



# Connections

The ELECTRICAL and COMPUTER ENGINEERING Alumni Newsletter

Vol. 19, No. 1 Fall 2002



## From the Chair: S.S. Venkata

### Growth and Change

You'll notice that this issue of *ECpE Connections* is somewhat

shorter than our past efforts. Next spring we will mail a longer newsletter that includes all of the information you're used to seeing from ECpE. However, this fall we're sending you an abbreviated issue just to keep in touch and to share briefly with you the ways your department is growing and changing.

The department is, of course, first and foremost the people who teach and learn here, as well as the graduates we've sent out into the world. This fall, then, we're delighted to welcome a host of new faculty members who will both introduce new lines of research into the department as well as help make our current efforts even stronger. In this issue we offer brief profiles of these new scholars and teachers. Most are here already; one will come in January. As their profiles attest, they are an impressive group of intellectuals who will make an already strong department even stronger.

Intellectual ferment, however, takes place in a *place*, and it's no secret to most of you that for years now ECpE's dynamic growth has been outstripping the capacity of Coover Hall to accommodate it. That's no longer the case. We've included here a brief update on the Campaign for Coover Hall, an effort that will see both a substantial increase in lab, classroom, and office space for the department, and much-needed upgrades to our

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## College to Launch Campaign for Coover

The computing power that in 1948 required whole floors of buildings and massive amounts of energy to generate can now be produced on a desktop using a few cents worth of electricity. Unfortunately, such efficiencies of scale do not apply to educating people who make such technological miracles commonplace. This still requires space, and lots of it—a commodity increasingly hard to come by at Coover Hall.

That's about to change, thanks to a \$25-million campaign that, in addition to upgrading current facilities, will add another 35,000 square feet to Coover Hall. With the help of alumni and friends, the Iowa State Foundation is looking to raise about half that sum, with the balance provided by the legislature.

With more than 1,800 graduate and undergraduate students, the Department of Electrical and Computer Engineering at Iowa State is easily the single largest department on campus. And those numbers are only expected to increase, with current projections setting enrollment in the department at nearly 2,200 students in the next couple of years.

Along with increased enrollment comes an increase in the ranks of faculty, which in turn requires even more lab, office, and classroom space. In short, to remain attractive to the very best faculty—along with the grants and graduate students such faculty bring with them—ECpE must provide the best facilities in which to conduct state-of-the-art research and teaching.

That's an imperative not lost on ECpE Chair **Mani Venkata**.

"This department's goal is to reach the top twenty in national rankings," Venkata stresses. "Besides having excellent faculty and students, high quality space is critical to achieving that vision in the near future."

According to **Keith Fortmann**, executive director of development for the College of Engineering, the enhancements and additions to Coover may feature modular spaces that would meet the needs of future workgroups and technology. Further, the improved facility will bring together members of the department currently housed in buildings throughout campus. These arrangements, Fortmann says, will significantly improve the collaboration and productivity of faculty, and in the process, preserve and enhance the department's strong national reputation.

Improvements to the existing facility include new heating, cooling, and sprinkler systems; new windows, roofs, and plumbing; and redesigned lighting throughout the building. Additionally, existing laboratories will be completely renovated to support new classrooms and teaching and research labs.

Although the Campaign for Coover Hall is in its early stages, the improvements "are going to happen," Fortmann insists, reflecting the determination of the College of Engineering to offer incoming students the best possible preparation for a continually changing profession.

The campaign works to the benefit of alumni as well. The improvements will make for a stronger ECpE, and that, Fortmann notes, "guarantees the continued value of and respect for the diploma" of ISU-educated electrical and computer engineers.

# New ECpE Faculty

## Thomas E. Daniels

Thomas E. Daniels brings expertise in intrusion detection and network forensics to the department. His doctoral research at Purdue University is the first general study of the low level mechanisms used to conceal the sources of network traffic and how to instrument networks to determine the source. As an undergraduate at Southwest Missouri State University, Daniels received a Science and Engineering Research Semester Fellowship at Oak Ridge National Laboratory in Tennessee. In 1998 he was the Intel Fellowship recipient at Purdue University.

Daniels has extensive experience developing information security materials for the classroom. He has taught classes for Purdue's Center for Education and Research in the Information Assurance and Security continuing education program, and he developed and held tutorials for practitioners at the Computer Security Institute NetSec in 1999 and 2000.

## Yong Guan

Yong Guan is a 2002 Ph.D. graduate from Texas A&M University at College Station. He joins ECpE as an assistant professor with research interests in computer networks, distributed systems, operating systems, computer and network security, and mobile and wireless networks. Guan received the best paper award from the IEEE National Aerospace and Electronics Conference in 1998 and took second place in the graduate category of the International ACM student research contest in 2002.

Guan earned his B.S. and M.S. degrees in computer science at Peking University, Beijing, China. He was team leader and principal designer for several projects at Texas A&M, including NetCamo, working on providing secure and survivable real-time communications services.

## Sang W. Kim

Sang W. Kim will join ECpE in January as an associate professor. Recently a consultant with the Wireless Systems Research Department at AT&T Labs in Middletown, New Jersey, he has 14 years experience as a faculty member at the Korea Advanced Institute of Science and Technology (KAIST) and the California Institute of Technology. Kim earned his B.S. at Yonsei University, Korea, and his M.S. at KAIST. He came to the U.S. on a Fulbright Graduate Study Award and earned his Ph.D. in electrical engineering at the University of Michigan in 1987.

Kim has co-authored 16 journal articles and 41 conference papers and holds 4 patents. His research interests are wireless

communications: CDMA, adaptive modulation, channel coding, and diversity techniques. He is a senior member of IEEE and associate editor of *IEEE Communications Letters*. In September 2000, he received the best paper award at the IEEE Sixth International Symposium on Spread Spectrum Techniques and Applications. (A photo was unavailable at time of printing.)

## Ratnesh Kumar

Ratnesh Kumar joins ECpE as an associate professor after 11 years at the University of Kentucky. Kumar earned his bachelor's degree at the Indian Institute of Technology in Kanpur in 1987. He completed his Ph.D. at the University of Texas, Austin, in 1991.

While at Kentucky, Kumar received faculty fellowships at NASA-Ames, Argonne National Laboratory-West, the Applied Research Laboratory at Pennsylvania State University, and the Institute of Systems Research at the University of Maryland.

Kumar's research includes algorithms for modeling, verification, control, and diagnosis of reactive/event-driven, real-time, and hybrid systems, and their applications to automated logic control synthesis, communication networks and protocols, embedded systems, and formal verification of software/hardware systems. Since 1991 he has received close to \$3 million in research grants and contracts. He has co-authored a book, *Modeling and Control of Logical Discrete Event Systems*, as well as 42 journal articles, 7 book chapters, and 47 conference articles.

Kumar has been associate editor for *IEEE Transactions on Robotics and Automation*, *SIAM Journal of Control and Optimization*, *IEEE Control System Society*, and the *Workshop on Discrete Event Systems*.

## Yao Ma

Yao Ma completed his Ph.D. in electrical engineering at the National University of Singapore in 2000 and was a postdoctoral fellow at the University of Toronto prior to joining ECpE as an assistant professor. Ma earned his bachelor's degree at Anhui University and his master's at the

University of Science and Technology of China.

His research interests include signal processing for wireless communications, performance analysis for digital communications over general fading channels, and acquisition and synchronization in multiple-access communications. Prior to his fellowship, Ma was principal researcher in an industrial project on the acquisition of ultra-wide bandwidth communications at the National University of Singapore. He

is co-author of 12 journal papers and plans to write a book about digital communications over fading channels.

## Jiming Song

Jiming Song, assistant professor, has spent the last two years as a principal staff engineer/scientist at Motorola Inc. in Arizona. Prior to this, he was senior research scientist at the Center for Computational Electromagnetics at the University of Illinois, where he developed an industrial-strength code, the Fast Illinois Solver Code (FISC), which has been distributed to over 400 government and industrial users.

Song earned his B.S. and M.S. degrees in physics at Nanjing University and completed his Ph.D. at Michigan State University in 1993. His current research focuses on developing fast algorithms in computational electromagnetics and non-destructive evaluation, modeling to VLSI interconnects, radio frequency components, and wireless communication. He is co-author of 6 book chapters, 29 journal articles, and 74 conference papers.

## Srikanta Tirthapura

Srikanta Tirthapura earned his bachelor of technology degree in computer science in 1996 at the Indian Institute of Technology, Madras. He completed his M.S. and Ph.D., also in computer science, at Brown University, and joins ECpE as an assistant professor.

Tirthapura's research interests include

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distributed data structures and algorithms, scalable multicast, fault tolerance, and algorithmic issues in networks and databases. For his Ph.D. thesis, he worked on the design and analysis of distributed queuing protocols. As an intern at Bell Labs in New Jersey, he worked on problems involving algorithms for streaming data sets, combining aspects of communication complexity with data streams. His research has resulted in seven published articles and presentations at symposiums in the U.S., Portugal, Greece, and India.

**Zhengdao Wang**

Zhengdao Wang comes to ECpE as an assistant professor from the University of Minnesota, where he earned his Ph.D. Following undergraduate work at the University of Science and Technology of China in Hefei, Wang spent 10 months as a research assistant at the Institute of Acoustics, Chinese Academy of Sciences in Beijing. He worked on DSP chip design for video CD drive/players. In 1997 he began his graduate studies at the University of Virginia, Charlottesville.

At the University of Minnesota, Wang received the Graduate School Doctoral Dissertation Fellowship. His research focused on wireless communications, especially transmitter and receiver design for improving physical layer transmission rates and reliability. He is co-author of 9 published journal articles, 1 book chapter, and 17 conference papers.

**Clive Woods**

Clive Woods joined ECpE last January with the rank of professor. A native of Britain, he earned his doctorate at Oxford University, where he also was awarded a master's degree. He had been on the University of Sheffield faculty since 1983.



Woods has made significant contributions in areas such as magnetic materials, semiconductor devices, microwave acoustic devices, and properties of superconducting materials. He has held major research contracts with the Engineering and Physical Sciences Research Council, European Commission, Defense Engineering Research Agency, British Council, and British Aerospace. Currently his research focuses on novel opto-acoustic devices for fast imaging applications.

Also an innovative teacher, Woods pioneered a plan that gave Sheffield sophomores the opportunity to design, fabricate, and test a working solid-state device, utilizing clean-room facilities. In addition, he headed the department's course on digital systems and co-authored a major reference text, *Digital Logic Design*.

**Zhao Zhang**

Zhao Zhang comes to ECpE as an assistant professor from Williamsburg, Virginia, where he completed his Ph.D. in

computer science at the College of William and Mary. He earned his bachelor's and



master's degrees at Huazhong University of Science and Technology in Wahan, Hubei, China. In 2000 he served as a research intern at Hewlett-Packard Laboratories in Palo Alto.

Zhang's research interests include computer architecture, operating systems, and parallel and distributed computing, particularly hardware/software approaches for optimizing cache/memory performance. During his research assistantship, he investigated ways to enhance memory systems to address the demands of increasingly faster processors. The results were published in the proceedings of MICRO-33, a premier conference on computer micro-architecture, as well as in the proceedings of HPCA-8, *IEEE Micro*, and the *SIAM Journal on Scientific Computing*.

## New ECpE Staff

**Susana Alvarez** is the department's new administrative specialist. She has worked at



Iowa State for 14 years, 6 of those in financial management, including her most recent assignment at IPRT. Susana's responsibilities with ECpE range from budget development to administration of the

department's financial resources to proposal preparation and beyond. A native of the Philippines, she holds a B.A. in economics from the University of Mindanao and taught high school in Manila before coming to America. She has yet to adjust to Iowa winters but in warmer weather enjoys biking and swimming.

**Julie Eppert**, secretary, has been at Iowa State for 23 years. She comes to ECpE from



the Office of Precollegiate Programs for Talented and Gifted (OPPTAG). Julie's responsibilities at ECpE include providing secretarial support for personnel appointments, travel, and purchasing, among other functions.

She lives with her husband and two children, Amanda and Lisa, on a farm southwest of Ames. She enjoys quilting and spending time with her daughters.

**Diane Schall**, clerk, has been at Iowa State for eight years and worked previously



with the Sponsored Programs Accounting Office. At ECpE she handles purchasing, accounting, and financial monitoring. Diane, her husband, and four children live in Ogden. She enjoys walking and camping in the summer.

—continued from page 1

existing facilities. Not only will the "new" Coover improve research and instruction in the department, it will also help lay the groundwork for ambitious new projects like our Information Infrastructure Initiative, or "iCube," a research center that will take IT at Iowa State to the next level (more on iCube in our spring newsletter).

Growth and change. As the news in these pages reveals, the future is bright for electrical and computer engineering at Iowa State. You've been part of our past; now go with us into this bright future.

—Mani Venkata

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We want to hear about your personal news and career moves for alumni notes in future newsletters. (You're welcome to enclose photos; however, we can't return them.) We need your help, too, with donations to scholarship funds, lab facilities, student groups, and other department activities. If you're making a contribution to Iowa State, please consider designating it for the Department of Electrical and Computer Engineering. This form will make it easy to send us news, a pledge, or a gift.

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