BAYLOR UNIVERSITY SCHOOL OF ENGINEERING & COMPUTER SCIENCE

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Mastering Multiple Disciplines

A DECADE OF GROWTH IN BAYLOR BIOINFORMATICS

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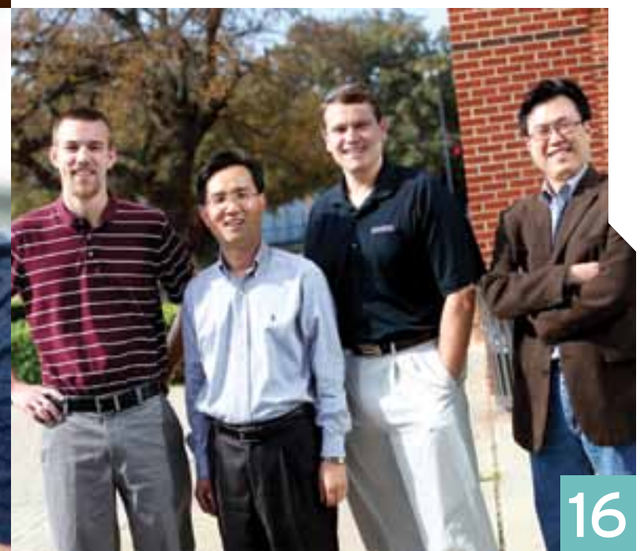
SYNERGY
Baylor University Engineering & Computer Science

Synergy is a publication of the Baylor University School of Engineering & Computer Science that establishes a communication link to keep alumni and friends aware of the spirit of discovery at the School. Established in 1995 from programs dating to 1974, the School of Engineering & Computer Science has provided a quality education to more than 2,500 graduates in the tradition of excellence, a cornerstone of Baylor's heritage. *Synergy* is produced for the School of Engineering & Computer Science by Baylor's Division of Marketing & Communications.



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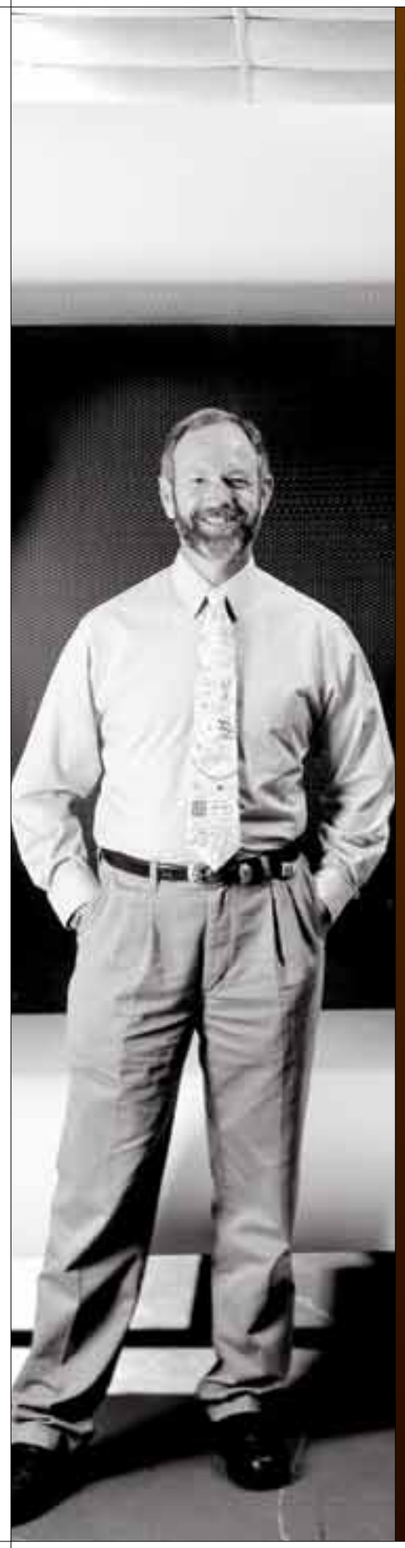


OH WHAT EXCITING THESE TIMES ARE for Baylor's School of Engineering and Computer Science (ECS)! As we observe ECS's 15th birthday, it's easy to look back with pride at from where we've come and to the future with confidence in where we're headed.

Evidence of increasing attainment comes from the quantity and quality of the students we attract. With Board of Regents' support and encouragement, ECS enrollment this academic year climbed to nearly 800 students.

During the past decade, we doubled the number of ECS faculty and added four new master's degree programs. Our newest faculty members are introduced later in this issue.

Another notable milestone is the continued growth and maturation of our **bioinformatics** program, now 10 years in the offering.

We continue a tradition of excellence to the global community in service and innovative education. Baylor has served as the headquarters for the Association for Computing Machinery-International Collegiate Programming Contest since 1989, and I salute the outstanding efforts of Dr. Bill Poucher, professor of computer science and ICPC executive director, along with his multitudes of volunteers. Congratulations on another successful competition, sponsored by IBM and hosted by Harbin Engineering University in Harbin, China this past February.

While we are proud of those accomplishments, we continue to seek additional venues for academic and research growth. In this issue of *Synergy,* you'll read about a few of them.

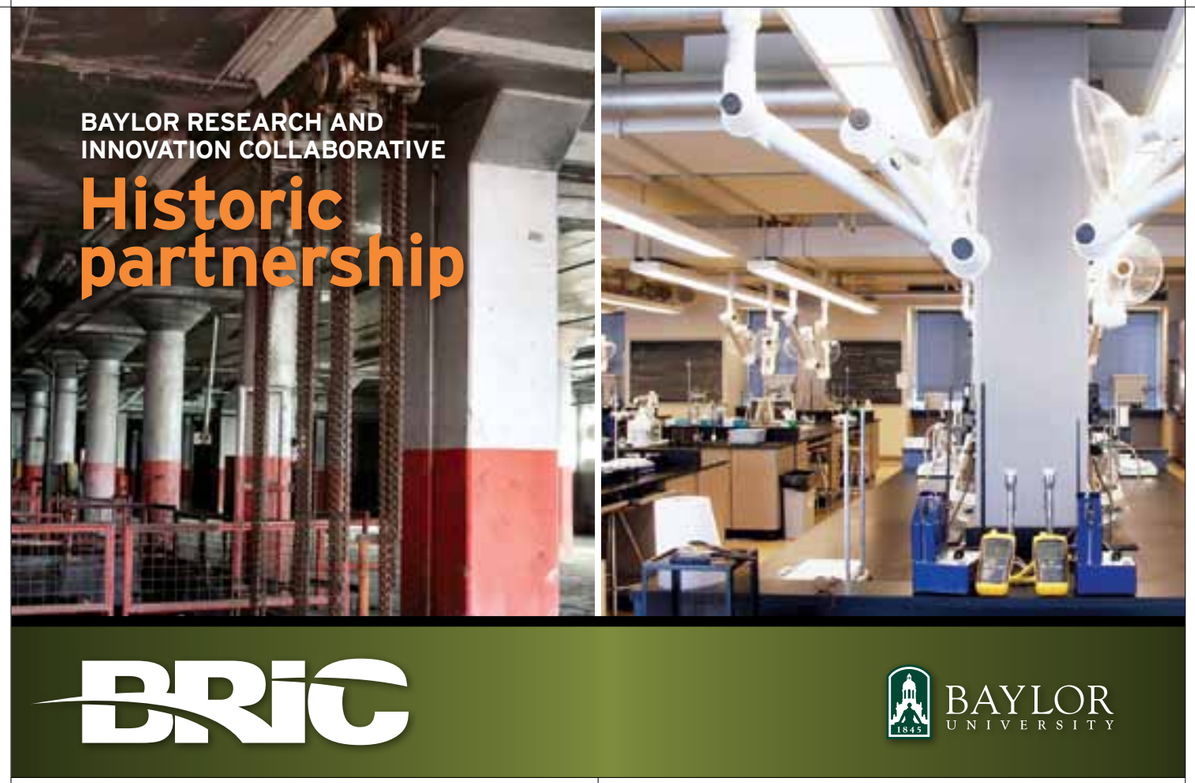
A new project promises to launch ECS forward with unparalleled acceleration. Led by Vice Provost for Research Truell Hyde, ECS joined with Baylor, other local higher education institutions, area business and civic leaders, and state and local governments to rejuvenate a long-closed tire-manufacturing facility as the Central Texas Research Park. The park will develop, promote and market science and engineering technologies, university research and advanced technology training and workforce development. The park's first project will be the **Baylor Research and Innovation Collaborative** (BRIC) and ECS will be an anchor tenant.

We will attain a new level of influence as we expand our research activities through the interdisciplinary BRIC and by offering our first PhD program. In February, the Board of Regents approved our plans for a PhD in electrical and computer engineering. This program will collaborate with other ECS and Baylor departments and support Baylor's efforts with BRIC, generate external grant funding and provide faculty access to talented graduate students and industry colleagues. As a result, Baylor University will play an increasingly significant role in the advancement of technological innovation around the globe.

Indeed this is an exciting time to be a part of Baylor and ECS in this journey to prepare tomorrow's technology innovators and leaders! We have been entrusted to invest our time and talents in our students, faculty, staff, and alumni. The returns are only beginning. We look forward to your involvement, whether through the generation of new ideas, feedback, influence, or resources. It would be my pleasure to hear from you.

Ben Kelley

Dean Benjamin Kelley



IN OCTOBER 2009, hundreds of people gathered to hear the announcement of a partnership between Baylor, other local educational institutions and governmental entities to advance modern research opportunities and repurpose a long-closed manufacturing facility.

The announcement presented the creation of the Central Texas Technology and Research Park and the park's first project, the Baylor Research and Innovation Collaborative (BRIC), to be housed in the former General Tire facility in Waco. BRIC will turn the long-shuttered manufacturing plant into a modern 300,000-square-foot technology research center.

The renovated plant will provide facilities and support to allow private companies and other educational institutions to collaborate with Baylor on cutting-edge scientific research into aviation, alternative fuels and the manufacture of advanced materials such as bulletproof and security components. It also will allow Baylor to expand the engineering component in the ECS by adding a doctorate in engineering degree and providing facilities for graduate students in mechanical and electrical engineering to do research. *Note: The Baylor Board of Regents approved a research oriented PhD program in electrical and computer engineering during its February 2010 meeting.*

The Texas Legislature has appropriated $10 million to Texas State Technical College for "capital expenditures and renovations for collaborative research projects" in partnership with Baylor, while Baylor Regents have committed an initial investment of $10 million to support the first phase of renovation.

The facility is expected to provide new jobs and a significant economic boost to Central Texas, much as similar research parks have done in Austin and other cities across the country.

PARTNERS

The Central Texas Technology and Research Park will develop, promote and market science and engineering technologies, university research and advanced technology training and workforce development. Those collaborating in the project include Baylor University, Texas State Technical College, McLennan Community College, McLennan County, City of Waco, City of Bellmead, Waco-McLennan County Economic Development Corporation, Bellmead Economic Development Corporation, Waco Industrial Foundation, Heart of Texas Council of Governments and the Greater Waco Chamber of Commerce.

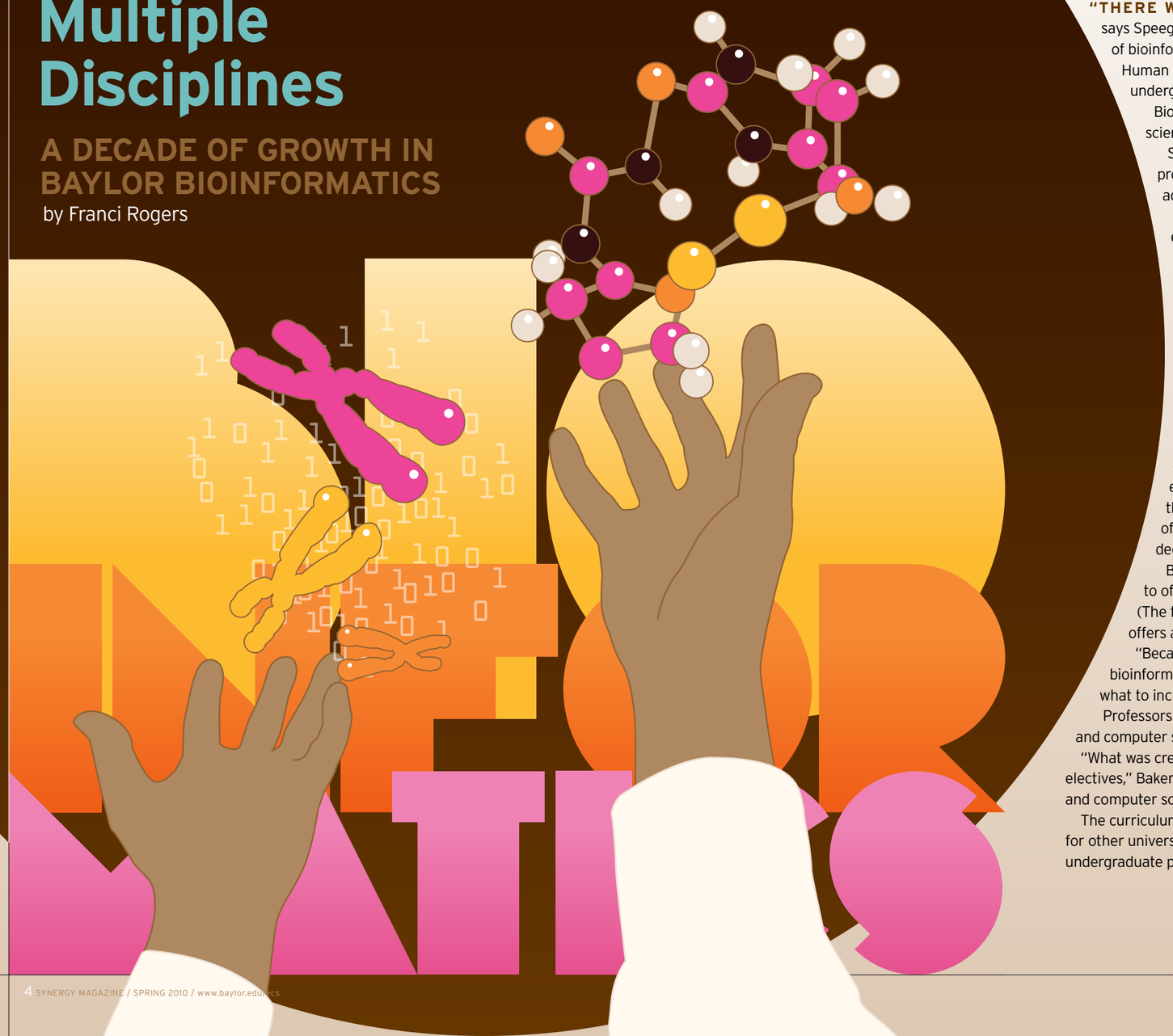
"The primary purpose of the BRIC is to enhance regional applied research capability; provide cutting edge workforce training and development; encourage collaboration between higher education, business, industry, governmental entities and communities; and to encourage technology transfer and commercialization of research in order to foster economic development within the region," Interim Provost Elizabeth Davis says.

For more information, see a collection of stories about BRIC at ecs.baylor.edu/Synergy.

Mastering Multiple Disciplines

A DECADE OF GROWTH IN BAYLOR BIOINFORMATICS

by Franci Rogers



A LITTLE MORE THAN 10 YEARS AGO, A BAYLOR STUDENT APPROACHED DR. GREG SPEEGLE WITH THE NOTION OF A DOUBLE MAJOR IN MOLECULAR BIOLOGY AND COMPUTER SCIENCE.

"THERE WAS NO WAY TO DO IT AT THE TIME," says Speegle, professor of computer science. "The notion of bioinformatics was just starting, mainly because of the Human Genome Project, and we had never heard of an undergraduate program in the field."

Bioinformatics is the intersection of computer science, life science, mathematics and statistics.

Speegle called on Dr. Chris Kearney, associate professor of biology, to see if there was a way to accommodate the student's request.

"Right away we realized that neither of us knew enough about the other's field and what they were doing," Speegle says. "My last biology class was when I was in the ninth grade."

"And the only thing I knew about computers was from my own computer," Kearney adds.

Once they started talking, they began to uncover how much each of their fields had to offer the other. Their discussions became the first step for Baylor's development of an undergraduate degree in bioinformatics.

"At the time Baylor made the decision to create the program, bioinformatics was really an emerging field," says Dr. Erich Baker, who joined the Baylor ECS in 2002 as an assistant professor of bioinformatics. "It was mostly seen as a graduate degree program."

Baylor became the second university in the nation to offer bioinformatics as an undergraduate degree. (The first was Carnegie Mellon University, which now offers an undergraduate degree in computational biology.)

"Because the idea of an undergraduate degree in bioinformatics was so new, we had a lot of discussion about what to include in the program," Baker says.

Professors and advisors from the life sciences, mathematics and computer science were involved in the decision-making.

"What was created is an exhaustive curriculum, with no electives," Baker says. "It's essentially a double major in biology and computer science with a minor in chemistry."

The curriculum they developed is now the standard, nationwide, for other universities that are creating bioinformatics undergraduate programs.

"We're very proud of the fact that our program gives students the full experience of both majors, and that other institutions recognize that value and use our program as a model," Baker says.

INITIALLY, THE MISSION of the program was to give students a wide background in a variety of areas: informatics (database design, web interfaces, data warehousing, distributed systems, security and library science); computational science (mathematics, statistics, algorithms, computer science, modeling, imaging and High-Performance Computing); and life science (genetics, physiology, embryology, immunology, developmental biology, medicine, epidemiology, pharmacology, psychiatry, veterinary medicine, ecology, forensics, anthropology and agriculture). Later additions included gene and genome product sequencing and structure analysis.

"Our goal is to produce students competent in those areas," Baker says. "We want them to know enough computer science to know what is computable, and enough life science to know what needs to be computed."

The Human Genome Project is the perfect example of the application of the study. When biologists first began investigating genes at a molecular level, there was no viable way to manage the data being collected. By the 1980s, when the project of mapping the entire human genome really got under way, biologists turned to computer scientists to make the project a reality.

"The Human Genome Project knit things together," Kearney says. "You have all that data to manage, and you need to find a way to go back and access it so problems can be solved more easily. Biologists needed to become tech savvy."

In turn, Speegle says, the computer science field needed to learn more about biology.

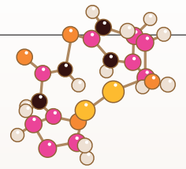
"We needed to learn some biology, so we could understand how to get the information they were interested in," he says. "And that's how bioinformatics bridges that gap. Suddenly we have people who can do both."

And, people who can do both, Baker says, are in high demand.

After "What is bioinformatics?" the question Baker most often hears is from prospective students and their parents, "Can I get a job with this major?"

"That isn't a problem in this field," he says. "Our students are highly recruited, not only in industry but to advanced degrees."

Of the students leaving Baylor with an undergraduate degree in bioinformatics, nearly 75 percent complete a graduate degree (mainly in bioinformatics) and 60 percent go beyond to PhDs or medical degrees.



THOSE WHO GO INTO INDUSTRY, like pharmaceuticals or medical research, are highly sought after.

"The numbers speak volumes for the quality of students we get," Baker says. "And it can only get better as we get the word out about our program."

Promoting the program is a difficult task in a field that is so relatively new.

"Because the field itself is so new, and because most programs are not aimed at undergraduates, it has been difficult to recruit," Baker says. "Most parents and high school guidance counselors don't know it's a career path, so most of our students apply at Baylor not realizing bioinformatics is a major. Our faculty and students are our most effective recruiters right now."

Suddenly we have people who can do both. And people who can do both are in high demand.

Adam Ecklund, director of Baylor ECS Student Initiatives, works to make recruiting a high priority.

"The more people learn about this degree field and how it can be applied, the more attractive it becomes," Ecklund says. "We have many high ability students who are passionate about biology or life science, but also have an interest in computer science, and vice versa. When they learn about this major, and find out everything they can do with this degree, they love it. Sometimes the major finds you."

His message to incoming students is that they don't have to wait until they are at a graduate level to learn bioinformatics.

"Baylor has an incredible, well-established bioinformatics programs – one of the best programs in the country – and it is for undergrads," he says. "Once a prospective student gets a chance to interact with our faculty and see how passionate they are, and they see how well people do with this major, they know they are making the right choice."

Many of the 93 graduates and 35 current bioinformatics students in this growing program agree with Ecklund. A few of their stories are included here.

Dr. Greg Speegle
Professor of
Computer Science

Dr. Chris Kearney
Associate Professor
of Biology

Dr. Erich Baker
Associate Professor
of Bioinformatics

Ellen King '03

ELLEN KING '03 As a pathology resident at the University of Texas Southwestern in Dallas, Ellen King feels like she is living out her destiny. As a child she found herself drawn to what seemed like two diverse interests: life science and computers.

When her father, an engineer who fostered her interest in analytical thinking, introduced her to the emerging field of bioinformatics, she was thrilled with the prospect of making it her career path.

"I loved computer science, and I loved science," King says. "When my father told me what bioinformatics was about, I was excited. Those were the two things I've always loved and didn't want to choose between. It's what I wanted to do all along."

Discovering that Baylor had an undergraduate program that fit her interests so well made her college choice an easy one. In 2005, King became one of the first to graduate from Baylor with its newly established bioinformatics degree.

From Baylor, she went on to UT Southwestern for medical school, spent a year doing bioinformatics research in a drug discovery program, and is now a resident in pathology.

She credits her success to Baylor.

"I feel like I've been being taught forever," King laughs. "Far and away the best experience I've had has been at Baylor. The education I got there was phenomenal."

The McKinney, Texas, native said she had the opportunity to meet the founder of pathology informatics during her time in medical school. He was impressed by the amount of knowledge she took away from her undergraduate experience.

"He told me, 'I've never met anyone like you, who's been prepared like you.' I owe all that to Baylor," King says. "I know it will serve me well into the future."

Already, King has found that her background in bioinformatics has set her apart from her peers.

"No one has this skill set, especially in medicine," she says. "Since few people have this background, it is hard for the various people to communicate sometimes. It feels almost like they (computer science and medicine) are two different languages, and that I can translate for them."

King uses the example of how banks integrated computers into everyday operations to make things easier and more efficient.

"Computers in banking helped to make banking safer and faster. They moved their data to computers to help the numbers make sense," she says. "The medical community is behind. We still use physical slides and paper. Imagine how much better patient care we would have if we were using more technology to help manage the data. That is what pathology informatics is. There is too much data in science to not use computers to make sense of it."

However, she says, computer knowledge alone isn't enough.

"You need the dual knowledge," she says. "We know the code for tens of thousands of genes, but you can't use computers to organize that information if you don't know what a gene is."

The field, she admits, isn't for everyone. There remains a need for people on both sides of the equation. King sees herself as an essential bridge between the two worlds.

"You have to enjoy it, because sometimes it is tricky," she says. "It feels like you're using different parts of your brain. Science can be vague and computer science isn't. What I learned at Baylor was how to put them together."

ROBERT CARROLL '09 With a major that consists of nearly a double major in biology and computer science, with a minor in chemistry, and leaves little or no room for electives outside the discipline, it's easy to fall under the impression that bioinformatics undergraduate students at Baylor have time for nothing but studying. But that assumption, Robert Carroll notes, is far from reality.

The Granbury, Texas, native graduated from Baylor in 2009. Despite the rigorous curriculum of bioinformatics, he found time to get what he calls the "entire Baylor experience."

"I was very involved in campus activities," Carroll says. "I was in the Golden Wave Marching Band and the Courtside Players band, and traveled with both of them. And I was active in Kappa Kappa Psi (an academic national band fraternity). There are so many things happening all the time at Baylor; my undergrad experience wouldn't have been the same without doing outside things."

With a heavy course load, Carroll says the key is organization.

"Even with studying, you can stay involved on campus. You just have to make a schedule and figure out time management. I wasn't so great at this as a freshman, but I learned," he says. "Now I can't imagine college without doing all of it. Class was fun, but there is so much more at Baylor."

Staying in contact with his professors is another way Carroll managed to fit fun into studying.

"The professors there are always happy to help," he says. "They really want you to learn and be prepared for the next step."

For Carroll, that next step was to continue his education. He is taking graduate classes in bioinformatics at Vanderbilt University in Nashville, Tenn., and is on track to become a PhD candidate.

"Baylor's degree program really covered all my bases," he says. "I feel completely qualified because of the coursework and the professors I had a Baylor. They gave me an incredible foundation in bioinformatics."

While other students are taking competency courses to get up to speed in certain areas, Carroll has been able to take all upper level courses at Vanderbilt.

"Realistically, I could get my master's degree a bit sooner, but instead I think I'm going to take more courses that are really interesting to me," he says.

After completing a PhD program, Carroll wants to explore career options, including the possibility of working in personalized medicine; however, he hasn't decided on a firm career path.

Robert Carroll '09

Sunny Chopra
Baylor Junior

Jeremy Jay '06

> The professors are always happy to help. They really want you to learn and be prepared for the next step.

"That's one of the main things about bioinformatics that appealed to me," he says. "It's so versatile. It's given me a broad base, and I feel like I can be anything I want to be."

SUNNY CHOPRA, BAYLOR JUNIOR Sunayana "Sunny" Chopra considers finding Baylor's bioinformatics program "a gift from God."

The junior from League City, Texas, graduated *summa cum laude,* ranked No. 1 in her high school class, and applied at other universities. Almost on a lark, she decided to visit Baylor.

"I loved the people, loved the campus, and when the tour guide told us about the honors program, I knew this is where I wanted to be," she says.

Chopra entered Baylor as a biology pre-med major, but she says that Dr. Erich Baker asked her if she liked computer science.

"He told me to just take the first semester to see how it came out," she says. "I did, and I did well, and I continue to do well. He was right. Bioinformatics is perfect for me."

Her plans still include medical school, yet Chopra believes that the bioinformatics program is a firm foundation for her future medical studies.

"My heart has been set on medicine from the start," says Chopra, who volunteers at Hillcrest Baptist Medical Center in Waco. "I like the idea of solving puzzles, and that's what medicine is to me; that's what I like about bioinformatics. It is exactly like solving a puzzle."

Chopra explained that taking introduction courses in chemistry, biology and computer science gave her the basics; however, her first bioinformatics course pulled together all the pieces.

"Of course, you get great information in the intro classes, but you really don't get the whole picture until your first bioinformatics course," she said. "That's when it all fit together for me. In the other courses, you get all the pieces. With bioinformatics, you learn how to put them together to get the solution. That's what I love, and that's what I want to do."

JEREMY JAY '06 After graduating from Baylor in 2006 with a bioinformatics major and chemistry minor, Jeremy Jay went to the University of Tennessee to complete his master's degree and is now a PhD candidate in computational biology. One day, he sees himself back in a college classroom as an instructor, but not before he sees what life is like outside the academic world.

"I want to work in the industry for a while," Jay says. "Ideally, I'd like to work for a non-profit company, maybe doing research. Eventually I'd like to teach bioinformatics at a university, but I think it's important to be able to bring real-world experience into the classroom."

Jay got a taste of real-world experience as an undergraduate. The hands-on research he did at Baylor set him apart from his peers at Tennessee, where he also works at Oak Ridge National Laboratory. He is looking forward to an internship he will have at Jackson Laboratories in Maine during summer 2010.

"The resources here are great, and my Baylor education allows me to know how to use them," Jay says. "I feel like we were introduced [at Baylor] to real-world tasks and got real experience while doing our group research projects and internships."

While Jay isn't ready to get back to the classroom immediately, he does have advice for those interested in pursuing bioinformatics majors.

"Do your own research projects. Do an internship. Get as much experience as you can," he says. "You will make yourself more marketable. You can do anything." ■

Outstanding Grad Rick Tullis shares principles for life and career

RELATIONSHIPS MATTER

by Meaghan Ortolf

FOR RICK TULLIS, PE, life is a journey of relationships – with God, family, friends and colleagues – and he sees every milestone in his life as a triumph of those relationships.

Tullis' journey includes a relationship with Baylor where he earned a bachelor of science in mechanical engineering in spring 1993. Tullis, named a Herbert H. Reynolds Outstanding Young Alumni during Baylor's 2009 Homecoming activities, said the strenuous academics, small class sizes, and multi-disciplinary approach in the engineering department well prepared him for his career.

One of the first places that tougher-than-average education proved its firm foundation was a 6-month graduate engineering training program that he went through as part of his employment with The Trane Company. The extremely competitive class consisted of 40 graduate engineers from big-name engineering schools across the country. Tullis notes he "fared very well" in the course and that he came to appreciate how well Baylor had prepared him.

Perhaps equally important to the academics, Tullis' student career extended beyond the invisible walls of his major and allowed him to enjoy many of the traditions that make Baylor unique. He credits Baylor's smaller size for his ability to explore other aspects of college life during his undergraduate years. As a member of Sigma Alpha Epsilon fraternity and the Baptist Student Union, he formed relationships outside of his major field of study, participated in such activities as All University Sing, and served as co-chairman of the Greek Council for Christ. "Not only did the 'Baylor experience' help me grow into a more well-rounded person," Tullis says, "but it was through Greek Council for Christ that I met my wife!"

He believes that one distinct advantage of Baylor's engineering program is its interdisciplinary approach. Engineering students work with engineers in different major fields of study as well as with students outside of the engineering department. This approach gives students a look at how business is done in the real-world.

"It is exciting now to see Baylor putting technology students and business/entrepreneur students together to tackle projects around the globe," Tullis says. "Today's Baylor students have awesome opportunities available to them."

After graduation Tullis went to work for The Trane Company, where he became the controls product manager for North America, and then eventually left the corporate world to work in small business at Waco Systems Inc., where he served as the manager of engineered services. The next career step meant taking an entrepreneurial risk to pursue a dream. In 2005 Tullis partnered with three men – Texas A&M engineering graduate Stefan LeRow and Baylor Hankamer School of Business graduates Brian Aynesworth and Will Fair – to start Capstone Mechanical, where he serves as president.

Capstone Mechanical is an engineering, contracting and service company that serves Central Texas mainly in the areas of air conditioning and plumbing. With about 100 employees currently, it is one of the fastest growing companies of its kind. Reflecting Tullis' and his partner's relationships with God, Capstone is built around a "servant leadership culture." The company sets itself apart in the industry through its core values, noted on its website as including "being good stewards of resources," "treating others the way you would want to be treated" and "doing the right thing." Capstone hopes its ethics in action enable its customers to see the difference and to keep coming back. "Capstone has far exceeded what I had imagined it would be when we started in 2005 and I'm especially thankful for the great people I get to work with on a daily basis." he notes.

Tullis and his partners maintain a relationship with Baylor through Capstone in multiple ways. The company performs engineering, contracting and service for many campus buildings that are under construction or renovation. Yet, the most valuable relationship could be the internships Capstone provides for Baylor engineering and business students. Interns receive training for their future fields and personal mentoring on how a career doesn't mean you have to ignore your faith.

Tullis gains some satisfaction in "teaching interns that what they're doing really matters, their work is important and they should take pride in it." The interns are shown how to carry their personal values into the work place and that their professional work is an opportunity to serve God and others.

Capstone is a corporate partner with Baylor ECS, meaning the young company contributes financially to Baylor's different programs and receives recognition. "We see what Baylor is doing as important," Tullis said. Beyond donations and the internship program, he also takes time to speak with students and work with engineering student projects.

"Today's Baylor students have awesome opportunities available to them."

Baylor ECS Dean Ben Kelley appreciates the time and effort given by Tullis and Capstone. "He remains an active supporter of our engineering program through the professional partnership of his company, Capstone Mechanical, and also a proud sponsor of Baylor athletic events," Kelley said. "Examples of their active partnership include internship positions, meeting with students about careers in the heating and air conditioning industry, and providing technical and material resources for projects within our School."

Tullis' interaction with Baylor is an effort to help Baylor ECS continue to grow and move forward. He particularly wants to help ECS achieve future expansion goals so that more students can continue to find relationships and experiences similar to those he had at Baylor. ■

Scholarships provide access to another level

STEPPING STONES

by Davin Allen

MITCHELL MEBANE has been tinkering with computer programming – for fun – since he was 8 years old. He excitedly recalls out-smarting the robots in an assembly language coding assignment and revels in the satisfaction of solving a particularly challenging problem when participating in the Association for Computing Machinery-International Collegiate Programming Contest.

No, Mitchell Mebane isn't your average student. A computer science major with a minor in German, Mitchell is tapping into all Baylor has to offer. From challenging computer science classes to the chance to study abroad with Baylor in Germany – his first trip outside of Texas – Mitchell has discovered innumerable opportunities. Moreover, Baylor has been the source of rich friendships with likeminded students, insightful relationships with professors who guide him toward success...and new hope.

Although five generations of Mitchell's family had called Baylor their alma mater, attending the prestigious university sounded like a long shot to Mitchell. In a family of nine children that has grappled with serious illness on multiple occasions, the tools to provide for Mitchell's Baylor education were limited.

> "The scholarships they gave have changed my life. They brought me to Baylor and helped me to move forward with my dreams."

"Baylor was sort of this unattainable goal at first," Mitchell recalls. "But over several months before I enrolled in college, I kept getting scholarships from Baylor and I thought, 'God is trying to tell me something.'"

Indeed, it was scholarships, such as The J.L. and Laura S. Brittain Scholarship among others in the School of Engineering and Computer Science, that were the stepping-stones to Mitchell's future.

"Without scholarships, I wouldn't have been able to attend Baylor," he says. "They're one of the major reasons I've been able to take the next step in life."

And that's only the beginning. Scholarships also opened the door for Mitchell to move into Baylor's North Village as part of the ECS Living-Learning Center instead of commuting to campus each day. "Having roommates instead of being on my own is incredibly beneficial," Mitchell explains. "They are people I can interact with who have either taken the same classes I have or are in the same classes now. I'm not having to figure out everything on my own like I did when I lived at home."

Diving into the complexities of computer science with others on the same journey has strengthened Mitchell's understanding of his field and also has prompted him to think about people rather than just computers.

Now, Mitchell daily takes excellence by the reins and seeks to weld his interest in computers with his drive to help others. A senior planning to graduate in May, he is passionate about his role in the computer science world – not only because Baylor ECS is preparing him for a job writing code, designing software or being a consultant, but because he enjoys applying his knowledge and making computer programs functional.

"I'm interested in the impact of increasingly cheap, available technology on bridging the gap in third world countries," Mitchell says. "This is the start of where the third world can begin to compete technologically because, now, they'll have the tools."

Inside the classroom and out, Baylor has broadened Mitchell's horizons. Immersed in an intellectual atmosphere and surrounded by loving people, he has gained invaluable mentors who have helped him reach his potential and develop his own career goals. Remembering how he was sold on computer science during the intro class his freshman year, Mitchell is enthusiastic about the opportunity to help other students – especially freshmen – find the missing puzzle pieces that will lead to their career.

"I'd like to share some of the wonderful things I've learned about computer science and nurture new students to help them find that maybe they are as enthusiastic about the subject as I am," says Mitchell. "It's not just a major that helps you get a job, but it's interesting and fun. While I enjoy more complex computer science, it's the first year that really shapes how people view the subject."

That's just one way this Baylor student hopes to give back. Scholarships have been key to Mitchell's Baylor experience...and to building his desire to follow in the footsteps of his benefactors. "The Baylor spirit nurtured my scholarship donors so that they wanted to help young people travel the same path they did," Mitchell muses. "The scholarships they gave have changed my life. They brought me to Baylor and helped me to move forward with my dreams. Hopefully I'll be able to turn around and help somebody else in the future."

Mitchell Mebane definitely aims for the stars. He knows that with the right algorithm he can get there. He is full of passion and dreams to help others fulfill their ambitions. While he finished high school with a plan to make a difference and a desire to become a Baylor Bear, Mitchell needed scholarships as the stepping-stones to reach his goal. Now, thanks to selfless donors with a zeal to see engineering and computer science students excel, Mitchell had a foundation to walk on.

You, too, can lay a foundation for students like Mitchell. To learn how you can support existing scholarships – the stepping-stones for generations of students – or how to establish one of your own, contact Kevin Ludlum, executive director of development, at (254) 710-6754, or see "Give to Baylor" at www.baylor.edu to make a gift online. ■

Baylor Study Finds Phosphorus Level That Leads to Declines in Stream Water Quality

A BAYLOR UNIVERSITY STUDY funded by the Environmental Protection Agency found that concentrations of phosphorus above 20 parts per billion (ppb) are linked to declines in water quality and aquatic plant and animal life. The study is the first to use the distinctive Baylor Experimental Aquatic Research (BEAR) stream facility.

"This study is the first to really link nutrient field observations to controlled experiments and allows water managers to use the research as the scientific basis for water management strategies," says Dr. Ryan King, associate professor of biology at Baylor, who led the study. "We were able to link cause and effect and show that the ecology of the streams is very sensitive to phosphorus."

The BEAR stream facility, the only one of its kind at an academic institution in the United States and one of a few in the world, is equipped with 12 miniature "real life" streams, which can be manipulated to look and act like streams found across central Texas and in other regions. The streams measure 60 feet in length and allow researchers to test aquatic contaminants in a controlled setting. BEAR also has 24 model wetlands and is located near the Waco Wetlands, west of the city limits.

Dr. Bryan Brooks, associate professor of environmental sciences at Baylor, and several Baylor graduate students also collaborated on the project.

Baylor Announces Largest Gift in University's History

In March, Baylor University announced receipt of what will be the largest gift in the university's history, an estate provision estimated to be valued in the range of $200 million to benefit medical research in the College of Arts and Sciences, the School of Social Work and other university programs.

The anonymous gift is being made by a Baylor graduate whose family has a history of providing gifts to the university supporting programs that are both innovative and have high potential to significantly advance the field of knowledge and experience in diseases, disorders, care, treatment and other issues associated with aging.

As a provision of the donor's estate, a foundation will be established at the time of the donor's death. The foundation will support several university efforts in continuing the donor's consistent and generous support.

The gift is the second-largest gift made to a Texas college or university and ranks among the top 20 private gifts made to higher education in the United States according to the most recent compilation of data reported by the *Chronicle of Higher Education.*

iTunes U features Baylor's Black Gospel Music Restoration Project

A popular download among Baylor's content available on iTunes U is the University Libraries' Black Gospel Music Restoration Project, a digital record and catalog of the most at-risk music from the black gospel music tradition from the 1940s to the 1980s.

Robert Darden, associate professor of journalism at Baylor, leads the project. Sixteen songs are available as a free download on iTunes U, a dedicated area within the iTunes U Store. Among the songs are such black gospel treasures as *Ain't That Right, Great Get'n Up Morning, Old Ship of Zion* and *This Train is Bound for Glory.*

Darden's search has turned up 78s, 45s, LPs and music in various taped formats used in the United States and abroad. Those involved in the project also are compiling taped interviews, informal photos, music programs, newspaper clippings and sheet music.

Charles M. Royce, chairman of the board of TICC Capital Corp. in Greenwich, Conn., and Harold (BBA '51) and Dottie Riley of Austin are among the financial contributors for the preservation efforts for "the Golden Age of Gospel Music."

Royce's gift to Baylor created The Charles M. Royce Black Gospel Music Restoration Project. Support from the Rileys of Austin strengthened Baylor Libraries' digitization and preservation efforts by equipping the Libraries with The Ray I. Riley Digitization Center, named in memory of Harold's father.

To expand and increase this one-of-a-kind initiative, The Prichard Family Foundation established The Lev H. Prichard III Traditional Black Music Restoration Endowed Fund in 2009. Paying tribute to Lev Prichard III, the gift embodies Lev and Ella (BA '63) Prichard's love of cultural and educational ventures.

One of the major contributors of records was Bob Marovich, a Chicago collector. The majority of the Black Gospel Music Restoration Project songs come from his collection of gospel 45s.

For more information about Baylor's Black Gospel Music Restoration Project, visit baylor.edu/lib/gospel.

Allison Indoor Practice Facility Earns LEED Silver Rating

Baylor's Jay and Jenny Allison Indoor Football Practice Facility has become the nation's first true football field house to be awarded a Leadership in Energy and Environmental Design (LEED) Silver Rating by the U.S. Green Building Council (USGBC) in its New Construction rating system.

The Allison facility is Baylor's second New Construction LEED Certified building, and Baylor now has three LEED-Certified facilities within the last year.

In June 2009, Baylor's George W. Truett Theological Seminary, built in 2002, earned LEED Silver certification in the USGBC's Existing Buildings rating system.

Last October, Baylor's Alwin O. and Dorothy Highers Athletics Complex, which includes the Simpson Athletics and Academic Center, became the university's first New Building LEED Certified structure. The newly certified Allison Indoor Facility, which includes a 100-yard synthetic playing surface, is adjacent to Baylor's two outdoor natural grass practice fields at the Highers Athletics Complex.

The facility bears the name of Baylor alumni Jay and Jenny Allison, who provided the lead gift. Jay Allison, a former university regent, is president and CEO of Comstock Resources, based in Frisco, Texas. He was named the Ernst and Young's 2009 Entrepreneur of the Year in the Chemicals and Mining category. Allison is president and CEO of Comstock Resources.

AROUND THE LAB ›

NEW FACES, FACULTY PUBLICATIONS AND PRESENTATIONS

Young-Rae Cho
Assistant Professor, Computer Science

Dr. Young-Rae Cho comes to Baylor's Department of Computer Science after earning his PhD in Computer Science Engineering at State University of New York in 2009. Before that, Cho received his Master of Computer Science degree from the University of Illinois.

Cho's research interests include bioinformatics and computer biology (functional genomics, computational systems biology, and network biology) and data mining and data management (pattern mining, classification, clustering, and data integration).

Cho has several patents, including a concept and formula to identify bridging nodes in scale-free networks which was patented in December 2007. Aidong Zhang, Murali Ramanathan and Woochang Hwang are named on the patent with Cho.

He has served as a reviewer for several journals, on conference program committees (BIBM and ICCIT), and as a conference volunteer. He also has published journal papers in IEEE *Transactions on Information Technology in Biomedicine, International Journal of Computational Biology, International Journal of Data Mining and Bioinformatics,* and others.

His teaching load will include, over several semesters, Principals of Data Mining, Introduction to Data Mining, Genomics and Bioinformatics, Introduction to Computational Biology, and graduate student mentoring.

Baker, E.J., Jay, J.J., Philip, V.M., Zhang, Y., Li, Z., Kirova, R., Langston, M.A., Chesler, E.J., "Ontological discovery environment: a system for integrating gene-phenotype associations," *Genomics,* 94(6):377-87, December 2009; Epub. September 2009. PMID: 19733230.

Baylis, C., Perry, J., Moldovan, M., **Marks II, R.J.,** and Dunleavy, L., "Use of a Step-Response Approximation for Thermal Transient Modeling in Power MOSFETs," Automatic RF Techniques Group Conference, Broomfield, CO, December 2009.

Meena, S., **Baylis, C.,** Dunleavy, L., and Marbell, M., "Duty Cycle Dependent Pulsed IV Simulation and Thermal Time Constant Extraction for LDMOS Transistors," Automatic RF Techniques Group Conference, Broomfield, CO, December 2009.

Baylis, C. and Dunleavy, L., "Electrothermal Nonlinear FET Modeling for Spectral Prediction," IEEE Electromagnetic Compatibility Symposium, Austin, TX, August 2009.

Baylis, C., Miller, H., Wang, L., and Moldovan, M., "Spectrum Issues in Power Amplifier Design," Tri-Service Radar Symposium, Boulder, CO, June 2009.

Baylis, C., Dunleavy, L., and Connick, R. (invited), "Modeling Considerations for GaN HEMT Devices," 2009 IEEE Wireless and Microwave Technology Conference, Clearwater, FL, April 2009.

Baylis, C., and **Jean, B.R.,** "A Course Sequence in High Frequency Electronics with Hands-On Laboratory Experiments," American Society for Engineering Education (ASEE) Gulf-Southwest Annual Conference, Waco, Texas, March 2009.

Greer, Stanton, and **Bradley, Walter L.,** "More Sustainable Non-woven Fabric Composites for Automotive and Building Construction Materials Using Coir (Coconut) Fibers," Annual Meeting of Society for Plastics Engineers, Orlando, FL, May 2010.

Bradley, Walter L., and Greer, Stanton, "Non-Woven Fabric Composites from Lignin-Rich, Natural Fibers," Patent Application: Attorney Docket No: ABYU-0027 (2086140014), October 6, 2009. Patent filed October 5, 2009.

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Bradley, Walter L., "The use of renewable natural resources for economic development: the case of the coconut," The Next Big Idea conference, Baylor University, February 2009.

Bradley, Walter L., "Processing and Properties of Unwoven-Fabric Composite Materials Made With 50% Natural Fibers: The Influence of Fiber Diameter," NATO-sponsored International Conference on Non-woven fabric composites, Kiev, Ukraine, May 2009.

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Cho, Young-Rae, Shi, L., and Zhang, A., "flowNet: Flow-Based Approach for Efficient Analysis of Complex Biological Networks," IEEE International Conference on Data Mining, Miami, FL, December 2009.

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Farison, James B., and Yang, Zhuocheng, "Multidisciplinary Engineering Programs and ASEE's Role as the Lead Society for Their ABET Accreditation," ASEE Annual Conference, Austin, TX, June 2009.

Farison, James B., "Innovations and Experiences in a Multidisciplinary Course on Image Formation and Processing: Simulation of a Corporate Environment," ASEE Gulf-Southwest Annual Conference, Waco, TX, March 2009.

Yang, Zhuocheng, **Farison, James B.,** and **Thompson, Michael W.,** "Fully Constrained Least Squares Estimation of Target Quantifications in Hyperspectral Images," Signal and Image Processing, International Conference on Image Processing, Computer Vision, and Pattern Recognition, pp. 910-915, Las Vegas, NV, July 2009.

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Yin, Bing, and **Hamerly, Greg,** "Hierarchical stability-based model selection for clustering algorithms," International Conference on Machine Learning and Applications, December 2009.

Ashtekar, N., and **Jack, D.A.,** "Stochastic Modeling of the Bulk Thermal Conductivity for Dense Carbon Nanotube Networks," ASME IMECE'09, Orlando, FL, November 2009.

Adewuyi, O.A., Okoli, O.I., and **Jack, D.A.,** "Optimization of Lamp Positions in the UV Curing of 3-Dimensional Composite Components manufactured Using the RIDFT Process," International Conference on Composite Materials, ICCM-17, Edinburgh, United Kingdom, July 2009.

Smith, D.E., Montgomery-Smith, S., and **Jack, D.A.,** "Modeling Orientational Diffusion in Short Fiber Composite Processing Simulations," National Science Foundation CMMI Engineering Research and Innovation Conference, Honolulu, HI, June 2009.

Tsai, C.-H., **Jack, D.A.,** and Zhang, C., "Stochastic Modeling on Elastic Property Prediction of Carbon Nanotube Reinforced Composites," Industrial Engineering Research Conference, IERC 2009, Miami, FL, May 2009.

Jack, D.A., Liang, Z., Li, S., Yeh, C., and Fielding, J., "Statistical Planar Conductivity Model of Orientationally Dependant Carbon Nanotube Network Buckypapers," SAMPE'09, Baltimore, MD, May 2009.

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Qadir, N., and **Jack, D.A.,** "Modeling Fibre Orientation in Short Fibre Suspensions Using the Neural Network-Based Orthotropic Closure," *Composites:* Part A, 40:1524-1533, 2009.

David Jack
Assistant Professor, Mechanical Engineering

Dr. David Jack joins Baylor's Department of Mechanical Engineering from Florida State University where he was a Visiting Assistant Professor of Industrial and Manufacturing Engineering and principal investigator for the High Performance Materials Institute.

His research interests include constitutive modeling of contemporary composite processes; rigid and flexible suspension dynamics; mechanics based modeling of contemporary composite products, predictive schemes for industrial processes and products with natural fibers and nanotubes; and conductivity analysis of carbon nanotube networks for high current applications.

He has taught courses such as Finite Element Methods, Numerical Methods for Engineers, Advanced Numerical Methods for Engineers, and Introduction to Programming for Mechanical Engineers. At Baylor, his courses include Strength of Materials, Numerical Methods for Engineers, Continuum Mechanics, Special Topics in Engineering, and mentoring graduate students.

Jack holds three degrees in Mechanical Engineering, receiving a BS in 2001 from the Colorado School of Mines, an MS in 2003, and a PhD in 2006 from the University of Missouri. He also earned a BS degree in Engineering Physics from Colorado School of Mines and an MS degree in Applied Mathematics from the University of Missouri.

He has co-authored several articles, including "Elastic Properties of Short-Fiber Polymer Composites, Derivation and Demonstration of Analytical Forms for Expectation and Variance from Orientation Tensors" for the *Journal of Composite Materials* and "An Invariant Based Fitted Closure of the Sixth-Order Orientation Tensor for Modeling Short-Fiber Suspensions" for the *Journal of Rheology,* both with D.E. Smith.

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Jordan, W., and **Kelley, B.,** "Calling and Motivation for International Engineering Projects," Christian Engineering Education Conference, pp.108-116, Waco, TX, June 2009.

Jordan, W., "Ethical Issues Related to International Development Projects," ASEE Annual Conference, Austin, TX, June 2009.

Jordan, W., Thomas, B., McGhee, R., and Lemus, E., "Creating a Sustainable Energy Business in Rural Honduras," ASEE Annual Conference, Austin, TX, June 2009.

Jordan, W., "Baylor's Experience with an On-Line Nuclear Engineering Course," Big 12 Engineering Summit, Kansas City, MO, October 2009.

Thomas, B., and **Jordan, W.,** "Renewable Energy for the Developing World," NCIIA Grantees Workshop, Alexandria, VA, March 2009.

Jordan, W., "Tips for Tenure: Successful Service," *A Symposium for New and Prospective Faculty,* presented at IMECE, Lake Buena Vista, FL, November 2009.

Jordan, W., "Meaningful Summer Engineering/ Entrepreneurial Missions," KEEN Annual Conference, Milwaukee, WI, October 2009.

Jordan, W., Thomas, B., and McGhee, R., "A Christian Approach to the Ethics of International Development Projects," Annual Meeting of the American Scientific Affiliation, Waco, TX, August 2009.

Kelley, Benjamin S., Rigby, B. Rhett, Vu, Hai D., "Teaching Engineering Biomechanics in Vietnam," ASEE Gulf-Southwest Annual Conference, Waco, TX, March 2009.

John Miller

Lecturer, Electrical and Computer Engineering

Mr. John Miller comes to Baylor's Department of Electrical and Computer Engineering after earning his Bachelor and Master of Science in Electrical and Computer Engineering from Baylor in August 2009.

From spring 2008 through summer 2009, Miller worked as a graduate assistant to Dr. Ian Gravagne, associate professor of Electrical and Computer Engineering. Miller's responsibilities included setting up and operating a 10W hydrogen fuel cell unit, designing and assembling a maximum power-point tracking switching power coupler for classroom demonstrations, and designing a system to collect data from an alternative energy museum display and to report it on a webpage.

His research interests are dynamic equations on time scales, engineering laboratory skill development, small scale energy systems, and appropriate technology.

Miller has several publications, including *Stability of Simultaneously Triangularizable Switched Systems on Time Scales* (with Gravagne) and *Design of a Phantom Load Controller for Entertainment Centers* (with C. Matcek and Gravagne), both in *Proceedings of the 2009 ASEE Gulf-Southwest Annual Conference*.

At Baylor, his course schedule for two semesters has covered Introduction to Engineering, Engineering Analysis, Electrical Circuit Theory, Digital Logic Design Lab, Electronics Design Lab, and Automatic Control Systems Lab.

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Sode-Yome, A., and **Lee, Kwang Y.,** "Application of Matlab sysmbolic and optimization toolboxes in static voltage stability in power systems," IFAC Symposium on Power Plants and Power Systems Control, Tampere, Finland, July 2009.

Lee, Kwang Y., Liangyu Ma, Chang J. Boo, Won-Hee Jung, and Sung-Ho Kim, "Intelligent Modified Predictive Optimal Control of Reheater Steam Temperature in a Large-Scale Boiler Unit," IEEE Power Engineering Society General Meeting, Calgary, Canada, July 2009.

Choi, Tae-Il, and **Lee, Kwang Y.,** "Interface of a Fuel Cell Distributed Generator with Distribution System Network," IEEE Power Engineering Society General Meeting, Calgary, Canada, July 2009.

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Khaleghi, Milad, Malihe M. Farsangi, Hossein Nezamabadi-Pour, and **Lee, Kwang Y.,** "Voltage Stability Improvement by Multi-Objective Placement of SVC Using Modified Artificial Immune Network Algorithm," IEEE Power Engineering Society General Meeting, Pittsburgh, PA, July 2009.

Du, Shu, and **Lee, Kwang Y.,** "Short-Term Load Forecasting Using Semigroup Based System-Type Neural Network," 15th International Conference on Intelligent System Applications to Power Systems (ISAP), Curitiba, Brazil, November 2009.

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Mart, S.R., and **McClain, Stephen T.,** "Heat Transfer from Protuberances and Simulated Ice Accretion Roughness Elements," ASME International Mechanical Engineering Congress and Exposition, IMECE2009-10825, Lake Buena Vista, FL, November 2009.

McClain, Stephen T., Tino, P., and Kreeger, R.E., "Ice Shape Characterization Using Self-Organizing Maps," First AIAA Atmospheric and Space Environments Conference, AIAA-2009-3865, San Antonio, TX, June 2009.

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Byeong-Mun (Ben) Song

Assistant Professor, Electrical and Computer Engineering

Dr. Ben Song joins Baylor's Department of Electrical and Computer Engineering from San Diego, Calif., where he founded ActsPower Technologies, Inc., in 2004 and served as its chief executive officer for five years.

ActsPower remains a leading high-tech company that provides advanced RF technologies for wireless communication industries.

Song's research interests include modeling, analysis, design, implementation and test of alternate energy power conversion systems for smart-grid; compact pulsed power system and energy storage system solutions for medical devices and defense applications; high energy efficient power converters and switched-mode power supplies; advanced electric vehicle propulsion systems and their digital controllers; RF power modules, electronic circuits, and digital filters; and wireless power management converter solutions.

He received his BS and MS degrees in Electrical Engineering from Chungnam National University in Deajeon, Korea. He received his PhD in Electrical and Computer Engineering from Virginia Tech in 2001.

Song has received numerous awards for his work, including the top Paper Award at the International Power Electronics Conference in Tokyo, Japan, in 2000. He also is listed in the *International Who's Who of Professionals.*

His courses at Baylor include Automatic Control Systems, Power Electronics, and Engineering Design II.

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Simmonds, Devon M., Reddy, Y. Raghu, **Song, Eunjee,** and Grant, Emanuel, "A Comparison of Aspect-Oriented Approaches to Model Driven Engineering," International Conference on Software Engineering Research & Practice (SERP), Las Vegas, NV, July 2009.

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Song, Eunjee, Kim, Hanil, and Sun, Wuliang, "A Property-based Verification Approach in Aspect-Oriented Modeling," Short Paper/Poster Session in 24th Annual ACM Symposium on Applied Computing (SAC), Honolulu, HI, March 2009.

Gregg, Jason R., Merchant, J. Shane, **Van Treuren, Kenneth W.,** and **Gravagne, Ian A.,** "Experimental Analysis of a Counter-Rotating Wind Turbine," Paper IMECE 2009-11355, ASME 2009 International Mechanical Engineering Congress and Exposition, Lake Buena Vista, FL, November 2009. » *This paper won third place in the Young Engineer's Paper Contest.*

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Van Treuren, Kenneth W., "Skills Gap: Understanding the Transition from Secondary School to the University," ASEE Gulf-Southwest Annual Conference, Waco, TX, March 2009.

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Van Treuren, Kenneth W., and **Eisenbarth, Steven R.,** "The Integration of Faith and Profession in the Engineering Discipline," Chapter 7, *Engaging our World: Christian Worldview from the Ivory Tower to Global Impact,* Selected papers from the International Institute for Christian Studies Conference, W&S Academic Press, Tulsa, OK.

Engineering grad sharpens skills by modding car to run on iPhone app

Baylor graduate Hunter Smith (BS '08) is part of a team of engineers from Austin-based National Instruments that made headlines recently for designing a system that uses an iPhone app to pilot a late '80s Buick. The app controls steering, the gas pedal, and brakes – everything needed to drive a car. Their work has been covered by mainstream outlets like CNN.com and BBC Radio as well as tech-focused sites like CNET, Gizmodo, Wired UK and CrunchGear.

Why design a car to be controlled via iPhone? The engineers, who collectively go by the name of Waterloo Labs, enjoy testing the limits of their abilities while having fun with do-it-yourself-type projects.

baylor.edu/baylorproud

1980

Mark Stuart Hammons (BS, CSI) reminisced recently that he participated on the 1980 programming team that came in fifth place that year. Mark lives in Plano.
Email: Mark6of1@verizon.net

1986

David Weiss (BA, CSI) continues his career with the Navy. He lives in Patuxent River, MD.
Email: sixcookiemonsters@gmail.com

1991

Ravishankar Venkateswaran (MS, CSI) works for Stage Stores, Inc., and lives in Houston, TX.
Email: rvenkat@stagestores.com

1994

Shawnee McCoy Huckstep (BA, CSI) and her husband, **Aaran** (BA, CSI-1995), were featured in an article in the *Colorado Springs (CO) Business Journal* for their successful company, TechWise.
Email: shuckstep@techwise.com

2000

Benjamin Thompson (BSE) earned his MS (2002) and PhD (2004) degrees in electrical engineering at the University of Washington in Seattle, WA. Dr. Thompson is on the research faculty at the Applied Research Laboratory at Pennsylvania State University where he is a research associate and department head for tactical processing and control technology in the undersea weapons office. Email: bbt10@psu.edu

2006

Amy Bowen (BSECE) has been a field test engineer at the National Renewable Energy Laboratory for small turbine independent testing at the National Wind Technology Center since September 2007. She is involved in duration, power performance, and safety and function testing for small wind turbines. Amy also is involved in software development for small turbine testing, blade testing, and the Siemens 2.3-MW project. Email: solarmoose@gmail.com

2007

David Keith Fisher (BSI) passed away as the result of a car accident in August 2009.

2009

Shawn Adair (BSME) works as a Mechanical Engineer I for Smith International in Houston. Smith International is a world-wide oil tool designer and manufacturer.
Email: SAdair01@smith.com

Eric Minor (BSME) works as the Jr. Mechanical Design Engineer for ADS/Transicoil, a custom engineered manufacturer of motors, resolvers, actuators, motors and LCD products for applications in aerospace, military, industrial and medical markets among other applications. He lives in King of Prussia, PA.
Email: EricMichaelMinor@gmail.com

Please stay in touch.

If you would like to let alumni and friends of the School of Engineering and Computer Science know about recent events in your life, please contact us:

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BAYLOR ALUMNI

BAYLOR UNIVERSITY
SCHOOL OF ENGINEERING & COMPUTER SCIENCE
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SYNERGY

CHANGE SERVICE REQUESTED

ON A COLD DAY...

Baylor professor of computer science/ACM-ICPC executive director Bill Poucher (seen above, center – *All for Baylor, Dr. Poucher!*) and a Baylor entourage of volunteers traveled to the 2010 ICPC event in Harbin, China, where the temperatures can be a bit nippy (say, -20° in February) at all times. Beyond the contest, students and volunteers participated in sightseeing, including festivals showcasing sculptures of ice and snow. View pictures and video of the events at **icpc.baylor.edu.**

On the other hand, it is accurate to say Waco, Texas, rarely sees 32°F for extended periods, yet the Baylor campus welcomed a few snow flurries in December 2009 and February 2010. The snow from one day in February managed to hang around for a few fun-filled hours. Check the archives of the Baylor Proud blog at **baylor.edu/baylorproud** for additional campus scenes.

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