SCOUTING THE FUTURE
Robot Detects to Save Lives

ALSO IN THIS ISSUE
2 Message from the Dean
3 Electric Vehicle Conversion
4 Seismic Changes to Building Code
6 Study Abroad
7 Telly Award Winner
8 Research on Capitol Hill
Holiday Greetings to you and your family from Chico!

In spite of the many challenges that we all face this year, we hope that this newsletter brings good cheer from the faculty and staff in the college, and rekindles good memories of your time in Chico. We have great stories to share with you – stories about our alumni, and stories about our faculty and students’ success.

The cover story highlights an effort that I am particularly proud of – one that has grown out of collaboration with Bill Wattenburg (distinguished alum 1999) and Dave McCallen (distinguished alum 2008) at Lawrence Livermore National Laboratory (LLNL). This collaboration has grown into a true partnership with the Lab, providing faculty and students with real-world design projects, supporting the research and development mission of LLNL, while simultaneously facilitating senior projects and internships for students. This work with LLNL has spawned prototype robots with real potential for commercialization as you will see from the story. This model for collaboration is one that I would like to see replicated throughout the college.

As some of you know, I was recently appointed as dean of the College of Engineering, Computer Science, and Construction Management after having served as interim dean for a year. I am humbled by the broad support that I received in this appointment and will work tirelessly to help make the college and its programs ones of first choice. This is going to be extremely challenging given the state’s current economic condition and the cuts to higher education. Since 2002, enrollment at Chico State has increased by 29 percent while overall state funding has declined by 28 percent. We are currently facing a critical test of how we are going to effectively serve our student population with severely diminished state resources. At the same time, the welfare of our state depends on our graduates and the knowledge, skills, and ideas they hold. We cannot be successful in meeting these challenges, however, without partners like you, who value what we do and continue to demonstrate your support with your gifts and pledges.

Our students and faculty continue to amaze me with the intensity of their on-going commitment to community service. The spirit of giving back to the community at-large has now become an annual tradition in the college, having started with rebuilding houses in New Orleans, and last year providing permanent shelter for those devastated by fires in Concow among others. Students arrived this fall asking “what’s this year’s service project?” and showing up in overwhelming numbers in our fall planning meetings. The full story will be told in our spring newsletter, but I assure you that it will be a great one.

On behalf of the faculty and staff of the college, I wish you and your families the best for the coming holidays and the year ahead!

Sincerely,

Michael Ward, Dean
College of Engineering, Computer Science, and Construction Management

Let us know what you’re doing! Send updates to eccconnections@csuchico.edu
Driving to work each day is an experiment for Eric Tischer, a 2001 graduate of CSU, Chico’s mechatronic engineering program. Tischer converted a 2001 Volkswagen Passat to an electric vehicle and has enjoyed the ride ever since.

“I found the car on Craigslist for $1,800,” Tischer said. “It had a good interior and seemed like a great car for the project.”

The project took one year to complete and more than $20,000. “I drive it every day,” Tischer explained. “There’s a lot of tuning. Even now, one year later, I’m still learning.”

Tischer has indulged his passion for rebuilding motors and vehicles for years. While in college he completed a conversion of an MG Midget and a Porsche 914. At Chico State, he was involved in the electric vehicle program where he gained much of his electric vehicle knowledge. Tischer said he learned the advantage of having an AC motor when other electric vehicle conversions used a DC motor.

“The AC motor allows me to drive freeway speeds on the freeway,” Tischer said. “I can reach 65 MPH uphill at full throttle and keep pace with bay area traffic.”

Tischer purchased most of the parts from online retailers, including the three-phase motor. Usually motors come with controllers, but the motor he purchased for a reduced price did not.

“This was by far the most difficult part of the project,” Tischer said. “I had to create the controller and that blew about $1,200 just testing parts.”

Finally, after six months of building the controller and continued testing, the motor turned over and he was elated. After modifying the chasse and having the rear springs custom wound, the 4,000-pound Passat was finally ready for the road.

Tischer uses the car’s 35-40 mile radius to commute to work. Using the carpool lane is an added bonus during rush hour. He plugs in the car when he arrives at work and it is charged when he drives home at night. His next purchase will be upgrading the batteries to lithium.

“The batteries are pricey, so I have waited to get them,” Tischer said. “They will allow a radius of approximately 100 miles for the vehicle.”

The Passat has been featured in WIRED Magazine and Tischer has a blog detailing the car’s progress (etischer.com/awdev/).

“It’s worth all the time and effort,” Tischer said.
Determining the seismic rating for a building just became a little easier. Civil Engineering Professor Curt Haselton, Ph.D., is in the final stages of preparing a system that will clarify and add consistency to the current policy of determining a building’s seismic rating.

“Let’s say you are building a structure out of some type of material not listed in the building code,” Haselton explained. “For example, Lego’s. We don’t know how Lego’s are rated on the seismic scale, so we are creating a method to test the Lego’s and make that determination.”

This method would be used for materials not already listed in the building code. The process outlined by Haselton is clear and concise with options depending on the current knowledge of how a given substance handles pressure and movement. The goal is to create consistency for all tests to determine whether a building is safe.

“This is an addition to the building code that will really clarify the process,” Haselton said.

Dr. Haselton has been working on the FEMA grant project since 2005 with faculty members from Stanford University, State University of New York, Buffalo, and the University of Colorado, Boulder. Faculty, graduate students, civil engineers and those on the committee to review the building code worked on the $1.8 million project.

Chico State civil engineering student Jacqueline Steiner also worked on the project. “She did an excellent job and was very thorough,” Haselton said. “This project was a great experience for the team and a great experience for her.”

Similar projects are on the horizon for Haselton for the future. Similar reviews of other portions of the building code will be completed in future that will allow a specific class of structure to be categorized and assessed for simplified review at the local level.

“It’s a project that really makes a difference in the field,” Haselton said.
Scouting the Future

A robot that easily detects radioactive elements and another that senses roadside bombs seemed like a good idea at Lawrence Livermore National Laboratory (LLNL). The California Mechatronics Group at CSU, Chico created both and continue to imagine more applications for robots.

“Livermore was looking for an inexpensive detector device,” mechatronic engineer Jason Coates explained. “We created the scout robot using parts we could get from hobby and hardware stores.”

The robots are relatively inexpensive and save lives. LLNL’s goal is to eventually have a robot with each combat unit in Iraq and Afghanistan. The number of robots needed requires them to be both efficient and affordable. In the prototype, a chassis from an electric toy truck and a standard video camera are integral to the design. What sets these robots apart from others, Coates said, is that they perform 80 percent of the function of their more expensive counterpart, but cost only 20 percent of the price.

“They need to be usable,” Coates explained. “If they are too expensive, they could only be used in special cases with approval. These robots are created to be used, blown up, and new ones purchased quickly for relatively little cost.”

After the robots were tested for LLNL, a power company also decided they would like a robot to perform inspections inside nuclear reactor containment buildings. This robot could detect whether there were toxic levels of radiation in a particular place, pinpoint the radiation source and allow the user of the robot to determine how to proceed.

“The energy company’s robot has already really helped save workers from exposure,” Coates explained. “There was a case where radioactive elements were not known in a particular area, but the robot immediately detected them, determined the source and spared humans from entering the contaminated area.”

The California Mechatronics Group is managed by faculty member Nick Repanich and mechatronic engineer Jason Coates, a graduate of Chico State. A group of students also consistently work on the project, giving them hands-on experience in a necessary and exciting field.

“We hope to create a robot that can be manned via the internet,” Coates explained with a smile. “Theoretically, I could be sitting here at my desk and the robot could be checking an area half the world away.”
Several engineering students are participating in a FIPSE grant that allows them to study in Canada and Mexico.

“I decided to participate in the program so when I finish my semester at University of Zacatecas Mexico, I will be able to compete better in a global society,” explained sophomore Francisco Guidos.

Guidos is majoring in construction management and believes that he will be working with people from several countries when he graduates.

“This experience will give me the right tools to understand people’s backgrounds and culture differences,” Guidos said. “I am going to take classes and work with professionals in a construction company there.”

The project, which began two years ago, is a collaboration among six campuses, two in the US, two in Mexico and two in Canada. The goal is to provide a cultural and more global experience in engineering.

“It really helps students learn how culture impacts every aspect of life, including engineering,” Dr. Al Richardson, the project director on the grant, explained. “It’s a great opportunity for students to meet others and forge lasting relationships with engineers in other countries.”

Students spend one semester at a partner university and study engineering and business. To do this, there is much preparation. Students going to study in Mexico must be somewhat competent in speaking Spanish. Those who are not fluent take two semesters of Spanish at Chico State before leaving for Mexico.

“They arrive a few weeks early and complete language training classes before school begins,” Richardson explains. “We want them fluent speakers so they can make connections with others and participate in everyday life.”

Senior construction management student Isaias Valdez has been preparing to attend the University Autonoma of Zacatecas in the Spring.

“To study abroad has always been one of my dreams,” Vadez said. “So when I came upon this wonderful opportunity I knew it was the right program for me. I’ve been meeting with Dr. Richardson for about a year to prepare.”

Students meet several times with campus advisors to determine courses that will transfer, courses that will be effective at understanding culture, and general information about traveling in other countries. Once they begin their semester abroad, they learn more than just engineering. Mechanical engineering student Luke Buell is studying in Winnipeg, Manitoba, Canada this semester.

“Locating housing was challenging,” Buell said. “I did it all on the internet and by phone, but it turned out well. I live in a house with four housemates. One is a young doctor from Cameroon who is currently

See page 8
Computer Graphics Work Wins Telly Award

Students and faculty in Applied Computer Graphics won a Telly Award for their work on the documentary “400 Years of the Telescope”. The documentary aired April 10, 2009 on PBS and was produced by Emmy award-winning producer Kris Koenig.

Applied computer graphics faculty Dr. Clarke Steinback, Frank Pereira and John Pozzi worked with ten students on the animation portions of the film. They were chosen by Koenig to work on the film in his Chico studio, Interstellar Studios.

“The students won several awards for their work at media arts festivals in 2007,” Steinback explained. “Kris Koenig is a Chicoan and he read about us in the newspaper. He thought he would give us a try.”

The faculty met with Koenig to discuss his ideas for the film. The film depicts the development of the telescope and several discoveries made throughout time. These discoveries lead to a new understanding of not only the solar system, but the universe as we know it.

“The project was a major endeavor,” Steinback said. “The film crew traveled to the Netherlands, Chile, Europe and Hawaii to produce it.”

The NSF-funded film provided a hands-on learning experience for students who normally do not have exposure to the major equipment to produce this level of work in the academic setting.

“We don’t have that type of lab equipment here,” Steinback said. “As a result, we completed most of our work at Koenig’s studio here in Chico. We built what we call a render farm, basically a room with several computers with the same programs, to complete the project.”

Each student was responsible for a particular animation portion of the film.

“Working in close proximity to the producer was perfect,” Steinback said. “The students would create, show their work to Kris, and have immediate feedback. We pulled a couple all-nighters, but the project was a great success.”

The film earned four Telly Awards, one specifically for animation. The partnership between Chico students and the Koenig allowed two students to travel to Holland last summer to study animation with one of Koenig’s associates.

“Our students are amazing,” Steinback said. “They continue to win media arts festivals, just recently winning first and second at the 2009 festival in October. They worked extremely well on this film and have a Telly to prove it.”

Applied computer graphics faculty member Frank Pereira holds the Telly Award.
Research Fit for Capitol Hill

An Agricultural Research Initiative (ARI) project was featured in a Capitol Hill research display and presentation in May 2009. Dr. Joseph Greene and students Kevin Parsons and Michael Choy presented their project titled “Use of Industrial Waste for the Microbial Conversion of Carbohydrates to Lactic Acid”. It was one of only 30 projects chosen nationwide for this honor.

“The project takes rice hulls from Lundberg Farms and spent yeast cells from Sierra Nevada Brewery and turns them into lactic acid,” Greene explained. “From that state, we turned them into PLA biodegradable plastic.”

The project earned recognition because it was unique and used waste products for a new, biodegradable purpose.

While in Washington, D.C. for the honor, the students and Greene met with Sen. Barbara Boxer. On their return to California, they also met with Congressman Wally Herger.

“It was a great opportunity for the students to show their research in the poster session and discuss it with people in the scientific and environmental community,” Greene said.

Continued from p. 6

Another is a Canadian business owner.

The third is a bio-systems engineering PhD student (also from Cameroon), and the fourth is a civil engineering master’s student from Saudi Arabia. It’s diverse.”

This diversity is exactly what the program aims to achieve.

“This project points to the amazing globalization of engineering,” Richardson explained. “Your colleagues are not going to be sitting in the next cubicle. They will be all over the world and employees will need to understand their cultures to complete projects.”

Making a tax-deductible donation to the College of ECC is easy! To make a donation on-line, use the link:

http://www.csuchico.edu/advancement/make_a_gift.php

and select the tab for the college.