



TryEngineering Today!

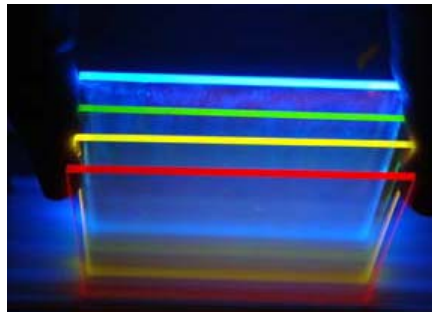
The monthly newsletter of TryEngineering - find out more at www.tryengineering.org

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Colorful Approach to Solar Energy

Revisiting a once-abandoned technique, engineers at the Massachusetts Institute of Technology (MIT) have successfully created a sophisticated, yet affordable, method to turn ordinary glass into a high-tech solar concentrator. The technology, which uses dye-coated glass to collect and channel photons otherwise lost from a solar panel's surface, could eventually enable an office building to draw energy from its tinted windows as well as its roof. "We think this is a practical technology for

reducing the cost of solar power," said Electrical engineer Marc Baldo. The researchers coated glass panels with layers of two or more light-capturing dyes. The dyes absorbed incoming light and then re-emitted the energy into the glass, which served as a conduit to channel the light to solar cells along the panels' edges. Because the starting materials are affordable, relatively easy to scale up beyond a



Organic solar concentrators collect and focus different colors of sunlight.

Source: MIT Photo / Donna Coveney

laboratory setting, and easy to retrofit to existing solar panels, the researchers believe the technology could find its way to the marketplace within three years. More information is at www.rle.mit.edu.

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Wave Power in Portugal

The world's first commercial wave power project was recently launched in Aguçadoura, on the Portuguese coast. The Aguçadoura project will initially generate power using 3 Pelamis Wave Energy Converters (PWEC) which are a semi-submerged, articulated structures

composed of cylindrical sections linked by hinged joints. The second phase of the project will be to manufacture and install a further twenty five machines and bring the installed capacity up to 21MW. The generators are located about 3 miles off the coast. Once complete the project is

expected to meet the average annual electricity demand of more than 15,000 Portuguese households while displacing more than 60,000 tons per year of carbon dioxide emissions from conventional generating plants. More information is available at www.pelamiswave.com.





Working with Watermills

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.

The "Working with Watermills" lesson explores how watermills have helped harness energy from water through the ages. It also provides information for students about hydroelectric power.

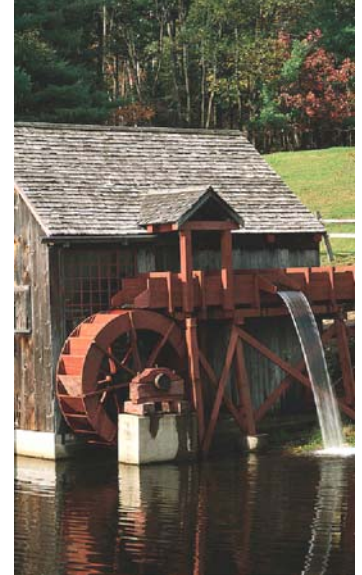
The lesson focuses on how watermills generate power. Student teams design and build a working watermill out of everyday products and test their design in a basin. Student watermills must be able to sustain three minutes of rotation.

As an extension activity, older students may design a gear system to be powered by the watermill. Students evaluate both the effectiveness of their own watermills and those of others, and

present their findings to the class. The lesson can be adapted for ages 8 - 18, and includes both teacher and student handouts and worksheets.

As a result of this activity, students should develop an understanding of structural engineering and design, the process of problem solving, and the importance of teamwork in engineering.

Explore this and other lessons at www.tryengineering.org/lesson.php.



Robotic Vacuum for the Shipping Industry

An automated robotic cleaning system that removes marine growth from the hull of a ship is being pioneered at Newcastle University in Scotland. Designed to reduce the carbon footprint of the world's shipping industry, the robot offers a solution to spiraling fuel costs and marine related pollution while removing harmful, non-indigenous species that could be transferred to local waters. Like an automatic carpet cleaner, the robot has been

developed out of an EU-funded project called HISMAR (Hull Identification System for Marine Autonomous Robotics) and is able to navigate its own way across the ship's hull. First a map of a hull is automatically charted, recording the location of every weld, rivet, or indentation of a ship's surface. The robot is magnetically attached to the ship's side and roams the hull, following a planned route, cleaning as it goes. Adjustable jets

of pressurized sea water blast marine growth off the ship's surface which is then sucked up into a main chamber where the material is filtered and the bio-fouling removed and rendered harmless to the local environment. In this way, the ship's robotic 'vacuum' continuously roams the ship's hull, preventing the build-up of slime, and boosting travel efficiency by cutting down on drag. More information is at <http://hismar.ncl.ac.uk>.



HISMAR robot.
Image Courtesy: HISMAR Project Team



Age Recognition Software

People who hope to keep their age a secret won't want to go near a computer running this software.

The computer software is being developed at the University of Illinois, (U.S.) and can fairly accurately estimate a person's age by examining only a person's face.

Age-recognition algorithms could stop underage drinkers from entering bars or prevent minors from purchasing tobacco products from vending machines. In addition to performing tasks such as security control and surveillance

monitoring, age-estimation software also could be used for electronic marketing.

For example, a camera snapping photos of customers could collect demographic data – such as how many adult men and women buy burgers, or what percentage of teenagers purchase a particular soft drink.

Estimating someone's age is not an easy task, even for a computer. That's partly because the aging process is determined not only by a person's genetic makeup, but by many other factors as well, including health, location and living

conditions. Consisting of three modules – face detection, discriminative manifold learning, and multiple linear regression – the researchers' age-estimation software was trained on a database containing photos of 1,600 faces.

The software can estimate ages from 1 year to 93 years. The software's accuracy ranges from about 50 percent when estimating ages to within 5 years, to more than 80 percent when estimating ages to within 10 years.

Find out more at www.cas.uiuc.edu.



Engineering Parachutes

Most people are familiar with what a parachute is -- a soft fabric device used to slow the motion of an object through an atmosphere by creating drag.

But, most people have never had a chance to design their own and understand the engineering behind the parachute. Many factors must be considered in the engineering of a

parachute. How heavy is the object that must be lowered safely? How fragile is it? Will temperature be a factor? What materials should be used?

TryEngineering.org provides a link to a NOVA interactive internet game that lets visitors try their hand at designing the ideal parachute for the Mars Exploration Rover

Mission. The volume, drag, strength, and stability of the design are tested online using a simulated wind tunnel. Site visitors can redesign their parachute until it operates as needed!

For the links to the Parachute Design game and other interactive engineering activities, click on "Play Games!" at www.tryengineering.org.





Computers Aid in Cancer Diagnoses

Imagine if your doctor could test you for cancer and instantly draw on lessons learned from billions of previous patient records. They could swiftly put your test results into perspective for early and effective treatment.

That possibility is a little closer each day thanks to the efforts of researchers at Central Queensland University (Australia) who are using the ability of computers to 'learn' and their ability to crunch massive data sets and carrying out related

research in computer science, data mining and bioinformatics.

"The computer can tell us very quickly about the status of a patient. And then the health practitioner and cancer patient can take the necessary steps which could save a patient's life," said researcher Jesmin Nahar, who notes that cancer is the number one killer of Australians.

The researchers are collaborating with others worldwide who are feeding genetic data

(expressed as microarrays) and image data (from CT Scans, MRI, ultrasounds, mammograms, X-ray, etc.) into computers.

The idea is to build up computer models for all the different stages of at least 13 different types of cancer and to use so many millions or billions of examples that the computer develops reliable algorithms using the machine learning concept. Find out more at <http://fbi.cqu.edu.au>.



CQUniversity Australia PhD candidate Jesmin Nahar believes quality cancer data can save lives. Image Provided by CQUniversity Australia



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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.

It is brought to you by:



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