John P. Wikswo Jr., Professor, BME, is the Gordon A. Cain Professor with joint appointments in the Departments of Physics and Astronomy and the School of Medicine. His research interests include biophysics, biomedical engineering, cardiac and cellular electrophysiology, and electromagnetism. He obtained his bachelor's degree from the University of Virginia and his master's and doctoral degrees from Stanford.

Luoyu Roy Xu, Assistant Professor, CEE, comes to VUSE from the California Institute of Technology, where he was Research Assistant in Solid Mechanics. His research interests include applied and experimental mechanics, material science and engineering. He obtained his bachelor's and master's degrees from the Beijing University of Aeronautics and Astronautics and his doctorate from the California Institute of Technology.

IN MEMORIAM

Howard L. Hartman, Dean of Engineering at Vanderbilt from 1974-1979, died January 12 in his home in Sacramento, Calif. Author of the 1971 textbook *Mine Ventilation and Air Conditioning*, Dean Hartman was best known for his work in underground excavation, rock drilling, and mine ventilation. Dean Hartman attended the Colorado School of Mines and went on to Penn State University to earn his bachelor's and master's degrees in mining engineering. He received his doctorate from the University of Minnesota. He was co-writing the second edition of *Introductory Mining Engineering* just before his death.

ALUMNI **MARYLY VANLEER PECK**

Lemonade from Lemons

Although she graduated magna cum laude in chemical engineering from Vanderbilt in 1951, Maryly VanLeer Peck wasn't eligible for the engineering honor society Tau Beta Pi. Women weren't allowed in the national organization.

It wasn't her first encounter with chauvinism.

"In our sophomore year, we took statics and strength of materials, and the statics course came first," Peck recalls. "My statics professor had been used to all men in his classes. I asked a lot of questions, and apparently he wasn't accustomed to that. We had our first test and he gave me back my test and said, 'Miss VanLeer, you are a very good student, but I don't want you taking my course next term.' I asked, 'Why not?' He said, 'I just can't adjust. Go take it under Professor So-and-So; he's better anyway.' I didn't get offended by those kinds of things. You take advantage of every opportunity and you do it all with a good sense of humor."

DAVID CRENSHAW

Both encounters ultimately ended happily. The professor who couldn't adjust to women in his class later sent several of his students to Peck to be tutored. That made her plenty of spending money, and also made her aware that she had a knack for teaching. The same professor also brought her a wedding gift three years later when she married five days after commencement.

Peck was ultimately inducted into Tau Beta Pi about 20 years later, when women were eligible to join.

"Every year they had the Tau Beta Pi banquet at Vanderbilt, I was always invited and given flowers," she says. "They couldn't have been nicer to me. Every time Tau Beta Pi invited me to a national convention to talk about why women should be inducted, I said, 'I got honored far more and received more attention than I ever would have as just an ordinary member of Tau Beta Pi. Sometimes I wonder why I'm trying to get this corrected.'"

It is little wonder that Peck became an engineer. Her father, Blake Ragsdale VanLeer, was Dean of Engineering at both the University of Florida and North Carolina State and later served as President of Georgia Tech from 1944 until his death in 1956. Both of her brothers and all three of her sons were also engineers. Two of her sons, Jordan and James, graduated from Vanderbilt. The middle son, Blake, attended West Point. All three earned their master's in engineering at Georgia Tech and work in the family business, McDonough Bolyard Peck. Her daughter Ellaine, an art therapist, got her talent from her Grandmother VanLeer, an artist and architect.

One of only three female engineering students at Vanderbilt at the time, Peck went on to establish a number of "firsts." She was:

- The first women to receive an engineering degree from the University of Florida. She earned an M.S.E. in 1955 and a Ph.D. in 1963.
- The first women to be appointed dean of a technical curriculum at the University of Guam, where her first husband was an Episcopal priest and missionary.
- The first female dean of Guam's Community Career College.
- The first woman to be named president of a public institution of higher learning (Polk Community College) in the state of Florida. She held the position for 15 years.
- The first to preside over a Society of Women Engineers (SWE) section in the South, as well as the first to recruit her mother for Society membership.
- The first SWE life member of record.
- The first woman to be admitted for membership in the Downtown Rotary Club of Winter Haven, Fla.
- A National Science Foundation fellow at the University of Florida, Peck used her chemical engineering degree for North American Aviation's Rocketdyne Division, researching solid fuels and hybrid combustion. She had previously worked for the Naval Research Laboratory in Anacostia, Md., and the Medical Field Research Laboratory in Camp LeJune, N.C. She was also associated with Pathfinders Inc., a consulting engineering firm.

Other than these stints with industry and the federal government, Peck's entire career has been in academia. Awards far beyond the norm have been bestowed upon her over the years. In 1962, she was named one of the "100 Important Young Men and Women in the United States" in a special issue of *Life* magazine.

In 1992 and again in 1997, the University of Florida recognized Peck as a distinguished alumna. In 1993, she received the Society of Women's Engineers Award for advancement and awareness of engineering as a profession for women. A year later, she received the Woman of Distinction Award from the Girls Scouts U.S.A. In 1995, she was awarded the "She Knows Where She's Going Award" by Girls Inc., former the Girls Clubs of America.

Now retired and recovered from breast cancer, Peck continues to be active in the Rotary Club scholarship and speech programs, All Saints Academy, United Way, the American Cancer Society's Reach for Recovery, and Girls Inc. A scholarship in her name has been endowed at Polk Community College, and another PCC scholarship is named for her through Girls Inc.

Her latest project is a joint national program of Girls Inc., the Society of Women Engineers, and the National Science Foundation to encourage young women to go into engineering and technical fields.

"I think there are certainly a lot more women going into science, math and engineering today, and there are a lot of people like myself encouraging them to do that," says Peck, now happily married to Ed Carey, who spent his university academic career teaching business and as a dean of business.

"I usually tell the young women majoring in engineering, 'You and all other beginning engineers are going to be given some jobs that will make you think, 'Why on earth did I major in engineering to do this?' The point is that you take advantage of every opportunity. You make lemonade when they give you lemons." VE

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Engineering NEWS

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Vanderbilt Wins NSF Multidisciplinary Grant for Reliability, Risk Engineering Program

Teaching engineers to design safer and more reliable aircraft, automobiles, environmental remediation projects, buildings, bridges and other similarly complex engineering systems is the goal of a new program at Vanderbilt University.

The new Multidisciplinary Training in Reliability and Risk Engineering and Management program, funded by a $2.7 million National Science Foundation (NSF) grant over five years, focuses education and research on ways to predict the performance and reliability of complex systems and equipment.

The program, which began this academic year, is unique, the first graduate training program in the world to study and develop multidisciplinary mathematical approaches to assessing and managing risk and reliability.

Drawing from the expertise of 25 faculty members from the School of Engineering, Owen Graduate School of Management and the College of Arts and Science, the program teaches graduate students to apply multidisciplinary techniques to assess reliability and ultimately create safe, effective and cost-efficient processes and products.

The program is the first NSF Integrative Graduate Education, Research and Training (IGERT) initiative awarded to Vanderbilt.

The Vanderbilt School of Engineering is an international leader in applying computational and experimental techniques to predict risk and reliability for infrastructure, environmental, network, mechanical and electronic systems. These tools are required because traditional reliability assessments are based on physical tests of the equipment or structure being evaluated, which is not cost-effective or even possible for complex systems like the space shuttle or a suspension bridge.

Sankaran Mahadevan, Professor of Civil and Environmental Engineering, leads the program as principal investigator. He and his team have developed a sophisticated set of mathematical alternatives to physical reliability tests, which typically involve damage or destruction of the equipment or system being evaluated. Enabled by increasingly powerful computing tools and techniques, Mahadevan's reliability methods use computer modeling and simulation to safely and accurately assess reliability.

"Graduate students who receive the comprehensive, cross-disciplinary training provided in our program will be able to apply these concepts to complex infrastructure, environmental, network, mechanical and electronics systems," he says.

In addition to training Ph.D. candidates in applying these techniques, the program will foster new research to develop highly integrated computer modeling and simulation methods that incorporate economic, legal, regulatory and social perspectives for reliability and risk management.

"The IGERT award will lead to development of Vanderbilt as the leading institution for reliability studies worldwide," says Professor Mahadevan.

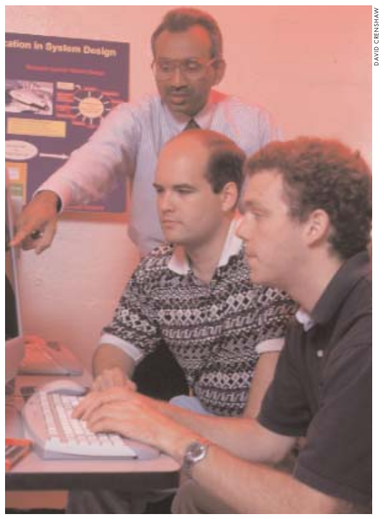
The program concentrates research in three areas: (1) large systems reliability and risk, (2) device and component reliability, and (3) uncertainty analysis methods. Large systems include transportation, environmental, aerospace and structural systems. Device and component research includes mechanical, electronic, and software components. Both of these research areas draw from the fundamental research on uncertainty analysis methods. Research findings will be shared with other scientists and engineers through a series of national reliability workshops.

The 35 Ph.D.s in the program participate in a broad-based educational plan that includes multidisciplinary coursework and dissertation topics, laboratory rotations, industry and government laboratory internships, seminars, workshops, case studies, and training in professional communication and ethics.

The outreach component of the program includes involvement with undergraduates, high school teachers, industry, government and other academic institutions.

Several government agencies and private industries are participating in the program as summer internship sponsors. Sponsoring organizations that will accept summer interns from the program include Boeing, General Electric, FedEx, General Motors, Xerox, Halliburton KBR, NASA, Sandia National Laboratories, Oak Ridge National Laboratory, the U.S. Air Force and the Tennessee Department of Transportation.

DAVID CRENSHAW



Prof. Sankaran Mahadevan (standing) is the principal investigator for the multidisciplinary team that comprises the IGERT program. (Also pictured, l-r, Kenneth Mitchell and Brian Hollander)

"We plan to aggressively recruit graduate students, particularly among those in underrepresented groups," Professor Mahadevan says.

The co-principal investigators of the IGERT program are David S. Kosson, Professor of Civil and Environmental Engineering and Chemical Engineering; Ronald D. Schrimpf, Professor of Electrical Engineering; Bruce Cooil, Associate Professor of Management; and Gabor Karsai, Associate Professor of Electrical Engineering and Computer Engineering. VE

Hardaway Named Distinguished Alumnus

L. Hall Hardaway Jr., chairman of the board of Hardaway Construction Corporation and Hardaway Group Inc., was recognized with the School of Engineering's 2002 Distinguished Alumnus Award.

The presentation was made at the School's annual Leadership Dinner at Featheringill Hall Feb. 1.

Hardaway graduated from the School of Engineering in 1957 with a degree in civil engineering. He began working as a field superintendent with Hardaway Construction, the firm his father founded in 1924.

Concentrating on the commercial side of the business, he led the company into a new era that culminated in the establishment of the Hardaway Group as the 19th largest private enterprise in Tennessee. The company employs 1,000 people. Following the family tradition, each of Hardaway's children — Cathy, Stan and Kay — has joined him in the business.

In addition to his business and professional achievements, Hardaway is known for his service to and support of Vanderbilt. A member of the University Board of Trust since 1990, he serves on the Academic Programs Committee and the Budget Committee. Hardaway has also served as president of the Nashville Vanderbilt Club and was a Steering Committee member for the Campaign for Vanderbilt. A longtime supporter of the School of Engineering, he has agreed again to serve on the School's Campaign Committee for Vanderbilt's upcoming campaign.

Hardaway has served the Nashville community in numerous capacities. He has been president and director of the Nashville chapter of Associated General Contractors and director of several construction organizations, including the Construction Specification Institute, Nashville Contractor's Association and the Tennessee Associated Builders and Contractors. Hardaway is also a past member of the Board of Governors of the Nashville Area Chamber of Commerce. In addition, he is a trustee of Davidson Academy, a trustee and deacon of First Baptist Church of Hendersonville and director of Goodwill Industries of Middle Tennessee Inc.

His company's contributions to the community include being Pencil Partner for the Jere Baxter School, the rebuilding of the Dollar General Store and learning center in the Sam Levy neighborhood after it was destroyed by arsonists and the sponsoring of Habitat for Humanity home-building projects.

The School of Engineering Distinguished Alumnus Award recognizes distinguished achievement, significant service, excellent character and a reputation that reflects well on the School. The honoree is chosen from nominations submitted by the Engineering Alumni Council and the faculty of the School of Engineering. VE

In this issue

FACULTY NOTES

Mark D. Abkowitz, Professor, CEE, made presentations on "Comparative Risk Assessment of Hazmat and Non-Hazmat Truck Shipments" to the Annual Meeting of the Transportation Research Board; "Risk Characterization of Hazardous Materials Truck Safety" to the World Conference on Transport Research, and "Tools for Distribution Risk Management" to the Conference on Hazardous Materials Transportation Safety.

John A. Bers, Associate Professor, EECS, conducted a workshop on "Marketing Your Invention" for the Inventors Association of Middle Tennessee in January.

Jack Cannon, Research Associate, EECS, received the first VUSE Award for Professionalism in Staff Service for his 42 years of service to the faculty and staff of the School.

Jimmy L. Davidson, Professor, EECS, was an invited speaker at the 2001 Energy Technology Expo. Davidson spoke on technological innovations that can solve problems such as recent power outages in California.

Benoit Dawant, Associate Professor, EECS, has been appointed for a second one-year term to the Steering Committee of the IEEE Transactions on Medical Imaging as representative of the Engineering in Medicine and Biology Society.

Daniel M. Fleetwood, Professor, EECS, was appointed Associate Dean for Research. He has also been elected a Fellow of the American Physical Society and appointed to the IEEE Fellows Committee, which evaluates candidates for Fellow Grade membership.

Kenneth D. Frampton, Assistant Professor, ME, has been appointed to the Executive Committee of the Noise Control and Acoustics Division of the American Society of Mechanical Engineers.

Ronald D. Schrimpf, Professor, EECS, attended the Radiation and Its Effects on Components and Systems conference in September in Grenoble, France, and presented a paper entitled "Effect of Amplifier Parameters on Single-Event Transients in an Inverting Operational Amplifier," which was nominated for the Outstanding Paper Award of the conference. The paper was co-authored by **Lloyd W. Massengill,** Professor, EECS, A.L. Sternberg, Y. Boulghassoul, H.J. Barnaby, S. Buchner, R.L. Pease and J.W. Howard.

Todd D. Giorgio, Associate Professor, BME, was given the VUSE Award for Faculty Research in recognition of his work in gene therapy.

Harris Named Orrin H. Ingram Distinguished Professor

Thomas R. Harris, Chair of the Biomedical Engineering Department, has been appointed the Orrin H. Ingram Distinguished Professor of Engineering.

"Professor Harris was selected for this honor because of his exemplary leadership and expertise in biomedical engineering education and research," Dean Kenneth F. Galloway says.

In addition to chairing the Department of Biomedical Engineering, Harris is Professor of Biomedical Engineering, Chemical Engineering and Medicine at Vanderbilt and Director of the National Science Foundation Engineering Research Center in Bioengineering Educational Technologies. He is also an active investigator in the problems of lung circulation.

Professor Harris obtained his bachelor's and master's degrees in chemical engineering from Texas A&M University, received his Ph.D. degree in chemical engineering from Tulane University and earned the M.D. degree from Vanderbilt. His research into lung circulation helped improve diagnosis and treatment of such lung diseases as Adult Respiratory Distress Syndrome. His work also contributed to the development of minimally invasive instruments and methods to evaluate lung vascular function and fluid balance in patients.

A Fellow of the American Institute of Medical and Biological Engineers, Harris's current research focuses on the synthesis of learning science, learning technology, and bioengineering for the Engineering Research Center. This is a large, multi-university effort involving Vanderbilt, Northwestern, the University of Texas and the Harvard/MIT Health Sciences and Technology Program, aimed at developing a new system for bioengineering education.

Orrin Henry Ingram was a member of the Vanderbilt Board of Trust from 1952 until 1963 and founded what became one of the nation's largest privately held corporations. The Ingram family funded the Distinguished Professorship in his memory. Ingram's son, E. Bronson Ingram, was president of the Vanderbilt Board of Trust from 1991 until 1995. Martha Ingram is currently president of the Vanderbilt Board of Trust. VE

Vanderbilt, Schlumberger Strengthen Relationship

Schlumberger and the School of Engineering have develped a mutually beneficial relationship. Schlumberger, which covers almost every continent as a supplier of technology and information services to the international petroleum industry and Internet technology services to telecommunications and other sectors, has found remarkable success with its School of Engineering hires.

The company co-sponsored a business etiquette training dinner for engineering students and participated in a technology-related career fair in the spring of 2001. Student interest in the company led to more interaction between Vanderbilt and Schlumberger, and this year Schlumberger tied Sprint for hiring the most Vanderbilt engineering graduates. Ryan Brechbill of the Vanderbilt Career Center says, "Throughout the academic year, Schlumberger participated in our Career Fairs and campus interviews; additionally, they sponsored Career Center events."

Daniel Tesfamicael, recruiter for Schlumberger's North American Oil Field Services, expresses excitement at the bonds forming between his company and Engineering graduates. "We at Schlumberger consider Vanderbilt to be one of the best universities in the country," he says. "Vanderbilt is one of our main recruiting sources, and we have had great success recruiting engineers and geologists there." Tesfamicael also notes that Schlumberger "looks forward to continuing our relationship with Vanderbilt and to becoming the number-one source of employment for engineers and applied sciences majors at Vanderbilt. We appreciate the quality of Vanderbilt's graduates as well as the services that the Career Center provides our company."

One engineering graduate has particularly enjoyed his first few months with Schlumberger. Matthew Fleming, BE'01, feels that "Schlumberger is a different kind of company. Most of the engineers they hire from Vanderbilt will start as field engineers, as VUSE graduates are known to be proficient in software skills." Fleming says that Vanderbilt alumni "have the people skills, the experience presenting concepts and thoughts, and the ability to work well in groups" necessary for success in the business world. He remarks, "My job is constantly changing: I am always facing a new set of challenges. As a field engineer, I am not tied to a cubicle or a computer." Schlumberger's worldwide operations allow workers a great deal of mobility; as one recruiter told Fleming, "See the world and let Schlumberger pay for it." A diverse company with about 25 percent of its revenue and workforce coming from overseas, Schlumberger literally offers a global working environment.

A catalyst for the recent Vanderbilt–Schlumberger affinity has been alumnus Joseph Flowers, BE'88, who applied for and secured a grant from Schlumberger to support the research of Jim Davidson, Professor of Electrical Engineering. He says, "I have great respect both for Vanderbilt Engineering and for my company, Schlumberger. When I found out that Schlumberger gives technical grants, I expected that Vanderbilt would have a project which would meet our interests." The specifics of Professor Davidson's work are of interest both to academia and industry, as Flowers notes: "The grants allow VUSE to accelerate its pace of innovation in micro-scale and nano-scale engineering." Improvements in microstructures and nanostructures, which Professor Davidson works with, have wide-ranging benefits which could be of help to Schlumberger. Flowers credits his Vanderbilt education with preparing him for the many facets of working for an innovative company such as Schlumberger, as he left school with "a high degree of technical expertise along with a balance of non-scientific skills for everyday use." In looking forward, he sees that Vanderbilt is "constantly improving its position in the collective intellectual consciousness, which allows the School to solicit ever more impressive challenges." VE

Centennial Professor Richard Speece Retires

Richard E. Speece, Centennial Professor of Civil and Environmental Engineering, retired last fall from his position at Vanderbilt. Speece came to Vanderbilt in 1988 and influenced colleagues and students alike with his originality in tackling significant environmental problems.

Centennial Professor Richard Speece retires after a 13-year career as a CEE faculty member.

David Kosson, Chair of the Civil and Environmental Engineering Department, says, "Professor Speece has made outstanding contributions to the School of Engineering through his teaching and research."

Eleven patents, over 120 archival publications, and exceptional praise from students attest to Professor Speece's successful career, and Professor Kosson cites the "widespread adoption of the approaches he has developed for surface water oxygenation and anaerobic biological treatments of wastes" as an indicator of Professor Speece's professional impact. While garnering numerous awards, he helped train a generation of environmental engineers now following in his path, changing the way we view the relationship between society and the environment.

One of Speece's novel ideas in wastewater treatment was to add small polyethylene structures for bacteria to cling to in wastewater tanks, which led to an optimized treatment process yielding effluent almost completely free of organic pollution, ammonia nitrate and bacteria. The project promises to save Tennessee and other states millions of dollars in expansion costs for wastewater treatment systems as rural areas become populated. VE

From the Dean

DAVID CRENSHAW

This is a great time for the School of Engineering. Featheringill Hall opened for classes in January. This beautiful, state-of-the-art facility with excellent classroom, office and laboratory spaces, has quickly won the praise of our students and faculty and our alumni. This new building is a very visible sign of our School's progress, and has served to raise the profile of the School of Engineering on the Vanderbilt campus

The School of Engineering faculty continues to experience wonderful success with their research efforts. The School's externally funded research program has essentially doubled in the last five years. Additionally, Engineering faculty are key participants in new Vanderbilt trans-institutional initiatives focusing on nano-science and engineering, biophysical sciences and bioengineering, and environmental risk and resource management. This past summer, the School was awarded a unique National Science Foundation (NSF)-funded graduate training program under their Integrative Graduate Education, Research and Training (IGERT) initiative to study and develop multidisciplinary approaches to assessing and managing risk and reliability. Strong, successful efforts continue in semiconductor radiation effects (U.S. Department of Defense Multidisciplinary University Research Initiative) and bioengineering education (NSF Engineering Research Center).

In December, the Institute for Software Integrated Systems (ISIS) hosted a national workshop to develop a roadmap for federally-funded computer software research. This NSF sponsored workshop included some of the top computer researchers and most influential government agency representatives to examine ways to dramatically increase software productivity and interoperability without compromising quality.

Two more of our terrific young faculty members won NSF CAREER Awards in the last year. Bridget Rogers, Assistant Professor of Chemical Engineering, and Ken Frampton, Assistant Professor of Mechanical Engineering, won this prestigious national award that recognizes and supports the teaching and research objectives of exceptional junior faculty members. This makes five CAREER awards for School of Engineering faculty in the past two years. And we are very optimistic about our chances for future such awards.

And undergraduate students? This year's freshman class, comprised of 251 men and 92 women, has an average SAT score of 1320. These are terrific, very capable students. With the addition of new funds to enable us to offer additional honor scholarships and minimize student loans, we expect next year's class to be even stronger. Thanks in part to improved financial aid capability, our new building, better classroom facilities and new technology resources, we expect 2002 to be an excellent year for student recruiting.

Next year, incoming freshman will be part of the first School wireless/wired network program. TransIT will equip freshmen engineering students with state-of-the-art laptops with wired and wireless access to the engineering community and the Internet. This mobile-access computing system will be used in the classroom for teamwork and student-faculty interaction and access to sophisticated computer environments and tools.

Exciting research, exemplary faculty, great students, and a terrific new building — these are strong forces aiding our School's progress. We're in a better position than ever to recruit top undergraduates, strong graduate students and excellent faculty to Vanderbilt … in spite of the intense nationwide competition for this talent.

This is a great time for the School of Engineering. We intend to continue to focus on our commitments to upgrade facilities, to provide an exceptional undergraduate engineering education, to expand our research programs, to strengthen our graduate programs, and to make a significant contribution to the nation in solving problems that require the expertise and effort of highly educated engineers. VE

A Very Small World

Balcarcel Focuses on Cell Metabolism

With ten trillion cells or so in the average human body, you wouldn't think that what goes on in a single cell would be worth noting, much less probing, studying, measuring and testing.

But to R. Robert Balcarcel, Assistant Professor of Chemical Engineering, the individual cell is far more important than just being the body's tiny, readily replacable building block. It's a world in its own right ... a world with clues to warn against chemical and biological warfare attack, prevent cancer, produce life-giving medicines like insulin more efficiently, and unlock the secrets of genetic functioning.

One of the applications of Professor Balcarcel's research is to help create a bio-sensing system that can warn of chemical or biological warfare attacks. He is focusing on cell metabolism for the "Instrument and Control the Single Cell" project, headed by Gordon A. Cain University Professor and Professor of Biomedical Engineering John P. Wikswo and funded by the Defense Advanced Projects Administration (DARPA) and the National Institutes of Health.

One of the goals of the project is to devise a biosensor that uses individual cells to monitor potential chemical or biological warfare threats. The device, called a nanophysiometer, will record metabolic signals from one or more isolated, living cells and control how the cells respond.

The biosensor is part of an approach to create a multi-phasic cellular biological activity detector that uses individual cells as "canaries in the coal mine," warning of chemical or biological threats. This approach differs from traditional detectors that are designed to detect the threatening agents themselves.

Professor Balcarcel is developing techniques that can quickly determine the state of a single cell's health. By studying only a handful of key metabolic processes, he can gain an accurate indication of the conditions that promote or threaten a cell. "Metabolism is the most basic function of a cell, the most fundamental activity of a living thing, because the other functions of growth, replication, sensing and moving all depend on it," he explains.

Professor Balcarcel has developed a way to simplify the study of stupifyingly complex processes of cell metabolism by measuring only key products of cell metabolism.

In the simplest form, his method will measure metabolites such as glucose, lactate, oxygen and carbon dioxide. Such measurements can in turn be used to estimate the functioning of other key metabolic fluxes and thus the cell's overall state of health.

He hopes his work will help utilize the information produced by decoding the human genome.

"The Human Genome Project decoded the DNA sequences, but we're probably decades away from understanding the entire spectrum of genes, molecules and reactions that determine cell physiology," Professor Balcarcel says. "Ultimately the goal of biological research is to figure out all the molecular details related to genes and cell physiology. In the meantime, metabolic screening can help us use what we already know." VE

DAVID CRENSHAW

Balcarcel, left, and Ph.D. candidate Yuansheng Yang hope this research will further knowledge of the most basic functions of the human body.

Michael Goldfarb, Associate Professor, ME, was appointed Associate Technical Editor of the American Society of Mechanical Engineers *Journal of Dynamic Systems, Measurement, and Control.* Goldfarb was also awarded the VUSE Award for Excellence in Teaching for the 2000-2001school year.

Peter G. Hoadley, Professor, CEE, was awarded the William H. Wisely American Civil Engineer Award from the American Society of Civil Engineers. The award recognizes "continuing efforts to promote appreciation of the history, tradition, developments, and technical and professional activities of the Society."

Thomas R. Harris, Chair, BME, has been appointed the Orrin H. Ingram Distinguished Professor of Engineering (see article, page 2).

William H. Hofmeister, Research Associate Professor, ChE, has joined the Metal Powder Industries Federation Technology Roadmap committee. Hofmeister also delivered "Rapid Prototyping by Direct Metal Deposition" to the Department of Mechanical Engineering at Canterbury University in Christchurch, New Zealand.

L. Ensign Johnson, Professor, EECS, emeritus, was awarded the Edward J. White Engineering Faculty Award for Excellence in Service for his many contributions to recruitment of undergraduate engineering students.

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Vanderbilt University Alumni Publications on the Web:
www.vanderbilt.edu/alumni/publications

Paul H. King, Associate Professor, BME, was elected member-at-large, BME Division, of the American Society for Engineering Education (ASEE). He also presented "Electrocardiogram Capture and Analysis" and "Biomedical Engineering in the New Millennium" at the ASEE annual conference.

Kazuhiko Kawamura, Professor, EECS, has been named a Fellow of the Institute of Electrical and Electronics Engineers, Inc. He also represents the Systems, Man, and Cybernetics Society of the Committee on Communications and Information Policy and the Research and Development Policy Committee of IEEE-USA.

Arthur M. Mellor, Centennial Professor, ME, received an American Institute of Aeronautics and Astronautics Certificate for Outstanding Contributions and Leadership.

Sankaran Mahadevan, Professor, CEE, served as a Guest Editor of the October issue of the ASCE *Journal of Aerospace Engineering*. He also recently began serving a five-year term as Member of the Executive Committee in ASCE's Aerospace Division, and a three-year term as Chairman of the Fatigue and Fracture Reliability Committee in ASCE's Structural Engineering Institute.

Ales Prokop, Research Professor, ChE, was awarded a Special Appreciation Award by the United Engineering Foundation of New York for his involvement as co-chair of the UEF conference "Bioartificial Organs III: Tissue Sourcing, Immunoisolation and Clinical Trials." He also delivered an invited lecture to the conference on "Bioartificial Organs in the 21st Century: Nanobiological Devices." Prokop is the founder of the conference series.

Robert J. Roselli, Professor, BME, marked 25 years as a faculty member in ceremonies at the Fall Faculty. In the tradition of the University, Chancellor Gordon Gee awarded him a chair bearing a brass strip engraved with Roselli's name and a brass disk engraved with the University shield.

Nilanjan Sarkar, Assistant Professor, ME, was appointed Associate Editor of I*EEE Transactions on Robotics and Automation* and was a panel reviewer for the National Science Foundation's Information Technology Research Program.

Karl B. Schnelle Jr., Professor, ChE, has authored *Air Pollution Control Technology Handbook* with Charles A. Brown.

Julie E. Sharp, Associate Professor of the Practice, ChE, presented "Using Kolb Learning Styles as a Teaching Tool" to the 2001 Annual Conference of the American Society for Engineering Education. She also presented selected preliminary results of a learning styles study of engineering students to the Frontiers in Education Annual. Her paper, "Teaching Teamwork Communication with Kolb Learning Style Theory," was published in the proceedings.

CAMPUS NEWS

Brechbill Teams Career Center With School of Engineering to Find Top Jobs for Students


DAVID CRENSHAW

Ryan Brechbill, Career Adviser for the School of Engineering, is on a crusade. He has spearheaded a hands-on effort to unite the Career Center and the School of Engineering in helping students find and secure the jobs that best suit them. Brechbill's in-the-trenches tactics include abandoning his Career Center office across campus twice a week and spending time at Engineering buildings, setting up informational interviews, sending out weekly flyers with employment leads and tips, and aggressively recruiting new corporate partners. Recently, Brechbill was able to take a break from the job market whirlwind to elaborate on his quest and share a few words of wisdom.

What are you focusing on doing to improve job prospects for our students?

Employer outreach is one of the biggest things we are trying to do right now, really reaching out to get more companies here and to provide more opportunities. We are trying to target not only local companies, but also national and international companies to post jobs with our office, attend our career fairs and conduct campus interview sessions.

How do you like spending time at the School?

I love to be over at the Engineering School. Last year, I had office hours at Jacobs Hall on Tuesdays and Thursdays. Students did not have to make an appointment; they could just walk in and have me look at their resume or ask me a quick question. Sometimes, if I didn't get any student traffic, I would roam the halls to see what's going on or put up flyers — anything to get out there and be visible. Spending time with the students allows me to get to know them better, and the better I know the students, the more I am able to help them.

What advice do you give students as they begin thinking about their careers?

The first step is to explore the particular field of interest. Students can do this by interning or even just talking to people who are in that profession right now. We call that "information interviewing." We have all kinds of contacts who have agreed to participate in these interviews. The alumni office also provides a service known as the Commodore Career Connection that has 11,000 alumni who are willing to answer questions students have about a particular profession or even a city that has piqued a student's interest.

How important are internships for students?

They are extremely important. You've got to have at least one, if not two. Basically, companies want students to have that experience when they come to work so the firms don't have to spend as much money training them.

What challenges do the School and the students face?

The size of the School is a challenge — getting companies to look at us and see that even though we have fewer students than other schools, our students offer more bang for the buck. Our students are not only strong technically, but also strong in their communication skills from our liberal arts program. That is how we sell companies on coming here, and we've had pretty good success so far.

What do you hear from employers about why they like Vanderbilt students?

They comment on the focus of Vanderbilt students. They know that our students have looked at their future and that they have set goals they want to achieve. They are very polished, very well prepared. They have done the research about the industry and the company. Once they have the position, they perform well.

What can alumni do to help?

Alumni are an extremely valuable resource that we need to tap. They can help by serving as career advisers through the Commodore Career Connection, posting jobs within their company with us, serving as contacts within a company, and participating in informational interviewing with the students. We are very open to exploring new ways to do things and new ideas, so we are open to anything they have to offer. We are very willing to listen to them and find ways to make their ideas happen. VE

Rogers Wins 2001 NSF CAREER Award


BILL ATKINSON

Rogers and undergraduate Virginia Wahlig

Bridget R. Rogers, Assistant Professor of Chemical Engineering, has won the prestigious CAREER Award from the National Science Foundation for her research on alternative materials that could be used to make faster and more economical computer components.

The Faculty Early CAREER Development awards are considered NSF's most prestigious honor for junior faculty members. They range in amount from $200,000 to $500,000 and in duration from four to five years.

The national award, given to selected faculty for their exceptionally promising research, will enable Professor Rogers and her associates to study materials that could replace the silicon dioxide currently used in transistors and other microelectronic devices that are the heart of computers and telecommunications devices.

"The semiconductor industry is well aware that it is rapidly approaching the functional limits of silicon dioxide used in computer transistors," Professor Rogers says. "Successful replacement of silicon dioxide is a critical step in the continued drive to build faster, lower-power, more integrated circuits."

A layer of silicon dioxide is used to make the part of a computer transistor within an integrated circuit that plays the pivotal role in switching the transistor on or off. Professor Rogers and her multidisciplinary team are studying certain thin films made of alloys strong enough at the molecular level to replace silicon dioxide as transistors are made smaller. To study these extremely thin films, Professor Rogers designed a unique ultra-high-vacuum chemical vapor deposition reactor that deposits the alloy and allows the researchers to study their properties before they are exposed to contaminants in the air.

Professor Rogers and her associates will use an instrument called a spectroscopic ellipsometer, recently purchased through a grant from the U.S. Defense University Research Instrumentation Program, to study alloy films of aluminum oxide and zirconium oxide. The laser equipment will allow the researchers to analyze the materials in place by studying their response to varying wavelengths and angles of laser light.

The films will also be analyzed in three other Vanderbilt laboratories to determine their electrical, chemical and physical properties.

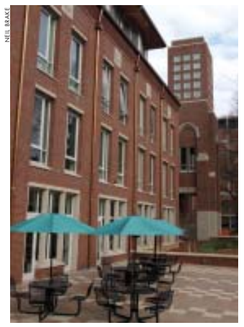
"What we're looking for is an alloy that can deliver the strong insulating qualities required," Professor Rogers says. "Because the probability is low that a material system can meet all the required criteria, we will need to make trade-offs between materials and study ways to work around the shortfalls inherent in the materials. We expect our research to lead to solutions to these problems for the microelectronic device industry." VE

VUSE is proud to announce that **Kenneth D. Frampton,** Assistant Professor of Mechanical Engineering, has been named the fifth member of the VUSE faculty to be awarded a National Science Foundation (NSF) CAREER award in the past two years. Frampton was granted the 2002 award for his research on "smart structures."

Working with engineers in the Vanderbilt Institute for Software Integrated Systems (ISIS), Frampton is developing a networked computer approach that can efficiently control complex systems like aircraft and space-based telescopes, without adding heavy, cumbersome and costly equipment.

Featheringill Hall Opens

The School of Engineering's new Featheringill Hall combines aesthetics with state-of-the-art technology. The building, which opened in January, houses more than 50 teaching and research laboratories and is fully integrated into the vast computer resources and networks of the School of Engineering and Vanderbilt. A three-story atrium with clerestory lighting is designed to be a focal point for student interaction and social events.


NEIL BRAKE

LEADERSHIP DINNER

A Spirit of Enthusiasm

VUSE Honors One of Its Own at Leadership Dinner in Featheringill Hall


David Crenshaw

The three-story atrium in Featheringill Hall

Dean Kenneth F. Galloway welcomed Chancellor E. Gordon Gee, Distinguished Alumnus L. Hall Hardaway Jr., students and supporters of the School of Engineering to the School's new Featheringill Hall for the Leadership Dinner on Feb. 1.

"I have looked forward to this evening for a long time," said Dean Galloway. "To be here in the atrium of our new building, truly a focal point for our school and a symbol of our progress, is an energizing experience."

The Dean thanked the supporters of the School, including Building Campaign Chair Bill Featheringill and Alumni Council President Jim Johnson, for their efforts and generosity in the construction of the new building. He also recognized the School's faculty for bringing several new grants, research and a growing reputation for excellence to the School. Dean Galloway noted that externally-funded research by faculty and students has doubled in the past five years.

"Exciting research, an exemplary and devoted faculty, great students and a terrific new building — these are the powerful forces in the progress our School is experiencing," he said. "There is a real spirit of enthusiasm about the progress that we have made. I believe we have a strong shared vision for the future of engineering at Vanderbilt."

Student Engineering Council President David Brogan, a Harrawood Scholar, thanked those present for their part in funding the School's many endowed scholarships and for the commitment they showed to the students by supporting the construction of the new building. "This building gives the Engineering School a new face to show to Vanderbilt and to the world," he said. "Not only do we have a new home, we've got the nicest house on the block."

In his remarks, Chancellor Gee joined Dean Galloway in praising the accomplishments of the faculty and students. Chancellor Gee, wearing his customary bow tie — black, complemented by his Vanderbilt gold vest — proclaimed, "The talents of the School of Engineering's faculty and graduates extend Vanderbilt's presence into the wider world. The ideas of the Engineering School are special because they are made manifest in the world, and the work that it does contributes to the larger work of our University."

Chancellor Gee introduced Hardaway, BE'57, as the recipient of this year's Distinguished Alumnus award. "Middle Tennessee is richer and certainly more well-built because of Hall's committed attention and wise use of his craft," stated Gee. "He distinguishes not only himself but also his profession and Vanderbilt University by his full presence within the community."

Hardaway spoke briefly about the effect the School has had on his life and thanked the Alumni Council, the faculty and those present for the honor of being named a Distinguished Alumnus of the Vanderbilt School of Engineering. VE


David Crenshaw

Chancellor G. Gordon Gee, 2002 Distinguished Alumnus L. Hall Hardaway and Dean Kenneth F. Galloway


David Crenshaw

Hardaway and Bill Featheringill, BE'64, for whom the new building is named

Six New Partners Join VaNTH Bioengineering ERC

The Vanderbilt-Northwestern-Texas-Harvard/MIT Engineering Research Center (VaNTH) for Bioengineering Educational Technologies has signed six new business and industry partners to help the Center develop innovative and effective education and training programs in bioengineering.

The new industrial partners to help in the enterprise include:

Nova Bionics Inc., a Nashville-based company that makes microelectronic semiconductor products for health care and medical research clients, will help the Center financially and will provide internships for Vanderbilt bioengineering students. The company will also consult with Center researchers on course content.

N•Tara, based in Johnson City, Tenn., produces digital video, 3D animation and interactive programming for advanced-learning and corporate communications. The company will create computer models to help students visualize principles and techniques used in biomechanics and biotechnology. The company will also make a financial contribution to the Center.

DigiScript Inc., which records, archives and presents conferences and workshops for clients to access through the Internet, CD-ROM recordings, and printed material, has agreed to make a monetary donation to the Center as well as to record and archive Center workshops, seminars and conferences. The company is based in Franklin, Tenn.

Smith & Nephew will also make a donation and will provide student internships as well as consultation on coursework for the Center. The Memphis-based manufacturer of orthopedic devices is part of the international firm Smith & Nephew, which provides a range of medical devices in orthopedics, endoscopy, advanced wound management, and rehabilitation.

Datex-Ohmeda, a manufacturer of anesthesia-delivery systems based in Madison, Wisc., will donate equipment and discounted textbooks to the Center and will provide consultation on coursework. The company is a division of medical-technology firm Instrumentarium Corporation of Helsinki, Finland.

Abbott Laboratories will give the Center financial support and will provide student internships. The Abbott Park, Illinois-based company produces pharmaceutical and health care products.

The new industrial partners join original partner National Instruments of Austin, Tex. National Instruments is providing LabVIEW software, which is widely used in engineering research, production and education.

"Our industrial partners are an integral part of the Center's mission," says Jerry C. Collins, the Center's industrial liaison and Research Associate Professor of Biomedical Engineering. "Bioengineering students need real-world experience, and our partners' financial support and consultation on the coursework we're developing help us ensure that the new educational materials will provide students the knowledge and skills they will need in their future careers."

The Center was founded by the National Science Foundation (NSF) in 1999 to provide the courses and educational resources in physics, mathematics, engineering science and biology that bioengineers need to keep pace with the bioengineering field's rapid evolution. The Center focuses on integrating and synthesizing the knowledge base as well as developing effective educational materials to teach the complex range of skills and understanding required. VE

Janos Sztipanovits, E. Bronson Ingram Distinguished Professor of Engineering, EECS, gave a presentation on "Embedded Software Development Research" to the Advisory Group on Electron Devices of the Office of the Under-secretary of Defense. The goal of the January meeting was to aid in assessing science and technology investment alternatives for the Director of Defense Research & Engineering.

Edward L. Thackston, Professor, CEE, emeritus, has been selected as "Engineer of the Year" by the Middle Tennessee Chapter of the Tennessee Society of Professional Engineers. Thackston also won the Landmark Paper Award from the Association of Environmental Engineering Professors for his 1969 paper on reaeration prediction. He was named a Chapter Honor Member by Chi Epsilon civil engineering honor society and the 2001 Outstanding Teacher of the Year by Tau Beta Pi.

Robert A. Weeks, Research Professor, emeritus, served as session chair for both the Interna-tional Glass Congress in Scotland and the "SiO2 and Advanced Dielectrics" symposium in France. He gave the plenary lecture to the Brazilian Glass Conference and First International Conference on Glass. Weeks is a member of the editorial board of the *Journal of Non-Crystalline Solids* and served as the 1998-2001 conference editor.

Robert A. Weller, Associate Professor, EECS, won an "R&D 100 Award" as a co-inventor, with colleagues at Sandia National Laboratories, of the ion electron emission microscope. The device was judged by *R&D Magazine* to be one of the 100 most significant technological inventions of the year.

John Wikswo, the Gordon A. Cain University Professor and Professor, BME, presented an invited talk, "The Magnetocardiogram, Tissue Anistropy, and the Cardiac Bidomain," co-authored by Franz Baudenbacher, to the conference "The Integrated Heart: Cardiac Structure and Function" in Queenstown, New Zealand. Wikswo presented "Analysis of Topological Charge in Electrodynamic Systems Using Fourier Decomposition," co-authored by Mark Bray, to the annual meeting of the Southeastern Section of the American Physical Society. Wikswo also presented an invited talk titled "Multiphasic, Dynamic, High Throughput Measurements and Modeling for Postgenomic Cellular Biophysics" and participated in a panel discussion, "Automating Physiological Data Collection: A Link to High-Throughput Modeling," at the Scientific Advisory Board Meeting of Physiome, Inc. At an Air Force Corrosion Program Office/S&K Technologies Working Group Meeting, he presented a progress report on "SQUID Imaging of Exfoliation and Intergranular Corrosion," co-authored with Yu Pei Ma, Kevin Cooper, James Suzel, and Robert Kelly.

NEW FACULTY

Malcolm E. Baird, Research Professor, CEE, joins VUSE from the Tennessee Department of Transportation, where he was director of the Office of Strategic Planning. He has extensive expertise in transportation planning, intelligent transportation systems, and transportation research needs and will serve as director of Vanderbilt Engineering Center for Transportation Operations and Research (VECTOR). Baird earned his bachelor's and doctoral degrees from Vanderbilt and earned two master's degrees from Georgia Institute of Technology.

Istvan Bartok, Research Instructor, EECS, joins the School from Budapest University of Technology and Economics in Budapest, Hungary, where he served on the faculty of the Electrical Engineering and Informatics Department. An experienced software engineer, he will work with the Institute for Software Integrated Systems. He earned his master's degree from the Budapest University of Technology and Economics.

James Bentley, Adjunct Professor, EECS, comes to VUSE from Oak Ridge National Laboratory. An international expert in analytical electron microscopy, he will study applications of these techniques to develop thin films and other new materials. Bentley obtained his undergraduate degree from the University of Salford, England, and earned his master's and doctoral degrees from the University of Birmingham, England.

Sanjiv Gokhale, Visiting Associate Professor, CEE, joins VUSE from Purdue University, where he was Associate Professor of Construction Engineering Technology. Gokhale obtained his bachelor's degree from the Indian Institute of Technology in Bombay, a master's degree from Vanderbilt, and another master's degree and his doctorate from Columbia University.

Moonil Kim, Research Associate, CEE, will conduct research on bacterial source tracking in Davidson County, Tennessee, streams. Kim obtained his bachelor's and master's degrees at Hanyang University in Korea and his doctoral degree from Vanderbilt.

Young Chol Kim, Visiting Professor, ME, comes to VUSE from Chungbuk National University in Cheongju, Korea, where he is Professor of Mechanical Engineering. Kim will be working with the Tennessee Space Grant Consortium and will also be a collaborating scientist at the Tennessee State University Center of Excellence in Information Systems. He obtained his bachelor's degree from Korea University and his master's and doctoral degrees from Seoul National University.

STUDENT NEWS

Students Keep Cargo from Getting Scrambled

They came hurtling out of the sky in a variety of shapes. There were triangles. There were cones. There were square boxes. There were inflated bags and parachutes. There were two-bladed helicopters and even a Leonardo da Vinci-like flying screw. All were brightly colored in red, white and blue and were entries in the annual engineering egg drop competition sponsored by FedEx and held Dec. 7.

While a cheering crowd of several hundred participants and observers watched from the ground below, some 60 containers, each cradling one raw egg, were dropped from the veranda of the Overcup Oak Lounge in Sarratt Center onto the brick pavement three stories below. Their flight times were clocked and two faculty members, Ken Frampton and Art Overholser, judged whether the eggs they carried survived the experience without even a scratch.

Teams of one to three engineering students were given an hour to surround their egg with a container capable of protecting it from the drop, made out of a FedEx box and a variety of other materials filling a plastic bag. A total of 136 students participated in the exercise and produced 60 entries, making it what organizers said was the University's largest egg drop competition to date.

This year, the rules were changed substantially from the previous year, when students could pick up the FedEx boxes ahead of time and use a wider variety of materials. The eggs broke in fewer than 10 percent of the entries, which took away a lot of the suspense. So, instead of seeking out a higher drop point, the Engineering Council decided to limit the materials that competitors can use and have them construct their entries in just an hour. The group also changed the criteria slightly. A cracked or broken egg still resulted in instant disqualification. But, of those that survived, entries using the least material were ranked ahead of those using added material. Contestants were required to use all of the FedEx box. Finally, of those using the least amount of material, the entries were ranked by their drop times — the shorter the better. "We thought that this would make the competition more difficult and do a better job of differentiating between the skill that went into the designs," says David Brogan, president of the Engineering Council, who directed the competition with Madani Adjali, head of the council's special events committee.

This year's winner was Timothy Brian Jones, a sophomore. His entry was a slender cone. "I picked the shape because I thought that it would direct the force around the egg rather than through it," he said. "I entered the contest last year and used a wide cone. This year, when they added the rule about the time, I made the cone narrower so it would be more aerodynamic and fall faster."

NEIL BAKER

Contestants Isaac Clements and Elizabeth Ballard with their entry

Second place went to graduate student Jim Placke and third place to sophomores Cole Moody and Matt Eames. Faculty judges awarded the creativity award to junior Ian Burgess for his minimalist approach of simply sticking the egg in a FedEx box, sealing it up and letting it drop.

In addition to the boxes, FedEx provided $500 in prize money: $200 for first place; 150 for second place; $100 for third place and $50 for most creative.

VE

ME Students Solve Vanderbilt Water Problem

A group of Vanderbilt mechanical engineering students used some "tunnel vision" to solve a University water problem that should save Vanderbilt about $35,000 per year in utility expenditures.

The University hit water while boring a huge tunnel between the new Vanderbilt Children's Hospital and the power plant, according to Robert L. Camperlino, Director of building and utilities for Plant Operations. The tunnel will house gas, electric and water utilities as well as communications lines for the new hospital.

"There is a substantial amount of in-leakage to the tunnel from two sources," Camperlino says. "One is from some underground springs that were previously trapped under the limestone rock. The other water is related to wet weather and rainfall. There is almost a mile of tunnel, and we've got water leaking in a number of places." The water is currently pumped into storm sewers.

When students Leighann Hamilton and Bobby Bailie contacted Camperlino to get ideas for their group's senior design project, he suggested they study the water problem in the tunnel and propose a solution. Other members of the team were Aaron Berutti, Chad Clark and Jesse Holmes.

The group, wearing galoshes and hardhats, inspected the site by descending a 120-foot deep shaft to reach the tunnel. The tunnel is eight feet, six inches in diameter. Bobcat earth-moving equipment fits inside with room to spare.

Members of the group revisited the tunnel a number of times to perform various tests. "We took flow rate measurements on a couple of springs that had been sealed, with a pipe and cutoff valve installed," Bailie says. "We were able to get some decent flow measurements on the first valve we opened. The second one was a whole other story. The three–and–a–half–inch pipe shot water out 17 feet when we opened the valve. It knocked us down. We tried a big drainage separator, but the water pressure blew it right out of our hands.

"We tried to catch it in a 30-gallon trashcan, but the water spread out so much after traveling 17 feet that we couldn't begin to catch it all," Hamilton adds. "We ended up doing trajectory measurements to get some idea of the water flow, which we estimated at 450 gallons per minute."

The team met regularly with Camperlino and Galen Romine, the project engineer who works for I.C. Thomasson Associates on the University's co-generation plant. The students came up with a plan to capture the tunnel water and use a large portion of it in the irrigation systems that provide water for the athletic and intramural fields near the Student Recreation Center and McGugin Center. They proposed that much of the remaining water be used to cool the bearings in a number of Plant Operation devices. Other water will be used to replace that lost to evaporation in the University's cooling tower. Currently, city water supplies all three above uses.

The group had to crunch numbers for piping schematics, equipment prices, water pressure flows, water temperature and the water's chemical composition. Camperlino, currently running a check to verify the numbers, plans to proceed with the project. He predicts the project will pay for itself in reduced city water bills within two to two-and-a-half years.

"I really liked working with this group," Camperlino says. "They were bright, enthusiastic and well organized. They were open to new ideas. We threw a few curve balls at them — things you don't get out of textbooks. They had to come up with some unique formulas and do research that engineers in the real world have to do when there's not a pat answer."

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Vanderbilt's Women's Mini Baja Team In a League of Their Own

Picture an off-road vehicle at the starting line of a dirt track designed to punish its participants. A mass of 134 other roaring engines surrounds the vehicle; they roar so loudly the driver cannot hear the cries of the crowd standing just a few feet away. Now, picture the driver. Did you picture a male? Most people do, but not the members of Vanderbilt's all-women Mini Baja racing team.

Karen Talla, Diane Muratore, Allyson McAdoo and Robyn Kratenstein broke the mold at the Society of Automotive Engineers' Mini Baha competition that took place June 1-3, in Troy, Ohio. These four women composed not only the first all-women team at Vanderbilt, but also the only all-women team to enter the competition.

The team members started working on their project in January 2001. They were responsible for designing, building, testing, promoting and racing the vehicle, as well as generating the finances they needed to support their project.

Karen Talla, the team leader, believes that not having males on the team allowed them to speak more freely about the things they did not understand. "The atmosphere was very relaxed, and we just had a lot of fun while learning so much," she says.

The pressure of being the only all-female team did not seem to get in the way of their success. In fact, it might have helped the group. Talla recalls, "The other teams doubted that we could even make the competition, because we were an all-girls team. I guess that made us — well, at least me — work even harder."

Karen Talla takes her team's off-road vehicle for a spin, showing that men are not the only ones who can succeed in the world of Mini Baja racing.

The hard work paid off for the team. Phil Davis, Research and Development Engineer at Vanderbilt, gloats, "The competition is very brutal and is designed to test the cars to their limits. Less than 50 of the 135 car entries finished the race and the girls were in that 50. I would say the girls measured up very well against the other teams."

School of Engineering Alumnus Builds Humanoid Robot

Imagine a robot that would serve as a helpmate around the home, performing useful household chores at your beck and call. That vision will become reality sometime in the future, thanks in part to a lab created by a Vanderbilt-educated computer science engineer.

Shane Chang, MS'87, Ph.D.'90, and his colleagues are developing the "seeing" and intelligence phases of humanoid robots at the Honda R&D Fundamental Research Labs in Mountain View, Calif. Honda's Version I humanoid robot is named Asimo (Advanced Step in Innovative Mobility). The 4-foot, 95-pound robot, which resembles a small astronaut, walked, bowed and waved to the crowd during a Japanese New Year's Eve TV gala that rang in 2001. Asimo depends on a wireless remote-control operator to tell it what to do. Future versions will be much more sophisticated.

"It's a very limited application right now, but that's only Version I," Chang says. "Eventually the robot is intended for domestic help applications. We're seeing in Asian society that older people living alone would enjoy some kind of non-intrusive help. So you would have this baby robot that can take care of domestic chores and provide extra security for your home or around you as you travel. We are looking for an economical and reliable way to do that."

Chang has hired eight Ph.D. engineers and computer scientists for the fledgling lab, just a year old and located in a new building. He plans to ramp up to 20 full-time employees in the near future and has the space ready to accommodate them. He may well expand beyond that. There are also seven graduate students working in the lab during the summer months.

One of the major obstacles that Honda and other humanoid robot-makers face is fear, particularly among science fiction aficionados and technofuturists, that robots will get out of control and harm humans. At least one highly-regarded scientist, Bill Joy, a co-founder of Sun Microsystems, has predicted that our own robotic creations might one day replicate themselves and contribute to humankind's demise.

"That's the perception, and we have to overcome that," Chang says. "The top of all our concerns is people's safety and security. We want to create an enjoyable experience. We don't want people to have to worry about whether they left the robot on when they left for work like they might worry about leaving the stove on and burning down the house. We have to be sensitive to people's perceptions."

Prior to joining Honda in 1997 as a chief engineer responsible for research in computer science, Chang worked as a computer scientist at General Electric, where he received the GE Research and Development Center's 1996 Albert W. Hull Award for distinguished early career achievement. He was recognized for his contributions to developing software that provides an ability to design easily maintainable jet aircraft engines, allowing parts requiring routine maintenance to be easily accessed by service personnel while greatly reducing development time and cost.

Chang came to Vanderbilt in 1985 as a graduate student in computer science. He joined the group in the Medical Image Processing Laboratory and also did work on magnetic resonance imaging under the direction of J. Michael Fitzpatrick, Professor of Computer Science and Computer Engineering.

Prior to that, he was a research associate in the Department of Radiology at Harvard Medical School. He also worked as an electrical engineer at the Research Institute of Mechanical and Electrical Engineering in his native Shanghai, China, before coming to the United States.

Chang, now in his mid-40s, has been awarded seven U.S. patents on his research and has authored 15 articles published in technical journals and conference proceedings. He has maintained his ties with Vanderbilt and Professor Fitzpatrick, who invited him to present a seminar on humanoid robotics research at Honda at the University last year.

"Vanderbilt is a special place," Chang says. "That's why I've been coming back as an advisor on and off in the last few years. I think Vanderbilt has tremendous potential."

VE

Endre Magyari, Research Instructor, EECS, joins VUSE from Nextra Ltd, Romania, where he served as a network engineer. He earned his master's degree from the Budapest University of Technology and Economics.

Christopher D. McKinney, Lecturer, EECS, and Director of the Vanderbilt Office of Technology Transfer will teach in the Master of Technology program. He earned his bachelor's degree from Willamette University, his master's degree from Oregon State University, and his doctoral degree from Idaho State University.

David C. Noelle, Assistant Professor, EECS, joins VUSE from the Center for the Neural Basis of Cognition in Pittsburgh, where he was a postdoctoral researcher. His research interests include cognitive neuroscience, artificial intelligence, cognitive psychology, and computational models of brain and behavior. He obtained his bachelor's degree from the University of California in Los Angeles and his master's and doctoral degrees from the University of California in San Diego.

Linda Bright Lankewicz, Visiting Associate Professor, EECS, is Associate Professor at the University of the South. She will conduct research at Vanderbilt during her sabbatical on multi-relational and distributed data bases. She obtained her bachelor's degree from the University of Georgia, her master's degree from the University of South Alabama, and her doctorate from Tulane University.

William R. Mahaffey, Professor, EECS, will serve as Director of the Management of Technology program. His research interests include systems engineering and information technology. He obtained his bachelor's and doctoral degrees from the University of Alabama.

Osman Parlaktuna, Lecturer, EECS, will teach Electrical Engineering and Mechanical Engineering. He obtained his bachelor's and master's degrees from the Middle East Technical University in Turkey and his doctoral degree from Vanderbilt.

Gabor Szokoli, Research Instructor, EECS, joins VUSE from Synergon Ltd. in Hungary. His major research interests include computer networks and routing protocols. He obtained his bachelor's and master's degrees from Technical University of Budapest.

Kevin K. Tseng, Assistant Professor, CEE, comes to VUSE from the Nanyang Technological University in Singapore, where he was Assistant Professor. His research interests include structural health assessment, computational solid/structural mechanics, and modeling of composite materials. Tseng obtained his bachelor's degree from National Taiwan University and his master's and doctoral degrees from Princeton University.