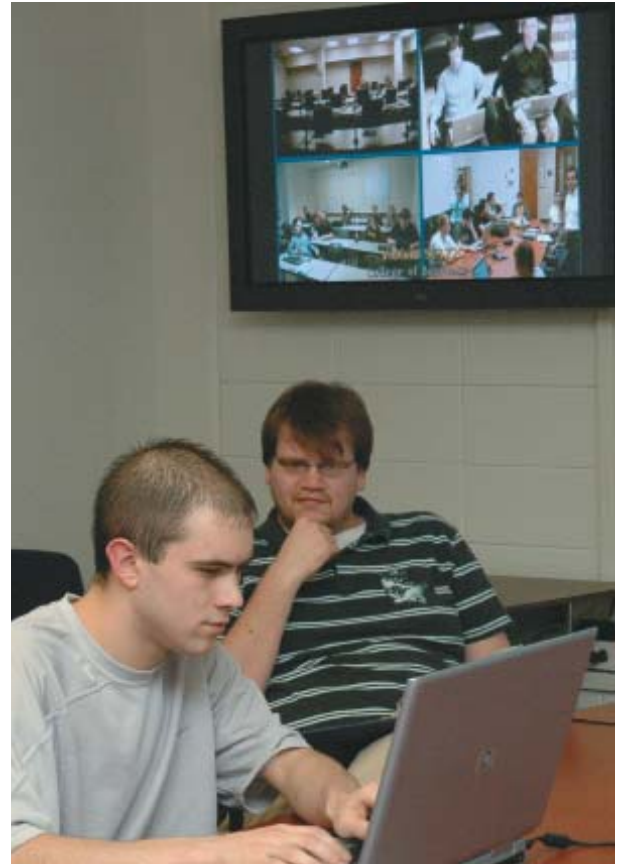
"YOU CAN'T BE CRISIS DRIVEN.
TO BE GOOD, YOU HAVE TO PLAN."

~ ARVIN AGAH
COURSE INSTRUCTOR

"While recruiting is a key component of the program, the relationships that are built between the universities and Cerner create opportunities to collaborate and create business relationships that are beneficial to both organizations," Smith says.

For students, the course was a way to experience what it takes to move an idea from the product concept stage through rapid prototype development of the product, Agah said.

"The techniques and methodologies they've learned in the course can apply to any software development project they work on in the future," says Agah. "That they were able to work on an actual product in a competitive business environment makes the experience richer and more relevant to their careers." ■



ITTC videoconferencing connected EECS students with Cerner staff and students from Kansas State, Iowa, and Purdue. In the above picture, the TV shows all the participants in the Software Development Lifecycle class. Cerner's associates committed between 500 and 700 hours to the course, above and beyond their day-to-day responsibilities.



EECS Associate Professor Arvin Agah, standing, leads the discussion. Cerner loaned each team a PDA on which to build, test, and run their designs. Each member of the winning team received a PDA.

Photos by Jill Hummels

EECS Escapes with “Best in Show” at the...



For the sixth time in seven years, EECS has won Best in Show at the Engineering Expo. The Department's most popular exhibits at the recent Expo in February 2007 included infrared laser tag and the programmable, buildable robots known as Lego Mind Storms. Additionally, EECS students created a new night vision exhibit with infrared cameras connected to televisions. Expo participants used the cameras to find infrared beacons hidden throughout the room.

"I think the reason we (EECS) have been so dominant is simple: our technology is more interesting and easier to display on a small scale," says [Nicole Schnell](#), EECS Expo chair. Schnell planned the Department's activities during the fall semester and did most of the prep work during winter break.

Schnell oversaw approximately 50 EECS undergraduates who participated in the '007 Expo: Engineering Undercover. School of Engineering students created dozens of interactive exhibits and contests for Expo visitors just as the Q Branch developed cutting-edge technology for James Bond.

Since 1911, the School of Engineering has held the Expo each year to show young people the possibilities within engineering. The Engineering Student Council organizes the free, public two-



EECS senior Deebu Abi (forefront) explains research he conducts at the Center for Remote Sensing of Ice Sheets (CReSIS). CReSIS researchers develop new technologies to measure and predict sea level change.

All Expo Photos by Jill Hummels

day event, which usually draws up to 2,000 visitors. Many contests are geared toward junior high and high school students, but some have divisions specifically for younger students.

EECS alumnus and Engineering Director for Google Earth **Brian McClendon** (EE '86) was the keynote speaker for Expo. He demonstrated what Google Earth allowed users to do, such as viewing a 3-D model of the Eiffel Tower or watching real-time data on the arrivals and departures from the Amsterdam airport. ■

“ENGINEERS DREAM AND THEN BRING
THOSE DREAMS TO LIFE.”

~ DEAN STUART BELL
IN OPENING REMARKS AT EXPO



Students win prizes for their engineering feats at Expo (top picture) and also learn about the possibilities within engineering. Since 1911, the Engineering Student Council has held the annual event, which attracts up to 2,000 visitors.



The Google Earth map behind EECS alumnus Brian McClendon (EE '86) displays real-time data from the Amsterdam airport. The director of Google Earth engineering delivered the keynote address at the Expo.

Graduate Spotlight

Meet Daniel Fokum, second-year EECS Ph.D. Student

What are your top tips for new students?

1. Prioritize tasks appropriately.
2. Set limits on how much time you want to spend on a certain task. Sometimes something is fun, and you can get carried away.
3. Remember to set aside time to spend with friends and family. You can focus so much on school and research that you neglect relationships.
4. Read as much as you can. When you do, keep an annotated bibliography, and you should start this as soon as you get to campus.
5. Be willing to befriend other students and be willing to learn from other people.

Can you describe a specific failure or challenge that you encountered at KU and how you overcame it?

One of the classes I took last spring was pretty demanding. During that class, we talked to the professor about setting up discussion sessions. He did, and we could come in and ask questions. I also started studying with a friend.

My biggest challenge though was moving to Lawrence and having to readjust. I no longer had my friends just down the street. I have come to like Lawrence more and more.

Please explain your research.

I am working on a rail sensor net project. We are going to try and track cargo from a port in Mexico into Kansas City, and I am looking at developing the communication requirements for that project. Right now a lot of this is conceptual, but sensors would be gathering data from a pallet or a case on the pallet. Collected information would be sent to a point on the train where it would be forwarded to an operation center. Companies would have better visibility of cargo being transported.

Why did you choose KU?

My advisor at UMKC earned his Ph.D. here, and he recommended it. There is also a good communications and networking program at KU. My professors are well known in their fields.

Where do you see yourself in the next five years?

I would like to be teaching at a research university. I do not know where, but I would like to be teaching.



Major: Computer Science

Hometown: Cameroon, Africa

Anticipated Graduation: May 2009

Future Plans: Teaching

Photo by Janene Snyder

Doctoral Graduates

Doctoral degree programs include course work approved by the student's committee, a doctoral qualifying exam, research skills requirement, comprehensive exam, dissertation or research project, and final oral exam.

Summer 2006

Kenneth Filardo, "Development of a Portable IFF Avionics Test Set," D.E. Electrical Engineering
Advisor: Dr. Glenn Prescott

Winter 2006

David Janzen, "The Influence of Test-Driven Development on Internal Software Quality: An Empirical Evaluation,"
Ph.D. Computer Science with Honors
Advisor: Dr. Hossein Saiedian

Biao Fu, "Optical-Domain Performance Monitor Design for Next Generation Optical Networks," Ph.D. Electrical Engineering
Advisor: Dr. Rongqing Hui

John Paden, "Synthetic Aperture Radar for Imaging Basal Condition Beneath Polar Ice Sheets," Ph.D. Electrical Engineering with Honors
Advisor: Dr. Chris Allen

Spring 2007

Yueting Wan, "Optical Properties of III-Nitride Semiconductors & the Applications in All-Optical Switching," Ph.D. Electrical Engineering
Advisor: Dr. Rongqing Hui

Zhongjun Wang, "A Hybrid Algorithm and its Applications to Fuzzy Logic Modeling of Non-linear Systems," Ph.D. Computer Science with Honors
Advisor: Dr. Man Kong



EECS doctoral student David Janzen (left) accepts an award at the ACM Student Research Competition Grand Finals in May 2006. He placed third in the prestigious international competition. After earning his Ph.D. in 2006, Janzen accepted an assistant professor position in the Computer Science Department at California Polytechnic State University.

Photo Courtesy of David Janzen



EECS Professor Ron Hui (left) and Ph.D. student Biao Fu make adjustments to a RF Spectrum Analyzer. Under the direction of Hui, Fu conducted high-resolution optical performance research.

Master's and Bachelor's Graduates

Summer 2006

Nour Abdul Fattah, BSCS
Patrick Casteel, MSEE
David Dunson, MSEE
[Madhuri Eunni, MSEE](#)
Ashley Frazer, BSEE
Narayanan Govindan Kasi, MSEE
Suman Kansakar, MSCS
Daniel Leung, MSCS
Srikanth Pyneni, MSCS
Senthil Shanmugham, MSCS
Karthikeyan Varadarajan, MSCS
Lalit Venkatesan, MSCoE
Adrien Yeganeh, MSCS
[Robert Yeganeh, MSCS](#)
Yang Yi, BSEE

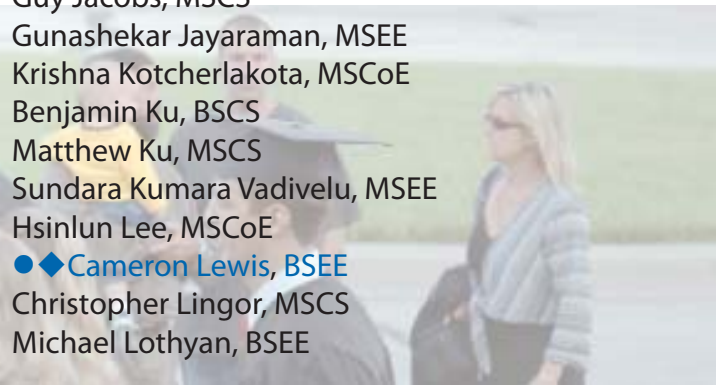
Winter 2006

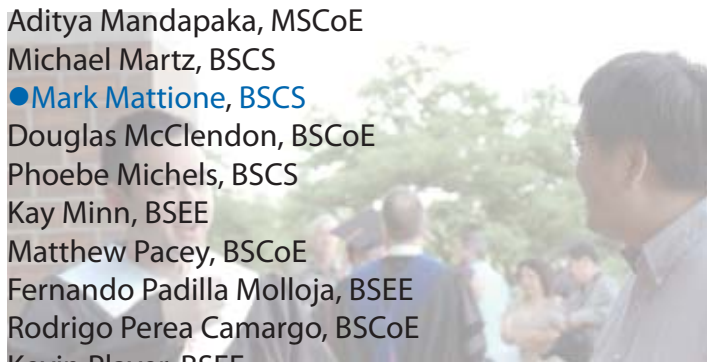
Mark Adams, MSCS
Mishari Alnahedh, BSEE
Gopalakrishna Anantha, MSEE
Ragavendra Anantha Padmanabhan, MSEE
[Eric Benavidez, BSCS](#)
Kellen Bombardier, MSCS
Gregory Bouzianis, BSCoE
[Jose Eduardo Cardoce Cascante, MSEE](#)
Hou Chong, BSCS
Ibrahima Diack, BSEE
◆◆ [Daniel Flanigan, BSCS](#)
Alexander Garrett, MSCS
Christopher Gifford, MSCS
Lauren Haake, BSCoE
Elliott Hoffman, BSCS
Mahender Immadi, MSCS
Dena Jolley-Broderick, BSCS
Mark Kalusha, BSCS
Shankar Konidena, MSCS
Maria Laura, BSEE
Adam Lohoefer, MSEE
Ambika Nanda, MSEE
Kamen Nikolov, MSCoE
Linda Ong, BSCS
Andrew Ozor, BSCS
Prabu Renganathan, MSCoE
Michael Schwakopf, BSCS
Shalini Sodagam, MSEE
Cody Southerland, BSCS

Jason Stewart, MSCS
Peng Seng Tan, MSEE
Jeffery Unger, BSCS
Vinay Vaddepalli, MSCoE
Vijo Varghese, BSEE
Rick Willyard, MSEE
Taylor Zavala, BSCS

Spring 2007

Temidayo Ajayi, MSCoE
Wael Alroumi, BSCS
Raymond Anderson, BSCS
Brett Barker, MSCS
Richard Bauck, BSCS
Eric Bean, MSCS
Patrick Bliven, BSEE
[Vincent Buhr, BSCS](#)
Thomas Bulis, MSCS
Mark Cagle, BSEE
[Travis Case, BSCoE](#)
Cameron Cederlind, BSEE
Ashwin Kumar Chimata, MSCS
Kevin Collins, BSCS
Samantha Cook, BSCS
Brian Cordill, BSEE
Dinesh Datla, MSEE
Charles Derr, BSEE
Nigel Dunham, BSEE
Kyle Foraker, BSCS
[Benjamin Geheb, BSEE](#)
David Gill, BSCS
Ryan Grass, BSCoE
[Jordan Guffey, MSEE](#)
Deven Hammerschmidt, BSCS
William Hecker, BSEE
Nikala Heggstad, BSCS
Bao Hoang, BSEE
[Ryan Hogan, BSCoE](#)
Allan Jackson, BSCS
Guy Jacobs, MSCS
Gunashekar Jayaraman, MSEE
Krishna Kotcherlakota, MSCoE
Benjamin Ku, BSCS
Matthew Ku, MSCS
Sundara Kumara Vadivelu, MSEE
Hsinlun Lee, MSCoE
◆◆ [Cameron Lewis, BSEE](#)
Christopher Lingor, MSCS
Michael Lothyan, BSEE





Aditya Mandapaka, MSCoE

Michael Martz, BSCS

●Mark Mattione, BSCS

Douglas McClendon, BSCoE

Phoebe Michels, BSCS

Kay Minn, BSEE

Matthew Pacey, BSCoE

Fernando Padilla Molloja, BSEE

Rodrigo Perea Camargo, BSCoE

Kevin Player, BSEE

Manuel Richey, MSCS

Michael Rink, BSCS

Daniel Rollins, BSEE

Randy Rucker, BSCoE

Amrullah Saidin, MSCS

Vandana Samala, MSCS

Gregory Seibel, MSCS

Aydin Seyedi, BSEE

Kuyilmozhinangai Shanmugasundaram, MSEE

Kapil Dev Siddulagari, MSCoE

Adam Smith, BSCoE

Sripriya Srinivasan, MSCoE

Jacob Staley, BSCoE

Justin Strecker, BSCS

James Sulzen, BSEE

Santhosh Sundararaman, MSCS

□Steven Tenny, BSCoE

Alexander Thompson, BSCS

□Esen Tunar, BSEE

Joel Van Eenwyk, BSCS

Jonathan Van Eenwyk, MSCoE

Chandini Veeramachaneni, MSEE

Yaoyao Xie, BSEE

Lin Yi, BSCoE

Master

Bolded, blue names graduated with honors

Bachelor

●Departmental honors

□Distinction

◆Highest distinction



Computer Engineering major Andy Schmidt (left) and CoE graduate student Temidayo Ajayi stand outside the Lied Center, waiting to begin their commencement ceremony in May. Schmidt walked in May, but officially graduated with honors in August.



EECS Chair and Professor Costas Tsatsoulis congratulates a graduate during the School of Engineering ceremony. The Department had 76 graduates in the spring.

Good Things Really Do Come in Small Packages

EECS Researchers Develop Embedded Elements

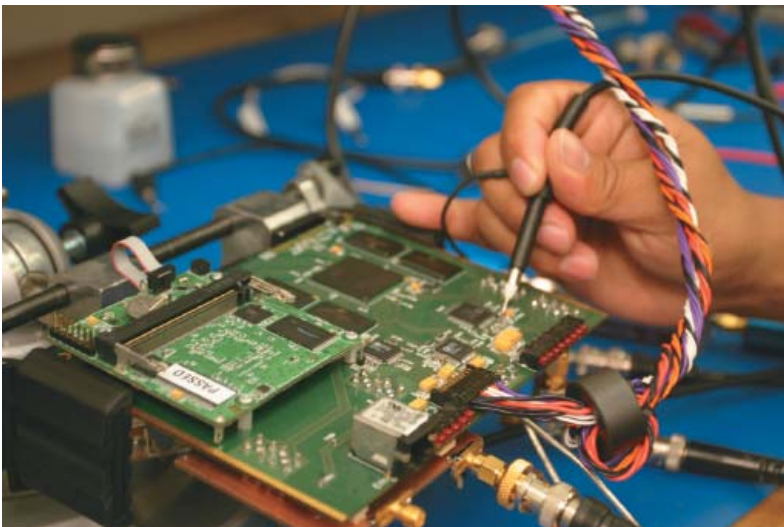
The contradictory notion of smaller electronic devices offering increased services is made possible by embedded systems. A combination of computer hardware and software, embedded systems are found in everything from automobiles, medical equipment, and airplanes to vending machines, toys, and mobile phones. EECS researchers specialize in creating new systems, tools, and design methods for fielding next generation embedded systems.

Since computer systems design (CSD) was formally established as an EECS area of concentration in 2004, investigators have secured 12 federal grants and published peer-reviewed articles in 5 journals and 24 conference proceedings. The following highlights a few EECS researchers specializing in CSD.

EECS Assistant Professor [Prasad Kulkarni](#) is the latest addition to the Department's growing CSD focus area. With expertise in compilers, embedded systems, and computer architecture, he will help advance the state of the art in CSD technology. (For more information on Kulkarni, please see page 10.)

EECS Professor [Perry Alexander](#) and his research team are developing the official IEEE (Institute of Electrical and Electronics Engineers, Inc.) industry standard for Rosetta, the system-level design language he created. Rosetta facilitates a more efficient production process. Different vocabulary and engineering processes make communication between different disciplines involving complex electronics difficult. Each individual model from each design domain must be consistent with all other system models. Rosetta enables interaction between disparate system models, enabling tools to find errors that only appear when considering multiple perspectives simultaneously.

Alexander's student research assistants, who have travelled to Australia and Europe to collaborate on Rosetta, participate in the standards process along with refining the system-level design language.



A student research assistant works on a field programmable gate array (FPGA) board. FPGA chips can be repeatedly reconfigured even while in use. The ability to reprogram these chips is critical to the success of embedded systems, a focus of CSD research.

Photo by Megan E. Gannon

After completing his sabbatical at the University of Paderborn in Germany last year, EECS Professor [David Andrews](#) has led the effort to formalize a student exchange between the research institutions. Andrews mentored University of Paderborn Ph.D. student [Enno Luebbers](#) who spent October at KU. EECS and Paderborn researchers are collaborating on the development of a hybrid threads (h-threads) compiler. Specifically, Andrews is creating a set of tools that enable software engineers to also function as hardware engineers. The h-threads compiler automatically converts C code into the hardware language VHDL. Andrews' compiler more authentically translates unaltered C than any other documented C-to-hardware converter. Using h-threads tools, development and verification of embedded systems can potentially be reduced from months to weeks.

Andrews also recently led the revision of the undergraduate digital design curriculum. The new curriculum introduces the use of modern Computer Aided Design (CAD) tools and systems on programmable chip components. The new courses follow a more holistic integrated hardware/software co-design approach.

CSD researchers collaborated with an international visiting scholar in the fall. [Helmut Keller](#), a professor at the Federal Institute of Technology (TGM Vienna) in Austria, came to work with CSD researchers on high-speed image processing projects. Additionally, he taught an EECS graduate course, Operators for Embedded Signal Processing.

EECS students who focus in CSD receive a hands-on, collaborative educational experience and opportunities to present their work through journal publications and conference presentations. Alumni with a CSD focus work at Intel, Garmin, and other prominent organizations. ■



Ph.D. students Nicolas Frisby (left) and Garrin Kimmell discuss their research on the system-level design language Rosetta. EECS Professor Perry Alexander leads an international team of researchers who have developed tools that allow different subsystems in complex electronics to communicate with one another.

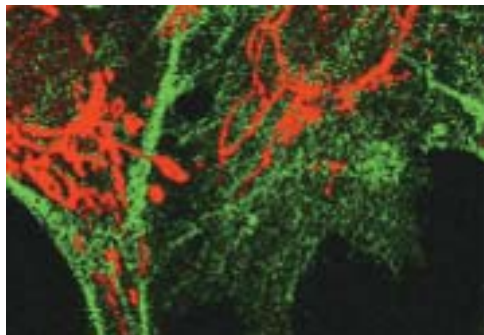
University of Paderborn Ph.D. student Enno Luebbers spent October at ITTC. EECS Professor David Andrews mentored the visiting scholar. EECS and Paderborn researchers are working on creating tools to reduce the cost and development-to-market time for embedded systems. Lubbers said his visit had strengthened the collaboration, and he was proud of what they had accomplished.



Compact, Economical Laser Allows Greater Access to Biological Imaging Technology

Advances in imaging and microscopic technologies are giving scientists a “big picture” view of biological systems. New techniques, such as two-photon microscopy, produce three-dimensional (3D) images of living cells at greater depths and higher resolutions than traditional tools.

In two-photon microscopy, an ultrafast laser emits pulsed light, or photons, that excite fluorescent labels attached to molecules. Scientists have observed cell development in hamster embryos,

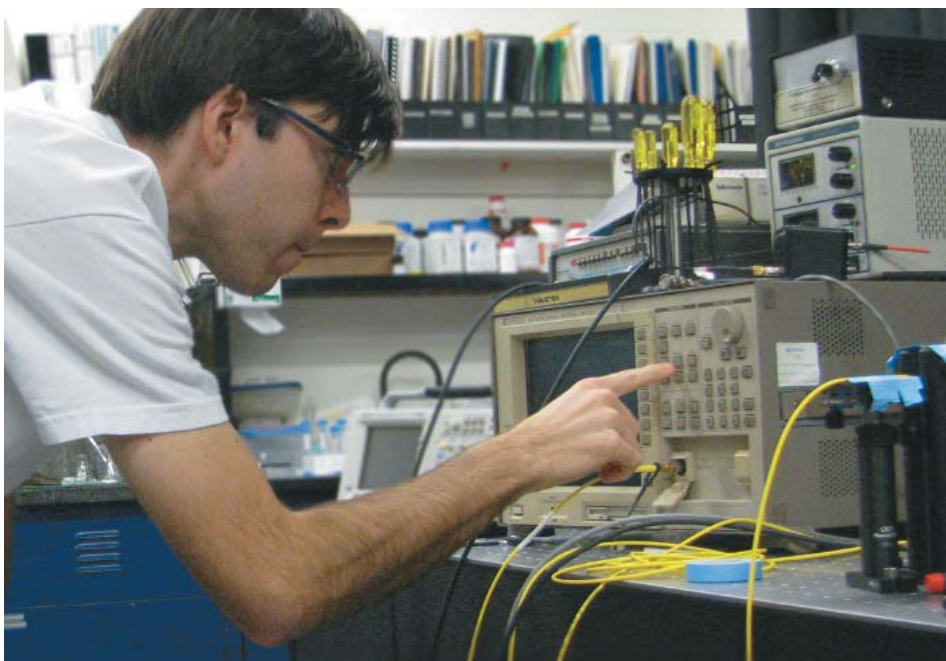


measured calcium in the brains of mice, and monitored the mechanisms in rats' hearts. Near-infrared laser-based scanning microscopy also reduces photo damage, permitting analysis over longer periods of time. However, the high cost and cumbersome size of the ultrafast laser needed for two-photon microscopy severely limits its practical applications.

Two-photon microscopy produces three-dimensional (3D) images of living cells, such as the cow cells above, at greater depths and higher resolutions than traditional tools. EECS Professor Ron Hui is developing an affordable, compact laser system that will increase the accessibility of two-photon microscopy.

EECS Professor [Ron Hui](#) is leading multidisciplinary research to develop an affordable, compact laser system that would increase the accessibility of two-photon microscopy. The effort is funded by the National Institutes of Health (NIH). By producing a near-infrared light source, called two-photon fiber-laser excitation (TP-FLEX), Hui will simplify the generation of optical pulses needed for two-photon microscopy. Using a much smaller fiber laser, the TP-FLEX system will be easily transportable unlike conventional, fixed two-photon systems that use large lasers. TP-FLEX will be attached to current biological imaging microscopes that have high-quality lenses.

EECS RESEARCHERS ARE DEVELOPING A POWERFUL LASER SYSTEM THAT CAN BE ATTACHED TO CURRENT BIOLOGICAL MICROSCOPES. THE PORTABLE LIGHT SOURCE WILL ENABLE UNPRECEDENTED ACCESS TO TWO-PHOTON MICROSCOPY.



EECS Ph.D. student Peter Adany adjusts a spectrum analyzer during testing of the optical fiber, the yellow cable. Adany observes how the fiber reacts in different situations and then creates computer simulation models to predict future behavior.

“The breadth of KU research provided me with in-house collaborators for the project, which streamlines the development of a two-photon microscopy system,” says Hui. “There is a great need for accessible biological imaging tools. TP-FLEX, which will be the size of a briefcase, will enable two-photon microscopy to become available to those outside large research centers.”

The KU system will permit the simultaneous monitoring of different biochemical functions through multicolor labeling. With biofluorescent markers attached to specific proteins, various protein and molecular configurations can be distinguished and observed. Thus, scientists can observe multiple cellular events at the same time.



The fiber turns fluorescent as light travels through it. By understanding and controlling the generation of optical pulses, researchers can produce 3D images of living cells at greater depths and higher resolutions.

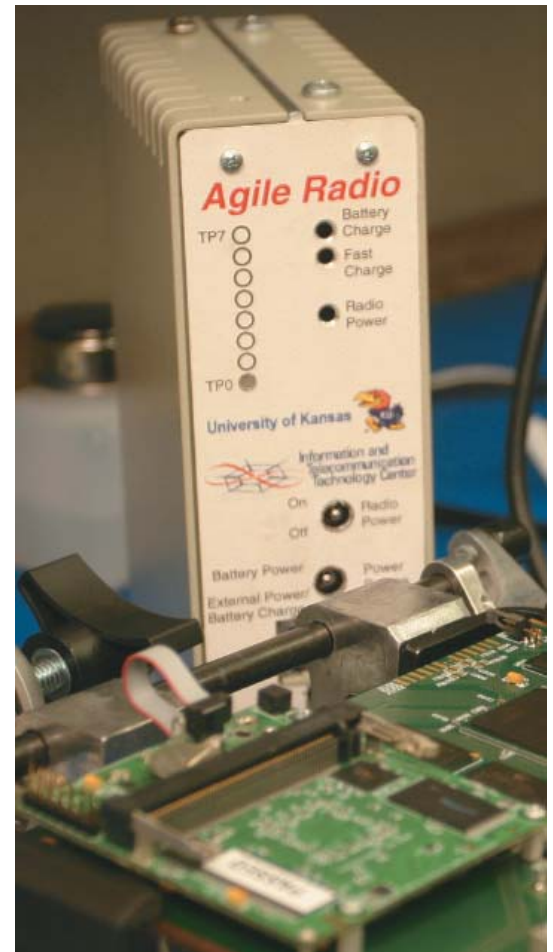
EECS researchers are collaborating with investigators from KU’s Department of Chemistry and the KU Medical Center on the “Portable and Wavelength-Tunable Two-Photon Microscopy” project. The lower cost and portability of TP-FLEX will enable greater accessibility for a wide range of biological, chemical, and analytical applications. ■

FIND Researchers Given a Clean Slate Upon which to Develop Innovative Global Network

EECS Distinguished Professor [Joseph Evans](#) and EECS Associate Professor [James P.G. Sterbenz](#) are helping lay the groundwork for a smarter, more robust network. They are among the first researchers to receive funding from the National Science Foundation's new Future Internet Design (FIND) initiative. FIND advocates a "clean-slate approach" to the development of a new innovative global network. According to the FIND web site, researchers are not bound by current limitations of the Internet and should focus on designing an ideal network. The new network will include greater security and functionality than today's Internet.

Evans is developing a structure and protocols, or "code of conduct," for cognitive radios. Cognitive radios will nimbly navigate the radio frequency (RF) spectrum, reacting to their environment. They seek out unused spectrum and negotiate use of these vacant frequencies with other nearby wireless devices. Cognitive radios jump channels without interfering with existing users, such as television broadcasts. Underutilized TV spectrum possesses empty frequencies, or "white spaces," that could provide additional capacity to spur on wireless development if the signals can be properly exploited.

Evans' FIND project builds upon a strong foundation of EECS work with cognitive radios, such as the KU Agile Radio. His research will lead to an open-source cognitive radio software protocol stack (CogNet), which will be evaluated on emerging cognitive radio platforms. The "NeTS-FIND: CogNet—An Experimental Protocol Stack for Cognitive Radio Networks and its Integration with the Future Internet" project is in collaboration with Rutgers University and Carnegie Mellon University.



Developed by EECS Professors Gary Minden and Joe Evans, the KU Agile Radio integrates several advanced technologies to enable better spectrum utilization. Evans' new NSF project will build upon technology previously created for the Agile Radio and other EECS research projects.

Photo by Megan E. Gannon

Sterbenz's project will lead to a new thin internetworking layer that serves to bridge various realms of the future "Internetwork," each of which may have disparate mechanisms, policies, and trust relationships. The post modern (PoMo) network will admit heterogeneity not possible in the current Internet, including mobile, wireless, ad-hoc, and sensor network realms that do not use Internet Protocol (IP) as the network layer mechanism. PoMo also explicitly recognizes trust and policy relationships between realms.

Additionally, EECS researchers are making the future network more reliable. Sterbenz is leading end-to-end transport research with an emphasis on security and intelligence. Authentication will prevent spam and other unwanted messages. The intelligent network will be able to distinguish between a dropped data packet or one that cannot be delivered because of congestion. In the former, the information would be resent immediately, but the network would wait until the congestion had cleared in the latter.

EECS is collaborating with the University of Maryland and the University of Kentucky on the "NeTS-FIND PostModern Network Architecture (PoMo)" project. Sterbenz's group is working on resilience and survivability of the architecture, in conjunction with Lancaster University. ■



Ph.D. students Justin Rohrer (standing) and Abdul Jabbar Mohammad examine data they have gathered for the PostModern Network Architecture (PoMo) project. Both are working under the direction of EECS Associate Professor James Sterbenz. Sterbenz's NSF project aims to bridge various realms of the future network.

In FY 2007, actively funded research projects with EECS faculty or research faculty with EECS courtesy appointments as PIs or Co-Is are listed below. The format is: [PI](#) co-PIs; funding agency; "title," start date – end date; and amount.

[Agah, A.](#); KUCR/KDOT (flow-through from U.S. Dept. of Transportation–Federal Highway Administration); "TRI 2006 Research Program Research Initiation (RI Award): A Realistic Driving Simulator Based on Parallel Computing," 08/18/06 – 8/17/07; \$49,463.

[Alexander, W.P.](#); KTEC; "Center for Excellence: Abstract Interpretation of Rosetta Specifications—Phase II," 7/1/07 – 6/30/08; \$44,536.

[Allen, C.](#); Johns Hopkins University (flow-through from NASA); "Pathfinder Advanced Radar Ice Sounder (PARIS)," 10/3/05 – 6/30/07; \$136,000.

[Andrews, D.](#); Cadstone, LLC; "Simulation of Rosetta Representations and Evaluations," 8/15/05 – 5/31/08; \$213,305.

[Andrews, D.](#); NSF; "ITR: Computation and Communication in Sensor Webs," 8/1/03 – 7/31/07; \$210,000.

[Andrews, D.](#) with R.D. Niehaus; NSF; "Extending the Thread Execution Model for Hybrid CPU/FPGA Architectures," 9/1/03 – 8/31/07; \$332,357.

[Beach, J.](#) with A.T. Peterson, S. Gauch, and D. Vieglais; NSF/KTEC; "ITR Collaborative Research: Enabling the Science Environment for Ecological Knowledge," 10/1/02 – 9/30/07; \$697,773.

[Besson, D.Z.](#) with D. Andrews, R.D. Niehaus, and D. Seckel; NSF; "RICE—Radio Ice Cerenkov Experiment," 1/1/04 – 8/31/08; \$279,668.

[Blunt, S.D.](#); Naval Research Laboratory; "Aspects of Adaptive Pulse Compression," 6/1/04 – 9/30/09; \$90,060.

[Blunt, S.D.](#); Office of Naval Research; "Waveform-Diverse Sensors," 10/1/05 – 9/30/08; \$330,701.

[Braaten, D.](#) with S.P. Gogineni; NSF; "IPY: GAMBIT: Gamburtserv Aerogeophysical Mapping of Bedrock and Ice Targets," 10/1/07 – 9/30/11; \$597,000.



During the ITTC Industry Advisory Board meeting in June, graduate student Padmaja Yatham presents her embedded radar research to Terri Reintjes of Sprint Nextel. Yatham worked under the direction of EECS Assistant Professor Shannon Blunt on his "Waveform Design for Embedded Radar Communication" project.

[Chen, X.-w.](#); NSF; "CAREER: Machine Learning Approaches for Genome-Wide Biological Network Inference," 3/15/07 – 4/30/12; \$691,345.

[Chen, X.-w.](#); U.S. Army Research Office; "Learning from Small Samples with High Dimensionality," 9/1/06 – 8/31/07; \$55,576.

[Colgren, R.](#) with X.-w. Chen; Kansas NASA EPSCoR/KTEC; "Modular Wireless Avionics System for Autonomous UAVs," 12/1/04 – 5/31/07; \$91,528.

[Deavours, D.D.](#); Honeywell; "RFID Tag Performance Analysis," 9/18/06 – 2/28/07; \$50,000.

[Deavours, D.D.](#); MacDermid, Inc.; "Effects of Conductivity, Thickness, and Width on UHF RFID Tag Antenna Efficiency," 6/19/06 – 8/28/06; \$12,154.

[Deavours, D.D.](#); Micro Security Devices, Inc.; "ITTC Industrial Affiliates: Support of RFID Alliance Lab," (Gift managed through KU Endowment Association)

[Deavours, D.D.](#); Praxair, Inc.; "Phase 1: Testing of Commercial Passive UHF RFID Tags on Metal Cylinders," 5/16/06 – 1/31/07; \$29,335.

[Duncan, T.](#) with B. Pasik-Duncan; NSF; "Stochastic Analysis and Applications," 7/1/05 – 7/31/08; \$429,715.

[Duncan, T.](#) with B. Pasik-Duncan; NSF; "Stochastic Systems and Control," 6/1/02 – 7/31/07; \$430,600.

- Evans, J.**; The Carmen Trust; "Graduate Scholarship in EECS; Student: Ju Suyang," 8/17/06 – 8/16/08; \$42,107.
- Evans, J.** with A. Wyglinski; NSF; "Workshop on Mobile Wireless Technology and the Impacts on Future Internet," 9/1/06 – 8/31/08; \$72,155.
- Evans, J.** with J. Roberts; New America Foundation; "Quantifying the Impact of Unlicensed Devices on Digital TV Receivers," 9/1/06 – 9/14/07; \$32,000.
- Evans, J.** with S. Seshan and D. Raychaudhuri; NSF; "NeTS-FIND: CogNet—An Experimental Protocol Stack for Cognitive Radio Networks and Its Integration with the Future Internet," 9/15/06 – 8/31/09; \$349,000.
- Ewing, M.** with T. Sorensen and G. Prescott; Fundamental Technologies, LLC; "Development of a High Altitude Balloon Experiment System (HABS) to Fly Standard Interface Payloads Under Controllable Flight Conditions," 3/12/06 – 11/15/06; \$28,912.
- Fang, J.** with G.H. Lushington; KUMCRI (flow-through from NIH); "K-INBRE: Web Server Tracker, an Automated Literature, Protein/DNA Sequence and Domain Tracking System," 5/1/07 – 4/30/08; \$28,679.
- Frost, V.S.** with R. Hui; NSF; "NeTS-NR: High-Speed Self-Configuring Networks Based on Cost-Effective Plug-and-Play Optical (PPO) Nodes," 10/1/04 – 9/30/08; \$205,305.
- Frost, V.S.** with R. Hui; NSF; "SGER: Index Switchable III-Nitride Planar Lightwave Circuits for Optical Communications," 8/15/05 – 1/31/07; \$39,498.
- Frost, V.S.**; Sprint/Nextel; "Advanced Technology Lab (ATL): Wireless Quality of Service Assessment," (Gift managed through KU Endowment Association)
- Frost, V.S.** with G. Lushington, G. Minden, S. Gauch, and T. Clark; U.S. Army Edgewood Chemical Biological Center ECBC/DoD; "Development of an Integrated Bioinformatics Information Infrastructure," 9/29/04 – 9/29/06; \$2,147,000.
- Frost, V.S.** with G. Minden, J.P.G. Sterbenz, A. Wyglinski, and D.F. Tucker; Sprint Corp.; "Robust Millimeter Wave Metropolitan Mesh Network," 4/1/07 – 3/31/08; \$198,850.
- Frost, V.S.** with G. Minden, R.D. Niehaus, D. Petr, and D. Deavours; Oak Ridge National Laboratory; "A Unified Architecture for SensorNet with Multiple Owners," 8/12/05 – 6/15/09; \$2,472,326.
- Frost, V.S.** with G. Minden, C. Tsatsoulis, J. Gauch, D. Deavours, and J. Evans; KUCR/KDOT (flow-through from US Dept. of Transportation-Federal Highway Administration); "TRI 2006 Research Program Research Team Partnership (RTP Award): Development of Technologies for Trusted Corridors," 8/18/06 – 8/17/07; \$174,706.
- Frost, V.S.** with J. Evans, G. Minden, and C. Tsatsoulis; Office of Naval Research; "Rail Sensor Testbed Program: Active Agents in Containers for Transport Chain Security," 6/25/07 – 6/24/09; \$1,217,000.
- Frost, V.S.** with T. Duncan; NSF-CISE; "Quantifying the Temporal Characteristics of Congestion Events in the Internet," 9/15/02 – 8/31/06; \$286,267.
- Gauch, J.**; Sprint/Nextel; "Advanced Technology Lab (ATL): Wireless Video Quality Assessment," (Gift managed through KU Endowment Association)
- Gauch, S.**; NSF; "CRI: Collaborative: Next Generation CiteSeer," 8/1/05 – 7/31/08; \$229,992.
- Gogineni, S.P.** with C. Allen, A. Agah, K. Demarest, M. Ewing, V.S. Frost, R. Hale, J. Holvoet, K. Nordheden, G. Prescott, D. Andrews, R. Colgren, D. Downing, J. Feddema, J. Gauch, M. Hoeflich, X. Li, and G. Tsofilas; NSF; "Science and Technology Center: Ice Sheets and Sea Level Rise," 6/1/05 – 5/31/10; \$21,425,189.



CRISIS graduate research assistants conduct experiments in Nichols Hall.

Gogineni, S.P. with C. Allen, V.S. Frost, D. Braaten, G. Prescott, C. Tsatsoulis, and A. Agah; NSF/NASA/KTEC; "ITR/SI+AP: A Mobile Sensor Web for Polar Ice Sheet Measurements," 10/1/01 – 9/30/07; \$6,432,125.

Gogineni, S.P. with C. Leuschen; NASA-Goddard Space Flight Center; "Validation of AMSR-E Snow Depth on Sea Ice Retrievals Using an Airborne Pulse Radar," 2/15/06 – 2/14/08; \$255,692.

Huan, J.; U of Kansas Medical Center Research Institute; "K-INBRE Cellular Pathogen Gene Identification via Graph Data Mining," 5/1/07 – 4/30/08; \$43,576.

Huan, J.; U of North Carolina; "Protein Structure-/Function-Specific Packing Motifs," 8/01/06 – 7/31/08; \$34,257.

Hui, R.; ITT Space Systems Div. (flow-through from NASA); "Multi-Functional Fiber Laser Lidar (MFL) for Ice Sheet Topographic Mapping—A Development and Demonstration Proposal," 10/1/05 – 9/30/06; \$114,000.

Hui, R.; NSF; "Intergovernmental Personnel Act (IPA) Agreement," 4/28/06 – 5/21/07; \$228,025.

Hui, R.; Nortel Networks; "Optical-Domain Performance Monitoring for Next Generation Optical Networks," 9/1/06 – 8/31/07; \$78,154.

Hui, R. with C. Allen; Sprint; "Non-destructive PMD Monitoring in Live WDM Optical Systems," 3/1/06 – 8/31/07; \$47,000.

Hui, R. with C. Allen; Sprint International Comm.; "PMD Monitoring in Live DWDM Optical Networks," 6/1/07 – 5/31/08; \$60,000.

Hui, R. with C.K. Johnson and L.A. Stehno-Bittel; NIH; "Portable and Wavelength-Tunable Two-Photon Microscopy," 9/1/06 – 3/31/09; \$472,923.

Krishtalka, L. with V.S. Frost and E. Perrins; NSF/KTEC; "Understanding and Forecasting Ecological Change: Causes, Trajectories, and Consequences of Environmental Change in the Central Plains," 4/1/06 – 3/31/09; \$167,112.



Ph.D. students Eric Howell (foreground) and Daniel Fokum prepare to show technology being developed at ITTC to FCC Commissioner Michael Copps. Tags, like the one held by Howell, could provide real-time data as goods travel through the supply chain.

Kuwana, T. with J. Gauch; U of California, Riverside (flow-thru from NSF); "Collaborative Project: Assessing the User-base and Expanding the Usability/Reach of the Analytical Sciences Digital Library through Developmental Workshops," 2/1/05 – 9/30/07; \$38,270.

Laird, C. with S.P. Gogineni; NSF; "SGER: High Resolution Radar Mapping of Ice Thickness and Near-Surface Layers in Northeast Greenland," 3/15/06 – 2/28/07; \$24,859.

Lushington, G.H. with J. Fang; KUMCRI (flow-through from NIH); "An Online Clearinghouse for Bioinformatics Software Sharing and Evaluation," 9/18/06 – 4/30/07; \$7,324.

Lushington, G.H. with J. Fang and T. Williams; KUMCRI (flow-through from NIH); "Proposal to Complete, Upgrade, and Enhance Data Handling in the Analytical Proteomics Laboratory," 5/1/07 – 4/30/08; \$3,653.

Miller, J.; KTEC; "Center for Excellence: A Reusable Learning Object Creation & Management System," 7/1/07 – 6/30/08; \$ 29,394.

- Miller, J.** with D. Cliburn, J. Borrero, and M. Doherty; NSF; "Collaborative Research: A Virtual Reality Laboratory and Curriculum for Undergraduates," 6/1/07 – 5/31/10; \$46,490.
- Minden, G.** with J. Evans, A. Agah, and A. Wyglinski; BBN Technologies (flow-through from DARPA); "Adaptive Distributed Radio Open-Source Intelligent Network (ADROIT)," 10/01/05 – 9/30/08, \$283,336.
- Minden, G.**; NSF; "The Future of Spectrum: Technologies and Policies Workshop," 4/15/03 – 8/31/07; \$78,637.
- Minden, G.** with J. Roberts; NSF; "National Radio Networking Research Testbed (NRNRT)," 10/2/03 – 12/31/07; \$1,852,560.
- Minden, G.**; NSF; "Support for Wireless Networking Workshop and PI Meeting," 9/1/03 – 8/31/07; \$152,316.
- Niehaus, R.D.**; NSF; "Collaborative Research: CSR—EHS: Semantic Domain Integration for Embedded and Hybrid Systems," 9/15/06 – 8/31/10; \$100,000.
- Perrins, E.**; RT Logic; "A VHDL-Based Telemetry Waveform Generator," 5/17/07 – 9/7/07; \$21,130.
- Perrins, E.**; U.S. Army; "New FEC Schemes for Aeronautical TM," 2/1/06 – 1/31/08; \$155,000.
- Prescott, G.**; Cornell University (flow-through from NSF); "CReSIS International Research and Education Exchange Program," 1/3/06 – 9/30/07; \$138,000.
- Prescott, G.**; NSF; "Development of a High Altitude Balloon Experiment System (HABS) to Fly Standard Interface Payloads Under Controllable Flight Conditions," 8/15/06 – 11/15/06; \$28,912.
- Prescott, G.**; NASA/Goddard Space Flight Center; "Information Systems Technologies for the Earth Science Technology Office," 8/16/06 – 8/15/07; \$337,874.
- Prescott, G.**; NASA EPSCoR/KTEC; "Kansas Universities' Technology Evaluation Satellite: The MIST Mission," 2/1/04 – 5/31/07; \$22,294.
- Sass, R.** with D. Andrews and X.-w. Chen; NSF; "CRI: Collaborative Research: Reconfigurable Computing Cluster," 3/01/06 – 2/29/08; \$166,701.
- Sass, R.** with D. Andrews; NSF; "EHS: Dynamic Hardware Reconfiguration to Accelerate Java-Based Embedded Systems," 9/1/04 – 8/31/07; \$240,000.
- Schrock, S.** with W. Wang and T. Mulinazzi; Iowa Dept. of Transportation; "Evaluation of Rapid Deployment Mesh Networking for Work Zones," 9/1/06 – 8/31/07; \$18,385.
- Sterbenz, J.P.G.**; NSF; "NeTS-Find: Collaborative Research: Postmodern Internetwork Architecture," 9/1/06 – 8/31/09; \$200,335.
- Stiles, J.**; SAIC; "Optimal Space-Time Waveform Design for Adaptive, Multi-Mode Radar," 8/13/03 – 9/30/06; \$297,675.
- Tsatsoulis, C.**; NASA Goddard Space Center; "An Adaptive, Negotiating Multi-Agent System for Sensor Webs," 12/1/06 – 11/30/09; \$621,496.
- Tsatsoulis, C.**; KTEC; Center for Excellence: Learning the Contents of Images for Image Retrieval," 8/16/06 – 8/15/07; \$40,154.
- Wang, W.**; NSF; "Collaborative Research: Bridging Security Primitives and Protocols: A Digital LEGO Set for Information Assurance Courses," 3/15/07 – 2/28/09; \$78,460. ■



Graduate student Benjamin Panzer conducts radar testing for his research with CReSIS.

Books & Book Chapters

- Alexander, W.P.; *System-Level Design with Rosetta*, Morgan Kauffman, 2006.
- Meyen, E.L. and Y.N. Bui; *Teaching Exceptional Children and Youth in Today's Schools: What Beginning Teachers Need to Know*, 4th ed., Love Publishing, Jan. 2007.
- Andrews, D.L. and W. P. Alexander; "Laboratory Support for MIPS-style Processor Design," in CDROM addendum *Computer Organization and Design: The Hardware/Software Interface*, 3rd ed; (Eds.) Patterson and Hennessy, Morgan Kaufmann, 2006.
- Demarest, K.; "Waveguides and Resonators," *Fundamentals of Engineering Electromagnetics*; (Eds.) Rajeev Bansal, Taylor & Francis, 2006, pp. 227–253.
- Duncan, T.E. with B. Maslowski and B. Pasik-Duncan; "Linear Stochastic Equations in a Hilbert Space With a Fractional Brownian Motion," *Stochastic Processes, Optimization, and Control Theory: Applications in Financial Engineering, Queueing Networks and Manufacturing*; (Eds.) H. Yan, G. Yin, and Q. Zhang, Springer Science + Business Media, 2006, pp. 201–222.
- Duncan, T.E.; "Some Bilinear Stochastic Equations With a Fractional Brownian Motion," *Stochastic Processes, Optimization, and Control Theory: Applications in Financial Engineering, Queueing Networks and Manufacturing*; (Eds.) H. Yan, G. Yin, and Q. Zhang, Springer Science + Business Media, 2006, pp. 97–108.



- Gauch, S.E. with M. Speretta and A. Pretschner; "Ontology-Based User Profiles for Personalized Search," *Ontologies: A Handbook of Principles, Concepts and Applications in Information Systems*; (Eds.) Kishore, Ramesh, and Sharman, Springer-Verlag, Sept. 2006.
- Gauch, S.E. with M. Speretta, A. Chadralmouli, and A. Micarelli; "User Profiles for Personalized Information Access," *Adaptive Web*; (Eds.) Peter Brusilovsky and Alfred Kobsa, Springer-Verlag, Ch. 2, 2007, pp. 54–89.
- Grzymala-Busse, J.W.; "Rough Set Strategies to Data with Missing Attribute Values," *Foundations and Novel Approaches in Data Mining, Series: Studies in Computational Intelligence*; (Eds.) T.Y. Lin, S. Oshuga, C.J. Liao, and X. Hu, Springer-Verlag, Vol. 9, 2006, pp. 197–212.
- Huan, J. with W. Wang and J. Prins; "Protein Local Structure Comparison: Methods and Future Directions," *Advances in Computers*; (Ed.) Chau-Wen Tseng, Elsevier, 2006.
- Micarelli, A. with F. Gasparetti, F. Sciarrone, and S.E. Gauch; "Personalized Search on the World Wide Web," *Adaptive Web*; (Eds.) Peter Brusilovsky and Alfred Kobsa, Springer-Verlag, Ch. 6, 2007, pp. 195–230.

Journals

- Ahn, Y.M. with L. Vogeti, C.J. Liu, H.K.R. Santhapuram, J.M. White, V. Vasandani, L.A. Mitscher, G.H. Lushington, P.R. Hanson, D.C. Powell, R.H. Himes, K.F. Roby, Q.-Z. Ye, and G.I. Georg; "Design, Synthesis, Antiproliferative and CDK2-Cyclin A Inhibitory Activity of Novel Flavopiridol Analogues," *Bioorganic & Medicinal Chemistry*, Vol. 15(2), Jan. 2007, pp. 589–1170.
- Bali, S. and V.S. Frost; "An Algorithm for Fitting MMPP to IP Traffic Traces," *IEEE Communications Letters*, Vol. 11(2), Feb. 2007, pp. 207–209.
- Bandyopadhyay, D. with J. Huan, J. Liu, J. Prins, J. Snoeyink, W. Wang, and A. Tropsha; "Structure-based Function Inference Using Protein Family-specific Fingerprints," *Journal of Protein Science*, Vol. 15, 2006, pp. 1537–1543.

NASA Fellow and Ph.D. student Vijay Ramasami conducts research in ITTC's Radar and Remote Sensing Lab. Ramasami was one the principal authors on the "Sea Ice Thickness Measurements by a Wideband Penetrating Radar" paper presented at the American Geophysical Union Fall Meeting in December.

Blunt, S.D. with K. Gerlach and M. Rangaswamy; "STAP using Knowledge-Aided Covariance Estimation and the FRACTA Algorithm," *IEEE Trans. Aerospace & Electronic Systems*, Vol. 42(3), July 2006, pp. 891–903.

Blunt, S.D. and K. Gerlach; "Multistatic Adaptive Pulse Compression," *IEEE Trans. Aerospace & Electronic Systems*, Vol. 42(3), July 2006, pp. 1043–1057.

Cerutti, I. with A. Fumagalli, R. Hui, P. Monti, A. Paradisi, and M. Tacca; "Plug and Play Optical (PPO) Nodes: Network Functionalities and Built-in Fiber Characterization Techniques," *OSA Journal of Optical Networking*, Vol. 6(6), 2007, pp. 642–653.

Chaudhry, P. with F. Schoenen, B. Neuenswander, G.H. Lushington, and J. Aube; "One-Step Synthesis of Oxazoline and Dihydrooxazine Libraries," *J. Combinatorial Chemistry*, Vol. 9(3), 2007, pp. 473–476.

Chen, X.w. with S. Kim, V. Pavlovic, and D. Casasent; "Advanced Signal Processing Techniques for Bioinformatics," *EURASIP Journal on Applied Signal Processing*, Editorial, Vol. 2006, 2006, Article ID: 51090.

Chen, X.w. with X. Zeng and D. van Alphen; "Multi-class Feature Selection for Texture Classification," *Pattern Recognition Letters*, Vol. 27(14), 2006, pp. 1685–1691.

Chen, X.w. with B. Gerlach, D. Chen, and Z. Liu; "Structural Risk Minimization Based Gene Expression Profiling Analysis," *Int. Journal on Bioinformatics Research and Applications*, Vol. 3(2), 2007, pp. 153–169.

Deavours, D.D.; "Are Item-Level Tags Up to the Job?" *RFID J.*, Vol. 3(1), 2006, pp. 27–32.

Dubois, M. with G. Bohling and S. Chakrabarti; "Comparison of Four Approaches to a Rock Facies Classification Problem," *J. of Computers and Geosciences*, Vol. 33(5), May 2007, pp. 599–617.

Eunni, M. with M. Sivakumar and D.D. Deavours; "A Novel Planar Microstrip Antenna Design for UHF RFID," *J. Systemics, Cybernetics & Informatics*, Vol. 5(1), Jan. 2007, pp. 6–10.

Fang, J.W. with Y.H. Dong, G.H. Lushington, Q.Z. Ye, and G.I. Georg; "Support Vector Machines in HTS Data Mining: Type I MetAPs Inhibition Study," *J. Biomolecular Screening*, Vol. 11(2), 2006, pp. 138–144.

Gerlach, K. and S.D. Blunt; "The Factored-SVD Formulation and an Application Example," *Digital Signal Processing*, Vol. 17(1), Jan. 2007, pp. 199–208.



ITTC RF Electronics Engineer Dan DePardo refines hardware for EECS Professor Gary Minden's SensorNet project. Their research led to an article in *IEEE Communications Magazine*.

Gerlach, K. with A.K. Shackelford and S.D. Blunt; "Combined Multistatic Adaptive Pulse Compression and Adaptive Beamforming for Shared-Spectrum Radar," *IEEE Journal of Selected Topics in Signal Processing*, Vol. 1(1), June 2007, pp. 137–146.

Goodman, N. and J.M. Stiles; "On Clutter Rank Observed by Arbitrary Arrays," *IEEE Trans. on Signal Processing*, Vol. 55(1), Jan. 2007, pp. 178–186.

Grzymala-Busse, J.W. and W.J. Grzymala-Busse; "An Experimental Comparison of Three Rough Set Approaches to Missing Attribute Values," *Trans. on Rough Sets, Lecture Notes in Computer Science Journal Subline*, Springer-Verlag, Vol. 6, May 2007, pp. 31–50.

Grzymala-Busse, J.W. with Z.S. Hippe and T. Mroczek; "Deriving Belief Networks and Belief Rules from Data: A Progress Report," *Trans. on Rough Sets, Lecture Notes in Computer Science Journal Subline*, Springer-Verlag, Vol. 7, 2007, pp. 53–69.

Haas, R.J. and J.W. Fang; "Mining Protein-Protein Interaction Data," *Current Bioinformatics*, Vol 1(2), 2006, pp. 197–205.

Hanzlik, R.P. with T.M. Koen, B. Theertham, Y.H. Dong, and J.W. Fang; "The Reactive Metabolite Target Protein Database—A Web-Accessible Resource," *BMC Bioinformatics*, Vol. 8, 2007, article no. 95.

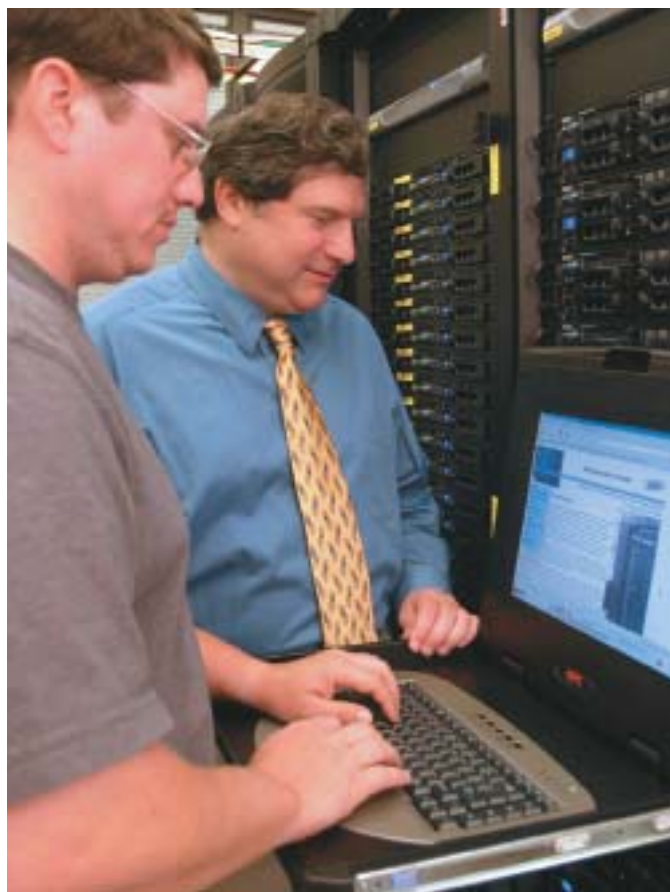
Hui, R. with R. Saunders, B. Heffner, D. Richards, B. Fu, and P. Adany; "Non-blocking PMD Monitoring in Live Optical Systems," *Electronics Letters*, Vol. 43(1), 2007, pp. 53–54.

- Jin, Y. with S. Bali, T.E. Duncan, and V. Frost; "Predicting Properties of Congestion Events for a Queueing System With fBm Traffic," *IEEE Trans. Networking*, Vol. 15, 2007, pp. 1098–1108.
- Lazarou, G.Y. and V. S. Frost; "Variance-Time Curve for Packet Streams Generated by Exponentially Distributed ON/OFF Sources," *IEEE Communications Letters*, Vol. 11(6), June 2007, pp. 552–554.
- Li, Q.S. with S. Cai, R.T. Borchardt, J.W. Fang, K. Kuczera, C.R. Middaugh, and R.L. Schowen; "Comparative Kinetics of Cofactor Assoc. and Dissociation for the Human and Trypanosomal S-Adenosyl-homocysteine Hydrolases. 1. Basic Features of the Assoc. and Dissociation Processes," *Biochemistry*, Vol. 46(19), 2007, pp. 5798–5809.
- Liu, Z. with D. Chen and X.w. Chen; "CpG Island Identification with Higher Order, Variable Order Markov Models," *Data Mining in Biomedicine*, Series: Springer Optimization and Its Applications, Vol. 7, 2007, pp. 47–58.
- Lushington, G.H. with J.-X. Guo and J.L. Wang; "Whither COMBINE? New Opportunities for Receptor-Based QSAR," *Current Medicinal Chemistry*, Vol. 14(17), 2007, pp. 1863–1877.
- Manyem, S. with M.P. Sibi, G.H. Lushington, B. Neuenswander, F. Schoenen, and J. Aubé; "Solution-Phase Parallel Synthesis of a Library of D2-Pyrazolines," *J. Combinatorial Chemistry*, Vol. 9(1), 2007, pp. 20–28.
- Miller, J.R.; "Attribute Blocks: A Tool for Visualizing Multiple Continuously-Defined Attributes," *IEEE Computer Graphics & Applications*, Vol. 27(3), May/June 2007, pp. 57–69.
- Minden, G.M. with J.B. Evans, L. Searl, D. DePardo, R. Rajbanshi, J. Guffey, Qi Chen, T. Newman, V.R. Petty, F. Weidling, M. Peck, B. Cordill, D. Datla, B. Barker, and A. Agah; "An Agile Radio for Wireless Innovation," *IEEE Communications Magazine*, May 2007.
- Pasik-Duncan, B. (Guest Ed.); Special issue dedicated to the 65th birthday of Tyrone Duncan, *Comm. Information & Systems J.*, Vol. 7(1–2), 2007, Parts 2&3.
- Perrins, E. and M. Rice; "A Reduced-Complexity Approach to Iterative Detection of SOQPSK," *IEEE Trans. on Communications*, Nov. 2006.
- Perrins, E. and M. Rice; "Reduced Complexity Detectors for Multi-h CPM in Aeronautical Telemetry," *IEEE Trans. on Aerospace and Electronic Systems*, Jan. 2007.
- Peterson, L. with T. Anderson, D. Blumenthal, D. Casey, D. Clark, D. Estrin, J. Evans, D. Raychaudhuri, M. Reiter, J. Rexford, S. Shenker, and J. Wroclawski; "GENI Design Principles," *IEEE Computer*, Vol. 39(9), Sept. 2006, pp. 102–105.
- Plaut, J. with G. Picardi, A. Safaeinili, A. Ivanov, S. Milkovich, A. Cicchetti, W. Kofman, J. Mouginot, W. Farrell, R. Phillips, S. Clifford, A. Frigeri, R. Orosei, C. Federico, I. Williams, D. Gurnett, E. Nielsen, T. Hagfors, E. Heggy, E. Stofan, D. Plettemeier, T. Watters, C. Leuschen, and P. Edenhofer; "Subsurface Radar Sounding of the South Polar Layered Deposits of Mars," *Science*, Vol. 316(5821), April 2007, pp. 92–95.
- Ramasubramanian, P.G. with A. Agah and S.E. Gauch; "An Intelligent Information Retrieval System using Automatic Word Sense Disambiguation," *J. of Intelligent Systems*, Vol. 16(2), Feb. 2007, pp. 135–166.
- Rider, V. with K. Isuzugawa, M. Twarog, S. Jones, B. Cameron, K. Imakawa, and J.W. Fang; "Progesterone Initiates Wnt- β -Catenin Signaling but Estradiol Is Required for Nuclear Activation and Synchronous Proliferation of Rat Uterine Stromal Cells," *J. Endocrinol*, Vol. 191(3), 2006, pp. 537–548.
- Ryoo, J. and H. Saiedian; "A Highly Adaptable Architecture View Description Language," *J. of Systems and Software*, Vol. 79(8), August 2006, pp. 1180–1206.
- Salamat-Miller, N.S. with J.W. Fang, C. Seidel, A. Smalter, Y. Assenov, M. Albrecht, and C.R. Middaugh; "A Network-Based Analysis of Polyanion Binding Proteins Utilizing Human Protein Arrays," *Biological Chemistry*, Vol. 282(14), 2007, pp. 10153–10163.

EECS Assistant Professor Erik Perrins (left) and graduate student Balachandra Kumaraswamy stand on the roof of Nichols Hall with a HughesNet satellite. Their proof-of-concept communication system is part of the infrastructure for the "Understanding and Forecasting Ecological Change" project.



- Salamat-Miller, N.S. with J.W. Fang, C. Seidel, A. Smalter, Y. Assenov, M. Albrecht, and C.R. Middaugh; "A Network-Based Analysis of Polyanion Binding Proteins Utilizing Yeast Protein Arrays," *Molecular & Cellular Proteomics*, Vol. 5(12), Dec. 2006, pp. 2263–2278.
- Senf, A. with X.w. Chen and Y. Zhang; "Comparison of one-class SVM and two-class SVM for Fold Recognition," *LNCS: Neural Information Processing*, Vol. 4233, 2006, pp. 140–149.
- Shieh, W. with R. Hui and X. Yi; "Degree-of-Polarization and Eye-Closure Penalty Associated with Optical Signals with Orthogonal Polarizations," *IEEE Photonics Technology Letters*, Vol. 18(10), 2006, pp. 1122–1124.
- Smith, B.D. with J.L. Sanders, P.R. Porubsky, G.H. Lushington, C.D. Stout, and E.E. Scott; "Structure of the Human Lung Cytochrome P450 2A13," *J. Biological Chemistry*, Vol. 282(23), June 2007, pp. 17306–17313.
- Suprenant, K.A. with N. Bloom, B. Hendricks, K.E. Huffman, D.P. Corey, J. Fang, and G.H. Lushington; "The Major Vault Protein is Related to the Prokaryotic Toxic Anion Resistance Protein Family, TelA," *J. Experimental Biology*, Vol. 210, 2007, pp. 946–955.
- Tarca, A. with V. Carey, X.w. Chen, R. Romero, and S. Draghici; "Machine Learning and its Applications to Biology," *PLoS Computational Biology*, Vol. 3(6), June 2007, e116.
- Unruh, J.R. with E.S. Price, R.G. Molla, R. Hui, and C.K. Johnson; "Evaluation of a Femtosecond Fiber Laser for Two-Photon Fluorescence Correlation Spectroscopy," *Microscopy Research and Technique*, Vol. 69(11), 2006, pp. 891–983.
- Unruh, J.R. with E.S. Price, R. Gagliano, L. Stehno-Bittel, C.K. Johnson, and R. Hui; "Two-Photon Microscopy with Wavelength Switchable Fiber Laser Excitation," *Optics Express*, Vol. 14(21), Oct. 2006, pp. 9825–9831.
- Xiong, H. with Y. Zhang and X.w. Chen; "Data-dependent Kernel Machines for Microarray Data Classification," *IEEE/ACM Trans. on Computational Biology and Bioinformatics*, June 2007.
- Wan, Y. and R. Hui; "Design of WDM Cross Connect Based on Interleaved AWG (IAWG) and a Phase Shifter Array," *IEEE/OSA J. of Lightwave Technology*, Vol. 25(6), 2007, pp. 1390–1400.
- Wang, J.L. with J.-X. Guo, Q.-Y. Zhang, J.J.Q. Wu, R. Seifert, and G.H. Lushington; "A Conformational Transition in the Adenylyl Cyclase Catalytic Site Yields Different Binding Modes for Ribosyl-Modified and Unmodified Nucleotide Inhibitors," *Bioorganic & Medicinal Chemistry*, Vol. 15(8), April 2007, pp. 2993–3002.
- Watters, T. with C. Leuschen, J. Plaut, G. Picardi, A. Safaeinili, S. Clifford, W. Farrell, A. Ivanov, R. Phillips, and E. Stofan; "MARSIS Radar Sounder Evidence of Buried Basins in the Northern Lowlands of Mars," *Nature*, Vol. 444, Dec. 2006.
- Wood, S.J. with K.A. Miller, G.H. Lushington, M.R. Burns, and S.A. David; "Anti-Endotoxin Agents. 3. Rapid Identification of High-Affinity Lipopolysaccharide-Binding Compounds in a Substituted Polyamine Library," *Combinatorial Chemistry & High Throughput Screening*, Vol. 9(10), Dec. 2006, pp. 27–36.



Adam Hock, senior network systems administrator for the ITTC Bioinformatics Computer Cluster, and Victor Frost, ITTC director and EECS distinguished professor, demonstrate the high-performance computing environment. EECS Assistant Professor Xue-wen Chen and Bioinformatics Specialist Jianwen Fang are among the many KU researchers who use the cluster to analyze and store data.



Ph.D. students Eric Akers, left, and Richard Stansbury conduct field tests on an autonomous mobile rover (MARVIN II). They published the results with their advisor EECS Associate Professor Arvin Agah in two conference proceedings.

Photo by Megan E. Gannon

- Yoshikawa, K. with C. Leuschen, A. Ikeda, K. Harada, P. Gogineni, P. Hoekstra, L. Hinzman, Y. Sawada, and N. Matsuoka; "Comparison of Geophysical Investigations for Detection of Massive Ground Ice (pingo ice)," *Journal of Geophysical Research*, Vol. 111, 2006, E06S19, doi:10.1029/2005JE002573.
- Zhang, G. with H. Wang, J. Shi, X. Wang, H. Zheng, G.K-S. Wong, T. Clark, W. Wang, J. Wang, and L. Kang; "Identification and Characterization of Insect-Specific Proteins by Genome Data Analysis," *BMC Genomics*, Vol. 8(93), April 2007.

Conferences

- Akers, E.L. with R.S. Stansbury and A. Agah; "Long-term Survival of Polar Mobile Robots," in *Proceedings of the 4th Int. Conf. on Computing, Communications and Control Technologies (CCCT 2006)*, Orlando, FL, July 2006, pp. 329–333.
- Akers, E.L. with R.S. Stansbury, T.L. Akins, and A. Agah; "Mobile Robots for Harsh Environments: Lessons Learned from Field Experiments," in *Proceedings of the 11th Int. Symposium on Robotics and Applications, World Automation Congress, ISORA-69*, Budapest, Hungary, July 2006, pp. 1–6.
- Alexander, P.; "An Introduction to Rosetta," Kansas State University Dept. of Computer Science, Manhattan, KS, June 2007. (Invited)
- Alexander, P.; "System-Level Analysis of the Supervisor Virtual Platform," *The National Security Agency*, Baltimore, MD, Jan. 2007. (Invited)
- Alexander, P. and D. Burke; "SVP Decomposition and Trust Modeling," *Trusted Research Platform Face-to-Face Meeting*, Baltimore, MD, Nov. 2006. (Invited)
- Alexander, P.; "System-Level Design and Rosetta," UMKC Dept. of Computer Science, Kansas City, MO, Jan. 2007. (Invited)
- Alexander, P. and D. Burke; "Supervisor VP and Secure Boot," *Trusted Research Platform Face-to-Face Meeting*, Beaverton, OR, August 2006. (Invited)
- Andrews, D.; "hthreads: A Hardware/Software Co-designed Run Time System and Development Environment for Creating Custom Multithreaded Multiprocessor Systems on Programmable Chip," *Paderborn University, Paderborn, Germany*, Dec. 2006. (Invited)
- Andrews, D.; "hthreads: A Computational Model for Reconfigurable Devices," *16th Int. Conf. on Field Programmable Logic and Applications*, Madrid, Spain, August 2006. (Poster Presentation)
- Andrews, D.; "hthreads: A Hardware/Software Co-designed Run Time System and Development Environment for Creating Custom Multithreaded Multiprocessor Systems on Programmable Chip," *EPFL, Lausanne, Switzerland*, August 2006. (Invited)
- Andrews, D.; "hthreads: A Hardware/Software Co-designed Run Time System and Development Environment for Creating Custom Multithreaded Multiprocessor Systems on Programmable Chip," *Technical University (TU) Berlin, Berlin, Germany*, Jan. 2007. (Invited)
- Agron, J. with W. Peck, E. Anderson, D. Andrews, E. Komp, R. Sass, F. Bajot, and J. Stevens; "Run-Time Services for Hybrid CPU/FPGA Systems on Chip," in *Proceedings of the 27th IEEE Real Times Systems Symposium (RTSS)*, Rio De Janeiro, Brazil, Dec. 2006.
- Bali, S. with S. Machiraju, H. Zang, and V.S. Frost; "A Measurement Study of Scheduler-based Attacks in 3G Wireless Networks," *8th Passive and Active Measurement Conf.*, Louvain-la-neuve, Belgium, April 2007.
- Beldona, S. and C. Tsatsoulis; "An Investigation of Sharing of Seller Reputation Among Buyers in Agent-Based Markets," *3rd Int. Conf. on Autonomic and Autonomous Systems (ICAS 2007)*, Athens, Greece, June 2007.
- Beldona, S. and C. Tsatsoulis; "Reputation Based Buyer Strategy for Seller Selection for Both Frequent and Infrequent Purchases," *4th Int. Conf. on Informatics in Control, Automation & Robotics*, Angers, France, May 2007.

- Bilgen, M. with J. Gauch, R. Loganathan, M.D. Alanezy, E. Popel, T. Alrefae, and I.V. Smirnova; "Gaining New Insights on the Relations Between Structure, Property, and Function in Diabetic Heart using Elastography Imaging," Fifth Int. Conf. on the Ultrasonic Measurement and Imaging of Tissue Elasticity, Snowbird, UT, Oct. 2006.
- Blunt, S.D. and K. Gerlach; "A Generalized Formulation for Adaptive Pulse Compression of Multistatic Radar," Fourth IEEE Workshop on Sensor Array and Multi-Channel Processing (SAM), Waltham, MA, July 2006, pp. 349–353.
- Blunt, S.D. and P. Yatham; "Waveform Design for Radar-Embedded Communications," 2007 Int. Waveform Diversity & Design Conf., Pisa, Italy, June 2007, pp. 214–218. (Invited)
- Blunt, S.D. and T. Higgins; "Achieving Real-Time Efficiency for Adaptive Radar Pulse Compression," 2007 IEEE Radar Conf., Waltham, MA, April 2007, pp. 116–121.
- Blunt, S.D. with K. Gerlach and T. Higgins; "Aspects of Radar Range Super-Resolution," 2007 IEEE Radar Conf., Waltham, MA, April 2007, pp. 683–687.
- Burke, D. and P. Alexander; "Introduction to Trust Relations," High Confidence Software Symposium (HCSS'07), Baltimore, MD, May 2007. (Invited)
- Challum, V. with A. Chandramouli and S.E. Gauch; "Contextual Search Using Ontology-Based User Profiles," Recherche d'Information Assistée par Ordinateur (RIAO '07): Large-Scale Semantic Access to Content (Text, Image, Video and Sound), Pittsburgh, PA, May/June 2007.
- Chalishazar, N. with A. Lohofener, J.A. Roberts, and G. Prescott; "Mobile Line-of-Sight Radio Propagation Modeling for Polar Regions," American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 2006.
- Chandramouli, A. and S.E. Gauch; "A Co-operative Web Services Paradigm for Supporting Crawlers," Recherche d'Information Assistée par Ordinateur (RIAO '07): Large-Scale Semantic Access to Content (Text, Image, Video and Sound), Pittsburgh, PA, May/June 2007.
- Chen, X.-w. and J. Jeong; "Minimum Reference Set Based Feature Selection for Small Sample Classifications," in Proceedings of the 24th Int. Conf. on Machine Learning, Vol. 227, Corvallis, Oregon, June 2007, pp. 153–160.
- Clark, T.; "DNA Sequence Annotations as a Basis for Modeling Nucleosome Positioning," Beijing Genomics Institute, Beijing, China, July 2006. (Invited)
- Datla, D. with R. Rajbanshi, A.M. Wyglinski, and G.J. Minden; "Parametric Adaptive Spectrum Sensing Framework for Dynamic Spectrum Access Networks," 2nd IEEE Symposium on New Frontiers in Dynamic Spectrum Access Networks (DySPAN), Dublin, Ireland, April 2007.
- Datla, D. with R. Rajbanshi, A.M. Wyglinski, and G.J. Minden; "A Statistical Approach to Spectrum Measurement Processing," in Proceedings of the 2007 Virginia Tech Symposium on Wireless Personal Communications, Blacksburg, VA, June 2007.
- de Meer, H. and J.P.G. Sterbenz, (Eds.); in Proceedings of the Int. Workshop on Self-Organizing Systems 2006, LNCS 4124, Springer, Berlin, 2006.
- Deavours, D.D.; "From Pilot to Production: Practical Considerations in Your RFID Deployment," RFID World 2007, Grapevine, TX, March 2007. (Tutorial)
- Duncan T.E. with B. Pasik-Duncan and L. Stettner; "Remarks on Risk Sensitive Adaptive Control of Markov Processes," in Proceedings of the 45th IEEE Conf. Decision & Control, San Diego, CA, Dec. 2006, pp. 2861–2865.
- Duncan, T.E. with B. Maslowski and B. Pasik-Duncan; "Some Solutions of Semilinear Stochastic Equations in a Hilbert Space with a Fractional Brownian Motion," in Proceedings of the 45th IEEE Conf. Decision & Control, San Diego, CA, Dec. 2006.
- Evans, J.B.; "CogNet - An Architecture for Experimental Cognitive Radio Networks within the Future Internet," 1st ACM/IEEE Int. Workshop on Mobility in the Evolving Internet Architecture (MobiArch 2006), San Francisco, CA, Dec. 2006.



EECS Assistant Professor Shannon Blunt, left, evaluates calculations with EECS Ph.D. student and U.S. Navy intern Tom Higgins. The researchers had two papers published in the Proceedings of the 2007 IEEE Radar Conference in April.

Photo by Jill Hummels

Evans, J.B.; "Breakout session reports," LSN Workshop on Future Internet and Experimentation Facility Design (with GENI as an Example Proposed Initiative), Arlington, VA, July 2006.

Evans, J.B.; "Comparative Study of Frequency Agile Data Transmission Schemes for Cognitive Radio Transceivers," 1st Int. Workshop on Technology and Policy for Accessing Spectrum, Boston, MA, 2006.

Evans, J.B.; "Security & Privacy in Dynamic Wireless Networks," EU-US Summit Series on Cyber Trust Workshop on System Dependability & Security, Dublin, Ireland, Nov. 2006.

Evans, J.B.; "Spectrum Sharing for Directional Systems," 1st Int. Workshop on Technology and Policy for Accessing Spectrum, Boston, MA, 2006. (Poster)

Evans, J.B.; "TV Band Measurements and Implications for White Space Use," Defense Spectrum Summit 2006: Panel on Future Technologies for Spectrum, Annapolis, MD, Dec. 2006.

Fang, J. and J.W. Grzymala-Busse; "Mining Mass Spectrometry Database Search Results—A Rough Set Approach," in Proceedings of the Int. Conf. of Rough Sets and Emerging Intelligent Systems Paradigms (RSEISP'2007), Warsaw, Poland, June 2007.

Fang, J. and J.W. Grzymala-Busse; "Mining of MicroRNA Expression Data: A Rough Set Approach," in Proceedings of the 1st Int. Conf. on Rough Sets and Knowledge Technology, Lecture Notes in AI, Vol. 4062, Chongqing, China, July 2006, pp. 58–67. (Invited)

Fang, J.W. with N. Salamat-Miller, Y.H. Dong, and C.R. Middaugh; "Prediction of Polyanion Binding Potential in Proteins Using Random Forest" in Proceedings of the Int. Conf. Bioinformatics & Computational Biology, Las Vegas, NV, June 2007, pp. 427–431.

Frost, V.; "A New Perspective on Internet Quality of Service: Measurement and Predictions," CSEE Departmental Seminar, U. of Missouri, Sept. 2006. (Invited)

Gauch, S.E.; "Personalized Search Based on User Search Histories," Information Sciences and Technology Colloquium Series, Penn State, Nov. 2006. (Invited)

Gauch, S.E. and A. Chandramouli; "Semi-Automatic Update of Existing Taxonomy using Text Mining," 5th Int. Conf. on Ecological Informatics (ISEI5), Santa Barbara, CA, Dec. 2006.



Torry Akins, ITTC research associate, is working on a sensor component for the Polar Radar for Ice Sheet Measurements (PRISM) project. Akins collaborated on the "Synthetic Aperture Radar Imaging of Ice bed Interface" paper, which EECS Distinguished Professor Prasad Gogineni published.

Gifford, C.M. with A. Agah and G.P. Tsofilias; "Hybrid Streamers for Polar Seismic," American Geophysical Union (AGU) Fall Meeting, Eos Trans. AUG., Vol. 87(52), Abstract C41B-0335, San Francisco, CA, Dec. 2006.

Gifford, C.M. with C.L. Arthur, B.L. Carmichael, G.K. Webber, and A. Agah; "Promoting Diversity in Undergraduate Research in Robotics-based Seismic," American Geophysical Union (AGU) Fall Meeting, Eos Trans. AUG., Vol. 87(52), Abstract ED33B-1385, San Francisco, CA, Dec. 2006

Gifford, C.M. and A. Agah; "Robotic Deployment and Retrieval of Seismic Sensors for Polar Environments," in Proceedings of the 4th Int. Conf. on Computing, Communications and Control Technologies (CCCT 2006), Vol. II, Orlando, FL, July 2006, pp. 334–339.

Gleixner, T. and D. Niehaus; "Hrtime and Beyond: Transforming the Linux Time Subsystems," Proceedings of the Ottawa Linux Symposium, Ottawa, Ontario, Canada, July 2006.

Gogineni, S.P. with J. Paden, T. Akins, C. Allen, P. Kanagaratnam, D. Braaten, and K. Jezek; "Synthetic Aperture Radar Imaging of Ice bed Interface," American Geophysical Union Fall Meeting, Eos Trans. AGU 87(52), San Francisco, CA, Dec. 2006.

- Grzymala-Busse, J.W. and W. Rzasz; "Definability of Approximations for a Generalization of the Indiscernibility Relation," in Proceedings of the 2007 IEEE Symposium on Foundations of Computational Intelligence, Honolulu, HI, April 2007, pp. 65–72.
- Grzymala-Busse, J.W.; "Experiments on Mining Incomplete Data: A Rough Set Approach," in Proceedings of the 11th Int. Conf. on Info. Processing and Management of Uncertainty in Knowledge-Based Systems (IPMU'2006), Paris, France, July 2006, pp. 2586–2593.
- Grzymala-Busse, J.W. and W. Rzasz; "Local and Global Approximations for Incomplete Data," in Proceedings of the 5th Int. Conf. on Rough Sets and Current Trends in Computing (RSCTC 2006), Lecture Notes in AI, Vol. 4259, Berlin, Heidelberg, Nov. 2006, pp. 244–253.
- Grzymala-Busse, J.W.; "Mining numerical data—A Rough Set Approach," in Proceedings of the Int. Conf. of Rough Sets and Emerging Intelligent Systems Paradigms, Warsaw, Poland, June 2007.
- Grzymala-Busse, J.W. with Z. S. Hippe, A. Kordek, T. Mroczek, and W. Podraza; "Neonatal Infection Diagnosis Using Constructive Induction in Data Mining," in Proceedings of the 11th Int. Conf. on Rough Sets, Fuzzy Sets, Data Mining and Granular Computing, Toronto, Canada, May 2007.
- Grzymala-Busse, J.W.; "A Rough Set Approach to Data with Missing Attribute Values," in Proceedings of the 1st Int. Conf. on Rough Sets and Knowledge Technology (RSKT 2006), Lecture Notes in AI, Vol. 4062, Chongqing, China, July 2006, pp. 58–67. (Invited)
- Hayden, L. with G. Fox and S. Gogineni; "Cyberinfrastructure for Remote Sensing of Ice Sheets," TeraGrid 2007 Conference, Madison, WI, June 2007.
- Heffner, B. with T. Schmidt, R. Saunders, R. Hui, D. Richards, and G. Nicholl; "43Gb/s Adaptive Polarization Mode Dispersion Compensator Field Trial," IEEE/OSA Optical Fiber Communication Conf. (OFC/NFOEC'2007), Paper NTuA1, Anaheim, CA, March 2007.
- Huan, J. with D. Bandyopadhyay, J. Snoeyink, J. Prins, A. Tropsha, and W. Wang; "Distance-based Identification of Spatial Motifs in Proteins Using Constrained Frequent Subgraph Mining," in Proceedings of the IEEE Computational Systems Bioinformatics (CSB), Stanford, CA, August 2006.
- Janzen, D. and H. Saiedian; "A Leveled Examination of Test-Driven Development," in Proceedings of the 29th ACM Int. Conf. on Software Engineering (ICSE '07), Dublin, Ireland, July 2007.
- Kanagaratnam, P. with S.P. Gogineni, B. Holt, A. Mahoney, and V. Ramasami; "Sea Ice Thickness Measurements by a Wideband Penetrating Radar," American Geophysical Union Fall Meeting, abstract C52A-08, San Francisco, CA, Dec. 2006.
- Lohoefer, A. with C. Veeramachaneni, S. Raghunandan, V. Ramasami, J. Paden, T. Akins, P. Kanagaratnam, and P. Gogineni; "TI: Radar Sounding of Jacobshavn and Other Outlet Glaciers," American Geophysical Union Fall Meeting, Eos Trans. AGU 87(52), Fall Meet. Suppl., San Francisco, CA, Dec. 2006.
- Madhuri E. with M. Sivakumar and D.D. Deavours; "A Novel Planar Microstrip Antenna Design for UHF RFID," in Proceedings of the 4th Int. Conf. on Computing, Communications, and Control Technologies (CCCT '06), Orlando, FL, July 2006, pp. 6–10.
- Maglia, A. with J.L. Leopold, L. Analia Pugener, and S.E. Gauch; "An Anatomical Ontology for Amphibians," Pacific Symposium on Biocomputing (PSB 2007): Session on Biodiversity Informatics: Managing Knowledge Beyond Humans and Model Organisms, Wailea, HI, Jan. 2007, pp. 367–378.
- Maglia, A. with J.L. Leopold, L.A. Pugener, and S. Gauch; "A Morphological Ontology for Amphibians: Facilitating the Integration of Genetic, Developmental, Anatomical, and Systematic Data," Pacific Symposium on Biocomputing (PSB 2007): Session on Biodiversity Informatics: Managing Knowledge Beyond Humans and Model Organisms, Wailea, HI, Jan. 2007.



EECS graduate student Madhuri Eunni refines a prototype of the KU-Tag, which can be seen at the bottom left. The innovative KU-Tag is profiled on page 6. Eunni wrote "A Novel Planar Microstrip Antenna Design for UHF RFID" paper that was published in the Proceedings of the 4th Int. Conf. on Computing, Communications, and Control Technologies.

- Mani, P. and D.W. Petr; "Investment Function: Enhanced Fairness and Performance in Multi-hop Wireless Networks," in Proceedings of the 2nd IEEE Int. Workshop on Heterogeneous Multi-Hop Wireless and Mobile Networks 2006, Oct. 2006.
- Marathe, K. C. with V.A. Jara, T. Akins, P. Kanagaratnam, S.P. Gogineni, K. Jezek, C. Allen, and D. Braaten; "Airborne Radar Demonstrator for Imaging of Ice-Bed Interface," American Geophysical Union Fall Meeting, abstract no. C21A-1135, San Francisco, CA, Dec. 2006.
- Markus, T. with D.J. Cavalieri, A. Gasiewski, S.P. Gogineni, J. Heinrichs, P. Kanagaratnam, M. Klein, W. Krabill, C. Leuschen, J. Maslanik, J. Sonntag, J. Stroeve, and M. Sturm; "March 2006 Arctic AMSR-E Sea Ice Validation Campaign: Coordinated In-situ, Aircraft, and Satellite Measurements," American Geophysical Union Fall Meeting, abstract # C52A-02, San Francisco, CA, Dec. 2006.
- McMillin, B. with C. Gill, M.L. Crow, F. Liu, D. Niehaus, A. Potthast, and D. Tauritz; "Cyber-Physical Systems Distributed Control: The Advanced Electric Power Grid," National Workshop-Beyond SCADA: Networked Embedded Control for Cyber Physical Systems, Pittsburgh, PA, Oct. 2006.
- Meyen, E.L. and J.R. Miller; "A System for Creating and Managing Reusable Learning Objects," in Proceedings of the 6th IASTED Int. Conf. on Web-Based Education, Chamonix, France, March 2007, pp. 353-358.
- Miller, J.; "Multivariate Visualization and Applications to Uncertainty," seminar for Dept. of Geological and Atmospheric Sciences, Virtual Reality Applications Center, Iowa State University, Ames, Iowa, Sept. 2006.
- Minden, G. with J.B. Evans, L. Searl, D. DePardo, V.R. Petty, R. Rajbanshi, J. Guffey, Q. Chen, T. Newman, F. Weidling, D. Datla, B. Barker, M. Peck, B. Cordill, A. M. Wyglinski, and A. Agah; "KUAR: A Flexible Software-Defined Radio Development Platform," 2nd IEEE Int. Symposium on Dynamic Spectrum Access Networks (DySPAN 2007), Dublin, Ireland, April 2007.
- Mohammad, A.J. with D. Hutchison and J.P.G. Sterbenz; "Towards Quantifying Metrics for Resilient and Survivable Networks," in Proceedings of IEEE ICNP 2006, Santa Barbara, CA, Nov. 2006.
- Narayana, M. and D. Haverkamp; "A Bayesian Algorithm for Tracking Multiple Moving Objects in Outdoor Surveillance Video," in Proceedings of the 4th IEEE CVPR Workshop on Object Tracking in and Beyond the Visible Spectrum, Minneapolis, MN, June 2007.
- Natarajan, P. with W. Liu, J. Oechslein, and A. Agah; "A Haptic Display for Robotic Rehabilitation of Stroke," in Proceedings of the 11th Int. Symposium on Robotics and Applications, World Automation Congress (WAC 2006), Budapest, Hungary, July 2006.
- Niamsuwan, N. with J.T. Johnson, S.P. Gogineni, and K.C. Jezek; "Electromagnetic Scattering Model Performance Assessment of the Global Ice Sheet Mapping Orbiter Concept," American Geophysical Union Fall Meeting, Eos Trans. AGU 87(52), abstract no. IN23B-05, San Francisco, CA, Dec. 2006.
- Niehaus, D.; "Important Issues for Cyber-Physical Systems," NSF Planning Workshop on Cyber-Physical Systems, Washington, D.C., July 2006.
- Niehaus, D.; "Virtualization Here, There, Everywhere," NSF Workshop on High-Confidence Software Systems for Cyber-Physical Systems, Washington, D.C., Dec. 2006.



Ph.D. students Rakesh Rajbanshi (standing) and Tim Newman along with master's student Jordan Guffey (in the back) prepare for a presentation at the 2nd IEEE International Symposium on Dynamic Spectrum Access Networks. Rajbanshi's paper, "Feasibility of Dynamic Spectrum Access in Underutilized Television Bands," was accepted for the conference.

Photo Courtesy of Rory Petty

Olivier, S. with J. Huan, J. Liu, J. Prins, J. Dinan, P. Sadayappan, and Cw Tseng; "UTS: An Unbalanced Tree Search Benchmark," in Proceedings of 19th Int. Workshop on Languages and Compilers for Parallel Computing, New Orleans, LA, Nov. 2006.

Peck, W. with E. Anderson, J. Agron, J. Stevens, F. Baijot, and D. Andrews; "Hthreads: A Computational Model for Reconfigurable Devices," in 16th Int. Conf. on Field Programmable Logic and Applications, August 2006. (Reviewed Paper in Poster Session)

Perrins, E.; "A Comprehensive and Robust Receiver Design for ARTM CPM," University of British Columbia, Vancouver, Canada, August 2006.

Perrins, E.; "Everything You Wanted to Know About Double Differential Encoders But Were Afraid to Ask," Int. Telemetry Conf., San Diego, CA, Oct. 2006.

Rajbanshi, R. with A.M. Wyglinski and G.J. Minden; "Adaptive-Mode Peak-to-Average Power Ratio Reduction Algorithm for OFDM-based Cognitive Radios," in Proceedings of the 64th IEEE Vehicular Technology Conf. - Fall, Montreal, Canada, Sept. 2006.

Rajbanshi, R. with Q. Chen, A.M. Wyglinski, G.J. Minden, and J.B. Evans; "Quantitative Comparison of Agile Modulation Techniques for Cognitive Radio Transceivers," 1st IEEE Workshop on Cognitive Radio Networks, Las Vegas, NV, Jan. 2007.

Rajbanshi, R. with Q. Chen, A.M. Wyglinski, J.B. Evans, and G.J. Minden; "Comparative Study of Frequency Agile Data Transmission Schemes for Cognitive Radio Transceivers," 1st Int. Workshop on Technology and Policy for Accessing Spectrum, Boston, MA, August 2006.

Rajbanshi, R. with V.R. Petty, D. Datla, F. Weidling, D. DePardo, P. Kolodzy, M. Marcus, A.M. Wyglinski, J.B. Evans, G.J. Minden, and J.A. Roberts; "Feasibility of Dynamic Spectrum Access in Underutilized Television Bands," 2nd IEEE Int. Symposium on Dynamic Spectrum Access Networks, Dublin, Ireland, April 2007.

Raychaudhuri, D. with N. Mandayam, J.B. Evans, B.J. Ewy, S. Seshan, and P. Steenkiste; "CogNet—An Architecture for Experimental Cognitive Radio Networks within the Future Internet," 1st ACM/IEEE Int. Workshop on Mobility in the Evolving Internet Architecture, San Francisco, CA, Dec. 2006.

Rink, T. with P. Kanagaratnam, D. Braaten, T. Akins, and S. Gogineni; "A Wideband Radar for Mapping Near-Surface Layers in Snow," in Proceedings of IGARSS, Denver, CO, August 2006, pp. 3655–3657.



EECS Ph.D. student and U.S. Air Force Major Geoff Akers describes his research to ITTC Industry Advisory Board member Gary Mastin, a principal engineer at Lockheed Martin. Akers is creating a dual-purpose radar system that will conduct image mapping, such as Google Earth, and target detection and tracking. Current radar systems are limited to image mapping or target detection.

Rowland, J.R. and D.W. Petr; "Work In Progress: Redesigning the EE Service Course," in Proceedings of the 2006 IEEE/ASEE Frontiers in Education Conf. (FIE'06), San Diego, CA, Oct. 2006.

Shackelford, A.K. with J. de Graaf, S. Talapatra, K. Gerlach, and S.D. Blunt; "Shared-Spectrum Multistatic Radar: Preliminary Experimental Results," 2007 Int. Waveform Diversity & Design Conf., Pisa, Italy, June 2007, pp. 443–447.

Shackelford, A.K. with J. de Graaf, S. Talapatra, S.D. Blunt, and K. Gerlach; "Adaptive Pulse Compression: Preliminary Experimental Results," 2007 IEEE Radar Conf., Waltham, MA, April 2007, pp. 234–237.

Shanmugan, K.S.; "Uplink Capacity of Satellite-Based WCDMA Networks," in Proceedings of the IEEE Mobility Conf., Paper A61 on CD, Bangkok, Thailand, Oct. 2006.

Shanmugan, K.S. and J.C. Thacker; "Satellite-Based WCDMA for a UHF Military Communication System," in Proceedings of the 12th Ka and Broadband Communications Conf., Paper K00061 on CD, Naples, Italy, Sept. 2006.

Shivadas, A. and J. Gauch; "Real-Time Commercial Recognition Using Color Moments and Hashing," Video Processing and Recognition, Montreal, Canada, May 2007.

Sterbenz, J.P.G.; "The Internet Hourglass Considered Harmful," Dagstuhl Workshop on Naming and Addressing for Next Generation Internetworks, Wadern, Germany, Oct. 2006. (Invited)

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Alumni Spotlight

Meet Denise Moore (CS, '86), Director of the State of Kansas Division of Information Systems and Communications and Chief Information Technology Officer for the Executive Branch

What are your top tips for students?

I think it is important to complete an internship before graduating. Having experience in your field of study when you enter the job market is a real plus. I know many IT departments, particularly in state government, want to hire interns, especially in the summer. If your school has an internship program, make use of it. Let people know that you are looking for an internship, and contact companies that you would have an interest in working for in the future.

Please describe a challenge that you have encountered in the work force and how you overcame it.

Being a female in a male dominated profession has presented a number of challenges. Several years ago I became the first woman IT Director for a state agency. I had to attend a meeting of other state IT Directors but was not afforded the same stature as my colleagues in similar agencies. I was straightforward with the person leading the group, and we resolved the matter. It is typical to encounter these situations in a predominately male dominated profession. I found it important to not overreact, but at the same time, address the situation directly.

What does a typical day for you look like?

I don't think I have typical days. Routine is not something I expect, which is probably why I enjoy the work I do. A lot of computer science and technology is about solving problems both at the technical and management levels. My daily work includes providing direction, advising, and making decisions in collaboration with many different people. So many things come to my attention on a daily basis I have to move quickly and decisively. Sometimes getting people working together effectively is one of the most important aspects of my work.

What are your favorite memories from EECS and/or KU?

One of the best things, when I look back on my experience, was the challenging curriculum. There was a good camaraderie among the students, and we accomplished a lot of complex assignments. Those were actually enjoyable times. Working collaboratively with a diverse group of people is something that has served me well in the workforce. This was my second degree, and I was an older student when attending KU. One of the things that stands out for me is being pregnant with my second child. She will be graduating from KU this year.

Do you have any insights or parting comments you'd like to share with students?

I have a few general observations about entering the workforce. Try to be open-minded about job opportunities. Speaking from my own personal experience, the best opportunities are not necessarily the planned ones. Interview those interviewing you to see what vision they have and what directions they want to go. Make sure it is a good fit for you, and there is opportunity for growth. Be prepared for your interview. When you get the job you want, dig in, work well with others, and volunteer for new projects or tasks, especially if they are over your pay grade.



Degree: Computer Science, 1986
Highlights: First woman IT Director for a State agency and current CIO for the State of Kansas

Photo Courtesy of Denise Moore

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EECS Publications

Continued from Page 45

- Stiles, J.; "Adaptive Construction of Informationally Optimal Space-Time Radar Transmit Functions," 4th Tri-Service Waveform Diversity Workshop, Washington, D.C., Nov. 2006.
- Streb, J. with G. Kimmell, N. Frisby, and P. Alexander; "Domain Specific Model Composition Using a Lattice of Coalgebras," in Proceedings of the OOPSLA '06 Workshop on Domain Specific Modeling, Portland, OR, Oct. 2006.
- Streb, J. and P. Alexander; "Using a Lattice of Coalgebras for Heterogeneous Model Composition," in Proceedings of MoDELS Workshop on Multi-Paradigm Modeling: Concepts and Tools, Genova, Italy, Oct. 2006.
- Studinger, M. with R.E. Bell, D. Braaten, D. Damaske, F. Ferraccioli, C.A. Finn, P. Gogineni, and C.J. Wilson; "Exploring the Gamburtsev Subglacial Mountains with Aerogeophysical Surveys During the IPY," American Geophysical Union Fall Meeting, San Francisco, CA, Dec. 2006. (Poster)
- Syed, A. with K. Demarest and D. Deavours; "Effects of Antenna Material on the Performance of UHF RFID Tags," in Proceedings of the IEEE Int. Conf. on RFID 2007, Grapevine, TX, March 2007, pp. 57–62.
- Taylor, C.M. and A. Agah; "Evolving Neural Network Topologies for Object Recognition," in Proceedings of the 6th Int. Symposium on Soft Computing for Industry, World Automation Congress, Budapest, Hungary, ISSCI-71, July 2006, pp. 1–6.
- Trajkov, D. with J.B. Evans and J.A. Roberts; "Spectrum Sharing for Directional Systems," 1st Int. Workshop on Technology and Policy for Accessing Spectrum (TAPAS 2006), Boston, MA, August 2006.
- Troxel, G.D. with E. Blossom, S. Boswell, A. Caro, I. Castineyra, A. Colvin, T. Dreier, J.B. Evans, N. Goffee, K. Haigh, T. Hussain, V. Kawadia, D. Lapsley, C. Livadas, A. Medina, J. Mikkelsen, G.J. Minden, R. Morris, C. Partridge, V. Raghunathan, R. Ramanathan, C. Santivanez, T. Schmid, D. Sumorok, M. Srivastava, R.S. Vincent, D. Wiggins, A. Wyglinski, and S. Zahedi; "Adaptive Dynamic Radio Open-source Intelligent Team (ADROIT): Cognitively-controlled Collaboration among SDR Nodes," 1st IEEE Workshop on Networking Technologies for Software Defined Radio (SDR) Networks, Reston, VA, Sept. 2006.
- Wang, W. and A. Lu; "Interactive Wormhole Detection in Large Scale Wireless Networks," in Proceedings of IEEE Symposium on Visual Analytics Science and Technology (VAST), 2006, pp. 99–106.
- Wang, W. and A. Lu; "Visualization Assisted Detection of Sybil Attacks in Wireless Networks," in Proceedings of ACM Workshop on Visualization for Computer Security (VizSEC), 2006, pp.51–60.
- Wang, W.; "Visualization Assisted Detection of Sybil Attacks in Wireless Networks," Presentation at ACM Workshop on Visualization for Computer Security (VizSEC), Nov. 2006.
- Williams, D. with J. Huan and W. Wang; "Graph Database Indexing Using Structured Graph Decomposition," in Proceedings of the 23rd IEEE Int. Conf. on Data Engineering (ICDE), Istanbul, Turkey, April 2007.
- Zdzislaw, S.H. with J.W. Grzymala-Busse and T. Mrozek; "Belief networks vs. Belief rules: Basic Theory and Practical Issues," in Proceedings of the 3rd Conf. Chemometrics: Methods and Applications, Zakopane, Poland, Oct. 2006, pp. 47–67.
- Zhang, X. with W. Wang and J. Huan; "On Demand Phenotype Ranking through Subspace Clustering," in Proceedings of SIAM Int. Conf. on Data Mining (SDM), Minneapolis, MN, April 2007.

Patents

- Blunt, S.D. and K. Gerlach; "Robust Predictive Deconvolution System and Method," Continuation-in-part, U.S. Patent# 7,106,250, issued Sept. 2006.
- Blunt, S.D. and K. Gerlach; "Doppler-Sensitive Adaptive Coherence Estimate Detector Methods," U.S. Patent #7,212,150, issued May 2007.
- Gerlach, K. and S.D. Blunt; "Radar Processor System and Method," U.S. Patent# 7,193,558, issued March 2007.
- Richards, D.L. with C.T. Allen, D.C. Hague, and M.L. Jones; "Identification of Polarization-mode Dispersion on a Communication Network," U.S. Patent #7,221,871, issued May 2007.
- Stump, G.S. and C.T. Allen; "Apparatus and Method for Horizontal Drilling," U.S. Patent# 7,182,151, issued Feb. 2007. ■



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