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**SAFE AND (CYBER) SECURE:**

Rice's Glasscock School of Continuing Studies will be offering a security awareness workshop that provides a basic understanding of the threats to businesses data and offers best practices for managing information security in the work environment. See story on Page 7.



**TWO WHEELS, TWO PASSIONS:** Carlos Solis uses his long-distance motorcycle trips to call attention to the problem of modern-day slavery.

## Riding With the Wind to Stop Human Trafficking

Carlos Solis '03 rode his BMW motorcycle 10,400 miles from Houston to Alaska and back in four weeks to raise awareness of the human trafficking problem affecting our world. While he had to endure some cold and wet days, the epic journey offered moments of serene solitude and views of breathtaking beauty.

And to Solis, manager of educational technologies at Rice University, that's exactly the outcome he had hoped for. He wanted to combine his two passions: to end modern-day slavery, while riding his motorcycle on long-distance trips.

Solis got the idea about five years ago after listening to a lecture at Rice by David Batstone, founder of Not For Sale, a nonprofit organization whose mission is to stop human trafficking. In his talk, Batstone explained

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## Rice Students Create Robotic Arm

It was a big day for Dee Faught when a team of Rice University bioengineering students gave him a helping hand. In fact, they gave him a whole arm.

The team, Team Brittle Bones, made up of juniors Matthew Nojoomi, Nimish Mittal and Sergio Gonzalez, won Rice's George R. Brown School of Engineering Design Showcase and Competition last spring for their R-ARM, a robotic device for Faught that fits his motorized chair. A video game controller allows Faught to manipulate the robotic arm. The students had the eager teen try a nearly finished version of the device in September at Shriners Hospital for Children in Houston.

Faught, 17, lives with osteogenesis imperfecta, a genetic condition that makes his bones especially brittle. The device will enable him to perform tasks most people

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that human trafficking has become a global issue, affecting literally millions of people.

The Not For Sale website defines human trafficking as a form of slavery. “Slavery occurs when one person completely controls another person, using violence or the threat of violence to maintain that control and exploits them economically and they cannot walk away.” Sexual and labor exploitation are prime examples of human trafficking.

Within five minutes of listening to Batstone, Solis said his life was transformed. “It had really stirred something in me that made me feel that I couldn’t sit on the sidelines knowing about this problem and not doing anything about it,” he said. “I spent the next

Clubs and at churches and took to wearing orange, which is the color that represents human trafficking, much like pink represents breast cancer. Often he wears an orange shirt or orange shoelaces and when he’s cruising on his motorcycle, an orange headband.

“It’s a conversation piece that gives me the opportunity to talk about human trafficking,” Solis said.

Orange also appears on his motorcycle: the handlebars and engine protectors are painted orange and the saddlebag has an orange sign with the name of his latest trip. For example, “Texas to Alaska 2 End Slavery” was scribbled on an orange background as a way to highlight his efforts. “The sign,” he said, “invariably piques people’s curiosity and they come over to ask me about slavery.”

**“It had really stirred something in me that made me feel that I couldn’t sit on the sidelines knowing about this problem and not doing anything about it. I spent the next two or three weeks not being able to sleep. I was going over all sorts of ideas of what to do.”**

**— Carlos Solis**

two or three weeks not being able to sleep. I was going over all sorts of ideas of what to do.”

Solis was thinking about Batstone’s assertion that to become an active participant in the fight against human trafficking, people need not quit their jobs, sell their house or move to another country. “He suggested that we take the things we are passionate about,” Solis said, “and instead of turning them inward for self-edification to look outward with the purpose of helping others.”

Solis took his three passions — writing, photography and motorcycle riding — and began using them to raise awareness and funds for organizations that were fighting human trafficking. He created a website, 2 End Slavery, and posted photos and writings of his motorcycle trips. He also gave talks at Rotary

He raises funds with the motorcycle journeys by asking his friends and contacts to support him with a donation. In four years, Solis has raised \$25,000 and has distributed that money to three organizations: Redeemed Ministries, a local advocacy group that provides care for survivors of human trafficking; Polaris Project, a national advocacy group that runs a human trafficking resource hotline; and International Justice Mission (IJM), which rescues victims of slavery and sexual exploitation and provides them with legal representation.

Since 2009, Solis has taken five motorcycle trips to Bonneville Salt Flats in Utah; Death Valley, Key West and Alaska; and the deserts of West Texas, New Mexico, Arizona and Utah. In his trip to Alaska in 2012, Solis packed his BMW motorcycle with a tent, a

sleeping bag, clothing for five days, a camera, dehydrated food and a small stove. He left Houston in June and rode for four weeks, eight to 10 hours a day, and slept in campgrounds, where he always took the opportunity to talk to fellow travelers about human trafficking. Getting enough sleep was a problem, though, because Alaskan summer nights are only three hours long.

He encountered only one setback when his clutch gave out and roadside assistance took him to Anchorage, where he spent an extra day while his motorcycle was being repaired. A problem that didn’t materialize was the attack of bears. He carried mace to ward them off, and he did see a grizzly bear on the side of the road and another with cubs, but they stayed away, minding their own business. He saw an abundance of wildlife up close — a bald eagle only two meters away perched on a tree and a wolf that ran along with him for a short stretch. He saw elks, moose, bison and mountain goats.

His journey has inspired others to follow their convictions. “My conversation with him about his journey gave me time to reflect on my own journey in the fight against human trafficking and how everyone must play a part in spreading awareness about this terrible crime,” wrote Johanna Olivas, an activist and author, in her blog.

For the future, Solis wants to expand his focus from supporting organizations that rescue and restore victims of human trafficking to helping organizations that focus on prevention. “I want to work with organizations that empower individuals to make them less susceptible to becoming a victim,” he said. “Part of what makes human trafficking possible is the lack of opportunities for young girls.”

With that in mind, Solis is already planning his next long-distance trip. For a long time he has wanted to trace the Mississippi River to its origin. Another trip he is considering is to ride to eastern Canada and cross the Labrador Peninsula.

“I want to be of service,” he said. “It’s an element of my faith and I want to help those who I feel are disadvantaged or oppressed or are in some kind of trouble.”

**DAVID D. MEDINA**

Director  
Multicultural Community Relations  
Public Affairs



take for granted.

“It will help him reach into the cabinets and get a cup or something he can’t get to from his chair by himself,” said his mother, Stacy Faught. “One of the things I’m excited about is that he’ll be able to pick up his laundry off the floor.”

“We’ve seen a lot of people tell him he’s not going to be able to do certain things,” said his father, Keith. “Dee’s not one to say, ‘I can’t do it.’ He’ll figure out a way.”

Faught’s doctor, Gloria Gogola, had sug-

gested to the team’s adviser, Ann Saterbak, a professor in the practice of bioengineering education, that some students might consider designing a device to help Faught.

“I expected a high level of engineering talent,” said Gogola, an orthopedic surgeon at Shriners who has advised several design teams at Rice. “But I was astounded at the amount of sensitivity they had toward Dee. It gives me hope that there are young engineers out there who are so sensitive to people with special needs, who are fantastic

in their own right.”

“It will help me be more independent,” said Faught, who lives with his parents and siblings in Friendswood, Texas. “Now that I’m going to get it, I can’t wait. Not many kids I know get a robotic arm.”

The students, who did the bulk of their work at Rice’s Oshman Engineering Design Kitchen, hope to commercialize the product. They see themselves working on it even after graduation. They are applying for grants to further develop R-ARM and



**A GRIP ON INDEPENDENCE:** Rice bioengineering students designed a robotic arm for Dee Faught, who suffers from a genetic condition that make his bones brittle.

**“I EXPECTED A HIGH LEVEL OF ENGINEERING TALENT. BUT I WAS ASTOUNDED AT THE AMOUNT OF SENSITIVITY THEY HAD TOWARD DEE. IT GIVES ME HOPE THAT THERE ARE YOUNG ENGINEERS OUT THERE WHO ARE SO SENSITIVE TO PEOPLE WITH SPECIAL NEEDS, WHO ARE FANTASTIC IN THEIR OWN RIGHT.”**

— GLORIA GOGOLA

hope to work with advisers at Rice’s Jesse H. Jones Graduate School of Business to devise a business plan.

Gonzalez said he is aware of commercial robotic arms that cost upward of \$25,000. The students made Faught’s arm for \$800. “As we start producing more, the cost could go down even further,” Nojoomi added.

Faught plans to attend Houston Community College for the next two years and then transfer to a school in New York to pursue a career in music. He currently DJs events, but would like to advance into production of his own and others’ music.

“He’s an incredible kid,” Mittal said. “I think that’s part of the reason we stuck with it. If it was just an abstract kind of project, we would have been less motivated. But the fact that we were building it for Dee drove us. We didn’t want to disappoint him.”

▶ To see the YouTube video, please visit <http://preview.tinyurl.com/ricearm>.

**MIKE WILLIAMS**

Senior Media Relations Specialist  
Public Affairs

## Conducting an Inventory of the Big Thicket

When it comes to learning about biological diversity, nothing beats “diving headfirst into nature.”

That’s the way Olivia Ragni, a senior in Rice’s Biological Diversity Lab, described her experience this October when she and her classmates joined forces with local experts to conduct an inventory of the flora and fauna of the Big Thicket National Preserve near Kountze, Texas.

The students were joined by Nancy Grieg, director of the Cockrell Butterfly Center at the Houston Museum of Natural Sciences; Cassidy Johnson, Houston toad research coordinator at the Houston Zoo; Kevin W. Conway, assistant professor and curator of fishes at Texas A&M University; Cin-Ty Lee, professor of earth science at Rice and an expert on birds; Evan Siemann, professor and chair of ecology and evolutionary biology at Rice; and David P. Lewis, president of the Gulf Coast Mycological Society.

Following a short trip to become familiar with the Turkey Creek Unit of the preserve, the students corresponded with their expert volunteers to develop a plan for the survey. Then they rolled up their sleeves and got busy doing the hard work of identifying as many species as they could over the weekend.

To complete the survey, the students worked in groups alongside their expert volunteers for an entire day searching for as many individuals

of their focal group as possible. For some, like the fungus group, this simply meant walking slowly through the forest and carefully looking for mushrooms. Others, like the butterfly and dragonfly groups, had to chase their targets with nets. The bird and mammal group had a stealthier technique. They used motion detecting “camera traps” to photograph any animal that walked or flew past their study sites. Other groups, like those surveying reptiles, amphib-

“I ENJOYED THE CHANCE TO GET OUT IN THE FIELD AND COLLECT MY OWN SAMPLES. WHEN DOING FIELD WORK YOU NEVER KNOW EXACTLY WHAT TO EXPECT AND THAT ELEMENT OF UNKNOWN MAKES THE EXPERIENCE MORE EXCITING.”

— SENA MCRORY

ians and ants, used pitfall traps dug into the ground to see what accidentally fell in. The fish group had perhaps the most challenging task, wading in the chest-deep waters of Village Creek with a large net suspended between two poles.

Thanks to a Charles Duncan Award for Instruction in Natural Sciences, each group was equipped with a GPS-enabled digital camera that they used to photograph each species they encountered. Although some samples of insects, trees and mushrooms had to be brought back to the lab for more careful identification, the cameras allowed the students to complete the survey without sacrificing the lives of most of their organisms.

The students are still working on identifying their samples, but preliminary results suggest that, collectively, the group observed nearly 200 different species, including eight mammals, 25 birds, seven reptiles, three amphibians, 11 fish, 16 butterflies and moths, 10 ants, 24 trees and 84 fungi.

The students will be posting their images, along with the species’ name and the precise location where it was observed, on iNatural-

ist.org, a website that allows anyone with an interest in the natural world to document observations. Their data will contribute to the Thicket of Diversity project, an effort by the Big Thicket Association to document every living thing within the Big Thicket region of Texas.

For some students, the survey was an opportunity to do something completely new.

“Having grown up in an urban environment my entire life, it was really nice to experience what nature was like,” added senior Yakira Alford. “I was honestly afraid of being in the woods at first, but it turned out to be an enriching experience.”

Even students with more outdoors experience, like senior Sena McRory, found the project rewarding.

“I enjoyed the chance to get out in the field and collect my own samples. When doing field work you never know exactly what to expect and that element of unknown makes the experience more exciting,” McRory said. “I also enjoyed talking with the other experts about their careers and unique experiences in a more casual, nonclassroom setting.”

Senior Kelsey Wooddell agreed. “My favorite part of the experience was seeing the passion of the experts working in the field with us.”

Next year’s class plans to return to the same site and continue surveying the Big Thicket National Preserve, adding new observations to a growing compendium of biological diversity.

**SCOTT SOLOMON**

Professor in Practice  
Department of Ecology and  
Evolutionary Biology



**IN THE THICK OF THINGS:** Rice undergraduates join forces with local science experts to conduct an inventory of the flora and fauna of the Big Thicket National Preserve near Kountze, Texas.



## ‘Tinkering’ With Ways to Engage Middle School Girls in Computer Science

Rice School Science and Technology (SST) partnered with Schlumberger to offer the Computer and Engineering Design Academy for Middle School Girls.

The program is designed to inspire young women to envision themselves as scientists and engineers by exposing them to hands-on design experiences that connect science, technology, engineering and mathematics (STEM) to tangible, real-life applications using new and exciting technology.

SST staff members Amber Szymczyk and Matthew Wettergreen guided four Rice engineering students, sophomore Caroline Lane, senior Kim Le, junior Edward Luckett and junior Sam De la Torre on how to visualize and design innovative programming curricula. Rather than using traditional programming of learning via syntax or a simulated gaming environment, they developed a hands-on, constructivist approach, in which students creatively explored and learned about both hardware and software and created tangible objects.

Using Arduino microprocessors, an open-source computer-aided design program, and an inexpensive 3D printer, students learned computer engineering through inquiry science and engineering design. SST staff members Gigi Nevils-Noe, Matthew Cushing and Jordan Trachtenberg worked side-by-side with the four Rice engineering students to teach the academy. As a result of this two-week summer program, the middle school girls are 50 percent more likely to take a computer science course in high school.

During the program, the girls learned manufacturing techniques focused on rapid prototyping, how a 3D printer creates objects by melting plastic and depositing it in layers, basics of computer-aided design, and how to use TinkerCAD, a browser based 3D modeling software. They also completed online lessons in TinkerCAD and design challenges and modeled objects of their choosing. Their final project was a team challenge in which they modeled either a zoo or a park. Girls were introduced to microprocessors and circuits via the Arduino Uno and various electrical components, worked in teams and followed a guide to complete various tasks, including creating a LED temperature indicator and a 3D printed owl by combining what they had learned during the program. Each owl was programmed to turn its head and change the brightness of its LED eyes depending on external light conditions. Students were given the owls they designed, the components necessary to make it work and an Arduino Uno.

In the spring, 15 former participants will be recruited to return for four days to participate in Saturday Maker Meet-Ups, an extension of their summer work and an incubator for SST’s new innovative STEM Outreach Maker learning experiences. The participants will experiment with new materials and ways of honing their skills and deepening their knowledge. It also will enable them to “make” by tinkering, creating, experimenting, talking and meeting with Rice engineering students, SST staff and with their summer academy friends.

**CAROLYN NICHOL**

Director, SST

**ALICE CHOW**

Associate Director Research and Grants, SST

**LINDA SCOTT**

Executive Director, SST

## Rice Students to Build Another Habitat House

Rice’s Habitat for Humanity chapter dedicated its Centennial House a little over a year ago, but that hasn’t stopped the organization from making plans for a second home, the Rice Second Century Home.

As with the Centennial House, Rice students will be involved in every aspect of planning, fundraising, design and construction efforts. Rice students Julia Madden and Alex Cooper, who are working closely with Rice student architects and other Rice and Houston community members, are leading the project.

“The house will be the first of many ways for Rice to show its commitment to serving the Houston community in its second century,”



Madden said. “And it’s bringing together students from different residential colleges and majors in addition to encouraging collaboration across various undergraduate and graduate departments.”

The house will fulfill all design requirements set by Houston Habitat for Humanity and the city of Houston. Cooper noted that the most direct benefit to the Houston community will be to the family who is selected through a competitive application process by Houston Habitat for Humanity.

“It is noteworthy that in keeping with Habitat’s philosophy, the house will not be given away,” Cooper said. “The family will put in at least 100 hours of sweat equity for the first down payment in addition to paying the 20-year no-interest mortgage on the house to pay for its building costs.”

Approximately \$35,000 has been raised toward the \$70,000 goal to be met by December, and the students are seeking volunteers to contribute labor when construction begins in January. The goal is to have the house built by May.

Anyone interested in donating labor or money can visit <http://habitat.rice.edu/rsch>.

“THE HOUSE WILL BE THE FIRST OF MANY WAYS FOR RICE TO SHOW ITS COMMITMENT TO SERVING THE HOUSTON COMMUNITY IN ITS SECOND CENTURY. AND IT’S BRINGING TOGETHER STUDENTS FROM DIFFERENT RESIDENTIAL COLLEGES AND MAJORS IN ADDITION TO ENCOURAGING COLLABORATION ACROSS VARIOUS UNDERGRADUATE AND GRADUATE DEPARTMENTS.”

– JULIA MADDEN

**AMY HODGES**

Senior Media Relations Specialist  
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## Rice Curriculum Transforms Former North Forest ISD Schools

Saying that social media is key to developing relationships is an understatement. This past June, Reid Whitaker, executive director of Rice Digital Learning and Scholarship and founder of STEMscopes, sent a simple tweet to Terry Grier, superintendent of Houston Independent School District: “STEMscopes is the solution.”

The minute the tweet went out, a full 127 characters shy of the limit, it hit home with Grier and began a movement to transform HISD’s newest annexed schools from the now defunct North Forest ISD into models for science education.

Through this collaboration, four elementary schools have begun using STEMscopes, a Rice University generated K–12 science curriculum, with intensive implementation support from Heather Wilde, a former science coordinator in Cy-Fair ISD and STEMscopes trainer.

Traditional science teaching is simply ineffective in these student populations, many of which are multiple years behind on basic reading skills. Lance Green, a fifth-grade science teacher at Elmore Elementary, puts it best: “The students are really invested in science and enjoy the challenge. Many students ask for more homework!”

STEMscopes has given these teachers, most of whom are just beginning their first years in the classrooms, a chance to teach students through constructivist learning-by-doing pedagogy. Armed with a myriad of hands-on investigations, connections into other content areas and ample opportunities for students to explore, these teachers are turning what once were failing schools into science learning beacons.

More often than not, science is taught as a string of vocabulary words. Both students and teachers are beginning to recognize that learning is a bilateral process. Teachers need to be facilitators, enabling students to struggle and explore science phenomena in controlled settings so that the students become owners of the knowledge rather than simply regurgitating it.

Nevertheless, there have been challenges.



**EXPLORING INSIDE THE CLASSROOM:** Students at North Forest ISD are using STEMscopes, a Rice University generated K–12 science curriculum, which emphasizes collaborative learning and hands-on investigations.

**“THE STUDENTS ARE REALLY INVESTED IN SCIENCE AND ENJOY THE CHALLENGE. MANY STUDENTS ASK FOR MORE HOMEWORK!”**

—LANCE GREEN

For many this has been a difficult transition as it necessitates releasing some amount of classroom control and not supplying an answer the moment the group becomes stuck or frustrated.

Unsurprisingly, one teacher commented when the STEMscopes implementation began that, “the biggest challenge has been getting the students to understand that working in groups is a part of everyday life. They do not have the social skills to collaborate with each other effectively.”

Two months later, the changes are already

taking hold. By understanding STEMscopes’ design and team-teaching with Wilde, the same classroom now boasts students that collaboratively make circuits together and derive the meaning of conductors and insulators in their own words without teacher input.

As assessment data begins to pour in from the pilot schools, STEMscopes is beginning to show a significant impact on the students’ science aptitude. HISD will be using this data and future results to determine if STEMscopes should be used across all schools to reform science teaching throughout the district. If the students in these four elementary schools are any indication, Rice may soon be spreading its educational outreach to thousands of Houston students, paving the road for future Owls.

**DAVID ERIC ALVIAR**

Assistant Director of Communication and Marketing  
STEMscopes



## Rice Offers Solutions in Developing Mathematics Leaders

Several members of the Rice University School Mathematics Project (RUSMP) provided professional development to more than 250 mathematics leaders from across the state attending the Texas Association of Supervisors of Mathematics (TASM).

RUSMP members Anne Papakonstantinou, Richard Parr, Susan Troutman, Carolyn White and Alice Fisher were charged with presenting strategies that would enable mathematics leaders to decode the language and interpret the mathematics of the revised K–8 Texas Essential Knowledge and Skills (TEKS).

The transition from the current to the revised TEKS in grades K–8 is presenting serious challenges for public school districts across Texas. RUSMP designed a professional development session to address the rigorous treatment of mathematics expected in the revised TEKS so that mathematics leaders can support teachers as they prepare students for the more difficult State of Texas Assessments of Academic Readiness (STAAR).

In its 28-year history of working with teachers, the RUSMP team has amassed a plethora of interesting mathematics problems, which prompt lively discussions on how to solve them. During a morning session in October, RUSMP presented several of these problems to TASM members who participated in problem-solving activities and discussed how they arrived at their answers.

Some of the problems they tackled were “Which Bed, Bath, & Beyond coupon would you use for a particular purchase?” and “The egg dilemma of how many eggs did Anne have in her basket at the beginning of an egg-distribution activity?” The RUSMP team led discussions on how these types of problems can ramp up the rigor in mathematics lessons.

During the afternoon, TASM members were divided into two groups, K–5 and 6–8, in order to decode the language and interpret the mathematics in the TEKS for their particular grade bands. The K–5 group investigated fractions, in particular the notion of unit fractions, a new concept for that grade band, using Cuisenaire rods and patty paper. The 6–8 group focused on proportional and nonproportional reasoning and linear and nonlinear functions through multiple representations, much of which has been moved from high school to the middle school grades. They also explored an equator problem using tape measures and globes, and sorting circles and justified mathematical relationships using multiple representations.

The closing activity had TASM members carefully analyzing the new language in the revised TEKS under the guidance of the RUSMP team.

### ANNE PAKONSTANTINO

Director, Rice University School  
Mathematics Project



## Improving Information Security in the Houston Business Community

When it comes to information security, what employees don't know could hurt them and their company. The Greater Houston Partnership (GHP) recognized that education and awareness could improve the information security resilience of local businesses, especially small to mid-sized organizations that don't have security-specific staff.

The GHP created the Cybersecurity Task Force with leading experts across multiple industries and sponsored a conference in November. Rice's Vice Provost of Information Technology Kamran Khan served on the task force and participated as an expert panel member at The State of Cybersecurity: Preserving Business Vitality.

After learning that many small-to-medium businesses are looking for a way to learn critical information security skills, Khan approached Rice's Glasscock School of Continuing Studies about offering a practical security awareness workshop to Rice and the Houston communities. Consequently, Strategies for Reducing Risk in Corporate Information Management will be offered May 2, 2014.

This entry-level course provides a basic understanding of the threats to businesses' data and devices, as well as the tools executives need to introduce best practices for managing information security in their work environment. As part of this full-day workshop, participants receive a binder of employee awareness documents and training modules, as well as electronic versions that can be customized for their company.

Course instructors will be Marc Scarborough, Information technology security officer, and Carlyn Chatfield, information technology manager for technical communications.

► For additional information or to register, visit Rice's Glasscock School of Continuing Studies website at <http://www.gscs.rice.edu/>.

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# AT LARGE



**INSIDE THIS ISSUE:** Middle school students take part in a program at Rice that is designed to inspire young girls to pursue careers in science and engineering. See story on Page 5.

**David D. Medina**, Director, Multicultural Community Relations, Office of Public Affairs

