



TryEngineering Today!

The newsletter of TryEngineering - find out more at www.tryengineering.org

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Engineering Students Make Electric Car

Roger Dougal, a professor at the University of South Carolina's College of Engineering has an interesting class project. He owned a 1972 MGB red convertible that was collecting dust, and challenged his engineering students to transform it into an electric car. About 15 students have worked on the car since Dougal began the great experiment ... and they succeeded! The "Electric MG," as it's called, is a reality. "It can go really fast for short distances," said Dougal, who estimates that about \$10,000 has been spent in

making the changes over a period of about 18 months. The original engine is in Dougal's garage and has been replaced by an AC motor with a custom driveshaft. In its place is a bank of more than 100 supercapacitors, resembling soft drink cans that have been encased in a plastic box and loaded into the trunk for the power source. A lithium battery will be added later



Image Credit:
University of South Carolina College of Engineering

and coupled with the supercapacitor bank to improve range and efficiency. Much of the student ingenuity and labor was volunteered. Some students have received course credit for their work.

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Flexible Solar Strips Light Bus Shelter

There won't be any more waiting in the dark at a McMaster campus bus shelter. New flexible solar cell technology developed by a group of engineering researchers at McMaster University in Canada has been installed to power lighting for night-time transit users. The ability to bend the solar cells to fit the curved roof of the bus shelter is one of the main features of the

technology. The flexibility is achieved by tiling a large number of small silicon elements into an array, mounting them onto a flexible sheet, and connecting them through a proprietary method. The two solar strips installed on the McMaster bus shelter are about 90 centimeters long and 12 centimeters wide. Each strip has 720 one-centimeter square solar

cells and generates up to 4.5 Watts of power. The solar cells capture sunlight during the day and convert it to electricity to recharge batteries located in each lighting unit. The batteries can hold enough charge to light the shelter for the better part of a night. TryEngineering offers a related lesson plan called "Here Comes the Sun." Find out more at www.tryengineering.org.



Exterior view of flexible solar strip designed by engineering researchers at McMaster on curved bus shelter.
Credit: McMaster University



Measuring the Wind

Each issue, TryEngineering Today profiles one of the many lesson plans available on TryEngineering.org. Each lesson plan is aligned with education standards to allow teachers and students to apply engineering principles in the classroom.

As many businesses and homes seek green options for energy, wind power is increasing considered a viable option for options where the wind is consistent and strong enough to turn a turbine. A special device called an

anemometer is used to test wind strength.

The "Measuring the Wind" lesson focuses on how anemometers are engineered to measure the speed of wind, and how designs have changed over time. Student teams design and build a working anemometer out of everyday products and learn about feasibility testing for locations considering harnessing energy from wind turbines. Student anemometers must be able to sustain the wind generated by a fan or

hairdryer at varying speed and students must develop a way to measure and chart rotations at different wind speeds. Student teams also evaluate the effectiveness of their anemometer and those of other teams, and present their findings to the class.

The lesson can be adapted for ages 8-18, and includes teacher and student handouts and worksheets. Find this and many other engineering lessons at www.tryengineering.org/lesson.php.



Smoke Alarm System Wins Award

A life-saving student design that could replace the smoke alarm as the essential home gadget has won the international James Dyson Award, an international design award that celebrates, encourages and inspires the next generation of design engineers. Automist can both detect fires and put them out by aerosolising the water from a standard kitchen tap. It fits directly onto a standard kitchen tap to create a domestic alternative to a sprinkler

system. In the event of a fire, a wireless heat detector triggers the under-sink pump driving water through a nozzle -- quickly filling the kitchen with a fine mist to put out the blaze. The 2009 James Dyson Award goes to Yusuf Muhammed and Paul Thomas (students at London's Royal College of Art) for their design concept, the Automist. The winner and their design engineering department both receive 10,000 pounds cash. James Dyson appreciated

the inventors' ingenuity, saying, "This simple but clever device should become a permanent safety feature in the home. Automist not only detects a fire but can put it out as well." The idea for the design came from a brainstorming session with a number of firemen at Chelsea Fire Brigade in London. The team worked on the design with trauma and stress experts, fire engineers, international sprinkler specialists and fire fighters.



Automist
(Image Source:
James Dyson Foundation)



Purdue to Lead US Earthquake Engineering Network

Advancing research and education to reduce the devastation and loss of human life from earthquakes and tsunamis is the goal of a new center at Purdue University. The National Science Foundation recently awarded \$105 million to a Purdue-led team to spearhead a center that will serve as headquarters for the operations of the Network for Earthquake Engineering Simulation, or NEES. Purdue will connect 14 NEES research equipment sites and the earthquake engineering community through groundbreaking cyberinfrastructure,

education and outreach efforts. The center will help researchers share information and equipment to enable research and innovation in earthquake and tsunami loss reduction, and conduct broader outreach. "Purdue's depth of knowledge in earthquake engineering, innovative high-performance computing experts, education professionals and outstanding interdisciplinary research abilities allow the university to make great contributions to this area," said Purdue President France A. Córdova.

In the past decade, 124 major earthquakes have occurred throughout the world, according to the U.S. Geological Survey. Major earthquakes are generally accepted to register a magnitude in excess of 7 on the Richter scale and inflict serious damage, including the collapse of buildings and bridges, over a large area. The organization estimates that earthquakes were responsible for 463,959 deaths in the past decade. TryEngineering offers a related lesson plan called "Shake it up with Seismographs." Find out more at www.tryengineering.org.



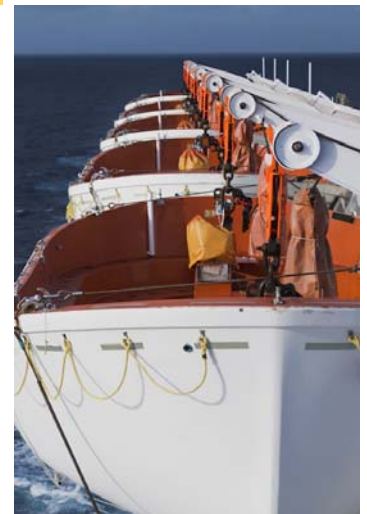
HUBzero is a new way for scientists and engineers to publish and share information. The latest hub will be used to study the causes and effects of earthquakes for the Network for Earthquake Engineering Simulation, or NEES. This hub joins others focused on topics such as nanotechnology, microelectromechanical systems, pharmaceutical products, cancer care, assistive technologies for people with disabilities, heat-transfer issues in engineering, and several others. New hubs are being created at a rate of about one per month. (Purdue University image/Michele Rund and Steve Tally)

Try the "Build a Lifeboat" Game

TryEngineering links to a wide range of online activities and games to encourage students to try out engineering. In each issue we spotlight a game -- this time an interactive game which challenges players to engineer a lifeboat by selecting the appropriate material for each component. "Build a Lifeboat" was developed by the Royal National Lifeboat Institution in

Poole, England. By playing the game you learn not only about materials engineering by selecting which materials to use to build components of the lifeboat, but also experience first hand how engineers design and redesign products until they achieve an optimal design. As you build your life boat, you may have to try and try again too! You'll launch each

boat you design to see whether it passes the test! For the link to "Build a Lifeboat" visit www.tryengineering.org/play.php. And also click on lessons to try your hand at building a working model of a boat with the "Hull Engineering" lesson too! Find this and many other engineering lessons at www.tryengineering.org/lesson.php.





Technology Spots Stolen Cars in Traffic

A computer program that may enable moving police cars to automatically detect stolen or unregistered cars in surrounding traffic has been developed by researchers at the University of Technology, Sydney (UTS), Australia. The program uses new techniques based on hexagonal pixels, rather than the conventional square pixels, to enable a computer linked to a camera to accurately identify and read number plates in real-time -- so the number can be checked immediately

against databases. Other applications being investigated include using the program to manage evasion of car parking fees, and as a real-time warning system for oversize and overweight trucks. Project leader Professor Xiangjian (Sean) He said hexagonal pixels gave much smoother edges in images than square pixels, which tend to look like jagged steps when the image is highly magnified. Hexagonal pixels can provide equivalent picture quality using 13 percent fewer

pixels. "It's not a new idea, but what our team has done is to use hexagonal pixels to develop much better methods of curve detection than is possible with square pixels, and this has opened the way for much quicker and more accurate shape identification," Professor He said. "The potential is enormous -- it could provide improved resolution for still and moving digital cameras and could find many applications improving the object recognition capabilities of robots."



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TryEngineering.org

is a resource for students (ages 8-18), their parents, their teachers and their school counselors. It is a portal about engineering and engineering careers, developed to help young people understand better what engineering means, and how an engineering career can be made part of their future.

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