

# CIVIL AND ENVIRONMENTAL ENGINEERING [ civil.umd.edu]

A newsletter for the alumni and friends of the Department of Civil and Environmental Engineering

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Professor Witczak Inspires Alumni Named Scholarship Creates Opportunities for Future Students



Project to Provide Real-Time Parking Information System

# CHAIR'S MESSAGE

elcome readers to our latest issue of <u>Civil</u> <u>Remarks</u>.

> We have much news to share with you this issue. And, I am eager to begin. So let's get started.

First we have received wonderful news. CEE benefits greatly from the generosity of our alumni. Alums Ken Bell and Bill Wainger, have decided to pool their efforts for a legacy campaign. This

campaign is especially special as it will honor a beloved professor, Matthew W. Witczak. Both men, as students, were greatly influenced by their experience with Professor Witczak and wanted to show their appreciation.

As Ken Bell put it, "None of us in the professional world would be successful without the education we received and the professors who cared for us and made our education their careers." This remains true even today.

If you would like to honor this inspiring faculty member, please see http://www. cee.umd.edu/giving/witczak for more information, or contact Allison Corbett, our Clark School assistant development director, at acc@umd.edu or 301-405-5841.

Speaking of Ken Bell and Bill Wainger, we decided to do a profile on Bill Wainger as part of our usual alumni profile segment. I think readers will enjoy learning more about this special graduate of our program and his success.

As I have mentioned often, we take great pride in our faculty. And deservingly so with such faculty members as Professor Witczak who touch the lives of students in a lasting way. In this issue, we profile such a faculty member with our article on Paul Schonfeld.

Schonfeld learned early on that he was drawn to the rewards of teaching, keeping

in touch with his students throughout the years and taking great satisfaction in their success. His story is one that inspires.

Then there are the students who are the purpose of what we do as educators. In this issue we profile an amazing young woman. Meredith Willson spent this past summer participating in a 70-day, 4,000mile bike ride from Baltimore to Portland, Ore. She made this effort in honor of her mother's friend who passed away from cancer and as a participant of the 4K for Cancer, a program of the Ulman Cancer Fund for Young Adults. In taking on this challenge, she not only helped other, but was able to see much of the environment that she hopes to help protect as an environmental engineer.

Our course profile this time is on ENCE 302 – Probability and Statistics. With this profile we let a former student of the course share his thoughts more directly. David Webb is now a Ph.D. student in the reliability engineering program. It is interesting to hear what he has to say and his perspective on ENCE 302.

Of course our work is not confined to the classroom, but outside of it as well, as I have said many times. Masoud Hamedi, a research associate, and I are working on research that will provide a real-time parking information system for the large trucks using our highways with safety being the primary issue. Again, it is important for us to develop research that impacts lives in a real and important way. We hope this research does just that.

Then, I am deeply supportive and appreciative of our staff, which makes CEE run as well as it does. I know I say this often. But feel very much that it is true. In this issue we profile Molly Burke, who joined our staff in December 2012 as our payroll coordinator. She has held varied jobs and brings with her much experience and knowledge which will benefit us greatly.

I hope you enjoy this issue as much as we enjoy sharing our news with you.

Ah: Haghani

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### **Project to Provide Real-Time Parking Information System**



hight truck parking in the United States is a significant problem that is growing worse," says Masoud Hamedi, a research associate, working on this issue with Ali Haghani, CEE department chair.

Drivers have found themselves parking illegally on freeway shoulders and ramps when legal parking is either not available, or the availability of free parking spots in a truck parking facility is not known.

Adds Haghani, "Safety is a primary issue, and one of the priority strategies in the safety area is to reduce the need for trucks to park on highspeed highways."

Thus, adequacy of rest area parking is one of the most critical issues today and is gaining national importance. "Improved safety and greater operational efficiency may be realized if commercial drivers could receive real-time information on availability of parking at known locations within their general travel areas," says Hamedi.

And, that is precisely the goal of the real-time truck parking information system being developed by Hamedi and Haghani.

According to Hamedi and Haghani, occupancy of parking spaces is monitored through a network of ultra-low power wireless magnetic sensors in real-time, and the information is disseminated through variable message signs, mobile application and other travel advisory systems.

The project includes four main components: sensing, collecting, processing and user interface. The sensing component refers to networks of magnetic sensors that measure the magnetic field at different spots. The collecting component uses the same microcontroller as the sensing component to collect the data measured by the sensors. The processing component consists of central database located at remote stations. And, the user interface component consists of developed software to remotely connect to the servers and check the status of the spots in realtime along with other necessary information for administrators to control the performance of the system.

"The advantages to this system are many," says Hamedi. "The real-time parking monitoring system is low-cost and low-maintenance, scalable and easy to deploy." And, "Unlike imagery based technologies the system is not sensitive to weather conditions such as snow and fog. It is also completely anonymous and thus the privacy of the truck is not comprised. "Since both the detectors and the collectors are wireless, no additional "IT infrastructure is required in the parking facility," says Hamedi. "This solution is layout independent and can be deployed with minimal calibration."

The system has been deployed and tested at I-95 North Welcome Center from January 2013 to May 2013. According to Haghani and Hamedi, several experiences were conducted and ground truth information was also provided to measure the performance of the system. "The overall error rate of the system during the experiment was 3.75% on average and can potentially be lowered by using more sensors at each spot and using repeaters to avoid signal blockings.

"In summary, the real-time solution for continuous monitoring of the target parking spots was successful," says Hamedi. Adding, "If all truck parking facilities in the area are equipped with such systems truckers can be directed to the next parking lots and utilization of all facilities can be optimized."



# **Professor Witczak Inspires Alumni** Named Scholarship Creates Opportunities for Future Students



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By Jennifer Figgins Rooks

many A. James Clark School of Engineering graduates, Ken Bell, '74; '77, M.S.; '83, Ph.D.; Civil Engineering (CE), and Bill Wainger, '80; '82, M.S., CE, spent the years following graduation building careers and raising families. Recently both men decided it was time to give back to the school that helped lay the foundation for their careers.

What started as a seemingly straightforward process for the two alumni — make a donation to the school and help future students succeed became a much larger gesture when a common thread emerged. Clark School Assistant Development Director Allison Corbett first met Bell and Wainger when they approached the school about making a donation. She quickly learned that both graduates recalled a particular faculty member who had made a difference in their lives. Her interest piqued, Corbett asked if they would be interested in pooling their efforts for a legacy campaign to honor CE Professor Matthew W. Witczak, and the graduate award in his name was created.

"If not for Dr.Witczak, I never would have chosen to become a geotechnical engineer," says Bell.While pursuing his undergraduate degree, Bell had not considered specializing in a field until he took classes with Witczak."His enthusiasm for the topic was contagious," recalls Bell.

At Witczak's suggestion, Bell decided to pursue both a master's and a Ph.D. in geotechnical engineering. While working on his Ph.D., Bell, who was married and starting a family, left the university to take a position at Bechtel. Witczak was not pleased with Bell's decision to leave school before completing his dissertation and "he read me the riot act." Witczak continued to communicate with Bell in an effort to get him to return to school. "He pushed me when I needed to be pushed," remembers Bell. "I have spent 33 years in geotechnical engineering, and I trace my success back to him."

Wainger also attributes a large part of his graduate success to Witczak. As a teacher, he said, Witczak "saw the beginning and the end [of a topic] and knew how to get you there" – a vision that Witczak applied in and out of the classroom.

After declining Witczak's initial suggestion that he attend graduate school, Wainger spent nine months working for a large engineering company before deciding that path was not for him. While the previously offered graduate positions were no longer available, that did not stop Witczak from making sure Wainger had a place in the program. "I had the best relationship with him," recounts Wainger. "He was the one professor who challenged me the most."

When asked about giving back to the university and honoring Witczak, Bell notes, "None of us in the professional world would be successful without the education we received and the professors who cared for us and made our education their careers."

For more information on the Dr. Matthew W.Witczak Graduate Award, visit http:// www.cee.umd.edu/giving/witczak or contact Allison Corbett '12 at acc@umd. edu or 301-405-5841. The **CEE Steel Bridge Team** was invited to participate in American Iron and Steel Institute's "Steel Day" event, held on October 4, 2013, in Washington, D.C., at AISI's downtown headquarters. The event, collaboration between AISA, the National Steel Bridge Alliance (NSBA) and the House and Senate Steel Caucuses, featured the University of Maryland's large-scale bridge model in addition to models from the University of Akron, University of Delaware and the University of California, Berkeley.

The Steel Bridge Team is part of UMD's student chapter of the American Society of Civil Engineers (ASCE), which also includes UMD'sConcrete Canoe Team. Chapter president Tess Niehoff and members Ross Jespersen and Craig Lampmann were on hand to represent the team at the event.

Jespersen, a junior and current project manager for the 2014 Steel Bridge Team, said the event was a great opportunity to gain exposure for both the program and the competition. Last year, the National Student Steel Bridge Competition drew over 200 teams from across the United States, Canada and Mexico to compete.

The Steel Day 2013 event also featured remarks from Reps. Pete Visclosky (D-IN) and Virginia Foxx (R-NC).Visclosky, vice chair of the Congressional Steel Caucus and father of a Maryland alumnus, acknowledged the UMD team in his remarks with a "Go Terps!" and spent time afterward speaking with the students.

Foxx congratulated the students on their efforts and for being involved with these kinds of projects. As a former teacher and educator, she said she "believes in experiential education."

The Steel Bridge and Concrete Canoe teams are gearing up for the 2014 competition season.

The University of Maryland's **A. James Clark School** of Engineering hosted its first Mpact Week, a four-day event that attracted more than a thousand attendees and hundreds of K-12 students to ithe College Park campus. The Mpact Week events, which took place October 23-26, 2013, showcased the Clark School's research, education, innovation and entrepreneurial ecosystem.

Highlights from the week included a Student Startup Showcase at Maryland Innovation Mpact, a captivating Whiting-Turner Lecture about surgical robotics by Simon DiMaio of Intuitive Surgical Inc., as part of the Fischell Festival, several hundred K-12 students in attendance at Maryland Robotics Day, and a celebration honoring Team Gamera, the Clark School's human-powered helicopter team.

On Sept. 25, the **University of Maryland** and Northrop Grumman launched the Advanced Cybersecurity Experience for Students (ACES), the nation's first cybersecurity honors program for undergraduates.

Supported by a major grant from Northrop Grumman, the ACES program is designed to educate future leaders in the field of cybersecurity through rigorous, handson learning experiences, an intensive interdisciplinary curriculum, collaborative projects and professional insight from industry and business leaders. The four-year Honors College program offers students a living-learning experience, giving them the opportunity to collaborate and work closely together as they pursue their advanced program of study in cybersecurity.

ACES students will take on an intensive curriculum, which includes general cybersecurity offerings, as well as a variety of other topics, including cybersecurity forensics, reverse engineering, secure coding, criminology, and law and public policy. Summer internships will augment coursework with real-world projects and develop a pipeline of talented students. Throughout, Northrop Grumman will provide guest lecturers, participate in an industry advisory board, pose real-world problems for students to solve and provide advisors and mentors for capstone projects.

During July 2013, the University of Maryland's **Engineers Without Borders (EWB)** team made its eighth trip to Ethiopia in continued partnership with the town of Addis Alem. Since completing a community center in January 2010 as a first project, the town of Addis Alem (now Ejere) and Maryland's EWB team have continued forging ties together, offering engineering students the chance to take on realworld projects while also providing a practical benefit to the town. Now in its second phase of improving the town's marketplace, EWB spent a week in July assessing new ways to manage stormwater drainage, improve general sanitation, and construct more robust infrastructure that will culminate in a better market environment for both vendors and consumers.

The team consisted of CEE Professor Barton Forman, professional engineer Ed Elder, Cathy O'Riordan, Ph.D., and students Yoseph Fehesa (aerospace engineering), Nicholas Valdez (civil and environmental engineering), and Abigail Henningsgaard (bioengineering). The team was led by senior civil and environmental engineering student Brett Jansen, who has been involved with Maryland's EVVB team since 2010 and previously worked on design for the stormwater management system implemented in Ejere in January 2013.

During the trip, the team met several times with Ejere's new mayor and other municipal officials to investigate the level of success of previous projects. Additionally, these meetings helped identify key areas of focus for improving the marketplace. Throughout the rest of the week, the team conducted several interviews with both consumers and vendors in the marketplace to better determine how best EWB can work alongside of the municipality in executing existing development goals for the market. The team also performed water quality tests on the local river and the water retention basin constructed in January 2013. Lastly, the team spent one more morning volunteering at one of Ejere's schools, teaching children and pre-teens basic lessons in water filtration and bridge design.

Moving forward, the team will begin their project design phase this fall to create a master development plan for the

# On the Road for a Good Cause

Student Rides Bike across the U.S. to Raise Money for Cancer



was a young woman with a purpose. Meredith Willson spent this past summer participating in a 70-day, 4,000 -mile bike ride from Baltimore to Portland, Ore.

"I did it in honor of my mother's friend who passed away from colon cancer," says Willson.

The 4K for Cancer is a program of the Ulman Cancer Fund for Young Adults. The non-profit organization is dedicated to enhancing lives by supporting, educating and connecting young adults, and their loved ones, affected by cancer. Since 2001, groups of college students have undertaken journeys across America with the goal of offering hope, inspiration and support to cancer communities along the way.

In 2013, 127 4K for Cancer participants traveled across America and were able to raise nearly \$775,000 to support young adults affected by cancer.

"I have always wanted to bike across the country," says Willson, who is a member of the university's triathlon team and the engineering school's Alpha Omega Epsilon. "This gave me the opportunity to do this while helping others."

The program offers participants four different endings, according to Willson, including San Diego, San Francisco, Seattle and Oregon. "Portland was my first choice, and I was fortunate enough to get chosen for it," says Wilson. "I had visited Portland last summer with my family, and I loved it. We were there after my brother's graduation. It's such a green city, trying to encourage the use of riding bikes instead of driving cars. There's this real promotion of green living."

And well-suited to Willson, who plans to graduate in May of 2015, and is pursuing the water resources and environmental track.



She just came to the university in the spring of 2012. She began her college career at the University of Virginia, but changed her mind. "I just felt the University of Maryland had a better engineering program," she says, adding that growing up in Annapolis, Md., many of her friends had gone to the University of Maryland, and "I was hearing great things from them," she says. "I really love Maryland and the spirit of supportiveness at the school."

Among those saying good things about the university was older her brother, who graduated in 2012 with an economics major and is an environmental engineer now. The **University of Maryland** was selected in a national competition to lead a two-year, \$11.3 million new National Center for Strategic Transportation Policies, Investments and Decisions. The University of Maryland consortium includes Arizona State University, Louisiana State University, Morgan State University, North Carolina State University, Old Dominion University and the University of New Orleans.

The University of Maryland National Center for Strategic Transportation Policies, Investments and Decisions (NCSTPID) is one of only five national centers that were selected in this nationwide competition and the only one with a focus on the U.S. Department of Transportation (DOT) strategic goal of "Economic Competitiveness."

The theme of the TPID Center will be "Strategic Transportation Policies, Investments and Decisions for Economic Competitiveness." The Center will conduct research and provide education and technology transfer related to this theme, and will directly support the U.S. DOT's strategic goal of economic competitiveness with consideration for other relevant strategic goals, such as safety and environmental sustainability.

"With the growing volume of traffic, an aging infrastructure and a need for smarter, more seamless movement of freight, this new UMD-led center will offer informed guidance on how best to invest precious transportation dollars," says University of Maryland President Wallace Loh. "I am very proud that our engineering expertise and leadership has been recognized in this tangible way."

The expected total funding level for the first two years for this center will be around \$11.3 million, of which about \$5.65 million are federal and the rest is matching funds. The University of Maryland Department of Civil and Environmental Engineering Transportation Program has a distinguished history in transportation research and education, and the NCSTPID award is a recognition of the contributions of the program's faculty to the state-of-the-art in transportation research and education.

"With these initial resources and support from our college and university, we can further develop our transportation program into a dominant force in this topic area," says the Director of the NCSTPID, Professor Lei Zhang.

The NCSTPID is concerned with the integrated operations and planning of all modes serving the nation's passenger and freight transportation system, including the institutional issues associated with their management and investments. In particular, the TPID will focus on research, education and technology transfer activities that can lead to: 1) freight efficiency for domestic shipping and for our international land, air and sea ports; 2) highway congestion mitigation with multi-modal strategies; and 3) smart investments in intercity passenger travel facilities, such as high speed rail.



Professor **Gregory Baecher** has been appointed to the National Research Council (NRC) of the National Academies Coastal Protection Committee.

NRC has initiated a review of U.S. government programs for coastal risk reduction as part of the NRC's support for the U.S.Army Corps

of Engineers. As a member of the committee, Baecher will work with fellow members to analyze and review various aspects of current policy and provide input to the U.S. Army Chief of Engineers on scientific, engineering and water resources planning issues related to reducing flood risks from coastal storm surges.

The committee will review risk-reduction strategies that have been used along the U.S. East and Gulf Coasts to reduce impacts of coastal flooding, and design standards or levels of protection that should be adopted.



**Professor Gang-Len Chang** was invited to deliver a keynote speech at the 10<sup>th</sup> International Conference of Eastern Asia Society for Transportation Studies on "Challenges and Suggestions to Transportation Professionals in Asia." The conference was held in Taipei in September. Chang received his Ph.D. in Transportation Engineering from the University of Texas at Austin, and performs research in the areas of network traffic control, freeway traffic management, real-time traffic simulation and dynamic urban systems.

The Eastern Asia Society for Transportation Studies (EASTS) was founded in 1994 as a result of a meeting among transport experts from 13 countries/regions in eastern Asia. It is an umbrella organization of transportation science societies with the primary objectives of fostering and supporting excellence in transportation research and practice and to stimulate professional interchange in all aspects and modes of transportation. The EASTS conference has emerged as the primary transportation conference in Asia.

Chang also gave an invited talk at the workshop "Development of mixed flow traffic simulation and optimization models for developing countries in Asia," sponsored by Taiwan University and the Ministry of Transportation and Communications.

The **University of Maryland (UMD)** and Siemens Corporation have announced the largest ever in-kind software grant from Siemens PLM Software. The in-kind grant has a commercial value of more than \$750 million. Siemens' product lifecycle management (PLM) software will provide UMD students and researchers with a uniquely

# Planes, Trains and Automobiles

Professor has Spent Career Teaching and Researching Transportation

Paul Schonfeld wasn't so different from other young boys growing up in Romania.

"I remember playing with toy trains, planes and cars," he recalls.

But as he became older his fascination did not fade. And the young boy from Romania grew up to come to America and today is a professor in CEE focusing on transportation.

Schonfeld and his family came to NewYork City to live when he was 14. "I remember it being very large," he says with a chuckle. Lots of planes to look up and see in the sky and the constant buzz of traffic moving through the city streets.

After high school, he went on and received his bachelor's degree in civil engineering at MIT in 1974, as well as receiving his master's degree in 1974 at MIT. His thesis was on "Optimization of Urban Transportation Networks."

MIT had been Schonfeld's first choice, and "I was pleased to go there," he says.

He finished his education at the University of California, Berkeley, in 1978 with a Ph.D. in civil engineering and a thesis on "A Macroscopic Methodology for Transportation Policy Analysis." His minor areas were economics and business administration.

He worked hard at Berkeley and admits to taking quite a shine to the weather. "At times Berkeley felt like a vacation resort," he says with a grin.

While at Berkeley he was a research assistant then a research specialist from 1975 to 1977. In 1978, he began his formal career. He came to the University of Maryland, drawn to the CEE department's transportation program to work as an assistant professor. He spent 19 years as director of CEE's transportation program and went on to become an associate professor in 1984 and a full professor in 1993. Early on, he also worked in the private sector, including work as a transportation engineer for the IBM Scientific Center at Cambridge, Mass.

But he found that he quite enjoys teaching, even to this day, and especially enjoys working with graduate students.

"I definitely enjoy teaching," he says. 'There is something very rewarding about watching students complete their education and go on to become successful. That's the greatest reward."

At this time he has supervised 34 Ph.D. dissertations and 39 master's thesis, not including the many scholarly papers supervised and participation in the countless Ph.D. student dissertation committees and M.S. student scholarly paper committees.

Through the years he has kept in touch with many of his students. "I am proud that many go on to become teachers themselves or have other successful careers," he says.

His graduate courses have included Highway Traffic Characteristics and Measurements; Regional Transportation Planning; Public Transportation Planning and Airport Planning and Design, as well as over 50 independent study courses.

Besides teaching, he also has done consulting work for such organizations as the National Institute of Standards, the U.S. Army Corps of Engineers, the Federal Transit Administration and various private companies.

Then there is his research.

He is actively involved with the relatively new Center for Transportation Economic Competitiveness. And other current research projects include Evasive Flow Capture Problem: Optimal Allocation of Weigh-in-Motion Stations and Security Checkpoints from the National Science Foundation; Integration of Multimodal Transportation Services, funded by the Mid-Atlantic University



Transportation Center; Needs, Barriers and Analysis Methods of Integrated Urban Freight Transportation, also funded by the Mid-Atlantic University Transportation Center; and BWI Airport Internal Circulation Analysis funded by the Maryland Aviation Administration; and Economic Impacts of Multimodal Transportation Improvements funded by the Maryland State Highway Administration.

With the change in technology came change in transportation research. "We are dealing with problems on a much larger and more complex scale than three or four decades ago, because computers can handle them now," he says. "We FACULTY PROFILE (cont. on page 14)



After graduating in 1995 with a BSCE from Maryland, **Cristiane Queiroz Surbeck** moved to southern California and worked for a civil and environmental engineering consulting firm, Geomatrix Consultants, now AMEC. She worked primarily in soil and groundwater remediation of industrial contaminated sites. She also worked on projects

that identified environmental liabilities for buyers of industrial real estate. These projects led her to trips all over the country and to Brazil and Mexico. During that time, she also earned a master's degree, part time, in Environmental Engineering and earned her California Professional Engineer license. After a very satisfying seven and a half years of this work, Surbeck decided to pursue a Ph.D. in Environmental Engineering at the University of California, Irvine. She graduated in 2007 and immediately took a tenure-track position in the Department of Civil Engineering at the University of Mississippi. This past summer she earned tenure and promotion to Associate Professor. Surbeck's activities at UM had included teaching undergraduate and graduate courses and conducting research projects ranging from topics of soil remediation, bacterial contamination of surface waters, and drinking water treatment. She is also the professional mentor for UM's chapter of Engineers Without Borders and has traveled with the team to Togo, Africa. Her newest research activity has been with a National Science Foundation project on Social Sustainability (www. socialsustainabilitynetwork.org). Surbeck has also been very active with ASCE's Environmental and Water Resources Institute (EWRI), having been chair of the International Council and the Sustainability Committee.

At Maryland, Surbeck was an officer, and eventually president, of the Maryland chapter of SWE, where she learned organizational and leadership skills. Through the School of Engineering's job placement programs I had summer internships at the Maryland State Highway Administration, Vista Chemical Company in Baltimore, and at a geotechnical consulting firm in Lausanne, Switzerland. This last internship was brought to my attention by Jane Fines, who introduced me to the International Association for the Exchange of Students for Technical Experience (IAESTE).

The man behind a revolutionary network technology designed to aid in U.S. Navy fleet defense was honored November 12, 2013, by the University of Maryland's A. James Clark School of Engineering at the annual Innovation Hall of Fame induction ceremony.

Clark School alumnus **Jerry Krill**, a 1978 Ph.D. graduate in electrical engineering, will be honored for his technical leadership in developing the sensor network system known as the Cooperative Engagement Capability (CEC), a dynamically reconfigurable data-sharing network that provides a composite, common operating picture for Navy battle groups, allowing them to act as a coordinated, unified whole. The CEC network is robust enough to enable a ship to engage a threat with missiles based on radar data from another ship or aircraft many miles away. Senior Navy leaders have described CEC as "one of the Navy's crown jewels" that greatly enhances the Navy's air defenses.

Krill currently serves as assistant director for Science and Technology at the Johns Hopkins University Applied Physics Laboratory (APL) in Laurel, Md. He had spent the previous five years as APL's assistant director for programs, overseeing APL's 600-plus programs and heading its quality management initiatives. Before that he led the Lab's Power Projection Systems, among other supervisory and technical leadership positions.

He joined APL in 1973 and holds a number of patents. The Innovation Hall of Fame recognizes Clark School alumni, faculty and associates who have pioneered many of the most significant engineering advances in the past century.

CEE alum **Kristin Gilroy** (B.S. '07, M.S '08, Ph.D. '11) has completed an Embassy Science Fellowship in N'Djamena, Chad, through support from the U.S. State Department.

Since 2001, the Embassy Science Fellows Program (ESFP), run jointly by the U.S. State Department and USAID, has placed U.S. scientists at posts to provide expertise, advice and assistance with science and technology-related issues.

Gilroy, who works for the U.S. Army Corp of Engineers, was assigned to the U.S. embassy in N'Djamena to assess the current status of research projects and key gaps in research to identify critical analytical information on the disappearance of Lake Chad, which provides water to more than 30 million people living in the surrounding countries.

Gilroy spent four weeks in N'Djamena meeting with government agencies and regional organizations, including the Lake Chad Basin Commission, donors, and the University of N'Djamena, in an effort to identify opportunities for U.S. involvement in improving water resources management in the region.

Upon returning to the United States, she hopes to develop collaborations between the University of N'Djamena and U.S. agencies and universities to enhance in-house capacity to solve water resources management problems.

Ken Berkman, who received his bachelor's degree from CEE in 1991, has just been hired by the national architectural engineering and construction services firm, McKissack & McKissack in Los Angeles. Berkman has over 20 years of experience in delivering public and private sector projects – from planning and design through construction, including large public infrastructure improvement projects, such as highways, roads, bridge and utilities. The McKissack & McKissack has major offices in Los Angeles, Chicago, Baltimore and Washington, D.C.

# Alum Bill Wainger

Building Career One Achievement at a Time

University of MD has woven itself into the lives of the Wainger Family. Bill Wainger received his graduate and undergraduate degrees in engineering that paved the way for a successful career in real estate development and consulting. His sister received her PhD and now his daughter, a sophomore, is a proud Terp. Because UMD has been so good to him, Wainger felt it was now time to give back.

This Fall Wainger and fellow engineering alum Ken Bell created a scholarship in honor of Professor Matthew W. Witczak, who taught in the Clark School of Engineering for several decades. The scholarship will provide graduate students the kind of support that enabled Wainger to get the training that launched him into his career.

Growing up in the suburbs of Washington, D.C., Wainger had long been aware of the university and always thought he would go to Maryland. "I had tunnel vision from a young age," he says with a chuckle. "And I knew that college was the way to get the skills I needed to get where I wanted to go. I enjoyed all aspects my time in College Park – academic and social. I made friends there that have remained my friends to this day."

As an undergraduate, Wainger was a member of the Chi Epsilon Honor Society and the student chapter of the American Society of Civil Engineers.

But of all people he met at during his time in College Park, it was perhaps Professor Witzcak who had the greatest influence on Wainger's life. In fact, it was Witzcak's prodding that encouraged Wainger to continue on to graduate studies.

"When I graduated in 1980, I wasn't thinking about graduate school. I wanted to builder and start my career," says Bill Wainger, who today is principal and COO at TLB Associates, a geotechnical engineering consulting firm with offices in Glen Burnie and Washington, DC. Witzcak, however, had other ideas and encouraged him to pursue his graduate degree.

Although Wainger says he considered the suggestion carefully because "he really knew his profession and stood out as a teacher," the young, newly minted graduate stuck to his plan to go to work. He spent nine months working for a large civil engineering company. When the construction industry tanked in 1980, he began to re-think Witzcak's offer. But there was one problem. Previously offered graduate positions were no longer available. Witczak did not let that stop him from making sure Wainger had a place in the program.

Wainger received his master's degree in 1982, in civil engineering with concentration geotechnical engineering. In a career spanning three decades, Wainger has put to good use his UMD education, developing skills and expertise in land development, entitlements, zoning, real estate development, geotechnical engineering, construction management and feasibility studies.

"I have pretty much worn every hat in the development world with the exception of the legal one," he says, joking that he could probably write contracts since he has dealt with so many lawyers over the years.

Wainger has worked for leading development companies in the Washington/Baltimore area and had his own engineering consulting business. Before joining TLB Associates, he was Senior Vice President at Artery Group, LLC for more than a decade where he directed residential and commercial real estate development projects from acquisition to sales/ occupancy. Prior to Artery, he was director of Land development at Toll Brothers where he oversaw projects in Maryland and Tennessee, managing several land development managers and assistant managers as well as providing



corporate review for land development projects in Pennsylvania, New Jersey, Massachusetts and Virginia.

Wainger was land development manager at the Michael T. Rose Companies where he built single family developments and planned neighborhood developments, in Prince George's, Calvert and Montgomery counties in Maryland and Fairfax County in Virginia. He also provided land development consulting to several banks and major landholders including CSX and Xerox. Early in his career, he had his own firm, Development Consultancy Services, Inc., where he provided construction

ALUMNI PROFILE (cont. on page 13)



Wilson herself became interested in environmental science while in high school and taking an advanced course on the subject. "I became very interested in the global water crisis," she says. "When you think of all the people in the world who don't have access to clean water, it is overwhelming."

#### STUDENT NEWS (cont. from page 6)

marketplace. They hope to take a second assessment trip in January 2014.

**EWB** hosted the second annual University of Maryland ExPO: Engineering Skills Fair on September 28, 2013, in the Kim Engineering Building.

Student groups from all engineering disciplines led hands-on, interactive workshops on topics ranging from 3D printing and welding to automotive repair and power tools. The 15-30 minute sessions will gave students an opportunity to engage with one another and learn skills applicable to both engineering and everyday life.

Participating student groups included Maryland Sustainability Engineering, Steel Bridge, Concrete Canoe, Startup Shell, Society of Bioengineers, QUEST Honors Program, Terps Racing, Autodesk Student Experts, MESA, Sigma Phi Delta, Theta Tau and more.

The **Clark School of Engineering** is ranked No. 16 and recognized as one of the world's top engineering programs by the 2013 Academic Ranking of World Universities (ARWU).

The **University of Maryland** was also ranked this year as No. 38 worldwide, No. 29 in the U.S., and No. 13 among U.S. public research institutions.

Since 2003, the Center for World-Class Universities at Shanghai Jiao Tong University has published the ARWU. The rankings are based on each school's number of highly cited researchers, the number of articles published in journals of <u>Nature and Science</u>,

In fact, she experienced water issues during her biking trip in Baker City on the historic Oregon Trail. "During our stop, we couldn't drink the water there because of the possibility of cryptosporidium, a powerful pathogen," she says. "We had to go out and buy water or used water that had been boiled. This was really surprising for me. I never though you could encounter that while in the U.S."

She is considering moving out to Oregon or in that general area once her education is finished. "I want to do field work not just sitting in some office," she says.

The bike ride definitely made a difference in her own life. "I really got to see a big part of the U.S.," she says. "My favorite part was biking through the Rockies. It was so beautiful and such a rewarding experience."

She hopes to do the 4K for Cancer again someday. But currently, besides her dedication to her studies, she is preparing to compete in an Ironman Triathlon which includes swimming 2.4 miles, biking 112 miles and running 26.2 miles. She also hopes to raise money while participating in the triathlon and donating it to the Ulman Cancer Fund.

Whether it be biking across the country or working to better the water we drink, Willson is a young woman of determination. "No matter what it is, if I can make a difference, I will try," she says.

the number of articles indexed in the <u>Science Citation Index –</u> <u>Expanded</u>, the number of staff and alumni who have received Nobel Prizes and Field Medals, and per capita performance with respect to the size of an institution.

### At the end of June 2013, Maryland Sustainability

**Engineering (MDSE)** sent six members of the Sierra Leone Project team to Africa on an in-country assessment trip to investigate and collect data pertaining to three upcoming projects the organization plans to work on for Calaba Town, a small community on the outskirts of Freetown. After MDSE's successful implementation of a 1.5 kW solar-powered lighting system on the Abigail D. Butscher School in the summer of 2012, the student organization is continuing to partner with the Madieu Williams Foundation to work on engineering projects to improve the quality of life for the people in Calaba Town. Now that the school has lighting, which creates a better learning environment for the students and allows for extended use of the building, the school's next immediate need is improved water quality to keep students hydrated through the school day.

Kathryn Connolly, a senior chemical engineering student, led the team, which was comprised of CEE Professor David Lovell, professional engineer Ed Miller, and engineering students Ethan Schindel (materials engineering), Henry Ko (bioengineering), and Christopher Lawler (mechanical engineering), on the weeklong trip to Sierra Leone. The focus of the trip was on water quality testing of six water sources that could serve the school community: rain water, stream water and four natural springs.

# Payroll Coordinator Finds Work with Grad Students Most Rewarding

M. Burke joined the CEE staff in December 2012 as the Payroll Coordinator. She worked previously as a program management specialist in Human Resources for the Institute for Bioscience and Biotechnology Research (IBBR) in Rockville, MD.

Burke has experienced an involved career and recently talked about her lengthy career on and off campus.

I am originally from Eberbach, Germany. I am a naturalized United States citizen, and I grew up in Potomac, Md. I majored in history at the American University because I was interested in law. The first company I worked for was EG&G and I provided research support to engineers. EG&G was a government contractor firm, supporting the Naval Sea Systems Command (NAVSEA). Over the course of 3 or 4 years, I changed career paths, focusing on preparing and executing budgets for two NAVSEA defense programs (surface ship and submarine warfare). That was very exciting work. Eventually, NAVSEA hired me, in a program called 50/100 contractor conversion. The government hired 100 contractors in 50 days. I was one of the lucky ones hired through the program.

In 1993 with the birth of my second child, I decided to stay-at-home with our children. With the exception of substitute teaching, I focused on my family and my children's school activities for several years, deciding to return to work in 2008. I decided that human resources would be a good fit because I thoroughly enjoy working with people; and I was offered a job at the University of MD, Biotechnology Institute (UMBI, Rockville, now IBBR). I decided to transfer on-campus because I felt there were more opportunities to learn new things here, to grow professionally. And I like the academic environment.

I have two children, Emily and Patrick. Emily graduated from Towson University in 2012 and works for Sheppard Pratt in Towson, Md. She lives in Fells Point (Baltimore). Patrick is a junior at Towson University.

I love gardening, reading, bird watching, walking my dog, and travel.

I like CEE very much. The staff is very hardworking, and the faculty approachable and easy to work with. I interact with a lot of grad students, one of the favorite parts of my job.



### ALUMNI PROFILE (cont. from page 11)



management, geotechnical and environmental engineering, quality control and surveying services. Projects included such facilities as NASA, Walter Reed Medical Center and the Reagan and Dulles Airport; among others.

His work at TLB Associates has brought him back to engineering consulting but he is still building, in this case growing a company.

"I like building," he says. "That's what I've wanted to do my whole life. And I have had the chance to do this with several companies. I have found contentment in building a house where people live or an office building where they work. There is a sense of finishing a project and knowing it is yours. I can't imagine doing anything else."

But throughout his career, he has never forgotten Professor Witzcak.

"He is a phenomenal man. He did something for me, so I wanted to do something for him," says Wainger. valuable and sophisticated design and simulation tool for course work, research, academic projects and team-based competitions.

This in-kind grant from Siemens gives students and faculty access to the same technology that companies around the world depend on every day to develop and manufacture innovative products in a wide variety of industries, including automotive, aerospace, biotechnology, machinery, shipbuilding and high-tech electronics, among others.

UMD students and faculty will use the software in courses and research related to robotics design, bioengineering, space systems, product engineering, manufacturing and systems life cycle analysis. Student groups will use the software in their efforts to compete in national and international competitions, including the Terps Racing Formula SAE and Baja teams, and teams participating in NASA's X-Hab and Lunar Wheel Design competitions.

Access to the software will also help students to advance their professional careers after they complete their degrees. Graduates with Siemens' PLM software training are highly sought after by corporate recruiters seeking candidates for advanced technology jobs.

"Our students will benefit tremendously from using Siemens PLM software for course work, special projects, and international competitions, and their experience with the software will help them succeed in the workplace as graduates," says Dean of UMD's A. James Clark School of Engineering and Farvardin Professor of Aerospace Engineering Darryll Pines.



On July 25, 2013, Professor **Gerald Galloway** testified before the U.S. Senate Committee on Energy and Natural Resources on the "Aging US Water Infrastructure: A Badly Neglected National Problem." Galloway, an outspoken advocate for our nation's water resources and regular consultant for a number of national and international government organizations, made a presentation on the current challenges the nation faces with its water infrastructure.

In his presentation to the Senate Committee, Galloway discussed the current state of our country's water infrastructure, the extent to which it supports our society, and how it is consistently underfunded and overlooked. He identified the primary areas of concern facing our water resources, including an aging infrastructure, a changing climate, increasing energy demands, a lack of funding and a short-sighted view on the importance and cost of repairs.

According to Galloway's report, the U.S. contains 87,000 dams, 40,000 miles of levees, over 8,000 miles of irrigation canals, 54,000 drinking water systems, over 14,000 municipal waste treatment facilities, 12,000 miles of commercially navigable channels with over 200 locks, and almost a 1,000 commercial and smaller ports and harbors.

Despite the wide scale use and economic value of this infrastructure to the U.S. economy and U.S. residents, this extensive network averages only an overall D+ grade based on the American Society of Civil Engineers' (ASCE) 2013 Report Card for America's Infrastructure. This ASCE report card grades the current state of national infrastructure annually on a scale of A through F.

Galloway also reported ASCE's estimate that funds in excess of \$3.6 trillion dollars would be needed to correct deficiencies and modernize existing water and other infrastructures, much of which was built in the early part of the last century and is reaching the end of its projected life span. However, based on historical funding for these types of projects, there would be a \$187 billion dollar funding gap over the next seven years between the funding needed versus the funding granted.

FACULTY PROFILE (cont. from page 9)

are taking advantage of the technology that is available to us now."

His research has resulted in numerous papers and books and conference presentations.

Schonfeld is a Fellow of the American Society of Civil Engineers and of the Institute of Transportation Engineers. He has been editor of the Journal of Transportation Engineering and of the Journal of Advanced Transportation. He has chaired the publications committee of ASCE's Air Transport Division, among various other committees.

"I am very fortunate," says Schonfeld. "I've been here at the university close to 36 years. I have had the opportunity to do mostly the kind of work I like. I have the opportunity to work with extremely good students. My career has been quite interesting and satisfying." ALUMNI NEWS (cont. from page 10)

**Gregory Harrison** graduated with a bachelor's degree in fire protection engineering in 1966 and a master's degree in environmental health engineering in 1970. He writes that "I was the very first to get this degree, and I was the very first graduate student at the Maryland engineering school to obtain a M.S. on a non-thesis program." Adding, "I went on to receive an M.S. from GWU in engineering management, and. I eventually received a PhD. in safety engineering." He now does forensic engineering in private practice. Besides his work, "I have a third degree black belt in taekwondo and perform professionally as a jazz clarinetist with two performances at the Kennedy Center," he writes.

### **ENCE 302**

### ENCE 302 – Probability and Statistics: Former Student Talks about His Own Experience in Course



According to Professor Bilal M. Ayyub, who teaches ENCE 302 – Probability and Statistics for Civil Engineers, the objective of the course is to develop the ability of students to deal with uncertainty in engineering and perform probabilistic modeling, statistical analysis, including regression analysis and statistical decision making.

More specifically, he explains, "The educational objectives are establishing an understanding of the nature of uncertainty in engineering; performing applied probabilistic modeling of engineering systems; interpreting results of probabilistic and use them in decision making; analyzing data and computing descriptive statistics; testing hypotheses and computing confidence intervals for decision making; assessing the reliability of engineering components; performing Monte Carlo simulation and communicating results using formal reports."

David Webb took the course several years ago and is now a Ph.D. student in the reliability engineering program. He recently offered talked about his experience with the course.

## What was your impression of ENCE 302?

The course was somewhat challenging, but interesting. It covered engineering in a different context than most of the courses I had taken up to that time and reinforced the idea that engineering design does need to account for variability. 302 also involved a fair amount of mathematical theory in dealing with the basics of probability and statistics, which was a slight change of pace from other undergraduate courses, where the physical theory behind design was the predominant focus.

What was the most rewarding aspect of 302 and why?

I think the most rewarding part of **302 was learning a valuable tool** set for future engineering study. I planned on attending graduate school even as an undergrad and knew that any research I did would more than likely require some statistical analysis. Getting the basics of techniques such as hypothesis testing, regression, and simulation methods made my transition into grad school much smoother. Having a solid foundation of basic statistics made the portions of my research related to statistical analysis far simpler and the need for such analysis easier to understand.

What was the most challenging of ENCE 302 and why?

The most challenging part of ENCE 302 for me was the fact that the course was less physics based than others. Up until ENCE 302 most of my classes in the engineering school were focused on design and analysis using codes or physics based approaches. 302 however focused on probabilistic and statistical approaches used in engineering. I had taken some classes related to those topics in the past however they were purely math courses. Seeing statistics applied to engineering design took some getting used to.

How do you feel ENCE 302 will impact your further education and why?

After taking ENCE 302 I went on to take several other courses related to similar aspects of engineering such as risk analysis and uncertainty modeling in the civil program. Eventually I ended up in the reliability engineering program at UMD which is heavily based on statistical and probabilistic methods.



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