Nationally & internationally recognized scholars

Jian (Neil) Tang wins National Science Foundation CAREER Award for wireless communications work. Dr. Jian (Neil) Tang, a faculty member in Montana State University's Computer Science Department, has won a National Science Foundation CAREER Award worth $400,000. He will use the funds to look for ways to improve wireless communications using existing technology. Tang will work on a comprehensive networking solution using WiMAX technology and smart antennas. WiMAX can provide high-speed, long-range wireless communications in many situations and smart antennas can transmit data a long distance and improve network capacity. Tang will build a relay station model and testbed that other researchers can use and that will enrich how students study wireless communications and networks.

Ruhul Amin chosen as Fulbright Scholar. Dr. Ruhul Amin, MSU mechanical engineering professor and Bangladesh native, served as a visiting faculty member at the Islamic University of Technology (IUT) in Dhaka, Bangladesh, from May through August in 2008. Amin received a Fulbright Scholar Award to teach mechanical engineering courses, provide guidance in curriculum development and laboratory work, and to develop research activities with other professors. Sponsored by the United States Bureau of Educational and Cultural Affairs, the Fulbright is used worldwide to promote respect and mutual understanding between people in the U.S. and those in other countries.

Alumni Success

Jeffrey Sharkey among 10 finalists in Google contest. Jeffrey Sharkey, a 2008 graduate from MSU's computer science master's program, won $275,000 in a software design competition sponsored by Google. Sharkey's entry was one of the top 10 out of 1,800 in Google’s Android Developer Challenge, a contest designed to get software developers working on programs for Google’s cell phone operating system. Read the full article online at www.montana.edu/cpa/news/nwview.php?article=6164

Student-centered campus

Graduating seniors continue to surpass peers in FE Exam. In October 2008, College of Engineering graduating seniors once again outperformed all of their peer groups nationwide on the Fundamentals of Engineering (FE) exam. The eight-hour exam is the first step toward acquiring a professional license. COE seniors across all engineering disciplines achieved a pass rate of approximately 89%, while the aggregate national pass rate was 78%. MSU COE is among the 10 percent of engineering programs that require all graduating seniors to take the exam.

Computer science graduating seniors outperform their peers. In fall 2008, MSU’s Computer Science students achieved a median score of 78.5% on the Major Field Test in Computer Science, compared to the national median of 74% in the same session. These are from the second round of results following a new requirement for graduates to take the exam, which is used to measure student academic achievement in their major.

Eight COE students and their mentors honored with Awards for Excellence. Eight College of Engineering students are among 40 of Montana State University’s top seniors recognized at the 27th annual Awards for Excellence Banquet. The MSU Alumni Association and the Bozeman Chamber of Commerce sponsor the banquet. Honored students were nominated by faculty in their college or department. Qualified seniors must have a 3.5 grade point average on a 4.0 scale as well as demonstrated campus leadership and community service. In turn, the award-winning students each selected a mentor who was honored with them at the event. COE recipients and their mentors are Kelsi L. Canavan, Mechanical Engineering/Heidi Sherick; Erwin "Dan" Dunbar, Computer Engineering/David Dickensheets; Eric J. Moog, Electrical Engineering/Steven Shaw; Victoria Morefield, Chemical and Biological Engineering/Abigail Richards; Drew J. Nash, Mechanical Engineering Technology/Dave Foster; Bovard Tiberi, Mathematics and Computer Science/Rockford Ross; Heidi G. Tynes, Computer Science/Denbigh Starkey; and Jonathan Robert Weaver, Civil Engineering/Robert Mokwa.
**Opportunities for hands-on, active learning**

**Undergraduate works to inspire a new generation to save the world. Trevor Zuroff**, senior in chemical engineering, works in two laboratories, one in the Department of Chemical and Biological Engineering and another at the Center for Biofilm Engineering. After gladly working in auto body shops for years, Zuroff decided after his freshman year to get experience that would help him become an engineering professor. Zuroff studies quorum sensing, the tendency of biofilms, bacteria living in colonies, to communicate with each other and act as a unit. He is interested in how biofilms can be used to create things like biofuel and bio-plastics. Using bacteria for these products can be more efficient than traditional methods that use fossil fuels, but to use bacteria effectively, engineers need to understand how biofilms interact. Zuroff thinks that the alternative energy and manufacturing processes he's studying are important for the future, so he's eager to pass those lessons on to younger students. “Maybe they won't grow up to be engineers, but when the time comes to apply for college, they might remember that they learned about engineering once and that it was kind of cool,” said Zuroff. Read the full article at [http://www.montana.edu/cpa/news/nwview.php?article=6868](http://www.montana.edu/cpa/news/nwview.php?article=6868)

**More than 20 projects were on display at MSU's most recent Engineering Design Fair.** During fall and spring semesters, undergraduates from throughout the College showcase their projects at a design fair. Students learned valuable lessons about working in teams on a complicated problem. High-tech projects at the fair included an unmanned surveillance plane, sun-tracking solar panels, and a vest that can both heat and cool its wearer. More eccentric projects included a motorized winch system to flip mattresses and a device that can cook an entire breakfast at once, eggs and all.

Many students worked with outside sponsors who provided design specifications, which let students use engineering to meet real needs. One group built a portable solar-powered cooler for MSU’s student chapter of Engineers Without Borders. EWB had asked for a cooler that could keep medicines cool in remote locations without electricity and refrigeration. Read the full article at [http://www.montana.edu/cpa/news/nwview.php?article=6635](http://www.montana.edu/cpa/news/nwview.php?article=6635)

Above: Students who designed and built a remote control battering ram explained their design to Mandy Rutherford, an adjunct instructor for the multi-disciplinary junior-level design course. From left to right, Steve Pemble, MET; Shawn Johnson, ME; George Howell, ME; and Justin Moore, CpE and Physics.

**Leading Research**

**Center for Biofilm Engineering scientist Goeres tests claims of antimicrobial products. Darla Goeres**, research professor in the Department of Chemical and Biological Engineering, works in the Center for Biofilm Engineering (CBE). She has a five-year, $1.7 million contract from the Environmental Protection Agency to work on new ways to measure how well antimicrobial products perform against biofilms. Biofilms, communities of bacteria, range from dental plaque to the sludge that clogs plumbing. According to Goeres, the lab where she works, CBE’s Standardized Biofilms Methods Laboratory, is among the few labs in the world that can focus on methods development, thanks in part to EPA’s support. The EPA contract will let Goeres hire two more undergraduate students in her lab. They will receive training and experience to help them pursue graduate school or biofilms jobs. The lab normally hires four to six undergraduates each year.

**Peyton leads team investigating algae as a practical source of biofuel.** Recently, the U.S. Department of Energy awarded Montana State University and Utah State University a three-year, $900,000 grant to study the oil produced by algae, which could be a renewable source of biodiesel. **Brent Peyton**, a professor of chemical and biological engineering at MSU, is the principal investigator. Researchers will first identify which species produce the most oil and can produce it most efficiently. After identifying a candidate species, researchers will grow large numbers of it in a “raceway” bioreactor at Utah State. This 10,000-gallon, climate-controlled water tank has machinery to keep the algae gently moving to help them grow more efficiently. According to Peyton, algae should produce about 200 times or more biodiesel per acre than other biofuel crops. If researchers can develop practical processes for using algae to produce biofuel, there are side benefits. Growing algae does not require prime agricultural land or water suitable for irrigating food crops.
WTI houses one of the country’s largest driving simulators. The Western Transportation Institute at Montana State University is home to one of the largest and most sophisticated motion-based driving simulators in the United States. The $915,000 simulator pairs a surround sound system with real vehicle bodies mounted on a motion platform and surrounded by a 240-degree arc of projector screens. The new simulator will give WTI the ability to approximate existing places, including Montana’s problematic roadways, such as Highway 191 between Interstate 90 and West Yellowstone. As the simulated environment more closely approximates realistic conditions, researchers can be more confident that they are collecting valid behavioral data, especially those related to complex research questions. The data are important because car crashes are the chief cause of fatal injuries in rural areas and because testing systems prior to construction can help save money on road designs and infrastructure upgrades. Funding for the simulator came from a variety of federal and private sources.

Service & outreach
The College of Engineering was awarded $312,000 by the Toyota USA Foundation to support Teaching Engineering Applications in Math and Science (TEAMS), an innovative program developed to enhance teaching of K-12 math and science in and around Montana’s Native American communities. Read the article at http://www.montana.edu/cpa/news/nwview.php?article=6046

FIRST robotics tournaments inspire young students. Montana State University hosted 21 high school teams and 42 middle school teams from Montana, Utah, and Wyoming for FIRST Robotic tournaments in 2009. Robots inspire young students. When compared to their peers who haven’t participated in FIRST activities, FIRST students are: more than three times as likely to major specifically in engineering, roughly 10 times as likely to have had an apprenticeship, internship, or co-op job in their freshman year; significantly more likely to expect to achieve a post graduate degree; more than twice as likely to expect to pursue a career in science and technology; nearly four times as likely to expect to pursue a career specifically in engineering; more than twice as likely to volunteer in their communities. Read the article at http://www.montana.edu/cpa/news/nwview.php?article=5488

MMEC’s Holland recognized for economic leadership by Prospera Business Network. Prospera Business Network recognized exceptional businesses and leaders in Gallatin and Park County during its Annual Dinner and Business Excellence Awards ceremony in November 2008. The 2008 Economic Leadership Award was presented to Steve Holland, Director of the Montana Manufacturing Extension Center. This award is given to a government or non-profit leader for contributions to the state’s economic development. MMEC provides technical, business management and engineering assistance and demonstrates significant impacts for small and mid-sized manufacturers around the state. Prospera is a non-profit, member supported economic development organization in southwestern Montana. It was originally established in 1985 as the Gallatin Development Corporation.