Women engineers bring perspective to Electrical & Computer Engineering department

Juggling challenging research projects with teaching duties is the norm for three professors in the Department of Electrical and Computer Engineering. The fact that they are women in what’s still perceived by society as a man’s field poses no additional problems thanks to supportive colleagues and a fair workplace, they say.

Dr. Karen Payton, who started teaching at UMass Dartmouth in 1989, was the college’s first tenure-track female faculty member. There were other firsts as well. She was the first woman to receive a Ph.D. in electrical engineering from Johns Hopkins University and the only woman engineer working at a small company, Contraves-Goerz Corp. in Pittsburgh, prior to returning to school to earn her MS and Ph.D.

And she paved the way for those who followed. “I never really felt like an outsider because UMass Dartmouth has a good congenial environment and my colleagues all share the same goals,” Payton said. That being said, the relatively small number of female students—approximately 7% at the undergraduate level and 21% at the graduate level in the department—still gives one pause. The numbers are higher in the College of Engineering as a whole, with 82 female undergraduates or 10.2% and 56 graduate students or 21.7% now enrolled. Solutions are difficult to pinpoint, even though efforts are underway to recruit not only more women students, but other minorities as well.

“Part of the reason is that I don’t think girls are praised enough for being good in math. There’s a lack of role models,” Payton said. “I wish there was a cool TV show like ‘CSI Engineers,’ to inspire women. It’s a matter of finding the right area and making it click. For me, it was the appeal of the bio-medical field... never

Prof. Lester Cory reflects on Center for Rehabilitation Engineering, teaching career

He’s the recipient of dozens of awards for military, academic, and humanitarian achievements, and was honored at the White House by President Ronald Reagan with a Volunteer Action Award. But if you ask Professor Lester W. Cory to pinpoint the highlight of his career, his answer may surprise you.

“Receiving a thank you from Linda was the biggest thrill. She and a few others like her have made all the effort worthwhile,” he said.

Cory is referring to Linda Texceira, a young woman with cerebral palsy whose story touched him and was the catalyst for the Society for Human Advancement through Rehabilitation Engineering (SHARE), a non-profit organization he founded with two colleagues in 1982. Linda’s only means of communication was by shifting her eye gaze to letters written on a Plexiglas board held up by another person. Together with Professor Philip Viall, Cory designed a computer system that gave Linda a “voice,” and the ability to convey her thoughts for the first time.

Additional requests poured in for custom-designed systems to assist people with disabilities such as Lou Gehrig’s Disease, multiple sclerosis, spinal cord injuries, and a host of other conditions. The Center for Rehabilitation Engineering was established in 1987 on the UMass Dartmouth campus. Cory and Viall became its leaders along with the late Professor Richard Walder. SHARE is the center’s funding arm.

Today, the center’s engineers continue to adapt and build equipment to suit the particular needs and abilities of each client who seeks help. More than 2,525 clients have received equipment and services in 38 states and several foreign countries. In recent years, most clients live within a 30 mile radius, according to Cory.

He recalls other differences as well. “The center works with people with a wider range of abilities and needs compared to the 1980s. There was very little adaptive

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Message from the Chair

Welcome to the Fall 2007 edition of INFObytes. The department continues to evolve and grow. The department's longest serving faculty member, Chancellor Professor Lester Cory, retired over the summer, after over 40 years of service. Professor Cory ran the nationally-acclaimed Center for Rehabilitation Engineering. The department and the center will miss his faithful commitment to undergraduate education and assistive technology. This edition of INFObytes has a special article dedicated to Professor Cory. On the flip side, we are happy to announce the hiring of Dr. Yifei Li, as an assistant professor in the department. Dr. Li received his Ph.D. from Drexel University in Philadelphia. His research interests are in the areas of RF and photonics. Dr. Li joined the department this fall.

On the research front, the department continues its thrust in the areas of acoustics and acoustical signal processing and sensors and sensor networks. The department has recognized these areas along with marine applications as critical areas of research at UMass Dartmouth. Drs. Brown and Buck were awarded large research grants from the Office of Naval Research to continue their research in acoustical transduction and bioacoustics, respectively. Dr. Karen Payton and her collaborators were awarded a large National Institutes of Health grant, she is working with collaborators from Massachusetts Institute to develop improved hearing aids for people who suffer from impairments that cannot be medically treated.

Dr. Liudong Xing, who started teaching at UMass Dartmouth in 2002, said that the difficulty for her did not stem from being a woman, but rather from transitioning as a woman, but rather from transitioning as a professor's role. “The department was very supportive and there were senior faculty members, some women, who were my role models.” Noting that she currently has only one female undergraduate student but does work with many graduate students of both sexes, she added, “The department allows better interaction between students and faculty because of the small class sizes. This environment is more conducive for learning.”

Xing served as a program co-chair for the IEEE International Symposium on Dependable, Autonomic and Secure Computing in 2006. She is an editor for the “Short Communications” in the International Journal of Performability Engineering. She also serves as a vice program chair for the 2007 International Conference on Embedded Software and Systems, and is on the technical program committee for the International Conference on Bioinformatics and Bioengineering.

women engineers

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Dr. Liudong Xing

thought about doing anything else.”

Payton’s research is in the area of digital signal processing as it’s applied to predicting the intelligibility of speech degraded by room acoustics and/or reduced capabilities of a listener. With a $1.9 million, five-year National Institutes of Health grant, she is working with collaborators from Massachusetts Institute of Technology to develop improved hearing aids for people who suffer from impairments that cannot be medically treated.

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program committees of many international conferences and workshops.

Her research interests include dependable computing and networking, reliability engineering, fault-intrusion-tolerant computing and dependable computing in wireless sensor networks. Since she joined UMass Dartmouth, Xing has produced more than 30 research papers published or accepted by prestigious journals and international conferences.

A National Science Foundation grant of $40,000 is funding her project, entitled “Reliability Modeling and Evaluation of Fault-Tolerant Hierarchical Computer Systems.” Xing’s collaborators include Dr. Leila Meshkat from Jet Propulsion Laboratory and Dr. Wendai Wang from General Electric as well as two of her graduate students, Akhilesh Shrestha and Boddu Prashanthi.

Dr. Hong Liu, who has been teaching at UMass Dartmouth since 1990, cites compilers, computer networks and programming languages as her areas of expertise. She has just returned from sabbatical leave doing research to establish a multi-disciplinary network laboratory at the Advanced Technology and Manufacturing Center in Fall River. In addition, she is working on her first textbook about networks. She credits colleague Paul Fortier with giving her the confidence to take on the project. Previously, she assisted him with the writing of a companion workbook to one of his texts.

Liu acknowledges that juggling career and family issues presents challenges but appreciates the support of the union, her department, and the university environment in general for keeping her content.

“I’m seeing the growth and progress of UMass Dartmouth. It is an uphill climb,” Liu said. “While there is a better research emphasis now, it still hasn’t lost its core as a teaching-oriented place…My dream from the time I was a little girl was to be a teacher and I still carry that passion within me. I try to light the way for others and then watch their successes.”

equipment available for sale up until the early 1990s. The industry barely existed. A lot of things Phil and I built (in the past) were unparalleled which is why requests came in from all over the country,” he said. Until about 10 years ago, Cory and Viall personally designed and built everything at the center. “We were here typically five or six nights per week until 11 p.m. or midnight. I never got home in time to watch the 11 p.m. news. Ever! We lived here.”

Cory also had a hand in personally soliciting every donation that came into the organization. He also conducted fundraising activities and handled public relation duties, tasks that today are done by staff members.

Following his retirement this spring, Cory noted that the center will continue to provide direct service to individuals but he expects that his successor, the new director, will be charged with bringing in funded research. More faculty involvement in research is also anticipated.

In addition to leaving the Center, Cory will be saying goodbye to the classroom, where he has taught since 1959, beginning during his days as a Bradford Durfee College of Technology student.

He was officially hired full-time by the university in 1963. Since 1996, he’s held the rank of chancellor professor. Although Cory has observed a difference in maturity level and knowledge base of the students over the various decades, he still enjoys interacting with them, especially in the labs. “That’s the most rewarding part of the job. The most challenging part is motivating students to learn,” he said.

Cory said that it’s his role to manage the learning process, realizing that different students learn in different ways. Some respond to lectures, while others only take part in exams. Most don’t recognize the impact of a particular course until they take the course that follows, he said. “The key is to find a way to manage the way students learn.”

UMass Dartmouth alumni and faculty member Antonio Costa applauds Cory’s contributions to the center and the classroom.

“He has given an enormous amount of time and dedication to helping people with disabilities all over the world,” Costa said. “Les is also an outstanding teacher who always shows how practice relates to theory in his lessons.” As a student in the early 1980s, Costa said that he witnessed first-hand, and continues to observe, Cory’s talent. “He still lectures with a lot of zeal and enthusiasm… and he goes that extra mile to ensure that students can understand. If students are having a difficult time, Les changes the way he is teaching so that they can capture and grasp the material,” Costa said. “He is going to be missed.”

In addition to teaching, Cory spent 36 years as a commanding officer in the Rhode Island Air National Guard, and did consulting work in computer speech recognition, communications systems, and shipboard electronics systems for many years.

Currently, he is president of the Durfee Bells Preservation Society Inc., and on the board of directors for the New Bedford Airline Pilots Association. His future plans include spending more time with his wife Pat, five children, and nine grandchildren, traveling, flying planes, and completing long overdue work on his home in Tiverton. Hearing from his former students is something he still relishes.

“It’s been interesting for me to watch them as they get into their careers and positions with great responsibilities,” he adds. “Lately, my past students are telling me they have retired or they are about to retire…That kind of tells me it’s time for me to move on too.”
The University of Massachusetts Dartmouth

Edward DeSouza to leave position in December

After 25 years of employment at the university, Edward DeSouza will leave his position in December.

A professional technician in the Electrical and Computer Engineering Department since 1983, he began his career as a part-time visiting lecturer in mathematics during the prior year. DeSouza received his degree in Electrical Engineering Technology from Southeastern Massachusetts University.

DeSouza noted that his early days on campus involved greater interaction with students as he taught senior design projects, senior design labs, and an introductory calculus course for a few semesters. His work over the subsequent years has consisted of keeping the labs current and operational and ensuring that faculty members’ computers are working properly. He reports directly to Chairperson Dayalan Kasilingam who said of him, “Ed is the department’s Mr. Fix It. He knows PCs and networks like nobody else. He is incredibly creative when it comes to keeping the faculty computers up and running efficiently. He is truly a fixture in the department. We will miss him. I wish him all the best.”

A Dartmouth resident, DeSouza said that he is leaving his job because “it’s time. I’d like to do something a little different while I still can.” DeSouza used to be an avid cyclist and sometimes cycles to work, when the weather permits. Noting that he doesn’t like attention, DeSouza added that he has met a lot of nice people in the department and is certain that operations will carry on as usual following his departure. “There are capable people who will be around after I’m gone. It’s just the evolution of things.”

Dr. Michael Geiger joins ECE/CIS faculty

Assistant Professor Michael Geiger just finished his first year teaching at UMass Dartmouth in the departments of Electrical and Computer Engineering and Computer and Information Science.

Last fall, he earned his Ph.D. in computer science and engineering from the University of Michigan where he also received his master’s degree in 2002. His undergraduate work was completed at Cornell University seven years ago.

So what’s it like being the new guy on campus who is not that much older than the graduate students he is teaching?

Geiger feels he is adjusting well but admits that there are some challenges. “I was a teaching assistant but this is my first time running a class. It’s a lot more work than I anticipated. The sheer amount of preparation time that’s required surprised me the most—writing lectures, assignments, exams….” he said. “I’m mastering that. Overall, the students are very good although they sometimes seem reluctant to seek help. That’s one area I’m working on to improve…I want them to connect to me as a professor and feel comfortable about approaching me with questions or concerns.”

UMass Dartmouth’s mix of teaching and research expectations attracted Geiger to the position. Originally from Connecticut, he saw an opportunity to move closer to home after 10 years, as well as join an institution that has growing research aspirations.

His areas of interest include computer architecture, embedded systems, energy-aware computing and memory system design. Currently, Geiger is focusing on the design of low-power graphics processors, an interest that grew out of his love for playing computer games. During rare free time, Geiger and his wife Brenda also enjoy ultimate frisbee games.

Next semester, he anticipates taking on teaching duties for a wider range of classes. And he’s ready. “I don’t feel as though I’m being looked upon as the ‘new guy’ here. My colleagues in both departments are very friendly and helpful. In fact, they’ve gone out of their way to make me feel welcome,” Geiger said.

Still, with a laugh, he recalls a few times when other College of Engineering faculty members eyed him questioningly in parking lot 17 when he pulled into an elusive, designated space.

“I have been mistaken for a student, yes,” Geiger said. “Other professors will look at me and ask, ‘are you really a faculty member?’” He is now.
Professor Chi Hau Chen edits book on signal and image processing

Last fall’s publication of *Signal and Image Processing for Remote Sensing* by Taylor-Francis CRC Books marks the 24th work authored or compiled and edited since 1973 by Dr. Chi Hau Chen, professor of electrical and computer engineering. And he’s not finished yet.

Chen highlighted the scholarly work during a presentation at the National University of Mexico last November. He noted that the book’s uniqueness lies in its balanced treatment of signal and image processing in remote sensing. “Most data from satellites are in image form so most books on remote sensing deal exclusively with image processing,” he said. “This book combines the two processes and is not limited to problems with data from satellite sensors. It considers other sensors that acquire data remotely including signals and images from infrasound, seismic, microwave and satellite sensors. The book covers a broader scope of issues than others in the field.”

In addition to editing the book, Chen wrote some of the chapters. His collaborators from UMass Dartmouth included Dr. Dayalan Kasilingam, chairperson of the Electrical and Computer Engineering Department, and Zhenhai Wang and Xianju Wang, graduate students. Other chapters were written by acclaimed experts such as Dr. Norden E. Huang, inventor of Huang-Hilbert transform, Dr. Steven R. Long from NASA, and Dr. Enders A. Robinson, a major contributor to geophysical signal processing for more than half a century.

The key to getting books of this type published, Chen said, is the ability to attract renowned writers. Other chapter authors hail from the University of Iceland, Oslo University, Shanghai Jiatong University, Massachusetts Institute of Technology Lincoln Laboratory, and a host of other U.S. and worldwide institutions.

Chen has taught at UMass Dartmouth since 1968 and works primarily with the graduate student population. “I enjoy the freedom of the position that allows me to teach and explore my areas of interest,” he said. Retirement is a possibility in about two years. In the meantime, Chen anticipates the release of his next edited book, *Ultrasonic and Advanced Methods of Nondestructive Evaluation and Material Characterization*. It is scheduled for publication by World Scientific Publishing in 2007.

“In this book combines the two processes and is not limited to problems with data from satellite sensors. It considers other sensors that acquire data remotely including signals and images from infrasound, seismic, microwave and satellite sensors.”
Design team wins competition

A senior design team of students from the Electrical and Computer Engineering Department was the overall winner of the Sixth Annual Student Design Contest hosted by the Rochester Institute of Technology’s Institute of Electrical and Electronics Engineers student chapter.

The team, comprising Dan Precourt of Raynham, Erik Siggelkoe of Millis, Serge Khalife of Lebanon, and Jonathan Horton of Barrington, RI, earned the top award of $5,000 at the May event sponsored by Fairchild Semiconductor, the Rochester Institute of Technology’s Electrical Engineering Department, and IEEE Region I.

The students designed and built a video projection system that allows the ambient lighting to adaptively blend in with the dominant colors of images on a TV screen. The five-member judging panel unanimously selected the UMass Dartmouth team as the winner, describing the project as innovative, well-designed, and full of commercial potential.

A total of 23 teams competed, including groups from Rochester Institute of Technology, Northeastern, Rutgers, the United States Military Academy at West Point, Stevens Institute of Technology, the University of Kentucky, the University of North Carolina, the Royal Military College of Canada, and Santo Tomas University, Colombia.

Team leader Precourt explained that a client—in this case, Wireless Techniques of Stoughton—presents students with a problem or idea. Over two semesters, students plan and construct a solution. Christian Granata, founder of Wireless Techniques, plans to market the award-winning product.

Associate Professor Howard E. Michel was the senior design course instructor, while Chancellor Professor Lester W. Cory served as technical advisor.

Scott Chilstedt of Braintree, Dan Corbera of Taunton, Chris Mitchell of Milford, Eric Theberge of Westport, and Aaron Lawrence of Rochester made up a second UMass Dartmouth team that won the Best Innovation Prize. Their design of a wireless emergency locator, known as G-Track Mobile, to assist people with disabilities, earned them $500.
On May 4, Akhilesh Shrestha, a Ph.D. student in electrical and computer engineering, accepted a second place award in the Institute of Electrical and Electronics Engineers Region 1 Graduate Student Technical Paper Contest. His paper, “Reliability Modeling and Analysis of Wireless Sensor Networks,” was co-authored by faculty members Drs. Liudong Xing and Hong Liu.

Shrestha received his master’s degree in computer engineering from UMass Dartmouth in 2006 with a cumulative grade point average of 4.0 out of 4.0. He earned his undergraduate degree in electronics and communication engineering from Birla Institute of Technology in India.

“What I like about UMass Dartmouth is that the small, open environment allows you to freely talk to anyone about problems or questions you may have,” Shrestha said. “At a big university, it would be different. Here, the faculty always leave the door open to you.”

His research focuses on the reliability of wireless sensor networks. With an anticipated graduation date of summer 2008, Shrestha noted that he would like to “gain practical knowledge” by working in industry for five to ten years before returning to an academic setting to teach and conduct research.

A New Bedford resident, Shrestha worked on campus as a graduate assistant in the College of Engineering on web development and database administration. He is also a research assistant to Xing, who is impressed by his abilities. “Akhilesh is a very smart student, but what stands out is that he is self-motivated. Some other good students still need to be pushed to get started, but he doesn’t. He’s excellent in all of his classes and dedicated to his research,” she said.

Added Liu, who was his former co-advisor, “Akhilesh is top-notch. As a student, he’s the best I’ve seen so far in 20 years of teaching. His breadth of knowledge, persistence of solving problems, and curiosity is unmatched,” she said. “As a person, he’s intellectual and kind and also very humble.”

A huge New England Patriots and Red Sox fan, Shrestha also enjoys photography and playing guitar in his spare time.

Matthew Lowe is Student of the Year

Matthew Lowe advises freshman engineering students to put extra effort into fundamental courses. “At the end, it all comes together and pays off—you get out of it what you are willing to put in. And don’t ever be satisfied with being average.”

Lowe, who is the Electrical and Computer Engineering Department’s Student of the Year, knows what he’s talking about. The Westport resident anticipates receiving his bachelor of science degree in computer engineering in May 2007. A participant in the BS/MS degree program, he’ll earn his master’s degree in 2008.

In addition to maintaining a 3.65 grade point average, Lowe is the vice-chairperson of the Institute of Electrical and Electronics Engineers student chapter, a member of the Golden Key Honor Society, and on the dean’s list.

Last summer, he worked as an engineering intern at Western Digital Inc. in Lake Forest, California. Some of his duties included collaborating with leaders of a third-party software supplier to design a thorough test plan for a piece of prototype software; developing a Google installer program to be packaged with all external hard drives; and conducting performance testing on potential alternatives in the ultra low-cost, external hard drive arena.

He studied computer and industrial engineering at Virginia Polytechnic University and State University for three years before transferring two and a half years ago.

The move to attend UMass Dartmouth was a positive step, Lowe says, because he enjoys the close-knit, smaller atmosphere and hands-on style courses. “The professors are very accessible and friendly and their credentials are excellent. I find that I’m learning even more here than I did at Virginia Tech.”

His senior design project is entitled “The bat phantom ecosystem,” and his advisor is Dr. John Buck. Lowe’s team created a digital signal processing system that receives transmitted chirps from the large American brown bat, processes the chirps and then plays them back in real time. The customer, Dr. James Simmons of Brown University, is investigating the extent to which bats create digital images from the sonar they produce.

In his free time, Lowe enjoys surfing, photography, and music. His plans following graduation include another summer internship. He is weighing some offers that may take him back to California.
BREAKING NEWS

Engineers have been spotted everywhere, having fun and achieving success.

Clockwise from below—Les Cory’s retirement dinner, conferring a PhD to Honglei Chen, Senior Design Competition Participants (2), Annual Student-Faculty BBQ.