NSF Taps Hesham El Gamal
OSU Winners Now Total 37

Hesham El Gamal, assistant professor of electrical and computer engineering, has received the prestigious National Science Foundation (NSF) CAREER award, it was announced in April.

One of six OSU faculty members to be named this year for the NSF’s Faculty Early Career Development (CAREER) award, El Gamal’s selection brings to 37 the total of Ohio State CAREER award winners during the last decade. Six of the 37 were named while serving on the electrical engineering faculty.

The CAREER award, which provides funding of $400,000 over the next five years, recognizes Dr. El Gamal’s project to develop new schemes enabling high quality multi-antenna wireless data transmission. His work will focus on “multi-input multi-output (MIMO) fading in links, cells, and networks.”

“Since 1996, NSF has given the award to faculty who effectively integrate research and education within the context of the mission of their institution,” an NSF spokesman said. “It honors teachers and scholars who are likely to become academic leaders in the future.”

Life after Graduate School:
Defne Aktas, Husband Team up “Down Under”

As the daughter of professorial parents, Dr. Defne Aktas (MS98; PhD02) now pursues the academic life “down under” with her husband, Dr. Emre Aktas, who also is a post-doctorate researcher and her co-worker.

Defne and Emre (MS98; PhD02) are both research fellows in the Department of Electrical and Electronic Engineering at The University of Melbourne, in Australia.

Why Australia, land of kangaroos, koalas, emus and platypuses?

Because, Defne says, it’s an exciting, exotic panorama of amazing coastlines, rain forests, and wildlife, a tolerant multicultural society, a cosmopolitan lifestyle in Melbourne, and a top university with an interdisciplinary research center. It’s the right balance of research challenge, career development, and a thrilling environment.

“At the time I received this offer,” Defne recalls, “I was planning to join the faculty at one of the universities in Turkey, but I realized this position would enhance my career, increase my academic con-
tacts, generate more publications, and help me become involved in different aspects of research.”

“The University of Melbourne,” Defne observes, “attracts top academics and students from Australia and around the world. It has a diverse staff, and international students are mostly Asian and European.” Melbourne, Australia’s second largest city, has about 3.5 million inhabitants.

As research fellows, Defne and Emre are engaged in the Center for Ultra-Broadband Information Networks (CUBIN) research which is a part of the university’s EE department and is funded by the Australian Research Council.

“Since we are working in similar fields in the same working environment, we are very supportive of each other,” Defne says of their dual careers. “We can understand each other’s goals and also the difficulties; however, we are very careful to give each other enough space at work to preserve individuality.”

For Defne, a special benefit of her position at the University of Melbourne is that her supervisors, Drs. Stephen Hanly and Jamie Evans, are acclaimed researchers in information theoretic studies of wireless communications systems.

Defne is currently investigating the capacity of multiuser multicellular wireless communication networks with multiple antennas to determine possible capacity gains when base stations are cooperating to increase the rates of reliable communication by users. And she is also researching distributive transmission strategies for base station cooperation to increase data rates provided to users. “We want to identify situations,” she explains, “in which it is worthwhile to utilize the optical links between base stations for cooperation.”

As multiple antenna schemes are adopted in future wireless standards to support broadband applications over wireless links, Defne notes, it is important to develop robust transceiver structures that provide high data rates in a harsh multiuser setting where interference from other users is severe.

A native of Ankara, Turkey, Defne is the daughter of Drs. Savas and Zuhal Kucukyavuz, both professors of chemistry at the Middle East Technical University (METU), where Defne and Emre met during their undergraduate studies. Defne and Emre, who were members of the same graduating class, were married in 1999.

Defne chose to do her graduate work at The Ohio State University because of “its high ranking in engineering amongst other universities,” and she adds, “the fact that Emre was also accepted weighed heavily on my decision.” In 1996, she was awarded a scholarship by the Scientific and Technical Research Council of Turkey (TUBITAK) to support part of her graduate studies.

While at OSU, Defne was granted a two-year fellowship by the Center of Intelligent Transportation Research (CITR) to support her studies and her participation in a project for automated highway systems.

“I was fortunate to have Professor (Michael P.) Fitz as my advisor,” Defne recalls. “He is one of the pioneering researchers in space-time coding theory, and I am grateful for his guidance and support.” Prof. Fitz is now a member of the faculty at the University of California at Los Angeles.

Throughout her studies at Ohio State, Defne worked in the Information Processing Systems (IPS) lab. For six months after graduation, she collaborated with Professor Hesham El-Gamal, a mentor she described as “full of ideas.” She was investigating problems in multiple antenna wireless communications systems including performance analysis of space-time codes for noncoherent receivers, space-time transmission strategies for cooperative wireless networks, and multiuser scheduling in multiple antenna systems.

As she approaches the end of a year’s appointment at the University of Melbourne, Defne is now looking forward to joining the faculty of Bilkent University in Ankara in September where she will serve as an assistant professor in the department of electrical engineering.

“I want to educate and motivate bright young minds in my homeland,” she says, “and to continue contributing to research in the wireless communications field.”

With a backward glance at her own experience as a graduate student, Defne concludes she would have taken more advanced mathematics and would serve as an intern in “a company with a good R&D department to see how the academic environment differs from industry.”

For aspiring EE graduate students, she offers these suggestions: (1) Develop a strong academic background, especially in mathematics; (2) Learn to relate and interact with colleagues in other areas; (3) Follow developments in related areas; broad knowledge brings flexibility in research; (4) Get some practical experience as a summer intern or assisting with projects at the university.

As a co-worker or research project leader, Defne cites five qualities she would seek in members of a research team: strong academic skills, motivation, productivity, attention to detail, and good communication skills.

Apart from her academic responsibilities, Defne is a film enthusiast, scanning for classic and art films, and an avid reader.

Editor’s note: this is the eighth in a series of IPS alumni profiles.
In the sponsored research project, El Gamal seeks to develop the information theoretic and coding theoretic foundations of cellular and ad hoc MIMO channels.

A native of Cairo, Egypt, Dr. El Gamal is a PhD graduate of the University of Maryland, College Park, and holds MS and BS degrees from Cairo University. From 1996-1999, he was project manager in the Middle East Regional Office of Alcatel Telecom. For two years before joining the OSU faculty in 2001, he served on the technical staff with the Advanced Development Group, Hughes Network Systems, Germantown, MD. At Hughes he was a prolific researcher, co-authoring an IEEE journal paper, U.S. patent or patent application on the average of every 28 days.

Hesham and his wife, Maha Raslan, M. D., are the parents of two daughters.

Other Ohio State assistant professors earning NSF awards this year include Chris Brew, linguistics; Diane Foster, civil and environmental engineering and geodic science; Srinivasan Parthasarathy, computer science and engineering, Han-Wei She, computer science and engineering, and Fernando Teixeira, electrical and computer engineering.

The assistant professors of electrical engineering previously selected for the NSF CAREER award are: Ubli Mitra, Joel Johnson, Benn Coifman, and Philip Schniter. Dr. Mitra is now a faculty member at USC.

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Chlamtac Joins ECE-CSE as Ohio Eminent Scholar

The departments of Electrical and Computer Engineering (ECE) and Computer Science and Engineering (CSE) have announced the hiring of Imrich Chlamtac as the Ohio Eminent Scholar in Computer Networking and Communications. This position, a joint appointment in CSE and ECE, is an endowed chair funded in part by the Ohio Board of Regents. Chlamtac will arrive on campus in September 2004.

Since 1997, Chlamtac has been the Distinguished Chair in Telecommunications and Professor in the Electrical Engineering Department of the University of Texas at Dallas. While there, he founded and was director of the Center for Advanced Telecommunication Systems and Services, which dealt with research and applications in areas such as Next Generation Internet, Mobile IP, Bluetooth, DWDM networks and network design and management.

EE Department now ECE

On February 6, The OSU Board of Trustees approved the University Senate’s unanimous recommendation that the Department of Electrical Engineering be renamed the Department of Electrical and Computer Engineering.

Chair Zheng Steps Down

Professor Yuan Zheng will conclude his tenure as ECE’s sixth department chairman this summer.

Zheng’s ten years as chair witnessed approximately 240% increase in research expenditures, introduction of a new BS degree program in electrical and computer engineering, a doubling of annual journal publications per faculty member, and the recruitment of 22 new faculty members, including 13 new positions.

ECE was among four departments designated as Selective Investment Units in 1998, receiving special central university funding because they had been identified as having the most potential to elevate the university’s overall academic excellence.

Zheng steps down to devote full time to his active research program.
Seven Earn Masters Degrees

Praveen Kumar Gopala received his BE from Anna University, in Chennai, Tamil Nadu, India. His hometown is Chennai, India. Praveen completed a non-thesis MS and will continue in the PhD program at OSU.

Julie Jackson received a BS from Wright State University, Dayton, OH. Julie is from Riverside, OH. Her MS thesis is entitled, “A Physically-Based Model for the Generation of Synthetic VHF SAR Clutter Images,” and she will continue PhD studies at OSU.

Aditi Kothiyal holds the BE from Anna University in Chennai, Tamil Nadu, India. Also from Chennai, India, Aditi defended her thesis, “Low Complexity Iterative Decoding of Reed Solomon Codes to Achieve ML Performance,” and will continue the PhD program at OSU.

Ernesto Machado earned his BSECE from the Ohio State University. His hometown is San Juan, Puerto Rico. Ernesto’s MS thesis is “Rhythmic Analysis of Acoustic Musical Signals.”

Arul Murugan has a Bachelor of Technology from IIT Madras, India. His hometown is Salem, Tamil Nadu, India. Arul will continue his PhD studies at OSU.

Arun Pachai-Kannu received the BE from Anna University, Chennai, Tamil Nadu, India. Arun’s hometown is Virudhunagar, India. His MS thesis is entitled “Low Complexity Techniques for Tracking Doubly-selective Channels,” and he will continue PhD studies at OSU.

Jingpu Shi earned a BS at The University of Electronic Science and Technology of China, in Chengdu, Sichuan Province, P.R. China. His hometown is Dinzhou, Hebei Province. Jingpu’s MS thesis is “Pitch-Synchronous Acoustic-to-Articulatory Transformation,” and he will continue PhD study at Rice University in Houston, TX.

Internet access to IPS is available at http://www.ece.osu.edu/ips
Journal Publications

2003


In Review


J. Sun and O. Y. Takeshita, "Maximum Length Linear Congruential Sequence-Based Low-Density Parity-Check Codes," IEEE Transactions on Communications.


H. El Gamal and M. O. Damen, "Lattice Space-Time Constellations," CTW 03, Mesa, AZ, Apr.


