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<th>Tennessee Engineer Newsletter</th>
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Fall 2014

**Tennessee Engineer Fall 2014**

College of Engineering

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A Five-Year Analysis: Past, Present, and Future
An Exclusive Interview with Dean Wayne Davis
Welcome to the Fall 2014 edition of Tennessee Engineer! I am not writing a formal dean’s message for this issue since our cover article, “A Five Year Analysis—Past, Present, and Future,” offers an in-depth look at what has been happening in the College of Engineering since I was named as dean in March of 2009. The past five years and a half years have been a time of exciting change and progress for the college, and I’m happy to share with you detailed information about our faculty, staff, students, facilities, research, and development efforts. My next five-year appointment as dean was recently renewed, so this article also provides a glimpse at what might happen over the next five years, although the future is impossible to predict in a dynamic college like engineering!

I’ll return to the regular dean’s message format in the Spring 2014 edition. I hope you enjoy this issue and that it will provide you with ideas on how you can be a part of helping us to achieve our college’s vision and goals!

Wayne T. Davis
Dean of Engineering
Wayne T. Davis was named dean of the College of Engineering in March 2009 after serving as interim dean of the College of Engineering and Technology from 2004 to 2008 and as interim dean from 2000 to 2001. In this article, he offers a look back to Tennessee Engineer readers about what has been happening in the College of Engineering during his term as dean.

Overview

You were named interim dean of the UT College of Engineering on May 8, 2008 and interim dean on February 20, 2009. During this time, what have some of your greatest challenges?

WD: This question is an interesting one! I became interim dean just two weeks before the great recession and already had a thirty percent budget cut at the university, followed by three years with no raises for faculty or staff. Assuming a leadership role under those conditions would clearly have to be the greatest challenge that our college has faced in many years—at least as long as I have been at UT. But engineering is a very resilient profession—one dedicated to solving problems. So, challenges create opportunity and our college chose to accept that challenge. We have excelled in every way, as I will share in my comments. We have also included some graphics and charts to illustrate our progress.

TE: This year, 2014, marks your fortieth year with the University of Tennessee. You began your career at UT as an instructor in the Department of Civil and Environmental Engineering in 1974. What are the most remarkable changes that you have seen at the university, and more specifically, within the College of Engineering?

WD: It hardly seems possible that I have been on the faculty for forty years. Probably one of the most important characteristics of this university is that I was never hampered in my desire to be an excellent teacher and to pursue my dreams as a researcher. I think that the university provides opportunities for all of the faculty to achieve their goals—some will choose to do so at UT, and some will choose to leave for other venues.

In particular, for me, I was provided the opportunity to be an associate dean of the UT Graduate School half time relatively early in my career—It was one of my most valuable experiences from an administrative perspective. Throughout my career, UT’s focus on research has expanded—coming our college to excel and to graduate students, who, through intensive research training, have been accomplished problem solvers. Engineering research helps to produce better new products, and new applications that benefit the public. I came back to engineering full time after my sixth year in the graduate school as the result of a very significant research contract that I received from the State of Tennessee related to air quality nonattainment issues in the state. It was one of my most valuable experiences from an administrative perspective. Throughout my career, UT’s focus on research has expanded—coming our college to excel and to graduate students, who, through intensive research training, have been accomplished problem solvers. Engineering research helps to produce better new products, and new applications that benefit the public. I came back to engineering full time after my sixth year in the graduate school as the result of a very significant research contract that I received from the State of Tennessee related to air quality nonattainment issues in the state.

I would consider this institution’s transition to becoming a research-intensive university to be one of the most significant changes in the university and the college—and the good news is that the change is still in progress. The college continues to provide tuition waivers and stipends to graduate students, allowing us to recruit great students. The college and departments also receive research incentive funds related to external grants, which in turn benefit the research programs. We have also been able to allocate a large portion of these funds to graduate student research. As the new year starts, we will have to continue to work on this. The college’s goal is to provide them with the necessary financial resources to continue their work.

Faculty

TE: In 2015, the State of Tennessee and Governor Bill Haslam replenished to your very specific request for recurring funds with a $3 million allocation for the college’s budget, to be matched by matching state funds and private gift support. Considering the anticipated growth of the college’s enrollment, the state’s investment and the associated matching funds will be critical to continue growing the $3 million of recurring funds from the state’s budget to be matched by a combination of the chancellor’s office and the college and gifts from the private sector.

WD: We were at a crisis point three years ago with the realization that we had reached our capacity to increase our student numbers, given the number of faculty and the number of students that we had. We had approximately one hundred and fifty-three tenured/tenure track faculty. Considering the anticipated growth of our college’s enrollment, the state’s investment and the associated matching funds, the state’s investment will be critical to continue growing the $3 million of recurring funds from the state’s budget to be matched by a combination of the chancellor’s office and the college.

Students

TE: This thirty-four percent increase in the undergraduate student body over the past five years is very typical of colleges of engineering across the country as more and more students have realized the value of a science, technology, engineering, and math (STEM) degree. The good news that goes along with this growth is the recognition that engineering disciplines typically have the highest salaries for graduates of their undergraduate engineering programs as well as the lowest unemployment rates for those graduates. The last several years have been unusually higher than in past decades, I do anticipate continued growth of our undergraduate programs in the four to seven percent range per year for the next several years. The interest of both high school students and employers remains very strong.

WD: The thirty-four percent increase in the undergraduate student body over the past five years is very typical of colleges of engineering across the country as more and more students have realized the value of a science, technology, engineering, and math (STEM) degree. The good news that goes along with this growth is the recognition that engineering disciplines typically have the highest salaries for graduates of their undergraduate engineering programs as well as the lowest unemployment rates for those graduates. The last several years have been unusually higher than in past decades, I do anticipate continued growth of our undergraduate programs in the four to seven percent range per year for the next several years. The interest of both high school students and employers remains very strong.

Research Expenditures (FY 2009-2013)

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WD: The PHD program has also experienced tremendous growth during the past five years, from three hundred forty four students in 2009 to six hundred sixty five students in 2013. What are the factors that you see as contributing to this successful expansion of the doctoral program?

TE: The growth in our PhD programs has been unprecedented. This sixty-five percent increase in the last five years is over three times the national average. We graduated over one hundred PhD students last year compared to seventy-two last year (also the highest ever).

The growth is due, for the most part, to the fact that our faculty has been able to attract more and more funding in the doctoral area. On average, those funds increased from $191,000/faculty member to over $450,000/faculty member in the last five years, a thirty two and a quarter percent increase. The number of PhD students per faculty increased by that same amount. Our faculty deserves the credit for this amazing transformation of the college. This has resulted in additional admissions, new faculty and increased in faculty, which I predict will have an even greater impact in the coming years.

Growth in PhD Graduates by Academic Year

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<th>Academic Year</th>
<th>PhD Degrees Granted</th>
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<tr>
<td>2008-2009</td>
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<td>2011-2012</td>
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<td>2013-2014</td>
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TE: The College of Engineering has played a significant role in the UT-ORNL Governor’s Chair program, hiring eleven Governor’s Chairs since 2009 in areas such as advanced manufacturing, global nuclear non-proliferation and economics. What are the advantages of these outstanding faculty associated with the UT College of Engineering, and do you have plans to hire more Governor’s Chairs?

WD: The program is a great fit for us to work with the outstanding faculty to find synergies between the appropriate ORNL and our departments. This has been a very successful program for us in that our Governor’s Chairs were able to hit the ground running at both ORNL and UT and develop strong externally funded research programs very quickly.

In addition, the College of Engineering’s Governor’s Chair program is open to all departments and programs within the university, further enhancing the multidisciplinary activities of our college. Our Governor’s Chair program also presents the Governor with an opportunity to hire a select number of supporting faculty hires that were guaranteed for a three to five year period. These positions are provided by the state through the Governor’s Fund Program, which allows us to fund the long-term sustainability of these positions. The PA office, in coordination with the Governor’s Office, along with Governor Haslam’s vision for our future and the support of our College of Engineering, we have to continue to provide additional faculty/staff beginning in FY 15. We also committed to an additional twenty-five percent growth in our state-funded Governor’s Chair program.

AREAS OF RESEARCH

- Materials Science and Engineering
- Nuclear Engineering
- Aerospace Engineering
- Energy Storage
- Environmental Engineering
- Manufacturing
- Electrical Engineering
- Computer Science
- Civil Engineering

WD: When I became interim dean, UT had only one Governor’s Chair. However, our college has always had a strong relationship with ORNL, so it was a natural fit for us to work with the college to find strong candidates for these positions. The Governor’s Chair program is open to all departments and programs within the university, further enhancing the multidisciplinary activities of our college. Our Governor’s Chair program also provides the Governor with an opportunity to hire a select number of supporting faculty hires that were guaranteed for a three to five year period. These positions are provided by the state through the Governor’s Fund Program, which allows us to fund the long-term sustainability of these positions. The PA office, in coordination with the Governor’s Office, along with Governor Haslam’s vision for our future and the support of our College of Engineering, we have to continue to provide additional faculty/staff beginning in FY 15. We also committed to an additional twenty-five percent growth in our state-funded Governor’s Chair program.
How is the college able to meet the goals of its research and teaching mission? I will state's appropriations. The buildings helped to relieve part of the pressures on space created by the rapid growth of our student population, faculty size and critical needs for increased space. I will be forever thankful to these two friends and their families for their transformational investments in our college and to the success of our current and future students, faculty, and staff who are served by these facilities.

What is the current status of this new facility? The college has also seen a significant increase in the number of endowed Chairs, Professorships, and Faculty Fellows during the past five years. How do these positions influence the college’s reputation nationally and internationally, and what benefit do these high-profile faculty members provide to students?

What are some of the difficulties facing the college in the next five years? We always want to stay engaged with our alumni. You are involved when you recruit new students to the university and the College of Engineering. You are involved when you drive or walk in the parking lot (as do I). I've just signed an additional five-year contract with the university administration, state, alumni, and friends. With regard to students, it is to identify and secure adequate resources to attract the very best faculty members; to provide our students the truly diverse experience that our current and future students deserve, so this continues to be a high priority for both our college and university.

What are other ways for alumni to become involved?

What would you like to see as your legacy as dean when you retire or step down? What are your primary goals for the college in the next five years?

When I do retire, I would like to believe that everyone associated with this college has come to appreciate this college as much as we do. They know that we want to support the college but are unsure how to start giving? They know that we need “you” to be involved with our college as we continue on the journey to becoming a Top 25 public school. What are other ways for alumni to become involved? We involve comes in many ways: financial gifts, as an advisor on one of our boards, serving as a speaker to a student chapter, serving as a mentor, donating money to purchase equipment and supplies for student training/research experiences, and student design experiences such as freshman and senior design. My message to alumni and friends is that we need “you” to be involved with our college as we continue on the journey to becoming a Top 25 public school. What are other ways for alumni to become involved? What would you like to see as your legacy as dean when you retire or step down? What are your primary goals for the college in the next five years?
Dr. Gregory Reed Returns to Department of Civil and Environmental Engineering as Interim Head

Dr. Gregory Reed, the former associate vice chancellor of research with the University of Tennessee Office of Research and Engagement, is returning to the College of Engineering as the head of the Department of Civil and Environmental Engineering (CEE), effective August 1, 2014.

Reed, who was department head of CEE for twenty-one years until accepting the position in the Chancellor’s Office in 2007, initially had plans to retire in 2014. At the request of Dr. Dean Wayne Davis, he agreed to stay on at the university to act as the interim CEE head, where he will serve until a permanent department head is selected. The college will be conducting a national search beginning in the fall of this year aimed at the goal of selecting a new department head by the spring of 2015.

Reed received his PhD from the University of Arkansas. He is a Fellow in the National Society of Professional Engineers and the American Society of Civil Engineers and is the former president of the Tennessee Society of Professional Engineers and the Tennessee Engineering Foundation.

“I thoroughly enjoyed being department head in the past, so I am excited to be back to help the department continue to make significant progress during this time of transition,” Reed said.

“The college is excited about格瑞的 willingness to assist in this very important role, and we look forward to his return as interim head of the civil and environmental engineering department,” Davis said.
Faculty Focus: Dr. Thanos Papanicolaou

Dr. Thanos Papanicolaou joined the College of Engineering (CEE) in the spring of 2014 as the Henry Goodrich Chair of Excellence Professor in the Department of Civil and Environmental Engineering (CEE). He arrived from his previous position at the University of Iowa (UI) with barely a break in his workflow, successfully landing eleven grants over the summer and bringing literal truckloads of research capability along with him to establish the new Hydraulics and Sedimentation Laboratory (HSL).

The truckloads—three semi-trailers and seven smaller trucks—brought the large amount of equipment that enables Papanicolaou to study the way sediments and soil interact with flowing water and precipitation. He and his team members have kept busy setting up two large flumes, pumps, gauges, and other gear—including a boat.

“It has been a challenge for my personnel, research engineers, post docs, and graduate students working with me,” said Papanicolaou. “I appreciate their patience, too. I think this change is for good for everyone involved.”

His move to UT connects CEE with a multi-university research effort to improve the resilience of natural systems that have been modified for agriculture and other uses. Papanicolaou is co-director of the Critical Zone Observatory for Intensively Managed Landscapes (IML-CZO), a project funded by the National Science Foundation (NSF) with study sites in Iowa, Illinois, and Minnesota.

“The emphasis of the IML-CZO is to understand if we have exhausted the earth’s critical resources in an intensively managed landscape,” said Papanicolaou. “Can these landscapes support the increased demands for bioenergy and food production without further deteriorating natural ecosystem resources?”

Other important angles of Papanicolaou’s research involve increasing the understanding of how sediment builds up behind dams and affects infrastructure such as bridge supports, and also tracing the biology and source of the water-borne soil. Multiple national and regional agencies—from the Department of Transportation to NASA to TVA—look for beneficial information from these studies.

Papanicolaou grew up on his family’s farm in what he calls the “Midwest” of Greece, experiencing diverse landscapes from mountain rivers to fertile valleys and the sea coast.

“I also witnessed first-hand the different interactions that we humans must have with our environment to sustain our livelihood,” he said. “All these sights have shaped who I am as a researcher and a Teacher.”

Papanicolaou’s teaching focuses on the fundamentals of fluid mechanics and continuum, mechanics of sediment transport, and methods of hydraulic measurements. He likes to interact with students on a daily basis, encouraging involvement from early in their undergraduate years.

“I follow a Socratic approach by poking student participation through questions,” he said. “I really believe in fostering the idea of taking initiatives and in hands-on demonstrations.”

Papanicolaou earned his own undergraduate degree in civil engineering in 1990 from Aristotle University of Thessaloniki, Greece. He earned his MS degree in 1993 and his doctorate in 1997 from Virginia Polytechnic Institute and State University.

Multiple elements attracted Papanicolaou to join the UT community, with the dynamic nature of the college and the CEE department at the top of his list.

“I was impressed with the changes in the department and the desire to grow,” he said. “The commitment at the university level has been amazing. CEE is well balanced and, with the John D. Tickel building, provides state-of-the-art facilities for training future engineers.”

He feels encouraged in his work by his appointment as the Goodrich Chair of Excellence Professor, and additionally from winning the 2014 ACSE Hunter Rouse Hydraulics Award.

“Certainly it is an honor and recognition of my research efforts and efforts in the classroom,” said Papanicolaou. “The position allows me to lead an effort towards the establishment of an internationally-renowned laboratory with state-of-the-art facilities.”

Papanicolaou’s wife, Dr. Julie Andsager, was another influence in his move to Knoxville—she earned her PhD in journalism at UT in 1993. She has also joined the UT faculty after serving as a professor and interim director of the School of Journalism and Mass Communication at UI.

“She has good friends here and excellent memories,” he said. “She is a Volunteer!”

Outside of academics, Papanicolaou enjoys linguistics, math, and music, and keeps tabs on sports and politics. He and Andsager are eager to explore the Tennessee region, and find out where to get the best barbeque.

“I would love to visit the mountains whenever the opportunity arises,” he added.

Even with the flurry of activity accompanying their relocation and the establishing of new facilities, the couple has settled in smoothly to the UT community.

“My colleagues have been fantastic in welcoming me here, and the main office extremely helpful,” said Papanicolaou. “The campus appears to be a very dynamic place.”

NE Professor Receives Power Grant

Dr. Steven Skutnik, an assistant professor in the Department of Nuclear Engineering (NE) was among thirty-five awardees to receive the Ralph E. Powe Junior Faculty Enhancement Awards from Oak Ridge Associated Universities (ORAU). The funds are designed to “enrich the research and professional growth” of young faculty members at universities that are part of the Oak Ridge-based consortium. ORAU has awarded more than $27 million in grants through the Powe program since 1991.


CESS’s Nambisan Elected President of Council of University Transportation Centers

Dr. Shashi Nambisan, a faculty member with the Department of Civil and Environmental Engineering (CEE) and the Center for Transportation Research (CTR) has been elected president of the Council of University Transportation Centers.

Nambisan is one of the leading researchers in the area of transportation, whose expertise led the governor of Nevada to proclaim “Shashi Nambisan Day” in recognition of his efforts to improve transportation safety in that state.

“To be elected by my peers is both a great honor and a great responsibility,” said Nambisan, who, along with DaAnna Flinchum, serves as co-director of education and workforce development for the Southeastern Transportation Center. “I’m excited to be in a position to help address education, research, and outreach in my field of transportation. To be the spokesperson for such a diverse, well-respected group is a privilege.”

The Council of University Transportation Centers (CUTC)—is the leading proponent of safety, research, education, and development in relation to the upkeep and expansion of the nation’s transportation system.

While its beginnings can be traced to a 1971 federal mandate calling for the establishment of transportation-focused research centers, CUTC itself was founded in 1979 and now includes almost ninety public and private institutions.

The growth of the group has led to collaboration between institutions that might not have otherwise had a chance to work together, and has led to an increase in the sharing of ideas. Along the way, the spectrum of topics the group can cover has increased as well.

Nambisan, who has been on the CUTC executive committee since 2010, will serve until June 2015. He has previously been director, treasurer, secretary, and vice president of the group.
As in 2013, the College of Engineering (COE) continues to build its community with a roster of more than 20 new faculty members for 2014, moving forward to strengthen the college’s opportunities for teaching and research.

Department of Chemical and Biomolecular Engineering

Dr. John (Zhanhu) Guo
Associate Professor
PhD, Louisiana State University, Baton Rouge
Research Areas: Multifunctional polymer and carbon nanocomposites; electrochemical energy storage; supercapacitors and electrode materials; polymer nanocomposite membranes, fuel efficiency improvement; electropolymerization/electrodeposition; membrane, fuel efficiency improvement; energy storage; supercapacitors and carbon nanocomposites; electrochemical

Department of Civil and Environmental Engineering

Dr. Islam El-adawy
Associate Professor
Construction Engineering and Management Program Coordinator
PhD, Iowa State University
Research Areas: Sustainable infrastructure systems, risk and financial engineering; holistic management for rational and man-made hazards; contractual and legal affairs in construction; agent based simulation and system dynamics modeling; engineering education; and engineering ethics.

Dr. Kan Huang
Research Assistant Professor
PhD, Fudan University, China
Research Areas: Atmospheric science related to aerosol formation, transport, and impacts.

Dr. Shashi Nambisan
Professor
PhD, University of California, Berkeley
Research Areas: Transportation safety, risk analysis; data-enabled decision support systems; vulnerable road users; education and work-force development.

Dr. Shanshan Pan
Goodrich Chair of Excellence Professor
PhD, Virginia Polytechnic Institute and State University
Research Areas: Hydrodynamics, modeling, sediment transport, sensors.

Department of Electrical Engineering and Computer Science

Dr. Abbas Rashidi
Assistant Professor
PhD, Georgia Institute of Technology
Research Areas: Applications of information technologies for managing infrastructure systems; applications of machine learning, computer vision, pattern recognition, robotics, and image and signal processing techniques for automating different processes in construction industry.

Dr. Christopher Wilson
Research Assistant Professor PhD: Case Western University
Research Areas: Bank erosion; conservation practices; isotropic tracers; runoff and infiltration; sediment source partitioning; soil organic carbon biogeochemistry.

Dr. Michael Jantz
Assistant Professor
PhD, University of Kansas
Research Areas: Compressors, operating systems, and runtime systems (virtual machines), innovative system tools and techniques to enable more efficient execution on modern architectures.

Department of Environmental Engineering

Dr. Andreas Koschan
Professor of Practice
PhD, Technical University Berlin, Germany
Research Areas: Image processing, computer vision, biomaterials, robotics, multispectral and color vision, industrial inspection, and homeland security.

Dr. Donatello Materassi
Assistant Professor
PhD, Universita degli Studi di Firenze, Florence, Italy
Research Areas: Development of a general theoretical framework for the reconstruction of networks of dynamical systems.

Dr. Audris Mockus
Associate Professor
PhD, Carnegie Mellon University
Research Areas: Data storage systems; information theory; data communication and networks; joint source-channel coding; image/video coding and processing.

Dr. Yan Xu
Eli and Edythe Broad Professor of Practice
PhD, University of Tennessee
Research Areas: Power systems and power electronics, including utility applications of power electronics, renewable energy integration, smart grid; microgrid; communication, control, protection; energy management of power systems.

Department of Industrial and Systems Engineering

Dr. Anahita Khojandi
Assistant Professor
PhD, University of Tennessee
Research Areas: Process modeling, numerical analysis, computational anatomy, anthropology.

Dr. Janice Tolk
Assistant Professor
PhD, Texas Tech University
Research Areas: High Reliability Organizations (HRO); performance measurement; deferred maintenance; strategic management.

Department of Materials Science and Engineering

Chris Wetteland
Lecturer
Research Areas: Simulating the role of high-energy protons in primitive solar system materials; radiation damage in nuclear materials; beam analysis; ceramic processing; development of solar thermal and solar electric renewable energy systems; STEM outreach.

Department of Mechanical, Aerospace, and Biomedical Engineering

Dr. Emam Abdel-Fatah
Research Assistant Professor
PhD, University of Tennessee
Research Areas: Process modeling, healthcare engineering, pervasive computing, medical imaging, computer vision, machine learning, biomechanics, computational anatomy, anthropology.
Dr. Elizabeth Barker
Lecturer
PhD: University of Tennessee Health Science Center
Research Areas: Synthesis and characterization of novel biomaterials; development of hydrogel drug delivery systems; local drug delivery to solid tumors; drug penetration through tumor tissue.

Dr. John Schmisseur
Goethert Professor and H.H. Arnold Chair
UT Space Institute
PhD: Purdue University
Research Areas: Computational fluid dynamics focusing on high-speed viscous flows; turbulent and transitional shock interactions; integration of empirical and numerical simulations within a comprehensive framework.

Dr. Seungha Shin
Assistant Professor
PhD: University of Michigan, Ann Arbor
Research Areas: Fundamentals and innovative applications of energy transport and conversion (heat transfer physics); multiscale, multiphysics simulations (ab initio, molecular dynamics, and mesoscale Boltzmann); thermal energy transport and conversion in nonequilibrium, heterostructures (interfaces, molecular junctions), graphene, and energy conversion devices (solar cell, fuel cell, etc.).

Dr. Matthew Young
Eastman Assistant Professor of Practice
PhD: University of Tennessee
Research Areas: Engineering pedagogical methods; robotics and controls; machine design.

Department of Nuclear Engineering
Dr. David Donovan
Assistant Professor
PhD: University of Wisconsin-Madison
Research Areas: Nuclear fusion science and technology through experimental, theoretical, and computational methods.

Dr. Isaac Jeldes
Lecturer
PhD: Virginia Polytechnic Institute and State University
Research Areas: Problem solving and metacognition; self-regulated learning in engineering; academic motivation.

Dr. Rachel McCord
Lecturer
PhD: Virginia Polytechnic Institute and State University
Research Areas: Numerical modeling; geomechanics of slope stability; restoration of mine-reclaimed sites; soil erosion; retaining structures; partially saturated soils.

The Blalock, Kennedy, Pierce Analog Electronics Professorship offers me valuable opportunities to involve my graduate and undergraduate students in important research projects that greatly enhance the value of their engineering education. Our research team in the Integrated Circuits and Systems Laboratory partnered with the Jet Propulsion Laboratory, a NASA Center of Excellence for robotic space exploration, in the design and development of the Mars Science Laboratory Quad Operational Amplifier microchip. This microchip was used in the motor actuator electronics on the exploration rover Curiosity, which landed on the surface of Mars almost two years ago and is still transmitting data to NASA researchers. I am grateful for the chance to involve my students in such a once-in-a-lifetime venture, and I hope their excitement about this project and others we are currently working on with the support from this endowment will help their research efforts aspire to new groundbreaking innovations.

Dr. Benjamin Blalock
Blalock, Kennedy, Pierce Analog Electronics Professor
Department of Electrical Engineering and Computer Science

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Student News

Civil Engineering PhD Candidate Wins Award and Scholarship

Hyeonsup Lim, a PhD candidate in the College of Engineering’s Department of Civil and Environmental Engineering, received a check for $2,000 from the Intelligent Transportation Society of Tennessee.

In June, Lim received another $2,000 via the T. Darcy Sullivan Scholarship from the Tennessee Section Institute of Transportation Engineers (TISTE). The award was presented at the TISTE Summer Meeting, held July 30-Aug. 1 in Gatlinburg, Tennessee.

Lim also holds a Chancellor’s Scholarship and works with the Southeastern Transportation Center in Major Research Initiatives.

“I’m so happy to get these scholarships and opportunities to keep working on my desired research,” said Lim. “I’m getting a lot of benefits from our program. I really owe a lot of thanks to the great instructors in CEE. Dr. Lee Han’s support and encouragement and his referral of me were all significant factors in me winning this.”

Lim’s essay, “The Meaning and Value of ITS in Our Community,” was born out of a bit of introspection on his part.

“Many times I sat and thought to myself, ‘I study ITS, but what does that really mean,’” said Lim. “The big takeaway was that more focus needed to be put on how data was used, what people did with it, rather than just focusing on the quality or amount of data we get.”

Often referred to as big data, the amount of information coming in wasn’t just numerous in and of itself, but often came from multiple sources as well. Finding ways to sort through that, to analyze that for practical results became Lim’s goal.

“Dr. Han, my advisor, has encouraged me often to think about the fundamental purposes and meaning of using those data,” said Lim. “Coming at it from that angle was different from the sort of things I was used to doing, so I was thrilled to think about values of (everything) I do.”

Putting the goals stated in his essay into practice has become a priority, one made more important by advances in technology.

“The smartphone revolution has really brought about rapid changes and development in information technology,” said Lim. “The boundaries related to services and systems of ITS are crumbling. The key now is that it is not just simply adapting new technologies; it’s more about how intelligently we use them.

“It’s a reminder of the ‘intelligent’ part of ITS.”

Engineering Students Win in Vol Court Competition

Seeman discontinued operations for Willow List in June 2014 to focus on other projects and new professional opportunities in the Knoxville area.

Saah, junior in mechanical engineering, took the $500 second-place prize for founding MyPTshop.com, a web application for e-commerce fitness shop. Saah received space in the UT Research Park in Knoxville area.

Vol Court is a speaker series and pitch competition presented by the College of Business Administration’s Anderson Center for Entrepreneurship and Innovation. The goal of the program is to help people develop new business ideas and gain entrepreneurial skills. It is sponsored by the Anderson Center for Entrepreneurship and Innovation.

Vol Court is offered every fall and spring semester and is open to students, faculty, and the general public.

ISE Students Received Honors and Scholarships from IIE and Chancellor

Students in the Department of Industrial and Systems Engineering (ISE) won two prestigious scholarships from the Institute of Industrial Engineers (IIE) for 2014-2015. David Herberich, an ISE sophomore, won the Marvin Munden Memorial Scholarship in the amount of $1,650. ISE graduate student Isaac Atuahene won the Lisa Zaken Award for Excellence in the amount of $1,000.

In other awards and honors, multiple ISE students were recognized at the Chancellor’s Honors Banquet. Gabrielle Krilov, Gabrielle Krilov and Harry McQuillan McCray received 2014 Extraordinary Academic Achievement awards. Chambere Collier, Nathan Cole Irwin, Nathaniel Truett Siler, Harshitha Huppaneni, and Girish Upeti earned 2014 Extraordinary Professional Promise awards.

Bredeesen Center Graduates First Class As Program Grows

Scott Curran and Vincent Kangarao received their doctorates in energy science and engineering at the College of Engineering’s graduation ceremony on May 8, 2014, becoming the first graduates of the program founded by former Governor Phil Bredesen. The program is a joint effort in partnership with the University of Tennessee and Oak Ridge National Laboratory (ORNL).

The Tennessee General Assembly approved the program in a special session on education in January 2010. The first class enrolled in the Bredesen Center for Interdisciplinary Research and Graduate Education in Fall 2011, and it is now one of UT’s fastest growing graduate programs. “We’re awfully proud of Scott and Vincent,” said Bredesen Center Director Lee Riedinger. “They both transferred into our program once we’d started and were able to really shine and really do some positive things.”

Curran, who focuses on alternative fuels, works at the National Transportation Research Center. Kangarao, who focuses on renewable energy, hopes to one day return to Kenya and use this knowledge to help his homeland deal with its energy challenges.

“We’re gratifying to see the first graduates finish the program and be able to take what they’ve learned out into the world,” said Bredesen. “The center has been amazing in the way that it has been able to grab wide attention.”

The UT Board of Trustees renamed the program in 2011 to honor Bredesen’s leadership in education and support of UT-ORNL partnerships. UT-Chattanooga President G. Chook said the former governor laid the groundwork for the center to build a national reputation for its innovative interdisciplinary approach and opportunities for research between UT and ORNL.

“We’re pleased that the Bredesen Center has been so successful in recruiting and retaining people who are quickly becoming leaders in their fields,” said Chook. “The center is helping to advance our goal for growing research and graduate programs, all key steps in our journey to become a Top 25 public research university.”

Curran served as outreach advisor for UT’s EcoCAR 2 team, a US Department of Energy competition. He says the Bredesen Center helped to sharpen his focus on different fuels and fuel sources.

“Energy research is increasingly interdisciplinary, and the Bredesen Center is well suited to address both the knowledge depth and breadth needed to succeed in today’s environment,” Curran said.

The center is now a top choice for some of the most promising young scientists, thanks to a combined recruiting effort from UT and ORNL that has attracted students from League schools and top public universities. The center welcomed twenty-nine new students in fall 2013 and has more than one hundred students enrolled for fall 2014. For more on the Bredesen Center, visit bredesencenter.utk.edu/index.php.

Yang wins TSITE paper award

Jianjiang Yang, a PhD student in the Department of Civil and Environmental Engineering (CEE), has been awarded first place in the Transportation Research Board’s Transportation Systems and Operations (TSITE) annual student paper competition. His paper, “Short-term Freeway Speed Profiling Based on Longitudinal Spatial-Temporal Dynamics,” addresses, from a scientific standpoint, the concept of predicting traffic flow. The Southeastern Transportation Center helped support his project.

Much like meteorologists using data and instrumentation to forecast the weather, Yang’s idea focuses on officials using various means to calculate where problems and slowdowns might occur before they happen. “Using the data a city already owns, they can achieve a level of accuracy in short-term traffic forecasting,” Yang said. “In turn, that will provide the public with more accurate travel time information when planning for a trip, instead of having to rely on ‘best-case scenario’ travel time calculations like we have now.”

Along with the award, Yang received $500 and presented his paper at the group’s summer meeting, held July 30-August 1, 2014, in Gatlinburg, Tennessee.

Not only could his research help drivers in the future, but it also helped the state meet a key government mandate.

“We’re awfully proud of Scott and Vincent,” said Bredesen Center Director Lee Riedinger. “They both transferred into our program once we’d started and were able to really shine and really do some positive things.”

Curran, who focuses on alternative fuels, works at the National Transportation Research Center. Kangarao, who focuses on renewable energy, hopes to one day return to Kenya and use this knowledge to help his homeland deal with its energy challenges.

“Our state can use his findings to help meet the federal goal of providing real-time traffic updates,” said Dr. Lee Han, CEE professor. “Not only that, but having his work published in a respected publication like Transportation Research Record, a journal published by the National Academies, reflects well on him, on the department and on the college.”

The award isn’t the first Yang’s traffic-related work has put on spotlight. On UT in 2013, Yang, Bryan Bartnik, and Zane Pannell were on UT’s Traffic Bowl team, which won the national competition, losing in the final by only one point.

Jianjiang Yang stands with his award-winning poster.
Students from around the world pose for a photo at the Lean Summer Program event.

The opening ceremony featured speakers and specific information on participation in the Lean Summer program.

Students attending the opening ceremony at the Foundry.

The opening ceremony featured speakers and specific information on participation in the Lean Summer program.

The Lean Summer Program in the College of Engineering.

Sponsored by the Department of Industrial and Systems Engineering, the program attracted almost one hundred and twenty students to campus for a chance to study ways of reducing waste and increasing efficiency while partnering with students from countries around the world, beginning with an opening ceremony at the Foundry at World’s Fair Park on July 7, 2014.

“Studying the manufacturing process is one of the components, but the bigger opportunity is to have students from China, Brazil, Ghana, Colombia, Mexico, Venezuela, Chile, and the US getting together, learning to work together, and sharing ideas,” said program founder Dr. Rupy Sawhney, the Heath Faculty Fellow in Business and Engineering and a professor in the Department of Industrial and Systems Engineering.

While students get the benefit of the experience of the camp both scholastically and interpersonally, Sawhney said UT also gets a world of good out of the exposure.

“You have all of these students coming from a diverse array of places, and they all get to see UT, get to experience what UT has to offer, get to talk about UT when they get back home,” said Sawhney. “You really can’t understand how much of an impact it makes. People at Monterey University in Mexico had no idea what UT was when we started this. Now, if you go to their campus and ask ‘What do you know about the University of Tennessee?’ they will tell you that is where they learned Lean. From a university perspective, you can’t put a price on that kind of exposure.”

The future for the Lean Summer Program looks brighter still, with UT’s Enrique Macías del Arenal laying the groundwork for future partnerships with universities in France, Russia, and Italy.

If at least one of those European universities joins before next summer, it will mean the program will draw upon students from five of the six inhabited continents, with only Australia not represented.

Students began studies online at their home university before flying to UT for the remainder of the course. While at UT, students had access to facilities, laboratories, and research in addition to faculty input during their progress through four distinct phases.

As part of the process, students also had the opportunity to take the systems that they have developed and travel with faculty to sponsoring companies to see how their ideas translate into a real-world scenario. The visits have included such diverse sponsors as East Tennessee Children’s Hospital, Boeing Corporation, Aqua Chem, Pharma Packing, Monterey Mushrooms, Technichem, and the Brunswick Boat Group.

College of Engineering Hosts International Lean Summer Program

Students participating in the Lean Summer Program enjoy breakfast at the opening ceremony on July 7 at the Foundry.

Students from universities and institutes around the world arrived at UT this past summer as part of the International Lean Summer Program in the College of Engineering.

UT’s American Institute of Chemical Engineers (AIChE) Chem E Car Team followed its 2013 successes with a trip to the 2014 AIChE Southern Regional Conference, held at the University of Puerto Rico March 13-16, 2014.

AIChE Chem E Car Team Competes in Puerto Rico

The team placed second in the Chem E Car poster competition, adding to its list of awards from 2013, which included the National SACHE Award Inherent Safety in Design for the best application of the principles of chemical process safety to the Chem E Car competition.

The team also succeeded in funding its trip to the Puerto Rico conference through a department-specific call to action crowdfunding project, raising $3,330 in addition to a contribution from the Department of Chemical and Biomolecular Engineering.

Nuclear Engineering Students Receive DOE Scholarships

Nuclear Energy University Programs (NEUP) took notice of students in the Department of Nuclear Engineering (NE) in May 2014, bestowing nine undergraduate scholarships and three graduate fellowships.

Sponsored by the US Department of Energy (DOE) Integrated University Program, undergraduate winners receive a $5,000 scholarship, while the graduate fellowship winners receive $50,000 annually over three years, as well as $10,000 toward summer internships at national laboratories or other approved locations.

The nine undergraduate students awarded scholarships are Sarah Combes, Kaitlyn Darby, Travis Labossiere-Hickman, Tucker McClanahan, Danielle McFall, Gregory Meinweiser, Mikah Rust, Whitney Smith, and Alyxandria Wszolek.

The three graduate students awarded fellowships are Daniel Hamm, Elizabeth Jones, and Ryan Sweet.

“Having our students selected for these honors is a validation of the things we’ve got going on in our college,” said Dean Wayne Davis. “For our students to be recognized like this speaks to their dedication, innovation and commitment to their work.”

The goal of the program is to strengthen ties between students and this DOE’s nuclear energy research programs. Students are expected to take on studies of some of the challenges facing the industry today, including sustainability and efficiency.

The nine scholarships break UT’s previous high of six, and represent the most awarded to any university, while the three fellowships are tied for the most in this year’s awards.

The DOE Nuclear Energy University Programs (NEUP) undergraduate scholarship winners are, standing from left, Whitney Smith, Alyxandria Wszolek, Gregory Meinweiser, Mikah Rust, and Tucker McClanahan. Seated from left are Danielle McFall, Sarah Combes, and Travis Labossiere-Hickman. Not pictured, Kaitlyn Darby.

UT COLLEGE OF ENGINEERING
College of Engineering Recognizes Outstanding Achievers at 2014 Faculty and Staff Awards Dinner

The UT College of Engineering held its annual Faculty and Staff Awards Dinner on Thursday, April 3, 2014, at the Knoxville Hilton.

The award was established in 1957 to honor Dougherty, who was the guest of honor, receiving the 2014 Nathan W. Dougherty Award, the college’s most prestigious honor, at the event.

The recognition is far from the first for Kessel, as several buildings or spaces—including the auditorium at UT’s Science and Engineering Research Facility—already bear his name. He and his wife, Gloria, also established a scholarship in his name in the Department of Industrial Engineering at UT.

“IT’s always been a real pleasure to work with the university,” said Kessel. “It has provided so much for me, I’m just grateful to give back.”

The award was established in 1957 to honor Dougherty, who was the dean of the college, where the Nathan W. Dougherty building now bears his name. From 1940 to 1956, he was a star Vols football player from 1906 to 1909 and was also credited with helping recruit Robert R. Neyland to coach at UT. He was inducted into the College Football Hall of Fame in 1967.

Kessel, who graduated from UT in 1950 with a degree in industrial engineering, is best known as the first Knox County executive, serving from 1980 to 1994 after beginning his career on the Knox County clerk from 1966 to 1980.

“Dwight Kessel is one of the true success stories from the College of Engineering,” said Dean Wayne Davis. “When you take a look at all he has accomplished, you can see why we’re honored to be associated with him.”

Outside of politics, Kessel helped start one of the first Knoxville-area Internet companies—U.S. Internet—and has been involved in various charitable causes such as the Boy Scouts of America, the Kiwanis Club, and the Girls Club, as well as business-related activities like the Greater Knoxville Chamber of Commerce and the Tennessean Center for Research and Development. He also was a member of the executive board of the 1982 World’s Fair.

“He’s used his success to help his community thrive,” said Davis. “Everyone from those of us at the university to the people of Knox County in general have benefited from his generosity and from all he has given back.”

In addition to what he has done for his alma mater and his community, Kessel has contributed to the area where he first made his mark, thanks to an endowment he and his wife established with UT’s Institute for Public Service to assist county governments in the state.

Additional award recipients at the college’s Faculty and Staff Awards Dinner included:

Outstanding Support Staff: Samantha Allen, Business Manager, Department of Civil and Environmental Engineering; Justin Forbes, Senior IT Technologist II, College of Engineering; and Rita Gray, administrative specialist III, Department of Chemical and Biomolecular Engineering.

Outstanding Faculty Advisor Award: Dr. Paul Frymier, Department of Chemical and Biomolecular Engineering.

Moses E. and Mayme Brooks Distinguished Professor Award: Dr. Richard Bennett, Professor and Director, Department of Civil and Environmental Engineering.

Engineering Fundamentals Division: Dr. Douglas Birdwell, Department of Electrical Engineering and Computer Science.

Dr. Lynne Forbes, Senior IT Technologist II, College of Engineering.

Dr. Belle Upadhyaya, Professor, Department of Nuclear and Radiological Engineering.

The COE Teaching Fellow Award: Dr. Edwin Burdette, Fred N. Peeples Professor in the Department of Civil and Environmental Engineering and Dr. Hahn Choo, Associate Professor, Materials Science and Engineering.

College of Engineering Professional Promise in Research Award: Dr. Christopher Cherry, Department of Civil and Environmental Engineering.

Dr. Jason Hayward, UCOR Faculty Fellow and Professor, Department of Nuclear Engineering.

Dr. Jeremy Holsman, Assistant Professor, Department of Electrical Engineering and Computer Science.

Dr. Jackie Johnson, Associate Professor, Department of Mechanical, Aerospace, and Biomedical Engineering and the UT Space Institute.

College of Engineering Research Achievement Award: Dr. Lao Han, Professor, Department of Civil and Environmental Engineering.

Dr. Baochun Huang, Professor, Department of Civil and Environmental Engineering.

Dr. Bin Hu, Professor, Department of Materials Science and Engineering.

Dr. Belle Upadhyaya, Professor, Department of Nuclear Engineering.

Translational Research Award: Dr. Douglas Birdwell, Department of Electrical Engineering and Computer Science.

Dean Davis (left) and Associate Dean for Faculty Affairs Veerle Keppens (right) present the college-wide award winners (left to right): Dr. Paul Frymier, Dr. Edwin Burdette, Dr. Lynne Forbes, Dr. Butch Irick, and Dr. Hahn Choo.

Dean Wayne Davis (left) and Associate Dean for Academic and Student Affairs Massoud Parang (right) present the Outstanding Faculty Advisor Award to Samantha Allen from the Department of Civil and Environmental Engineering.

Dean Davis (left) and Associate Dean for Research and Technology William Dumke (right) with the recipients for the College of Engineering’s Professional Promise in Research Awards (left to right): Dr. Jason Hayward, Dr. Jeremy Holsman, Dr. Jackie Johnson, and Dr. Christopher Cherry.

Dean Davis (left) and Associate Dean for Faculty Affairs Veerle Keppens (right) present the Outstanding Staff Award to IT Specialist Justin Forbes.

Dean Davis (left) and Associate Dean Parang (right) present the Outstanding Staff Award to IT Specialist Justin Forbes.

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Innovative Computing Laboratory director Dr. Jack Dongarra presents information on the TOP500 list of the world’s fastest supercomputers.

In 2013, Dongarra announced that the standard needed a reset. Linpack measures linear equation calculations. Newer applications often require computations of more complex differential equations. Dongarra and team launched a new benchmark, the High Performance Conjugate Gradient (HPCG), to measure supercomputer performance more accurately and work in tandem with Linpack.

“We have reached a point where designing a system for good Linpack performance can actually lead to design choices that are wrong for the real application mix, or add unnecessary components or complexity to the system,” said Dongarra. “The hope is that this new rating system will drive computer system design and implementation in directions that will better impact performance improvement for real applications.”

This kind of advancement is the hallmark of ICL, now in the twenty-fifth year of its mission to establish and maintain UT as a world leader in advanced scientific and high-performance computing through research, education, and collaboration. Headquartered in the Claxton Building in the heart of the UT campus, it is part of the Department of Electrical Engineering and Computer Science (ECCS) in the College of Engineering. It serves as the cornerstone laboratory of the Center for Information Technology Research (CITR), one of UT’s nine Centers of Excellence.

Since Dongarra established ICL in 1989, it has grown into an internationally recognized research laboratory. Companies such as NVIDIA and Intel regularly collaborate with the lab’s researchers. NVIDIA designates ICL as a CUDA Center of Excellence (CCOE), and this collaboration benefits ICL with hardware, financial support, and other resources.

ICL is also part of the SciDB project of the Intel Science and Technology Center for Big Data. The lab helps improve the efficiency of large-scale data analytics by providing efficient codes for linear algebra on the Intel Xeon Phi co-processor, and also provides expertise on other Big Data applications and operations. ICL employs around forty researchers, students, and staff, and has earned many accolades, including four R&D100 awards. Among recent accolades, Dongarra won the ACM-IEEE Ken Kennedy Award at the 2013 SC13 conference, and also received a Professional Achievement Award from the Illinois Institute of Technology, where he earned his master’s degree.

In 2013-2014, ICL has produced ninety-four publications, including journal, conference proceedings, tech reports, and book chapters. ICL research scientists and co-authors earned Best Paper awards at a number of conferences, including an award for “Implementing a Blocked Asen’s Algorithm with a Dynamic Scheduler on Multicore Processors” at the 2013 IEEE International Parallel & Distributed Processing Symposium (IPDPS); an award for “A New Algorithm for Computing Eigenvectors of the Symmetric Eigenvalue Problem” at the Workshop on Parallel and Distributed Scientific and Engineering Computing (PDSEC); and for “Mixed-Precision Orthogonalization Scheme and Adaptive Step Size for CA-GMRES on GPUs” at the International Meeting on High Performance Computing for Computational Science (VECPAR).

Academically, ICL offers the Interdisciplinary Graduate Minor in Computational Science (IGMCS) degree. This program has twenty-nine students enrolled and forty-five graduates as of 2014. Eighteen departments from four UT colleges contribute more than one hundred thirty courses to the IGMCS.

ICL research keeps pace with high-performance computing (HPC) through three primary areas: numerical linear algebra, distributed computing, and performance evaluation and benchmarking. Numerical linear algebra algorithms and software form the backbone of many scientific applications in use today. As computer architectures change and grow more complex, these applications must also evolve to keep up with the hardware, and ICL has a long history of meeting this demand.

The latest project to address this challenge is the Benchmark Environment for Automated Software Tuning (BEAST). BEAST embraces the nature of accelerators—such as graphics processing units (GPUs) from NVIDIA and AMD, and the Xeon Phi coprocessors from Intel—to enable performance tuning at higher magnitudes of computing power and memory bandwidth than that of standard processors.

A lead project in ICL’s distributed computing area is to design software for the next generation of supercomputers, machines that operate at a level called exascale (capable of a quintillion floating-point operations per second). These computers could help solve some of the most demanding problems in numeric modeling, to answer questions across the scientific spectrum.

“You can’t wait for the exascale computers to be delivered and then start thinking about the software and algorithms,” said Dongarra. “The exascale computers are going to be dramatically different than the computers we have today.”

Dongarra received a $1 million grant from the US Department of Energy (DOE), starting in 2013 and spread over three years, to develop the techniques and software to effectively use exascale machines. Called the Parallel Runtime Scheduling and Execution Controller (PaRSEC), the project aims to address the issues created by the increasing complexity of supercomputer designs.

The addition of HPCG to the TOP500 is ICL’s latest development in performance evaluation and benchmarking. This adds to a collection of evaluation tools that allow programmers to increase the efficiency when mapping source/object code to a computer’s architecture. ICL’s benchmark software is widely used to profile the performance of HPC machines and plays an essential role in the management of computer infrastructure used by government and industry.

ICL’s three-part focus on these projects, and others, maintains its position on the front lines of computer evolution. In this regard, the US DOE appointed Dongarra in 2014 to a subcommittee studying the goal of achieving exascale computing within the next decade. The subcommittee issued a report detailing the top ten research challenges in reaching exascale computing. Meeting these challenges would have far-reaching impact on the scientific world.

“The need to advance our understanding of the universe is without bounds, as is the need for modeling and computing the phenomena around us,” said Dongarra. “For example, everyone is concerned about climate change and we need computers to help in modeling the climate. The need for computers to do oceanic clouds, ice, and topography are all tremendously important. And today we need at least two orders of magnitude improvement on that problem alone.”
The 2014 Homecoming weekend will be kicked off with two exciting events this year. On Friday, October 10, the new Fred D. Brown Residence Hall, named for the original director of the Minority Engineering Program (MEP) in the College of Engineering and the first building on the university’s Knoxville campus named after an African-American, will be dedicated during an afternoon ceremony. Prior to the dedication, the College of Engineering and the Engineering Diversity Programs Office will host an invitation-only luncheon in the University Center Ballroom from 11:30 to 1:00 p.m.

The Fred D. Brown Jr. Residence Hall is the first new residence hall to be built in forty-three years. Located on Andy Holt Avenue, the two hundred fifty thousand square foot facility accommodates seven hundred men and women and includes a dedicated art gallery to showcase students’ work, two dining locations, video message boards, a workout facility and recreation room, a full catering kitchen, a conference room, living area, an internet lounge on each floor, and a multipurpose meeting room.

Brown graduated from Hall High School in Alcoa, Tennessee, and earned his college degree from the Tuskegee Institute. He studied as a post-graduate at UT, Tennessee State University, Fisk University, and Vanderbilt University. Brown taught at Hall High School and Oak Ridge High School and was the first African-American member of the Alcoa Board of Education.

Dean Fred Peelles established the Minority Engineering Program in 1973, an initiative designed to motivate highly qualified African American young people to pursue engineering coursework at UT, and designated Brown as its first director. Brown launched the MEP into the Engineering Diversity Programs (EDP) Office and incorporated pre-college summer programs for middle and high school students, bridge programs for new freshmen, recruiting initiatives targeted at underrepresented students, and retention and mentoring programs.

In four decades since the program was established, UT has consistently ranked among the top fifty universities and colleges in the nation for graduation rates of African American engineering students. The college has graduated more than nine hundred minority students.

UT Trustee and industrial engineering graduate Spruell Driver submitted a letter to the UT Board of Trustees detailing his gratitude to Brown for influencing his own career.

“He made it his mission to personally identify and successfully recruit the best students in Tennessee and neighboring states with a high aptitude for engineering studies,” Driver said. “Mr. Brown went to great length to ensure that his students got off to a strong start academically and that we had a cohesive support structure to ensure successful persistence to graduation.”

The events will be part of the Homecoming 2014 festivities, which will include a parade on Friday afternoon and the college’s annual Alumni Barbeque, which will be held on Saturday, October 11, three hours prior to kickoff of the Tennessee Volunteers football game. Tickets to the Engineering Alumni Barbeque will be available for purchase online this fall.

For more details on the Fred D. Brown Jr. Residence Hall, visit uthousing.utk.edu/construction/construction.html or housing.utk.edu/students/new-construction./

For more information about Homecoming 2014 and the Engineering Diversity Alumni Luncheon, contact the Engineering Development Office at (865) 974-2779/engrdev@utk.edu.

Cutting-edge ideas in medical, mechanical, and biomedical technology were on display at the UT Conference Center April 21-22, 2014, for the annual two-day symposium sponsored by the Institute of Biomedical Engineering.

"IBME bringing all of these various disciplines and real-world partners together is a wonderful idea and the perfect example of how the colleges here at UT can work together," said College of Engineering Dean Wayne Davis. "Sharing ideas between colleges can not only help solve problems that one group or another might have had, but it can help alert you to things, both good and bad, that you might not have considered."

Medical personnel and equipment manufacturers in attendance provided immediate thoughts and feedback about which ideas have merit and the potential pitfalls of various programs and proposals, while at the same time getting the chance to present their own concerns to the very faculty and innovators who could help solve their problems.

"The Institute of Biomedical Engineering and our annual symposium exist to provide an intellectual bridge between highly talented researchers throughout the state of Tennessee in academia, industry, and the national laboratories," said IBME chairman Dr. Mohamed Mahmoud. "By bringing together researchers from across disciplines we were able to discuss and develop teams around highly complex topics," said Mahmoud. "We were able to address topics like cancer, neurological trauma rehabilitation, regeneration of damaged tissue, and how to provide quality treatment for patients with decreasing insurance reimbursement and rising costs."

For more information on the IBME, visit ibme.utk.edu.
The National Science Foundation area of the USA Science and Engineering Festival in April had representation from the University of Tennessee thanks to a spot in the prestigious event going to CURENT, the center for Ultra-Wide-Area Resilient Electric Energy Transmission Networks.

“Being able to take part in events like this helps serve as a way to educate the public about what CURRENT does, but to do so in an engaging, entertaining way,” said UT College of Engineering Dean Wayne Davis. “Any time you have a chance to make a positive impression on young minds, it’s a great opportunity.”

The largest science festival in the country, the gathering was sponsored by groups like Lockheed Martin, 3M, Northrop Grumman and the National Security Agency, and included appearances from speakers as diverse as Bill Nye the Science Guy and television host Mike Rowe.

Housed in the Min H. Kao Electrical Engineering and Computer Science Building in UT’s College of Engineering, CURRENT is a UT-led multi-institution research group focused on making the electrical grid more efficient, particularly in the area of energy transportation.

The research center’s presentation at the festival was “Powering Today and Tomorrow,” a look at solar energy and how it could be better utilized.

Participants were able to design their own energy circuits one of many possible cars as part of the exploration of how the sun’s energy—said to be twenty thousand times more than what is consumed—might hold the key to our future energy needs.

As part of the festival, students and adults had the chance to take part in more than three thousand activities or presentations.

“CURRENT was honored to represent the National Science Foundation and the University of Tennessee as one of sixteen engineering research centers at the festival,” said CURRENT Communications Coordinator Adam Hardebeck. “Having a part of the largest science festival in America provides us with an opportunity to connect with young people and showcase the fascinating research going on in our center.”

Participating groups included universities, museums and city television stations, and featured everything from robotic snakes to tsunami simulations. Additionally, there was music, magic, and other entertainment.

The fair took place April 25-27, 2014, at the Walter E. Washington Convention Center in Washington, D.C.

For more on CURRENT, visit current.utk.edu.

For more on the USA Science and Engineering Festival, visit www.usasciencefestival.org.

Researchers from UT recently garnered national attention for their part in a study that could lead to the development of tablets, TVs, and mobile devices the width of a piece of paper.

First published in Nature, the article details how researchers have been able to create wires only three atoms wide using an electron beam.

The lead researcher on the project was Vanderbilt PhD student Junhao Lin, who was a visiting scientist at Oak Ridge National Laboratory at the time.

Through the ORNL connection, UT’s Dr. Stephen Pennycooke, Dr. David Mandrus, and Dr. Jianqiang Yan—all of the College of Engineering’s Department of Materials Science and Engineering—got involved.

It’s the second time Yan and Mandrus have found recognition in Nature in less than two months. The pair’s research also was part of an article in early March on a University of Washington-led effort to reduce the size of LEDs.

“The role of my group was to supply some of the materials used in the study,” said Mandrus. “It’s very similar to the way we worked with the University of Washington group on the LEDs. The materials were grown in my lab in the Science and Engineering Research Facility.

The eventual products, called nanowires, are of a flexible metallic nature, and only one one-thousandth the width of the current microscopic wires used to connect transistors in today’s circuits.

The ability to pull water out of fog is one of many opportunities CURENT makes real by research involving Sarles, an assistant professor in the College of Engineering’s Department of Mechanical, Aerospace, and Biomedical Engineering.

The project Sarles took part in—Air-Surface Interface Bilayers on Oil-Infused Surfaces—was published recently in the Proceedings of the National Academy of Sciences.

The team, made up of Sarles and scientists from Oak Ridge National Laboratory’s Center for Nanophase Materials Sciences and the ORNL Energy and Transportation Sciences Division, discovered that water droplets placed on oil-infused surfaces formed stable, interconnected volumes without fusing into indestructibly larger droplets.

Creating networks of connected droplets is key to future breakthroughs.

While the physics of droplets on an oil-coated surface shows the premise of pulling water from fog, the ability to form air-stable lipid membranes will allow researchers to do everything from detecting airborne pathogens like chemical or biological toxins, pollutants, or synthetic nanoparticles, as well as converting energy using biogeloid moieties confined in the membrane.

“The first goal of this work was to understand the mechanisms that allow for droplets to remain as separate entities on the oil-coated surfaces,” said Sarles. “After that, we wanted to apply those principles to a variety of lighting, energy conversion, and even protein study applications.”

Along with this discovery came the awareness of how to create artificial cell membranes—e.g. lipid bilayers—between droplets in air.

The idea is that it would now be possible to stack such small wires together in clusters—researchers used a Lego block analogy—to build layers and circuits that would allow for a great reduction in the size of electronic products.

In addition to a reduction in size, the process could also make TV screens and tablets flexible, something that could prevent countless repairs.

Read the article in Nature at: http://www.nature.com/nnano/ journal/v9/n6/full/nnano.2014.81.html

COE Professor's Research Could Lead to Breakthroughs in Detection, Clean Water

CURENT Honored With Spot In USA Science and Engineering Festival

UT COLLEGE OF ENGINEERING 25

Previous work had established that when water droplets submerged in oil collided, the oil between the droplets would be excluded, allowing the droplets to coalesce in just seconds.

But by placing droplets on an oil-coated, superhydrophobic surface rather than submerging them, Sarles and the team showed that droplets would spontaneously join together and yet not coalesce when they collided. Instead, a thin layer of oil was wicked between the adjoining droplets, making a stable connection that lasted for up to days at a time.

“I measured the thicknesses of oil films that spontaneously assembled between colliding droplets,” said Sarles. “I pierced them with thin electrodes so that I could monitor how well electrical charge was stored at the interface between droplets, which allowed us to estimate the thickness of the oil film over time as the oil slowly drained.”

And while this thin layer of oil does eventually drain out—leading to coalescence—Sarles and the team showed that the fluid physics that caused the droplets to draw together could also be used to assemble artificial cell membranes.

This breakthrough enabled the team to extend the lifetime of the interface between droplets and marks the first time that droplet [interface] bilayers were formed in air.

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Smaller, Flexible Tablets and TVs Possible Thanks in Part to UT Researchers

Dr. Andy Sarles and researchers at Oak Ridge National laboratory have developed a method to create air-stable water droplet networks that could be valuable for applications in biological sensing and membrane research. Photo by Kyle Huyckendall

Dr. Stephen Pennycooke

Dr. David Mandrus

Dr. Andy Sarles

Junhao Lin

Karena Mary Ruggiero, a graduate student in the UT Department of Theory and Practice in Teacher Education, guides a boy who is wiring lights, motors, and buzzers together as a parallel circuit at the USA Science and Engineering Festival.
Students in the Intercollegiate Summer Bridge Program visited DENSO Manufacturing during their three-week experience.

The Intercollegiate Summer Bridge Program offered nineteen STEM students an overview of courses in their upcoming freshman year through the three-weeks of mentorship, academics, and campus life preparation.

The bridge program is based on the established model of the Tennessee Louis Stokes Alliance for Minority Participation (TSAMP), a statewide collegiate alliance funded by the National Science Foundation (NSF) that seeks to improve graduation rates and provide a transition in study from high school to the university for underrepresented students majoring in science, technology, engineering, and math (STEM) areas.

“This is always a rewarding experience to watch the students grow throughout the duration of the program,” said Enrica Echols, coordinator for Engineering Diversity Programs (EDP). “Through three weeks of mentorship, academics, and campus life preparation, our goal is that the students not only realize the expectations of their upcoming freshman year, but also identify and improve their weaknesses in order to meet the demands of their respective curricula.”

Students also visited area companies to give insight into different aspects of STEM careers. The group visited DENSO Manufacturing in Maryville, Tennessee, on July 18; Oak Ridge National Laboratory (ORNL) in Oak Ridge, Tennessee, on July 11; and Sweetwater Valley Farms in Philadelphia, Tennessee, on July 25.

These field trips allowed students to hear from engineers and scientists about their respective careers, and also engage in discussion about current projects and future internship/research opportunities.

In addition to the educational field trips, students also participated in a leadership retreat and teambuilding day at New Horizons Center for Experiential Learning in Knoxvile on July 12. This excursion was an opportunity for the students to get to know one another, learn to work as a team, and the importance of being an effective leader.

The success of the program will be measured by testing before and afterward, and by the transformation in the students’ perception and attitude over the three weeks. In the long term, student success will be tracked from their freshman year through graduation.

“We can proudly say that this year we had three national scholarship recipients, an educator of the year, and our first female region chair,” said Wallace, a biomedical engineering major. “We’ve producing leaders, and more specifically leaders in STEM fields, and I am excited that our national society has taken notice.”

Isaac Atuahene, a graduate student from Ghana in industrial and systems engineering at UT, was honored as a top regional chapter for the second consecutive year.

“Our chapter continues to excel and take on new challenges,” said UT Engineering Diversity Programs Director Travis Griffin. “They have a keen vision to fulfill the NSBE’s mission and increase the success rate of our engineering students, and I think that was on display for all to see in Nashville.”

Isaac Atuahene, a graduate student in the UT Department of Industrial and Systems Engineering, accepts the Golden Torch Dr. James A. Lumpkin Educator of the Year Award for contributions related to research and education at the NSBE event in Nashville.

UT’s chapter of the National Society of Black Engineers was recognized as the 2014 National Middle Chapter of the Year and senior Tiffany Siphonphone became the first female from UT to be elected regional chairperson, capping a highly successful national convention for members from the College of Engineering. The NSBE national convention was held on March 26-30, 2014, in Nashville, Tennessee.

“This is truly a tremendous recognition for our group to receive, and it highlights the successes being made here at UT toward a more diverse campus,” said College of Engineering Dean Wayne Davis. “To be recognized for those efforts is nice enough, but to be singled out in front of peer institutions makes it all the more special.”

Siphonphone, from Nashville, is only the second UT student overall to be elected regional chairperson, after Trevor Williams—her mentor—in 2007.

“It was just such an incredible feeling when they called my name,” said Siphonphone. “As I stood there taking the oath I felt like I was having an out-of-body experience. I hope I never lose this feeling.”

Siphonphone, an industrial engineering major, said that this recognition was for her personally, the real happiness in winning the award is what it says about the opportunity for underrepresented students at UT.

“For the national society to take notice of us, to single us out as a chapter is really special, and it makes you proud to be a VoL,” said Siphonphone. “You see the opportunities that have been created here at Tennessee, you see the progress we’ve made, and hopefully that can serve as an example to other universities and inspire them to do some of the great things we’ve done here at UT.”

UT chapter president Daniel Wallace, from Memphis, was equally enthused about the chapter’s success. In addition to winning the national award this year, UT was honored as a top regional chapter for the second consecutive year.

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As a student I am constantly challenged, but because I enjoy majoring in biomedical engineering, it is a responsibility I eagerly accept. However, financing tuition is one of the greatest problems students face. The Fred D. Brown Jr. Engineering Scholarship has been an extremely critical and supportive aspect for me in my academic career. It has allowed me to devote my time and efforts into pursuing a career I truly love as well as maintaining my GPA without going into debt. As the newest dormitory is dedicated to Fred D. Brown Jr., he leaves behind an inspiring legacy for me that I hope to one day emulate.

Olufunke “Tina” Anjonrin-Ohu
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Giving 2014: Focus on Scholarships

CONTRIBUTE TO BIG IDEAS

Act as if what you do makes a difference. It does.
-William James

The hardest part about writing this article twice a year is deciding exactly what to highlight. There is enough material for a book—or two! In reality, every gift points back to students. Endowed professorships recognize and support the faculty who help us attract great students and then provide the mentoring and instruction that is the hallmark of a great education. Program support allows engineering leaders flexible funds to enhance instruction or student services.

Every gift multiplies our strength as a college to create a better educational experience for students.

Scholarships are perhaps the best understood gift. After all, we were students once—perhaps struggling financially to pay tuition. These awards that recognize academic excellence or help meet financial needs make a difference with impact that is both immediate and far-reaching. Scholarships help individuals and so are extremely personal gifts with numeric impact.

The oldest scholarship in the College of Engineering is the Colonel Samuel H. Lockett, established in 1938. Although our records don’t go back that far, if our current award numbers can be extrapolated over that seventy-four years, we very conservatively estimate that over 1100 students have received a Lockett Award. Another scholarship was created by Herbert G. Duggan, who received his BS degree in mechanical engineering in 1945. Before his death in 1994, Mr. Duggan and his wife, Lilian, put UT Engineering in their wills. After her passing, a bequest of $1,995,478 was transferred to UT. Today, the Herbert G. and Lilian C. Duggan Scholarship endowment has increased in value to $2.1 million and has already provided $1,090,125 in scholarship dollars to 429 students.

This past academic year 807 students received over $1.4 million in scholarship awarded by the College of Engineering from 247 established scholarships! But that’s just one year. Imagine the power of those endowments over time.

A permanent scholarship can be named and endowed for gifts beginning at $25,000. At that level the annual award would offset a bit more than the differential tuition for one student each year. An endowed scholarship of $100,000 provides an amount approximately equal to one of today’s Tennessee Hope Scholarships. A $250,000 scholarship endowment provides in-state tuition.

For more information about how endowments work and how you can begin your own legacy, contact me. What you begin now will resonate powerfully into the future.

In another section of this magazine is a list of donors who gave somewhere to engineering in 2013-14: to support scholarships, to fund student projects, to endow a professorship, or to augment one of the many endowments or program funds throughout the college. To each of you we say—thank you.

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Executive Director of Development
College of Engineering
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1970s

Terry Begley (BS/Architecture '83, MS/CE '88) was appointed to the board of directors of Wellmont Health System in Kingsport, Tennessee. He serves as vice-chairman of the board at Holston Valley Medical Center. Begley is an alumnus of Eastman Chemical Company’s vice president of global supply chain and chief procurement officer. He has also served on the boards of Girls Inc. and the former Tri-Cities Bank and is currently on the UT College of Engineering Board of Advisors and UT National Alumni Board. He was also appointed president of the alumni board in 2015.

1980s

John Hanula (BS/Architecture '85, MS/CE '87, PhD '90) was appointed MWH Global as director of global business development for infrastructure and government. He is responsible for leading MWH’s global business development efforts in developing markets and for influencing and in close coordination with MWH’s regional and local offices and for cultivating and nurturing new business opportunities on a global level. He is a resident of Knoxville.

Alumni

News

Start-up Co-founded by CE Engineering Alumnus Finds Success on ABC-TV’s Shark Tank

Karl Hughes (BS/ME '92) and his team of entrepreneurs who founded the startup company Packback Books recently found success on the ABC-TV reality show Shark Tank. Billionaire businessman Mark Cuban, owner of the NBA Mavericks and one of the hosts of the show, liked the premise of the fledging company and signed off to pay $250,000 for a ten percent stake in Packback.

Packback affords college students the option of renting digital versions of textbooks online for five dollars or less instead of paying larger dollars for traditional and pricier physical textbooks. Hughes said the TV show gave Packback invaluable exposure.

“Being on Shark Tank was a big boost,” Hughes said. “We had publishers calling us after we were on the show.”

The company’s service is now available nationwide at packbackbooks.com and Hughes said they are offering about two thousand five hundred textbooks to approximately five thousand students.

For more info on the company and the episode of Shark Tank, visit blog.packbackbooks.com/page/2.

2000s

March 1st joined BergerAMAN in 1994, and has been involved in a number of structural analysis projects related to seismic activity and earthquake-resistant engineering. He also teaches a course geared towards bridge design as related to seismic activity for the National Highway Institute, and serves in various capacities with the American Association of State Highway and Transportation Officials Subcommittee on Bridge and Structures. He is considered an expert in the field of seismic-resistant construction.

Robert Sanders (BS/NE, MS/BS '86) was named by his employer, AREVA Inc., as Senior Technical Expert in nuclear severe accident phenomena. An individual must be an active member of the Society and at the international level to be named Senior Technical Expert. During his time with AREVA, Sanders’ accomplishments include: development and implementation of the MAAP model for the US EPR, development of a MAAP model for the Bellefonte Nuclear Plant, and expansion and acceleration of the capabilities of the MAAP program, specifically with respect to hydrogen production and behavior.

Memorials

Dr. Hall Carmack Roland (MS/EE '62, PhD/EngrSc '65), of Knoxville, died on March 3, 2014. Roland was a professor emeritus in the Department of Mechanical Engineering and the associate dean of engineering and a master’s and doctorate in nuclear engineering at UT. He was named a commissioned Naval officer during both World War II and the Korean War, and was a long-time member and chairman of the Knoxville chapter and director for Knoxville Flyers. He is remembered for his dedication to his family, as well as his enjoyment of teaching career and students.

Dr. H. Lee Dodds, professor emeritus and retired head of NE, was a student of Roland’s.

“Dr. Hall Roland was an outstanding teacher who was always eager to help his students, both inside and outside of the classroom,” said Dodds. “He was the first faculty member hired by Dr. Pietro Santangelo, our first head of department. He was also an expert in many areas of engineering, not just nuclear engineering. For example, he was an airplane instructor and he built a small airplane in his garage, which he flew on its maiden voyage. Roland touched the lives of many people in a very positive way. He is sincerely missed by everyone who knew him.”

Roland authored a textbook and also wrote a weekly column in the Knoxville News Sentinel. Roland was later compiled into a book titled The embarrassment. Roland retired from teaching in 1990.

Alumni

Michael N. Armstrong (BS/CE '79) died on March 14, 2014. He was a resident of Kingsport.

James Edward “Jim” Geiger Sr. (BS/EE '43) died on February 5, 2014. He was a resident of Murfreesboro.

Henry Hartsfield died

Former NASA astronaut and UT graduate

Henry W. Hartsfield (BS/EE '57, MS/ /IE '58) died on July 17, 2014, after an illness. He was 80 years old. Hartsfield earned a master’s degree in engineering science from UT Space Institute in 1971. He also served as commander of space shuttle Discovery’s mission and flew on three shuttle flights. After his final shuttle flight, Hartsfield served in a number of NASA administrative posts, including deputy chief of the astronaut office, deputy director for flight crew operations, and director of the Technical Integration and Analysis Division at NASA Headquarters.

Next he became deputy manager for operations in the Space Station Operations Office at NASA’s Marshall Space Flight Center in Huntsville, Alabama. Back at the Johnson Space Center in Houston he worked in the Space Station Freedom Program and as manager of the international Space Station Independent Assessment Team. He later became NASA’s director of independent assurance for Human Exploration and Development of Space.

Hartsfield was one of ten current or former astronauts who received a degree from the UT Space Science Institute. One of them, Barry “Butch” Wilmore, a 1994 UT graduate, will take command of the International Space Station in November. Another astronaut, Margaret Rhea Seddon, earned her medical degree from UT.

Dr. Mohammad Qureshi (PhD/CE '90) has been appointed to the California Board for Professional Engineers, Land Surveyors, and Geologists. Qureshi has been chief of traffic at the San Bernadino County Department of Public Works since 2012. He was also regional director and senior project manager at LIN Consulting from 2007 to 2012, director of the Port of Long Beach’s Institute for Multimodal Transportation from 2006 to 2007 and assistant professor and director at the University of Missouri-Rolla’s Missouri Local Transportation Resource Center.

Dr. Hash Hashemian (MS/NE '74), president and CEO of ACM Corporation in Knoxville, Tennessee, has been elected as a Fellow of the American Nuclear Society (ANS). Hashemian will be honored during the ANS Winter Meeting which will be held at the Disneyland Hotel in Anaheim, California, at the Opening Plenary ceremony on Monday, November 10, 2014. Hashemian’s nomination recognizes that he is one of the world’s premier nuclear instrumentation and control services companies. Hashemian has received other accolades in recent years, including being named as the 2013 Tennessee Small Business Person of the Year by the US Small Business Administration in Washington, DC, and was the recipient of the prestigious University of Tennessee University Professional Achievement Award in 2012.
Patel had been working as an engineer for three years when an interesting opportunity in the hotel business came along. One of his uncles was developing a hotel in Chattanooga and thought that Patel would be a perfect choice to develop and manage a relatively new Hilton brand at that time, the Homewood Suites. Although his engineering career was secure, Patel decided to take a chance on a new and exciting venture.

“I found out that building a hotel was not easy, but somehow I was able to get it done. Sometimes, there is no better way to learn than by baptism by fire,” Patel said. “When the hotel was completed, I literally took off my hard hat and put on a tie, and became the opening general manager of the hotel. The hotel struggled early, but I am proud to say that after eighteen months of hard work and determination, that hotel became the number-one hotel in the market. More importantly, something else happened in those eighteen months; a fire started burning inside of me. It took me a little while, but I found my passion where I never expected to, in hospitality. That passion, along with some confidence, allowed us to grow.”

Today, Vision Hospitality Group, founded in 1997, is one of the top hotel development and management companies in the U.S. Patel’s initial foray into hospitality gave him the self-assurance to seek out other opportunities. Vision now has more than one thousand associates, a portfolio of thirty-one hotels in five states, and a current pipeline of fifteen hotels associated with the industry’s premier hotel brands. The company has added to its new twenty-eight thousand-square-foot headquarters in downtown Chattanooga to support its associates who stand behind the company’s values and have embraced Patel’s shared vision to be the best, most respected hotel company in the country.

“Establishing a strong associate-focused service culture is the key,” Patel said. “We surround ourselves with great people and simply take care of them. Happy and loyal associates equate to happy and loyal guests. Happy and loyal guests lead to greater market share, which in turn shows a premium return on investment—when you invest back in your associates.”

Vision Hospitality Group owns and operates hotels associated with Hilton, Marriott, Hyatt, and InterContinental Hotels Group family brands. Patel said the company decides what demand drivers a particular location might have, and what brand best serves the site when pursuing a particular opportunity.

“For example, some brands are better located in transient locations such as immediately off of a highway exit, while others are being located deep within an ‘office park’,” Patel said. “Each situation poses its own set of criteria and challenges, and that’s one of the things that keeps it interesting.”

The company’s associates see themselves as being part of a hands-on company. From concept to design, through construction and to the hotel opening, Vision is always focused on the details, and that’s one of the things that Patel believes is essential to its success.

“As we continue to grow, and efficiency becomes a priority, it is more and more difficult to maintain that culture,” Patel said. “As it relates to the hospitality industry, we are in one of the best periods of growth and performance that industry has seen in many people’s careers. My biggest concern is hubs. We have just come through the worst period that our already undersized history of the lodging industry and I think that a short institutional memory poses the greatest risk to the industry today.”

“We engineers are trained to just figure things out.”

Patel and his wife, Parul, have been married for seventeen years and have three children: Parth, Ron, and Vineet. In his free time, he enjoys traveling, reading, and sports, and especially values spending time with family.

For more information on Vision Hospitality Group, visit www.vgshotels.com.

COE Brings Distinguished Leaders Back as Board of Advisors Emeritus

The University of Tennessee College of Engineering’s Board of Advisors has long been recognized for its leadership strength. The executives from government, education, business, and industry serve as advisors to the dean and many of the BOA members are UT-UTC alumni.

Dean Wayne Davis, not wanting to lose the engagement and expertise of former board members, created the position of Board of Advisors Emeritus—for those individuals rotating off the board. The group’s first introduction was at the college’s 2014 Faculty and Staff Awards Dinner on April 3.

The emeritus group will be invited to the awards dinner each year, and will have other opportunities for engagement with engineering college activities.

The following individuals are the new co-chair of board of advisors emeritus members:

- Dr. Donald B. Cox (ME '65, E89) Signal Mountain, TN University of Tennessee, Chattanooga Burkhart Miller Chair of Excellence
- M. Kimberly Carrol (ME '80) Knoxville, TN Inverture Laboratories, Inc. Chief Executive Officer
- Dr. Tom F. Cheek, Jr. (EE '61, E69) Garland, TX Faraday, TX Plasma Instruments Senior Member, Technical Staff (Retired)
- Nancy C. Cole (MetE '69, '88) Fernandina Beach, FL NCC Engineering Owner
- Dr. Michael W. Howard (EE '80, Eng. Sc. '96) Knoxville, TN Bell Labs Research Institute (EMPIR) President & Chief Executive Officer
- Dr. Dwight Hutchins (EE '86) Singapore Accenture Asia Pacific Managing Director - Management Consulting, Products
The College of Engineering (COE) and the College of Nursing collaborated on the renovation of an existing building to improve simulated instruction and research for students across multiple disciplines.

The Health and Information Technology and Simulation (HITS) Laboratory is housed in the former Student Health Center at 1980 Andy Holt Way. The HITS Lab features simulated learning experiences and opportunities to explore research scenarios. The building adds more than seven thousand square feet to simulation learning and health information technology development and research.

“Gaining first-hand knowledge of the impact that health technology has on improving patient care, quality, and safety is critical for nursing students,” said Dean Victoria Niederhauser. “Research has shown that when students engage in simulated scenarios in a safe learning environment, they are better prepared to enter into the workforce upon graduation.”

The $1.5 million project involved renovating the three-story building. The HITS Lab takes two floors and one floor houses a rare plant herbarium for the Department of Ecology and Evolutionary Biology in the College of Arts and Sciences. The second floor includes four patient exam rooms; a pediatric unit; a room that functions as an operating room, a birthing room and an emergency department; storage space; and lockers. It also contains a debriefing room with an observation and control laboratory where students and professors can observe how other students are handling simulated scenarios live. The experiences can be reviewed afterward so that students can review how they responded to situations.

The basement level contains an apartment with a bedroom, living room, and dining room for simulated learning and collaborative nursing and engineering research projects to tackle health care challenges. For example, HITS co-directors Dr. Tam Davis, director of the College of Nursing, and Dr. Xueping Li, associate professor of industrial engineering, plan to conduct a study using new smart-home technologies to assist with independent living for elderly people. These technologies will allow older adults to live safely and independently in their own homes. “Our primary goal for the HITS Lab is to advance the science of health information technology and discover ways to enhance consumer health and interprofessional health education,” Li said. “We will integrate clinical simulation, distance education, process optimization, and delivery of care using telehealth into an intraprofessional education (IPE) learning experience involving students in pharmacy, social work, advance practice nursing, medicine, and industrial engineering. I am excited about this collaboration and cannot wait to see HITS in operation!”

An open house and ribbon cutting for HITS was held on March 27, 2014, at Temple Hall on Andy Holt Avenue. The facility opened to students in January 2012.

For more details, visit [http://lab.engr.utk.edu/hits/](http://lab.engr.utk.edu/hits/).
The University of Tennessee has been selected to compete in the EcoCAR 3 Advanced Vehicle Technology Competition (AVTC), continuing a tradition of extended participation in all but one competition series in the twenty-six-year history of AVTCs.

“It is a tremendous honor for us, once again, to be able to be part of such a prestigious competition,” said College of Engineering Dean Wayne Davis. “Dr. (David) Irick and his team really put in a lot of effort, and I think that is reflected on their continual inclusion in the event.”

Sixteen universities will be competing, using a Chevrolet Camaro as their stock car.

“EcoCAR is an opportunity for the next generation of automotive engineers to help design and build innovative advanced vehicles that will reduce greenhouse gas emissions, protect the environment and save American families and businesses money at the pump,” US Energy Secretary Ernest Moniz announced. Through this competition, top American students gain valuable real-life experience that they can use to bring the auto industry into the cleaner energy future.

Advanced Vehicle Technology Competitions began in 1988 when the US Department of Energy partnered with various automakers to sponsor the nation’s first AVTC overall competition in a string that began with the “Manx National,” and has included topics such as vehicle design, fuel challenges and vehicle electrification, and has expanded to include communications and business teams.

Established by the Energy Department and General Motors, and managed by Argonne National Laboratory, EcoCAR 3 is the latest AVTC aimed at developing the next generation of automotive engineers.

The competition is used to pass on new knowledge to future generations of engineers, but it’s also focused on hybrid vehicle technology since as far back as 1992.

For EcoCAR 3, teams will be focused on reducing costs and coming up with new innovations that make hybrid or electric vehicles more accessible and more likely to be adopted by the general public.

”The other part of the challenge,” said Irick. “This and result of your car needs to be that you can’t tell it apart from a stock model. It needs to look completely like something you could get at the dealer.”

As part of the of the team, the competitions are composed of engineers, researchers and their own media representatives.

Typically, they contain fifteen to twenty team members, but some have as many as seventy-five.

UT’s past teams—including the current EcoCAR 2 team—have been sponsored in part by local industries including DENSO and the Electric Power Research Institute, as well as the support that they’ve received from the university and alumni. Support also comes in expertise, as General Motors and other auto-related businesses will be available to mentor and provide advice and feedback along the way.

“GM’s EcoCAR 2 team quotes the statistic that approximately fifty percent of the students that go through AVTCs and then work on-the-job training when they report to work. They’re used to the support and advice.”

In addition to the assistance that industry partners can lend teams along the way, students also have the added benefit of having worked with and having experience with the process, leading many to employment with those companies.

“Their feedback is critical,” said Irick. “At a minimum, it’s like having a year or two of the job under their belt. We’re using their software, the tools, the vehicle development process, so they can be immediately productive.”

General Motors, in particular, has been a successful landing pad for UT’s graduates.

“GM’s EcoCAR 2 team quotes the statistic that approximately seventy-five percent of the students that go through AVTCs and then work for them have applied for a patent on a new idea or design within two or three years after the competition,” said Irick. “They’ve hired ten or so of our students from the last two AVTCs, and having that relationship is beneficial to the teams, to GM and to the students individually.”

The competition used to be capped more toward alternate fuels, but it’s been focused on hybrid vehicle technology since around 1992 (all electric).

Each competition lasts multiple years, with EcoCAR 2—including UT’s current team—wrapping up this summer.

The College of Engineering recognized two hundred ninety graduates at the Spring 2014 commencement ceremony at Thompson-Boling Arena on Wednesday, May 7, 2014.

Parents, friends, and family were present for the ceremony, which started at 10:00 a.m. with a procession of faculty from both the college and the university.

University of Tennessee president Joe DiPietro, Knoxville Chancellor Jimmy C. Cheek, and Dean Wayne Davis led the procession, with Associate Dean Masood Parang handing the emcee honors for the event.

The keynote address was given by Kathy Caldwell, a 1985 graduate of the Department of Civil and Environmental Engineering. Caldwell held a number of civil engineering jobs throughout the south before becoming president of JEA Construction Engineering Services Incorporated in Gainesville, Florida. She has since retired, and she and her husband, Ron— who earned both his bachelor’s degree in civil engineering in 1975 and his master’s in 1981 from UT—run a private consulting firm.

Caldwell served as president of the American Society of Civil Engineers (ASCE) in 2011, and serves on the Board of Directors of Engineers Without Borders (EWB) and the American Association of Engineering Societies (AAES). She has testified about transportation before Congress and served as a “Champion for Change” for the White House.

In her address, Caldwell told the story of Harry Knox, for whom Knox County and Knoxville were named. She related how his breakthrough success was engineering a way for Continental Army cannons to climb a hill overlooking the British occupation of Boston, and how UT’s engineers have also had to climb the Hill to get their education, concluding by encouraging them not to ever stop climbing.

The college’s top students, Samantha Ann Hawks and Rebekah Kathryn Patton, both of the Department of Chemical Engineering, were recognized, as was the Department of Nuclear Engineering’s Blake Alexander Pollock for being the National Academy of Engineering Grand Challenge Scholar.

Special recognition was also given to the college’s ambassadors—Paige Louise Black (mechanical engineering), Joshua Michael Clark (computer science), Toniqua Shaunte Hunter (mechanical engineering), Emily Anne Leturmo (mechanical engineering), Rebekah Kathryn Patton (chemical engineering), David Aaron Seaman (mechanical engineering), and Victoria Dixie Vest (biomedical engineering).

Following the conclusion of the conferral of degrees and the reading of names, US Air Force Lt. Colonel Brian J. Lancaster commissioned four new second lieutenants for UT’s engineering graduates Phillip A. Butler, Harrison A. Jerrolds, and Henry N. Loewenkamp as the Air Force’s newest Second Lieutenants, drawing a standing ovation from the crowd.

The ceremony concluded with the UT Alma Mater.

For a video presentation of the entire commencement ceremony, visit: https://www.youtube.com/watch?v=rdJhrYOLsB8&feature=youtu.be

For a closed-caption presentation of the entire ceremony, visit: www.engr.utk.edu/commencement/
Calendar

### Fall 2014
- Classes Begin: Aug 20
- Labor Day: Sept 1
- Break Class: Oct 16-17
- Classes End: Dec 2
- Study Day: Dec 3
- Exams: Dec 4-5, 8-11
- Graduate Hooding: Dec 12
- Commencement: Dec 13
- Official Graduation Date: Dec 13

### Spring 2015
- Classes Begin: Jan 7
- 2nd Session Begins: Feb 26
- Spring Break: Mar 16-20
- Classes End: Apr 24
- Study Day: Apr 27
- Exams: Apr 28-30, May 1, 4-5
- Graduate Hooding: May 7
- Commencement: May 6-9
- Official Graduation Date: May 9

### Fall 2014
- Classes Begin: Aug 20
- Labor Day: Sept 1
- Break Class: Oct 16-17
- Classes End: Dec 2
- Study Day: Dec 3
- Exams: Dec 4-5, 8-11
- Graduate Hooding: Dec 12
- Commencement: Dec 13
- Official Graduation Date: Dec 13

### Spring 2015
- Classes Begin: Jan 7
- 2nd Session Begins: Feb 26
- Spring Break: Mar 16-20
- Classes End: Apr 24
- Study Day: Apr 27
- Exams: Apr 28-30, May 1, 4-5
- Graduate Hooding: May 7
- Commencement: May 6-9
- Official Graduation Date: May 9

Contact Information

- Senior Administration: 974-0533
- Communications: 974-5321
- Dean’s Office: 974-2779
- Development: 974-4008
- Engineering Advising Services: 974-1931
- Engineering Diversity Programs: 974-9890
- Engineering Fundamentals: 974-5323
- Engineering Professional Practice: 974-8360
- Engineering Research: 974-2454
- Engineering Student Affairs: 974-5279
- Finance & Admin. Affairs: 974-0816
- Research Centers: 974-9625
- Materials Processing: 974-0267
- Maintenance & Reliability: 974-9625
- Scintillation Materials: 974-5255
- Transportation Research: 974-5803
- Intelligent Systems and Machine Learning: 974-8295
- Innovative Computing Laboratory: 974-8295

Save the Date

College of Engineering Alumni BBQ On the Hill

The University of Tennessee College of Engineering invites you to Homecoming 2014 and the Annual Alumni Barbeque on the Hill. Saturday, October 11, 2014

Three hours prior to kickoff of the Tennessee vs. Chattanooga game.

Join us for a barbeque lunch, including hot dogs for the kids, catered by Dead End BBQ.

Enjoy exhibits and demonstrations, reunions with former classmates and faculty, and games for both adults and children.

Register today and be a part of the Tennessee Tradition.

Costs:
- $12.00/adults – $8.00/children under ten years of age

Register online at: www.volsconnect.com

For more information, contact Juliette McClure at (865) 974-2779 or e-mail jmclu10@utfi.org.