



John Underwood

On My Mind

In this issue of *Civil Engineering Impact*, we are focusing on the topic of entrepreneurship. Profiles of a number of our successful alumni are included, along with information about new educational approaches to prepare our students for the workplace. Whether our future graduates create their own companies or contribute to civil engineering projects in larger companies or governmental agencies, we hope their time spent at Purdue will inspire personal and professional excellence.

Please enjoy reading about our students, faculty, staff, and alumni in the pages to follow.

M. K. Banks

M. Katherine Banks

Professor and Bowen Engineering Head of Civil Engineering

Civil Correspondence

Boilers in Iraq

Last April, two Purdue alums, Robert Kmetz (BSCE '05) and Yongzhe Wang (BSTech '07), sent greetings and news from Iraq. Wang writes, *"We've been in Iraq for about three weeks now and already went out on numerous missions. We spend a lot of time on the road providing security for supply trucks, and we operate mainly in northern Iraq around Mosul and the Kurdistan area. It's been a very interesting experience for me so far, but I still miss my friends in the States very much."*

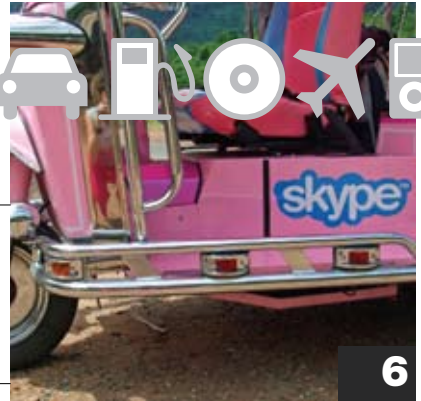
Robert Kmetz (left) and Yongzhe Wang.

Send your e-mails to peimpact@purdue.edu





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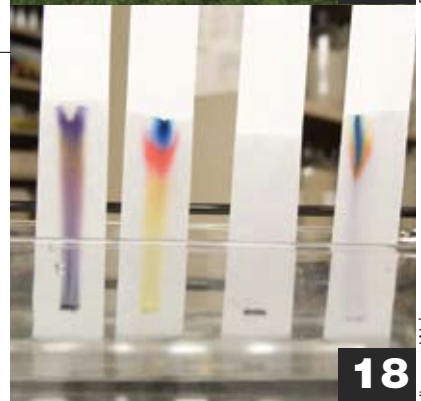
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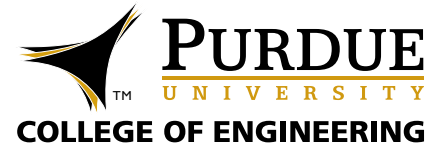
Calendar 2008

August		
15	Purdue at the State Fair	Indianapolis
September		
6	Purdue vs. Northern Colorado	Purdue
13	Purdue vs. Oregon	Purdue
20	CE Freshman Tailgate Purdue vs. Central Michigan (Band Day/Family Day)	Purdue
October		
4	Purdue vs. Penn State	Purdue
23	CE Scholarship Banquet	Purdue
25	CE Homecoming Breakfast Purdue vs. Minnesota	Purdue
November		
1	Purdue vs. Michigan	Purdue
22	Purdue vs. Indiana (Hall of Fame)	Purdue
December		
21	Commencement Reception	Purdue



Cheryl Kerker

Alumni, faculty, and students enjoy the 48th Annual CE Golf Open at Purdue's Birck Boilermaker Golf Complex. This annual event is held at the end of each year to give graduating students an opportunity to network with our corporate partners and alumni, as well as with Purdue faculty and staff.



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Vincent Walter

Kumares Sinha, the Edgar B. and Hedwig M. Olson Distinguished Professor of Civil Engineering, advises Jung Eun Oh (PhD '08), who is bound for a job at the World Bank.

Milestones and Career Starters

A named professor is elected to the National Academy while one of his students lands a prestigious spot at the World Bank.

This past February, the National Academy of Engineering elected Kumares Sinha, the Edgar B. and Hedwig M. Olson Distinguished Professor of Civil Engineering, into its society. It's a high honor indeed for the professor who's been at Purdue for 32 years and has served as the director of the Joint Transportation Research Program for the last dozen years.

"Election to membership in the National Academy of Engineering is one of the highest distinctions that can be bestowed on an engineer," says Leah Jamieson, Purdue's John A. Edwardson Dean of Engineering and a 2005 academy inductee. "Professor Sinha was elected for his contributions to the advancement of highway infrastructure engineering and management and to the education of transportation professionals worldwide."

Sinha's research on system performance, costing, and network optimization are used worldwide and have been adopted in pavement, bridge, and safety management systems developed by the U.S. Army Corps of Engineers, Federal Highway Administration, and National Research Council.

He received his bachelor's degree from Jadavpur University in India in 1961 and his master's and doctoral degrees from the University of Connecticut in 1966 and 1968, respectively. Sinha was named an honorary member of the American Society of Civil Engineers (ASCE) and was honored by various other organizations. He is the editor-in-chief of the *Journal of Transportation Engineering*, and he has served as a consultant for the World Bank for more than two decades. He also served as president of the Transportation and Development Institute of ASCE and has mentored more than 200 masters, doctoral, and post-doctoral students around the world.

continued on next page



“I am humbled by this honor because the recognition comes from my peers,” Sinha says. “Purdue is known for its outstanding engineering programs, and it’s gratifying to be part of this team.”

Oh, the Places She’ll Go

When Civil Engineering graduate Jung Eun Oh (PhD 2008) left Purdue in May, she headed to a prestigious position with the World Bank. Oh, who specializes in transportation and infrastructure systems, studied with Sinha. She focused on transportation economics

and policymaking, with the goal of improving daily life by providing better transportation policy. To better understand her subject, Oh also completed a master’s degree in economics at Purdue. She will now apply her interest globally through her position with the World Bank.

Oh was one of 30 or so students chosen from among 10,000 applicants for the World Bank’s “Young Professionals Program.” During the initial two-year assignment, she will work in the Transport Sector and be

in charge of the European and Central Asia region. The sector is in the organization’s Sustainable Development area and handles transportation issues as they relate to improving the quality of life in developing countries.

“I am very excited about this opportunity, where I will be working in an extremely international work environment, be exposed to new experiences, and have influence on people’s well-being,” Oh says.

■ **Linda Thomas Terhune and Clyde Hughes**



Vincent Walter

Meet Max: One need only visit Max Bales, the new director of development, in his office in the Civil Engineering Building to realize that here works a Boilermaker who must truly bleed old gold and black. Having grown up in Bloomington, Indiana (of all places!), Bales knew he was destined to attend Purdue. He graduated with an agronomy degree in 1989. Now, nearly two decades post, Bales has returned to his alma mater in what he describes as a dream position. “My goal was to someday come back here and be in a leadership position,” says Bales, who most recently worked in development at Virginia Tech. “This is a great opportunity as our civil engineering alumni are very loyal.”

His philosophy on philanthropy? “I’m trying to help those alumni who want to build their legacies at Purdue,” he says. “We talk a lot about naming opportunities and dollars, but I think the thing that we do best is make partners of our alums. Once someone has decided to partner with us, we’ll find an opportunity to do that, big or small.”



Dulcy Abraham

Faculty News

Dulcy Abraham received the Ross W. and Edith H. Buck Award for excellence in undergraduate counseling.

Professor Emeritus **Dan Halpin** was recognized as a Distinguished Civil and Environmental Engineering Alumnus of the University of Illinois in Chicago at the Union League Club this past February.

“Evaluating Static Segregation Resistance of Hardened Self-Consolidating Concrete Using Image Processing Technology” earned the Transportation Research Board’s (TRB’s) K. B. Woods Award for its authors Chuanxin Fang of Applied Research Associates, Inc., Illinois; and **Samuel Labi** of Purdue.

Santiago Pujol won the Edmund M. Burke Outstanding Civil Engineering Professor Award.

Jason Weiss received the Harold Munson Award for outstanding teaching. He was also named a 2008 Purdue Faculty Scholar, one of seven selected this year from the College of Engineering.



Dan Halpin



Samuel Labi



Santiago Pujol



Jason Weiss

Portraits by John Underwood



Monica Prezzi



Amit Varma

Promotions

From assistant professor to associate professor: **Monica Prezzi** and **Amit Varma**.

From associate professor to professor: **Antonio Bobet** and **Robert Frosch**.



Antonio Bobet



Robert Frosch



Seeing

Through a grant and the use of case studies, a Purdue research trio is turning the classroom into a real-world training arena for business-minded engineers.

By Gina Vozenilek



Professors Joe Sinfield (left), Robin Adams, and Aman Yadav collaborated on the award-winning Engineer of 2020 grant.



20/20

They say hindsight is 20/20, but in the eyes of the School of Civil Engineering, clearer vision will come with foresight and planning. An interdisciplinary team of thinkers is hard at work utilizing a grant from the Purdue Engineer of 2020 Seed Grant Funding Program. The program responds to the call of the profession to prepare future graduates to succeed in an increasingly complex work environment.

That team is composed of representatives from three complimentary backgrounds: Joe Sinfield, assistant professor of civil engineering; Aman Yadav, assistant professor of educational studies; and Robin Adams, assistant professor of engineering education.

Adaptive Expertise

The three members of the grant team were having lunch to discuss how to best serve the educational needs of their engineering students, when, according to Sinfield, “one point kept resonating with us—adaptive expertise. We wondered: When does what you learn in one context become transferable to other inevitable contexts?”

continued on next page



Vincent Walter



Engineering students spend a lot of time poring over books that feed their need for technical information. But once they leave the books and the predictable environs of school, these new engineers will enter an “ever-changing, interdisciplinary field,” according to Yadav. More than just book brilliance, says Yadav, “Engineers will need to have entrepreneurial skills. We argue that using case studies would be a good way to allow students to experience these complexities.”

Sinfield also believes that the engineer of the future will be more successful the more adaptive he or she is. “Technical skill and talent are on the rise, but that technical skill has the potential to be commoditized,” he says. Sinfield and his team are developing core case content for students to pursue open-ended problems. A one-time management consultant himself, he looks to the business side of engineering to find interesting and compelling case studies. “The case method is broadly employed in business and law school,” Sinfield says. “Engineers traditionally do not have significant exposure to this kind of learning, especially in settings that bring together perspectives on technology, business, and society.” So in the fall he launched CE 597B, “Entrepreneurship and Business Strategy in Engineering,” to help the students grow their professional skill sets.

“Why was the iPod so successful?” Sinfield asks, illustrating an example of a case that teaches students to think about the end product of entrepreneurship-driven thinking. The iPod was not the first of the MP3 players, so Sinfield encourages students to puzzle over what made this particular permutation of the technology catch on. He gets them asking questions that a business major might: “What was the iPod’s appeal? Ease of use? The marriage of technology and software? Aesthetics?”

Sinfield’s students become immersed in a project-oriented class and gain practical experience about being resourceful, managing uncertainty, and merging their talents with the needs of society. Sinfield plans to use the course as a test-bed for the case studies that will be developed through the Engineer of 2020 grant and will roll out in the fall.

“Success in any field,” says Sinfield, who himself has earned success as an entrepreneur, an engineer, and an educator, “is about well-structured, organized thinking.”

In With the New

The Engineer of 2020 grant aims to stimulate a new vision of engineering education, and although getting from here to there will not be an overnight journey, some first steps have already been taken. Adams clarifies that case-based learning has a pre-existing foothold in the engineering education tradition: “Case-based and problem-based learning are well established in engineering education—particularly in the areas of professional ethics and science concepts. As such, the pathway to including new cases in engineering classrooms exists and can be leveraged. What have been lacking are cases that represent new ways of understanding entrepreneurship and interdisciplinary thinking.”

The shift to more case-based learning for engineers hinges on this interdisciplinary open-mindedness, right down to the metaphors educators like Adams use to discuss the





concept. When Adams talks about developing good “stories” for engineers to explore, old ideas of the numbers-driven, formula-dependent engineering mindset begin to give way. But good stories of any kind are not easy to write. “A considerable level of work needs to go into creating a ‘story’ based on real experiences that allow students to delve deeply into important aspects of the case,” Adams says.

Adding legitimacy and relevance to these educational engineering narratives is the team’s interface with industry. “Our relationship with industry partners is a real strength of our project,” Adams says. “While we will likely develop a case from existing stories, such as the development of the iPod, most of our cases will emerge from people we personally know. This provides us the opportunity to play an active role in eliciting information about the case [rather than relying on existing resources]—in particular, eliciting information that might challenge some ideas about entrepreneurship and encourage new ways of thinking.”

An additional challenge is how eventually to prepare other engineering professors with the tools they need to implement these general principles in their own classrooms. “Personal experience has shown me that broadening the base of people interested in using cases in their classrooms is very possible. Many faculty are looking for ways to bring in more contemporary ideas but lack the resources for creating such curriculum,” Adams says. “However, while I anticipate interest, I should note that using cases in classrooms is a very different style of teaching than lectures.”

As it is, professors are strapped for minutes when it comes to navigating their syllabi. Case-based learning

will not replace all classroom experience, but faculty will be given support to learn how to weave open-ended education into the experience of Purdue’s young engineers. “We plan to offer workshops for faculty to learn about the cases, how to use them, their impact on learning, and lessons we’ve learned from using them in specific classes. In this way, we hope to build a collaboration network with those who are at the heart of making decisions about teaching.”

Not Just Engineering’s “Softer Side”

If the new methods proposed for teaching the Engineer of 2020 sound like they are out of the playbook of the College of Liberal Arts and the Krannert School of Management, that’s intentional. Educators like Sinfield, Adams, and Yadav see great value in the intellectual cross-pollination of their students to prepare them more globally for their careers. At the same time, the process by which these new methods will be implemented will be rigorous and researched.

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“Piloting these cases for their effectiveness is part of this process—and is quite time consuming,” Adams says. She explains the team’s plan to pilot the cases in a variety of venues that differ in scale (very large classes to more intimate classroom settings), focus (freshman year to specific disciplines), and intended learners (freshman to seniors). The team will study the variations and find out how their cases work in different situations. From there, they will develop an understanding of how the curriculum they develop could be used broadly across campus.

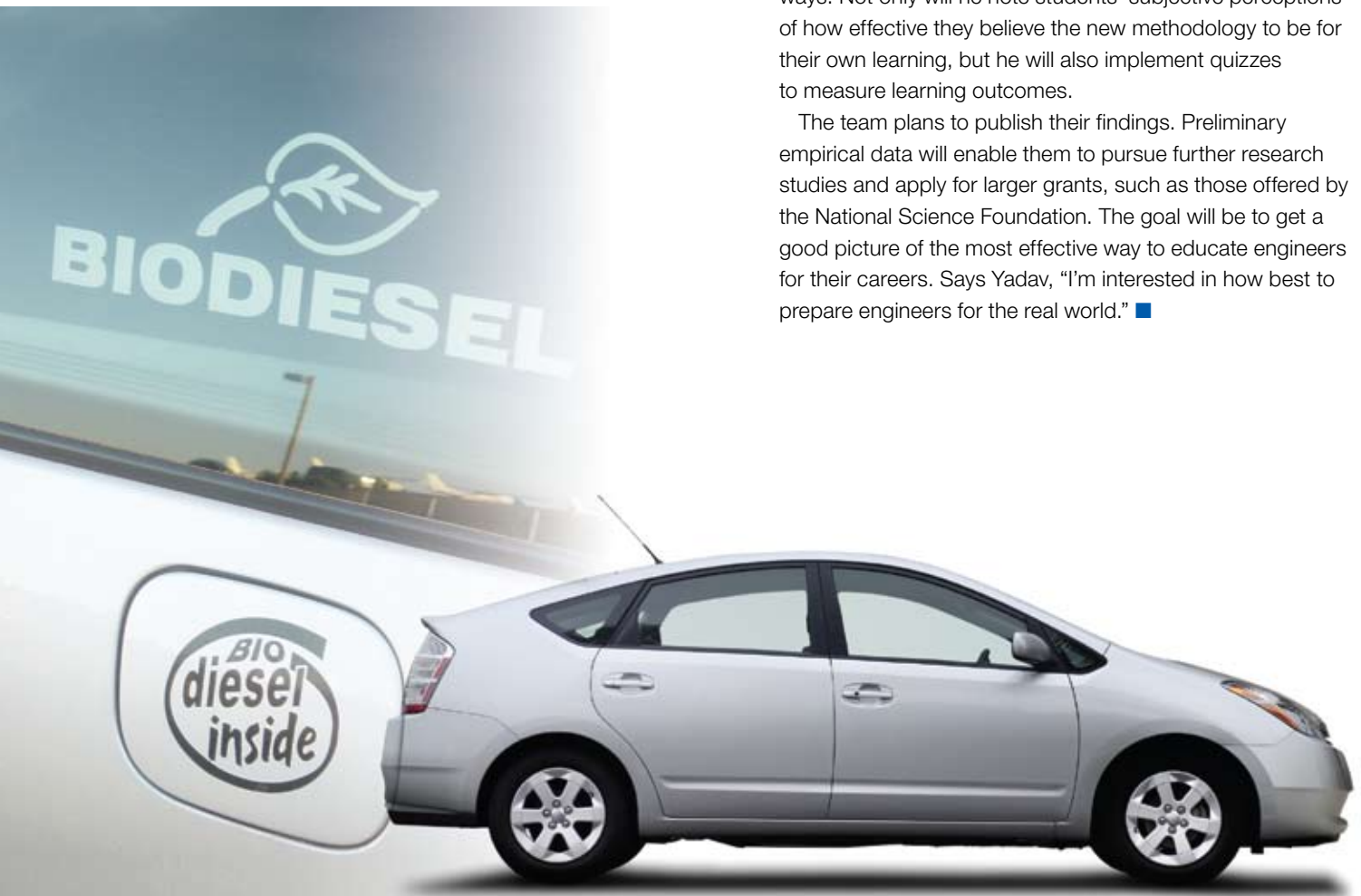
They predict it will catch on. In fact, case-based classroom engineering is already proving to be a popular and well-received innovation. Initial feedback from students

who took Sinfield’s new course was highly positive. Could the new pedagogy be...fun?

“Students will get to play around with what engineers actually do,” says Yadav, who will contribute his expertise in instructional design and research. But “playing around” won’t be all fun and games. “We’ll be looking to see if their analytical skills develop,” he says.

Yadav is working out rubrics for assessing the effect that the case-based classroom approach will have on its students. “We want to know if this new approach has a positive impact on conceptual understanding and problem-solving skills,” Yadav says. As he designs his assessment tools, Yadav plans to measure performance a few different ways. Not only will he note students’ subjective perceptions of how effective they believe the new methodology to be for their own learning, but he will also implement quizzes to measure learning outcomes.

The team plans to publish their findings. Preliminary empirical data will enable them to pursue further research studies and apply for larger grants, such as those offered by the National Science Foundation. The goal will be to get a good picture of the most effective way to educate engineers for their careers. Says Yadav, “I’m interested in how best to prepare engineers for the real world.” ■





Happiness Is a Warm Place and a Good Bottom Line

An entrepreneurial alumna shares her business success story.

By the time we entered the 21st century, there were nearly 50,000 engineering services firms, employing more than 850,000 workers. Thinking about all the engineers-turned-entrepreneurs who lead these companies reminds me of the commercial about NCAA athletes who “will go pro in something other than sports.”

January marked the 25th anniversary of my civil engineering firm EMCS, Inc. I graduated from Purdue, worked for a Wisconsin-based consulting firm, and obtained my P.E. before founding EMCS. My parents raised me with the entrepreneurial gene. Long before arriving at the School of Civil Engineering, I knew what a balance sheet was, that you need a sales goal, and that your people are your most important business asset.

In engineering, this is especially true. My company wouldn't have the reputation it has today without our talented and dedicated engineers and people who support them. Nothing makes success more challenging than to have to work against people, or within a system, where the “vision” is not shared. As a business owner, you must be prepared to invest in your people: training, perks, and spending personal time with them (one-on-one) to know what they need to be successful. If you can't show that you value them and can't provide opportunities to challenge and inspire them, they soon won't be working for you—or worse yet, they'll be working against you.

Entrepreneurship requires a host of skills in addition to those learned in the engineering classroom. In my first three years in business, I earned my MBA. Not officially, but that was when I developed my first business plan, formed a chart of accounts, and chose between a cash-basis and an accrual-basis accounting system. I also established a line of credit, a cafeteria-style employee benefit program, and a pension plan and obtained business insurance, including professional liability insurance.

Entrepreneurs wear lots of hats. Your job includes planning, goal setting, tracking, and monitoring both projects and the bottom line. When you get started, you are the sales department, the human resources department, the copy center, and the janitor. You get to work long hours: “24/7” thanks to e-mail, the Internet, and the time you spend on your pillow (wide awake practicing your collection calls, marketing presentations, employee “lessons,” and explanations for your banker). You get to learn that there are cycles in business and “this too shall pass.”

There is a silver lining. While studying engineering, you gained two of the most important skills an entrepreneur will need to be successful. Engineers are pros at problem solving and resourcefulness. There isn't an academic curriculum that does a better job of birthing great thinkers who can deliver great solutions.

Port Washington Road Bridge, Milwaukee County, Wisconsin.



Photos courtesy of EMCS, Inc.

Rosalie Morgan, BSCE '77, P.E.

I remember when we hired our four first new grads in 1990. An exciting milestone: to have reached the point of having the project delivery structure in place to effectively develop these young engineers. We helped them transition from the classroom to balancing project schedules, budgets, and client expectations as they continued to gain experience. My greatest satisfaction has come from impacting the lives of young people and seeing them grow with the many successful projects our team has delivered.

■ Rosalie Morgan, Owner, EMCS, Inc.





Bringing the Heat to Bowen Lab

With his breakthrough research on large floors and full-length columns, a structural engineer is gaining a greater understanding of a building's overall fire-structure stability.

The square footage alone—some 66,000 feet—allows for big-time testing in Purdue's Robert L. and Terry L. Bowen Laboratory for Large-Scale Civil Engineering Research. From the 32-foot building model tested for its resistance to earthquakes to the numerous projects that call for a large-scale look, Bowen Lab facilitates big breakthroughs. But for Amit Varma, an associate professor of civil engineering, his Bowen research space is yielding results that are downright


hot. And should we use the parlance of sports writers, you might even say that this researcher is on fire.

Ushered into the 21st century as we were with the images of the twin towers of the World Trade Center collapsing upon themselves, the interest in fire-structure stability has likewise exploded. Builders want to know: Is my structure safe? Will it be adequate in a design-level fire? And Varma's sponsors—the National Science Foundation, the National Institute of Standards and Technology, and the American Institute of Steel Construction among them—are more



Vincent Walter

Professor Amit Varma (seated) is leading a group of graduate students in learning more about how buildings burn.



than just funding sources. They're eager to find those answers.

For Varma, the answers are being found in a cutting-edge, fundamental approach that takes into account the whole building's stability, not just columns or small sections. "We're evaluating the performance of building structures under a realistic fire loading," he says. "This is a multidisciplinary field of structure fire interaction. It involves mechanical engineers who work in the field of combustion, computational fluid dynamics, and heat transfer analysis, along with structural engineers who are experts in experimental behavior of structures and collapse and the stability analysis of structures."

As compared to how buildings stand up in other extreme events, such as earthquakes or dangerous winds, the understanding of structural fire design in the U.S. has been somewhat limited, according to Varma. "It's not that it hasn't been good," he explains. "It's just that the technology is not based on a fundamental understanding of structural behavior and collapse."

To get at that better understanding, Varma designed a large-scale experiment specifically for use in Bowen Lab. Using a radiation-based heating system, which Varma compares to an electric stovetop that many of us use in our kitchens, his team can literally bring the heat to an entire floor system measuring 100 square feet.

An open flame would be much harder to control, not to mention particularly dangerous in a structure's lab. The radiation-based heating, however, actually allows the researchers to apply heat, and more of it, in a very confined setting. And as a structural engineer intent on gaining a physical understanding of how things fail, this close proximity and hands-on research is a great aid that pinpoints where both the failure initiates and how it propagates.

Over the next four to five years, Varma, with up to five PhD students, will perform various experiments on columns, subsystems, and composite beams, as well as floors. It's all work that will have been bolstered by state-of-the-art computer simulations they've done over the past year. "We use the results of the simulation to define our experiments," he says. "The purpose of the simulation is to find out how the building behaves and what its weakest link is."

If Varma can make the weakest link stronger, the overall structure can be improved. "A building is not a single column," he says. "Our experimentation is focusing on a more fundamental understanding of a building's overall performance."

And as Varma and his group build on this better understanding and predictability, the stronger, safer buildings are sure to rise and even stand tall in case of disasters. ■ **William Meiners**

World Shakers

Bowen's renowned earthquake specialists look to minimize the damage of temblors.

They come from all over the world and perhaps, not without coincidence, from areas that have been devastated by deadly assaults from Mother Nature's big hammer. But when it comes to speaking about the structural impact of earthquakes, you'd be hard pressed to find a group of more knowledgeable experts anywhere beyond Purdue's Bowen Labs. Michael Kreger, a professor of civil engineering, is the Bowen Lab director. Santiago Pujol and Julio Ramirez, an assistant professor and a professor of civil engineering, respectively, have significant experience in earthquake analysis and structural design. And Mete Sozen, the Kettelhut Distinguished Professor of Structural Engineering, foresees such devastation in his homeland of Turkey that he, along with a team of international experts, has suggested that the city of Istanbul build a second, satellite city.

"It is exciting to think about building a new city using completely new technologies," Sozen says. "It would use modern information technologies and be environmentally friendly. It would be safe, secure, and modern. But more important is that this city would provide a refuge and emergency services in the event of an earthquake."

Istanbul, which lies just north of the North Anatolian fault, is at high risk for a major earthquake within the next 20 years, Sozen says. ■ **Clyde Hughes and Emil Venero**



Big Brother on Campus

With his eye on the prize of a master's degree in civil engineering, Daniel Salazar plans on making a difference in the world he lives in.

At first glance, you might think that Daniel Salazar (BSCE '07), staff resident of Cary Quad, is just another grad student making his way through one of the most famous residence halls of Purdue. But you'd be wrong. Salazar's world view resonates far out from these hallowed halls, where he dreams of a world of engineers helping those less fortunate in a global economy.

Born in New York City to Colombian parents, Salazar brings an international perspective to almost everything he does. His father's job took the family from the Big Apple to Colombia before Salazar turned 8, so the banker's eldest son continued his education in South America through the age of 18. "I hold two passports, have worked in the U.S. and Colombia, and have even voted for presidents in each country," Salazar says. "I feel fortunate that I happened to have been born in America and experienced both cultures."

Always interested in bridges, architecture, and how things are built, Salazar sought out the best schools internationally to further his education. This research led to his discovery of the out-

standing reputation of Purdue's School of Civil Engineering. With a Purdue bachelor's degree in hand, he now expects to earn his MSCE in May 2009. True to his first engineering love, Salazar has an emphasis in structural design.

But it's not all structures and designs for this civil engineering student. Salazar is interested in the structure of a good family life as well. Perhaps missing his two little brothers back home, Salazar found fun and fulfillment through the Big Brothers/Big Sisters Program of Wabash Valley. Since 2005, Salazar has been paired with two "little brothers": boys now 12 and 7. "I have always had a great rapport with kids," Salazar says. "It probably comes from spending so much time with my own younger brothers."

And beyond the rapport and friendship Salazar can offer, he knows his "tangible impact on the individual and the community" keeps him involved in the Big Brother Program. "It's being a constant that's important," he says. "It's a constant support system, much like parenting."

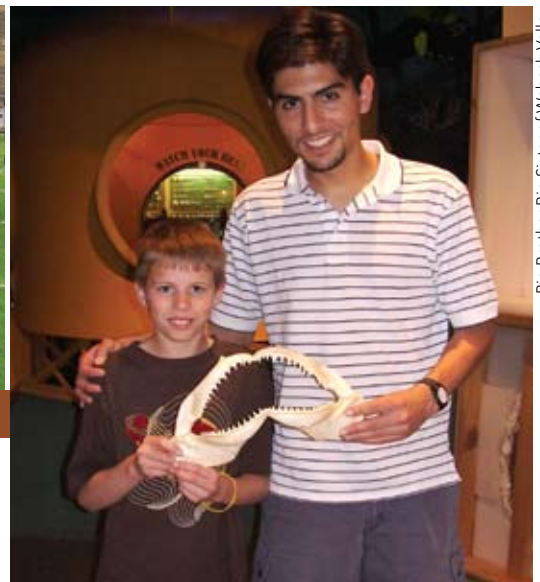
As he looks toward his professional and personal future, Salazar hopes to

maintain that impact on both individuals and community. This summer, he's working for CH2M Hill, a Denver-based engineering consulting company he could see himself joining full time after graduation. It's the scope of the company's projects that intrigues Salazar the most. "Although headquartered in Colorado, CH2M Hill sends out their engineers wherever they're needed globally," Salazar says. He likens the CH2M philosophy to the "Doctors Without Borders" program.

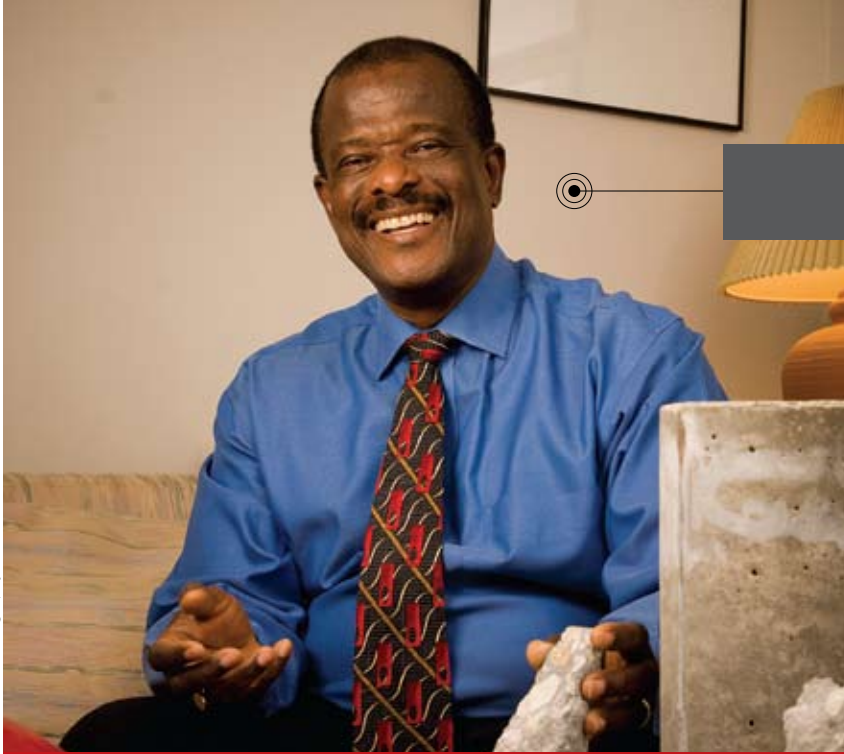
CH2M's projects could range from the design and implementation of a clean-water well to the development of a much-needed bridge benefiting the infrastructure of an entire community and much beyond. And the company's commitment to bettering humanity through engineering appeals to the like-minded Salazar. To engineer a better way. To make a difference in the world. To impact a single life in a positive way. These are the motivations of a global-thinking graduate student determined to leave his mark on the world. So goes the path of Daniel Salazar, a big brother on a mission. ■ **Linda Hupp**



Daniel Salazar and "little brothers" Aaron (above) and Timmy (right).



Big Brother/Big Sister of Wabash Valley



Ebow Coleman (PhD '81) built a business out of his concrete expertise.

up close: alumni

Concrete Plans

An entrepreneur's path is seldom set in stone—
even in a field as specialized as cement production.

After earning his BS in chemistry from Kwame Nkrumah University of Science and Technology in Kumasi, Ghana, Ebow Coleman (PhD '81) had an idea. A new cement plant was being planned for construction in his native country, and he wanted to ensure the plant had the proper expertise on board from the start. So, being the self-assured and enterprising man that he is, Coleman traveled to Prague's Institute of Chemical Technology and enrolled in a master's program in Cement Production Technology. Upon completion, he planned to return to Ghana so he could bring his newfound knowledge to the fledgling cement plant.

Instead, he ended up in West Lafayette.

"I had every intention of returning to Ghana," Coleman says. "But the more I immersed myself in my studies, the more I realized I had more to learn. Then I was presented with the opportunity to travel to the United States and enroll in a PhD program at Purdue. I couldn't resist."

Seizing opportunities represents a common thread in Coleman's life. From Ghana to Prague to Purdue, he carefully surveyed the options at each stage of his academic career and chose the path that would result in the greatest return—perhaps a trait inherent to an entrepreneur's DNA.

Coleman cites Purdue's close-knit civil engineering school and valuable mentorship from several professors, including Sidney Diamond and Bill Dolch, as major influences in his doctoral years. With a broad understanding of advanced methodologies in concrete and cement production, Coleman departed Purdue in 1981, once again in search of that next big opportunity.

Venturing southwest from Indiana, Coleman landed a job in Tulsa, Oklahoma, designing cements for specialty applications. But after nearly a decade in a corporate setting, his doubts continued to mount, and he began looking for a way out. "I didn't see a real opportunity for upward mobility, working in that world," he says. "Plus, I suppose I'm just a very self-directed person, an independent person. I knew

I possessed the knowledge and training to do this type of work on my own, and that idea appealed to me greatly."

And so Coleman struck out to Houston, Texas, and founded his current company, C3S, in 1991 (the company's name is derived from the chemical formula for tricalcium silicate, the principal component in the world's most widely used construction material). At first, the going was tough, and Coleman employed exactly one person: himself. But over time, his business grew, and he managed to lay inroads with large construction firms like Bechtel, as well as government agencies like the Port of Houston. His staff grew to eight, and C3S consulted on projects not only in the U.S. but Equatorial Guinea, Angola, and Peru as well.

"Our main goal," he says, "is to help clients build quality upfront so they can avoid extensive repair costs down the road." And the higher the stakes of a project, the greater the need for C3S. "The capital projects we consult on run from several million dollars to upwards of billions. That kind of investment makes it absolutely critical to carefully monitor the processes at each stage and employ the correct materials dependent upon the environment in which they're being placed."

Coleman has certainly come a long way since his youth in Kumasi, and he never could have predicted his current situation. Reflecting on the past 30 years, he says "I've always felt that flexibility with regard to my time was extremely important. That's one thing that drove me to start my own business. And now that I've been consulting with C3S for more than 15 years, I enjoy the challenge of facing the market and trying to win my share of the business."

Enjoying the challenge. Perhaps another trait inherent to the entrepreneur.

■ Patrick Kelly



CEAAAs Honored

Civil Engineering presented six new Civil Engineering Alumni Achievement Awards this past April.



John Underwood

The 2007-08 Civil Engineering Alumni Achievement Award recipients (from left to right): Susan Hida, Lester Hunkele, Thomas Doran, Willis Conner, Philip Stutes, and Anne Bigane Wilson.

Selected in 2007, six high-achieving alumni returned to Purdue last April to be honored as the latest recipients of the Civil Engineering Alumni Achievement Awards (CEAAA). Their brief bios follow.

Willis “Rick” Conner (BSCE '76), president and CEO of American Structurepoint, Inc., spent most of his childhood building and tinkering with just about anything with mechanical possibilities. Recognizing this talent, his father encouraged him to pursue engineering—a career Conner began at age 16, working part time as an apprentice drafter, blueprint boy, and deliveryman at the very company that would eventually name him president. He has been highly involved in such distinctive projects as the I-70

interchanges at the new Indianapolis International Airport, Super 70 and Hyperfix in downtown Indianapolis, the “Speedzone” urban redevelopment in Speedway, Indiana, the 15-story S&L Data Building in Cincinnati, and the regional headquarters for Reebok.

Thomas Doran (BSCE '75, MSCE '77), a Californian transplanted to Detroit in his childhood, discovered Purdue and gravitated toward environmental engineering, mainly due to the influence of his graduate advisor. Doran’s

interests in biology and chemistry led him to take graduate courses in chemical engineering, which supplemented his civil engineering training. After graduate school, Doran connected with Hubbell, Roth & Clark, a Michigan consulting firm, where today he serves as a partner and vice president. A lover of the written word, Doran has contributed both to technical forums and the print media, including publications such as the *Wall Street Journal*, *New York Times*, and *Detroit Free Press*.

Susan Hida (BSCE '81, MSCE' 83), spent her civil engineering days at Purdue interacting with professors and engineering professionals in and outside the classroom. The experience, she says, led to her feel more comfortable at conferences and meetings outside of the workplace. She was hired by the California Department of Transportation (Caltrans) after the Loma Prieta earthquake to help engineer an ambitious bridge seismic retrofit program. Later, she became a project engineer on various jobs across the state. She claims to have been in the right place at the right time for both Purdue and Caltrans. Her hard work and engineering expertise must have had something to do with it, too. She was named the Caltrans assistant state bridge engineer in 2007.

Lester Hunkele III (MSCE '75), a Brooklyn-born son and one of seven children, came to Purdue via West Point and the U.S. Army. Here, he earned a graduate degree in construction management and engineering. He served as the deputy assistant secretary of Veteran Affairs and worked at the executive level of several con-

struction companies before ultimately lending his name to his own company—Hunkele Consulting. Some specific assignments included assistant head of Marine Corps facilities, where he evaluated the explosion, building response, and prevention techniques days after the Beirut Bombing; program manager for the design and construction of the Ronald Reagan Building and International Trade Center in Washington; and consultant to a New York City commissioner to re-establish transportation flows in lower Manhattan after 9/11.

Philip Stutes (MSCE '75), a Louisiana native, had a family and a career in the works before attending Purdue. His company, then John E. Chance & Associates, offered him the chance to attend and audit graduate-level courses to bolster his knowledge of commercial satellite positioning. Post Purdue, Stutes began a career introducing satellite positioning and proper geodetic principles to his company and to the offshore oil and gas industry. He started with the Navy Navigation Satellite Positioning System "Transit," designed to position the

Polaris Submarine Fleet and eventually migrated to the Department of Defense's Global Positioning System (GPS). Today, Stutes is president of Fugro Chance, Inc., an offshoot of the company that sent him to Purdue in the first place.

Anne Bigane Wilson (BSCEM '79, MSCE '81), grew up the first of five daughters in Oak Lawn on Chicago's South Side. Her love of math and science drew her to engineering at Purdue, where she graduated from the first Construction Engineering and Management class with a BS degree. She then completed a master's degree in civil engineering in 1981. In the fall of 1984, Wilson joined her father in the family asphalt paving business in Chicago. Founded by her great-grandfather in 1907, Bigane Paving Co. is a fourth-generation firm, originally established for retail coal and oil sales. In the summer of 1987, however, Wilson and her partner and sister, Sheila, were put in the position of running the firm upon the sudden death of their father. Now president, Wilson helped celebrate the firm's 100th anniversary in October 2007.



Class Notes

Paul Foxworthy (BSCE '71, MSCE '73), from Orlando, Florida, joined Wycliffe Associates as director of construction services. He will oversee design and construction of facilities used worldwide for the translation of the *Bible*.

Frank O'Hare (BSCE '74) has joined CT Consultants in Columbus, Ohio, as a senior project manager.

Dale Arnold (BSCE '75), from Plymouth, Wisconsin, was promoted to vice president of Johnsville Sausage LLC.

George Ewoldsen (BSCE '75), from Sterrett, Alabama, retired from Vulcan Materials Company.

Louis Dasaro (BSCE '76), from Wilmington, Delaware, retired as chief structural engineer of Hercules, Inc. and began his lifelong dream of being an associate professor of civil engineering at Drexel University.

Stephen Willis (BSCE '78), from Pendelton, Indiana, is president of A-V Striping & Sealcoating Company, which specializes in pavement maintenance.

Daniel Dobry, Jr. (MSCE '80), from Kennesaw, Georgia, is the traffic engineering manager at Croy Engineering.

Kristopher Hahn (BSCE '85), from Bartlett, Tennessee, is working for New Dimensions Solutions, Inc. as a senior consultant doing reliability and risk analysis for utilities and mines.

Stacy Bartoletti (BSCE '91), from San Francisco, was named president and chief operating officer of Degenkolb Engineers, one of the nation's leading structural engineering firms in the design and seismic strengthening of buildings.

We are always interested in featuring recent news about our alumni. To have your accomplishments included in this magazine and share them with fellow alumni, please e-mail information on awards/honors/recognition, promotions, and related matters to Cindy Lawley (lawley@purdue.edu). Please be sure to include the year(s) and Purdue degree(s) you have received.



A True Boiler in the Basement

From her underground office in the Civil Engineering Building, a lab manager has— for 35 years now—helped put students and safety first.

As a military kid who spent much of her childhood on the move, Janet Lovell put down some serious roots after discovering Purdue as a teenager. She earned a biology degree in 1972 (and later a master's from the School of Science in 1994) and has subsequently clocked in 35 years in the School of Civil Engineering as a lab manager. Today, she's responsible for maintaining the equipment and training students in both the materials chemistry and the geotechnical laboratories.

With a friendly and familiar face in the Civil Engineering Building (CIVL) for nearly four decades, Lovell has no doubt witnessed a number of student hairstyle and fashion changes in that time. But what's the biggest change she's seen in students since 1973? It's not so much about a transition from bellbottoms and long hair to Ugg boots and iPhones but rather the skills students bring with them to campus straight out of high school. "The onset of computers has been the main thing," she says. "You can do a whole lot more with data acquisition now, and students come in expecting to do more."

Still, computer smarts alone don't mean students arrive with full knowledge of how to run the equipment, so Lovell trains them with a focus on both proper usage and safety. From a high-temperature furnace to chromatography equipment to thermal gravimetric analysis, Lovell helps build on classroom theory with the lab's hands-on component. "They still have to learn those tasks," she says.

A longtime member of various safety committees, Lovell now chairs the civil engineering safety committee, which is helping bring together various departments within the building. As chair, she's helping keep Purdue in accordance with federal regulations, as well as preparing for emergency building evacuation plans. Kathy Banks, the Bowen Engineering Head and Professor of Civil Engineering, appreciates her watchful eye. "The safety of our students, faculty, and staff in the civil engineering laboratories is of the highest priority to the school," Banks says. "Janet's extensive laboratory experience and excellent attention to detail make her the ideal leader for the committee."

From labs to offices, Lovell wants to keep CIVL safe. "We want to keep track of all of the available chemicals," she says, "particularly those that the Feds want us to track."

While there are still miles to go before she sleeps, or dare we say retires, Lovell maintains her active role to help keep a large school running smoothly. And however much she works "behind the scenes," it's a role that's not unnoticed. "Janet's dedication to Purdue is inspiring to all of us," Banks adds. "Over the last 35 years, she has significantly contributed to the educational growth of thousands of students. This is an amazing contribution to our school and the field of civil engineering."

And while those thousands have passed through the basement labs in what surely must seem like record time in retrospect, Lovell remains ever cognizant of proper training and doing things the right and safe way. ■ **W.M.**



Vincent Waiter

Janet Lovell, a CE lab manager, stands before the shelved samples, which are the byproduct of dozens of student experiments over the years.



check it out

Civil Engineering by the Numbers

See how our school stacks up in ten categories.

While civil engineers may not be crunching numbers like accountants on a daily basis, there's no doubt that some mathematical aptitude helped draw a number of them to Purdue and the School of Civil Engineering. Below, for your reading pleasure, are some numerical-based facts about our program.

Living alumni:
more than
11,000

Square footage
of CE space:
154,000

In-state tuition:
\$8,750
Out-of-state tuition:
\$24,850

Number of students:
567 undergrad
240 grad

*U.S. News and World
Report* rankings:
grad **7**
undergrad **8**

Number of companies
signed up on our
industry Web site:
442

Average starting
salary of undergrads:
\$54,116

Pounds of force required
to move the top of
the wall at the Bowen
Lab an eighth inch:
1,000,000

Number of eggs
cooked at
CE Homecoming
Breakfast:
360

Number
of faculty:
43



Vincent Walter



This colorful collage consists of work by MSE Professor R. Edwin García. It is actually two superimposed simulations of the nucleation and growth process of an undercooled Nickel melt. The background shows periodic tapestry of Ni nuclei during the initial stages of the solidification process. The superimposed structure in the center corresponds to a single solidified Ni-dendrite. The coloring embodies the degree of crystallinity and the orientation of each nuclei. Simulations were performed by Michael Waters (BSMSE 2008). García's work is featured in the current issue of *MSE Impact*.

