



DREXEL DIMENSIONS NOVEMBER

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MESSAGE FROM DEPARTMENT HEAD

The beginning of a new academic year is a natural opportunity to appraise where our Department stands, and to bring into the ECE family hundreds of new students – our future colleagues and professional partners. These students will soon fill the classes and the laboratories, open the new books and notebooks, and struggle with algorithms, formulas and new techniques. They will also start asking the questions and conduct the experiments that would ultimately lead to exciting discoveries, fresh insights, and novel products. We welcome both returning and new students to the Department, and wish you all a year of intellectual growth, ever-

growing curiosity, deeper understanding, and many instances of joy over new discoveries.

The academic year 2007-2008 (our 114th) finds the ECE Department housed in one of the most modern, well equipped, and elegant environments in academia – the new Edmond D. Bossone Research Enterprise Center. It also finds us in a very dynamic and energizing setting. About one third of the current members of our faculty have joined us, upon completing their formal studies in highly-rated institutions, during the last ten years. This profile makes Drexel's ECE Department one of the youngest (and brightest) groups



Moshe Kam, Ph.D., P.E.
Robert G. Quinn Professor &
Department Head

of faculty members in any major ECE program. This spirit of high energy and enthusiasm is felt everywhere – in our classrooms, lecture halls,

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SPECIAL DATES OF INTEREST:

- 11/30: 'A Taste of Drexel', for prospective undergraduate students and their families, 9am-2pm, Creese Student Center
- 12/7: College of Engineering and College of Business Holiday Reception, 3-7pm, Creese Student Center

EDWIN GERBER CELEBRATES 50 YEARS WITH ECE

Edwin Gerber has been associated with the Electrical Engineering Department at Drexel (now ECE) since 1957, when, upon graduation from Drexel with a Bachelor of Science degree in Electrical Engineering, he was offered the position of Instructor. He had later obtained a Master of Science degree from Drexel

(1961) and a Doctor of Philosophy Degree from the University of Pennsylvania (1980). Today he is a full professor of Electrical and Computer Engineering, and also serves as assistant ECE Department Head and a liaison to the Evening Program. Dr. Gerber's long career was (and is) devoted to engineering

education, and he is well known in the community of electrical engineering educators in the United States as a pioneer in the introduction and application of new information technology and dissemination techniques to the classroom. Among many honors he had received for

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SUMMER PROGRAM UPDATE

The College of Engineering (CoE) is engaged in a number of outreach programs to stimulate interest in science and engineering while forming connections with local area students and teachers. Outreach efforts extend year-round, but most of the structured programs take place during the summer.

The ECE Department is involved in all outreach programs and during the summer of 2007, faculty members again welcomed

teachers and students into their labs.

The following provides a brief overview of the programs that ECE participated in last summer.

Summer Mentorship Program and SEED:

The CoE Dean's Office sponsors and runs the Summer Mentorship Program and Summer Engineering Experience at Drexel (SEED).

The Summer Mentorship Program is an in-depth, two

week research experience that pairs motivated students from all over the country with faculty members in departments throughout the college.

SEED is a one week program (with multiple sessions) that exposes interested students to different disciplines within engineering through hands-on labs, industry visits, and overviews of disciplines and sub-disciplines.

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STUDENT NEWS: NSF GRADUATE FELLOWSHIP

National Science Foundation Graduate Research Fellowship Program (NSF GRFP): Dr. Adam Fontecchio's graduate advisee and Ph.D. candidate, David Delaine, was awarded the NSF GRFP, a three-year fellowship, in March 2007. Mr. Delaine was chosen from a highly competitive pool of

US students pursuing research-based Master of Science or doctoral degrees. Mr. Delaine was a NSF *Bridges to the Doctorate* fellow in his first year of graduate study at Drexel University, and completed his undergraduate degree at Northeastern University where he was also a recipient

of the Robert J. Bunche Scholarship. His research will explore the fundamental science and engineering of novel methods of power generation using Stirling engine configurations and radiometric phenomena to develop power-producing, micro-electromechanical systems.



David Delaine

EMPLOYER PROFILE: FAIRMOUNT AUTOMATION

Dr. Lebaudy has a unique perspective on the Drexel experience — both as an alumni and an employer. He earned a Ph.D. degree from Drexel University in 1996, and concurrently completed Master of Science and Bachelor of Science Electrical Engineering programs at Drexel University in 1993. While at Drexel he met Gary

Cane, who earned a Master of Science degree in Electrical Engineering from Drexel University in 1996 and his BS degree in Electrical Engineering from Drexel University in 1993. The two decided to launch their own business, co-founding Fairmount Automation in 1996. They have since grown it to employ over 30

professionals, including several other Drexel graduates and co-op students.

Fairmount Automation is based in Newtown Square, PA, and delivers innovative control solutions to military, transportation, and industrial automation markets. Its

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Dr. Andres Lebaudy,
Fairmount Automation

NEW FACILITIES: ANECHOIC CHAMBER

An Anechoic Chamber, a new facility for antenna testing, was installed on the first floor of Bossone Research Enterprise Center this past year. An anechoic chamber is isolated from interference by electro-magnetic signals, such as those emitted by

radio and television broadcasts, cell phones, power lines, and other electronic devices. This “quiet” chamber will allow the Department to accurately design, test and characterize antennas operating in the frequency ranges of 1 to 18

GHz, and represents a major new resource to the Drexel research community as well as local industry and government facilities that require a “quiet” electromagnetic environment for measurements and calibration.



Anechoic Chamber on the first floor of Bossone Research Enterprise Center

FACULTY NEWS: DR. NIHAT BILGUTAY HONORED

Throughout the past year, many awards have been bestowed upon and many receptions held in honor of Dr. Nihat Bilgutay, who completed his tenure as ECE Department Head.

Dr. Bilgutay served in this position for nearly 11 years, and had been a faculty member at the College of Engineering for more than 25.

Dr. Bilgutay managed to lead both communities into prominence through careful planning, optimal use of resources, and exemplary “people skills.”

During his tenure as Department Head, Drexel ECE saw a significant rise in research funding, productivity, new faculty hires and increased enrollment.

Special Dinner in Honor of Dr. Nihat Bilgutay

Staff and special friends of the College of Engineering recently gathered in the A.J. Drexel Picture Gallery to celebrate Dr. Nihat Bilgutay’s extraordinary service and commitment to Electrical and Computer Engineering.

Dr. Bilgutay’s achievements were praised by Dr. Selcuk Guceri (Dean of Engineering) and Dr. Constantine Papadakis (President of Drexel University).

Dr. Bilgutay was presented with a commemorative plaque by Dr. P.M. Shankar, ECE Interim Department Head.

College of Engineering’s 2007 Lifetime Achievement Award

This prestigious award was

presented to Dr. Nihat Bilgutay by Dean of Engineering Selcuk Guceri during the Annual Engineer of the Year Banquet held at the Rittenhouse Square Hotel on February 23, 2007.

Over 400 faculty, staff, and students were present to applaud Dr. Bilgutay’s accomplishments and allegiance to the university.

2007 Harold Meyers Award for Distinguished Service to the University

Dr. Bilgutay was selected to receive the 2007 Harold Meyers Award for Distinguished Service to the University. This is the highest honor the university bestows on its faculty and staff in this category. The award was presented on May 30 at the Behrakis Grand Hall.



Dr. Nihat Bilgutay



Did you know that at Drexel students can earn two diplomas (B.S. and M.S.) at the same time in 5 years. Find out more at www.ece.drexel.edu.

EDWIN GERBER (CONTINUED)

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these activities over the years are the *Centennial Certificate* of the American Society for Engineering Education (ASEE). Dr. Gerber served ASEE as program chairman, industry liaison, and session chairman for the instrumentation division.

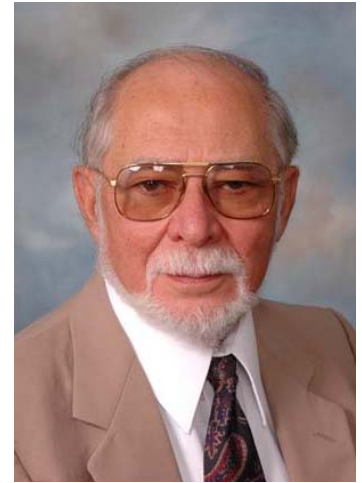
His publications include exposition of new instructional methods, including some of the earliest papers on computers in electrical engineering education, use of personal computers for circuit analysis, and applications of

the Maple and LabView computer libraries in undergraduate instruction. Other professional interests are in insulation of electrical conductors and their behavior under high voltages.

Drexel University had honored Edwin Gerber on many occasions for his pioneering work in engineering education and for his dedication to Drexel's undergraduate students. Among the awards he received are the Martin Kaplan Distinguished Faculty Award (1993), the Samuel Mercer Award for

Distinguished Instruction (1994), and the Thomas W. Moore Teaching Award (1995).

Dr. Gerber is a Senior Member of the Institute of Electrical and Electronics Engineers, a registered professional engineer in the State of Pennsylvania, and a past Fellow of the National Science Foundation. We wish him many years of continued professional activity good health and thank him for five decades of unparalleled dedication to Drexel's undergraduate students.



Edwin L. Gerber

EMPLOYER PROFILE: FAIRMOUNT AUTOMATION (CONTINUED)

(Continued from page 2)

products are installed throughout the world, controlling a wide variety of mission-critical and safety-critical processes and machinery. The Company is currently developing various distributed control systems that are to be deployed on the Navy's next generation land attack destroyer—expected to be the most technologically advanced ship ever built.

Dr. Lebaudy serves as Fairmount Automation's President and is responsible for managing all aspects of the Company's operations, including its recruiting efforts. He also maintains an advisory role in the Company's engineering activities, particularly its advanced

research and software development initiatives. Dr. Lebaudy continues to keep close ties with the University, having recently served as a member of the Advisory Board for Drexel's College of Engineering. Currently, he leads a Fairmount Automation team that is collaborating with students from Drexel's Data Fusion Laboratory on a program for the Navy's Office of Naval Research to develop a device that enable wireless communications through shipboard metal bulkheads. And this past May, Dr. Lebaudy and Fairmount Automation participated in the American Society of Naval Engineers Intelligent Ship Symposium held in Drexel's new Bossone Center.

"During my time at Drexel, I had an opportunity to interact with many talented people. Looking back I can certainly appreciate how formal classroom instruction and co-op experience changed my thinking and prepared me for the future. But I give just as much credit to my professional growth to the peers and role models that shaped my Drexel experience. I still work with many of them," says Dr. Lebaudy. He added, "When I get back to campus now I'm awed by the changes—the new Colleges, the new facilities. I am especially thrilled to see the new focus on entrepreneurship. It's fantastic — I think it serves as

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Fairmount Automation's exhibited its products at the ASNE Intelligent Ship Symposium held at Drexel in May 2007.

MESSAGE FROM DEPARTMENT HEAD (CONTINUED)

(Continued from page 1)

teaching labs, and research meetings. With the additional experience and knowledge contributed by our more senior faculty, and the solid connections that our Department has developed over the years with employers, industry, governmental agencies and the surrounding counties, we now offer our students and faculty stimulating choices for learning, research, and scholarship. Whether you are a current student or have been away for a while, now is the time to look into the research of our faculty, visit our labs, and find if we have a class, a research project, or the professional skills to conduct an R&D assignment that would meet your needs.

The new academic year also finds the ECE Department with a new Department Head. Dr. Nihat Bilgutay had completed more than a decade of dedicated,

energetic, and highly successful leadership as the Head of our Department, and at the beginning of July 2007, I have been privileged and honored to be named his replacement. The Drexel ECE family is grateful to Dr. Bilgutay for his exemplary tenure, and is also thankful for the committed service given to the Department in the last two years by the Interim Department Head, Dr. P.M. Shankar.

Any person who would become ECE Department Head at Drexel in this century must experience a strong sense of awe. This is the position held at one time by Arthur J. Rowland (who came here from Johns Hopkins University in 1893, started the Applied Electricity program, and was in charge for mere 25 years) and of Robert C. Disque (who was here even longer and ultimately became President of Drexel Institute of

Technology). This is also the post held by Hun Sun, Bruce Eisenstein, and Nihat Bilgutay, individuals whose spirit, strength of character and achievements are easy to admire but very hard to duplicate. While I cannot hope to match their accomplishments I share with these individuals a strong sense of dedication to this Department. Like them, I hold the conviction that jointly with you, Drexel's ECE students, alumni, faculty and friends, we can bring this fine Department to even greater heights, and ensure its place among the best establishments of learning and research, in the ever growing (and always thrilling) disciplines of Electrical and Computer Engineering.

— Moshe Kam, Ph.D., P.E.
Robert G. Quinn Professor &
Department Head
Electrical and Computer
Engineering Department

***"The academic year 2007-2008 (our 114th) finds the ECE Department housed in one of the most modern, well equipped, and elegant environments in academia."
— Moshe Kam***

EMPLOYER PROFILE: FAIRMOUNT AUTOMATION (CONTINUED)

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a stronger magnet for talented people, and so its virtues are self-reinforcing. Honestly, it makes me want to be a Drexel student all over again."

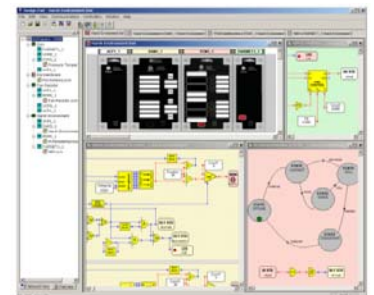
Over the years Dr. Lebaudy has found that Drexel students offer a great deal to his Company. He says "Maybe it's the pace of the quarter system. Maybe it's the

pervasiveness of the co-op experience. But Drexel students are different. They have a very professional approach and the confidence to step in and hit the ground running. As a small business, we need that."

His advice to Drexel students looking toward entering the workforce? "Get involved in research or development

projects that allow you to apply what you're learning in the classroom. Find something that truly interests you and pour your heart into it," suggests Dr. Lebaudy.

He adds, "When you're looking to land your first job, speak about that experience with enthusiasm and the offers will roll in."



Design Pad G3 is a third-generation graphical design tool used to program and configure Fairmount Automation's family of hybrid Programmable Automation Controllers.

SUMMER PROGRAM UPDATE (CONTINUED)

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Research Experience for Teachers (RET) and Research Experience for Undergraduates (REU):

Nano-Enlightenment

Dr. Adam Fontecchio, assistant professor in the ECE Department, ran an REU/RET last summer. His National Science Foundation funded Nanotechnology Undergraduate Education (NUE) project "Nano-Enlightenment" has proven very successful, and a supplement to this project was awarded by NSF to develop and offer a summer program for teams consisting of an undergraduate student and high school teacher. These pairs created laboratory and demonstration modules on nanotechnology for the first year CoE curriculum and the high school curriculum. During the fall term the students then travel to the teacher's classroom and assist in the presentation and demonstration of the material developed jointly during the summer.

RET-Nano and RETAIN

These are two NSF-funded programs that focus on teacher development. They bring middle school and high school teachers to Drexel University and the University of Pennsylvania for five

weeks during the summer. The teachers are paired with faculty members and graduate students and take part in cutting-edge research projects, workshops in lesson planning, grant writing, and bioethics seminars.

GK-12 3-Week Summer Program

The National Science Foundation awarded Drexel University \$1.8M to support the project Track 1, GK-12: Engineering as a Contextual Vehicle for Science and Mathematics Education, a three-year, innovative project under the direction of Drs. Eli Fromm and Adam Fontecchio of the ECE Department, Drs. Mary Jo Grdina and William F. Lynch of the School of Education, and Dr. Mun Young Choi of Mechanical Engineering and Mechanics. This program funds ten outstanding graduate fellows each year and pairs each one of them with a local, middle school teacher. The purpose is to create and implement curriculum modules in an engineering context and demonstrate real-world applications of mathematics and science. The program begins each year with an intensive summer multi-week workshop, during which the fellows learn pedagogy and classroom management techniques. The teachers are introduced to engineering

concepts and the fellow/teacher teams begin developing educational modules. Last summer the program began its second year and supported six former fellows and introduce four new fellows to the program.

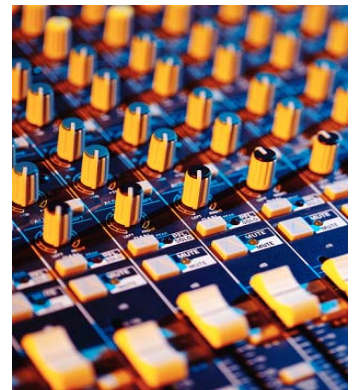
Summer Music Technology Program

As part of his NSF CAREER Award, Dr. Youngmoo Kim conducted an innovative, one-week learning experience in July, entitled "the Summer Music Technology (SMT) Program." This experience provided ten high school first- and second-year students with a unique opportunity to learn about music production technology and digital audio, and to use Drexel's Music Entertainment Technology laboratory (METlab). The program will take place again in Summer 2008.

It approaches music and audio technology from the perspective of engineering, mathematics and science, and explores questions such as: what technologies do artists use to record and produce their albums? What is mp3? How do music players (like the iPod) work (and how hard is it to build one)? What is digital sound (and how do math and physics help us understand sound)?



Dr. Adam Fontecchio ran an REU/RET last summer.



How do math and physics help us understand sound?



The ECE Department prepares men and women to become leaders working in a highly dynamic and global environment at the forefront of Engineering and pursues research to advance the state-of-the-art in Electrical and Computer Engineering and Engineering Education.

3141 Chestnut Street, Bossone 312 Philadelphia, PA 19104

Phone: 215.895.2241 Fax: 215.895.1695

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AWARD SPOTLIGHT: NSF CAREER AWARDS

This spring, not one but two ECE faculty members received the prestigious National Science Foundation CAREER Award. Both Drs. Naga Kandasamy and Youngmoo Kim received the



Youngmoo Kim is an Assistant Professor in the Electrical and Computer Engineering Department at Drexel University. Dr. Kim's research focuses on audio signal processing, machine listening, and music information retrieval. His thesis research explored coding and synthesis of the singing voice, investigating acoustic features relating to voice identity.

Faculty Early Career Development (CAREER) Award, which supports junior faculty and their efforts to integrate education and research with the goal of creating a foundation for like contributions in the future. Dr. Naga Kandasamy earned the award for his project entitled, "Decentralized Control and Optimization Techniques for Autonomic Performance Management of Distributed Computing Systems." This project aims to develop a scalable online control and optimization framework for designing autonomic computing systems. Given high-level performance objectives by users, these systems manage themselves under dynamic operating conditions, and promise to substantially reduce the manual effort involved in operating large-scale computing systems. This grant is a 5-year project with a budget of \$400K. Dr. Youngmoo Kim (ECE) was granted the CAREER Award

for his project entitled, "Exploring Creative Expression through Music and Audio Technology." The appeal of music is universal because it provides expression to our own emotions, and it follows that individuals would want some creative input to that expression. Though recent digital audio technologies have had a tremendous impact on the world of recorded music, its fundamental nature remains unchanged: once a recording is made, that single performance is forever fixed, preventing any true interaction with the listener. This project will integrate research in digital audio technology with educational activities with a common vision of transforming the passive act of listening to "recorded" music into an interactive experience in which the performance responds to the creative input of the listener. The grant is a 5-year project with a budget of \$500K.



Naga Kandasamy is an Assistant Professor in the Electrical and Computer Engineering Department where he teaches and conducts research in the area of computer engineering, with specific interests in embedded systems, self-managing systems, reliable and fault-tolerant computing, distributed systems, computer architecture, and testing and verification of digital systems.