

## News in Brief

## New Robots Can Provide Elder Care



Baby boomers are set to retire, and robots are ready to help, providing elder care and improving the quality of life for those in need. Researchers at the University of Massachusetts Amherst have developed a robotic assistant that can remind clients to take their medication, help with grocery shopping and allow a client to talk to health care providers.

Concerned family members can access the unit and visit their elderly parents from any Internet connection, including navigating around the home and looking for Mom or Dad, who may not hear the ringing phone or may be in need of assistance. Doctors can perform virtual house calls, reducing the need for travel, ScienceDaily reported.

"For the first time, robots are safe enough and inexpensive enough to do meaningful work in a residential environment," says computer scientist Rod Grupen, director of UMass Amherst's Laboratory for Perceptual Robotics, who developed project ASSIST.

The robot, called the uBOT-5, could allow elders to live independently, and provide relief for caregivers, the medical system and community services.

## Stereotypes Affect Performance



The England football team's poor record in penalty shoot-outs could be due to historical stereotyping, according to researchers at St Andrews University. According to BBC, the same applies to women tending to do badly at maths, psychologists said. Along with Exeter University experts, they claimed that the roots of many handicaps could lie in preconceptions held by others about certain groups.

However, belonging to a group exposed to the message "we are the best" could promote achievement, they said. The report argued that success or failure at work, school or in sport was not always down to lack of ability or incompetence.

Instead, it suggested that the power of stereotypes could cause poor performance when a person believed they should do badly. The report argued that the roots of poor performance lies partly in the preconceptions of how well a certain group—usually relating to gender or race—should perform certain tasks.

## Dull Jobs Numb the Mind



Boring jobs turn our mind to autopilot, say scientists—and it means we can seriously mess up some simple tasks.

According to BBC, monotonous duties switch our brain to "rest mode", whether we like it or not, the researchers report in Proceedings of National Academy of Sciences.

They found mistakes can be predicted up to 30 seconds before we make them, by patterns in our brain activity. The team hopes to design an early-warning brain monitor for pilots and others in "critical situations".

The scientists say the device would be particularly suitable for monotonous jobs where focus is hard to maintain—such as passport and immigration control.

"We might be able to build a device (that could be placed) on the heads of people that makes these easy decisions," said Dr. Eichele, of the University of Bergen, Norway. "We can measure the signal and give feedback to the user that your brain is in the state where your decisions are not going to be the right one."

In the study, Dr. Eichele and his colleagues asked participants to repeatedly perform a "flanker task"—an experiment in which individuals must quickly respond to visual clues. As they did so, brain scans were performed using functional magnetic resonance imaging (fMRI). They found the participants' mistakes were "foreshadowed" by a particular pattern of brain activity.

## Chocolate Bar Shown To Lower Cholesterol



The results of a University of Illinois study have demonstrated an effective way to lower cholesterol levels—by eating chocolate bars.

"Eating two CocoaVia dark chocolate bars a day not only lowered cholesterol, it had the unexpected effect of also lowering systolic blood pressure," said John Erdman, a U. of I. professor of food science and human nutrition, EurekAlert said.

Erdman attributes the drop in cholesterol numbers (total cholesterol by 2 percent and LDL or bad cholesterol by 5.3 percent) to the plant sterols that have been added to the bar and the drop in blood pressure to the flavanols found in dark chocolate. "After starting the CocoaVia bars by volunteers, we saw a marked differential effect on blood cholesterol, with the sterol-containing products doing better than those without sterols," said Ellen Evans, a U. of I. professor of kinesiology and community health and co-author of the study.

## Self-Healing Computer Systems Created

We've all heard about the space missions that are DOA (dead on arrival) when NASA engineers lose touch with the spacecraft or lander. In other cases, some critical system fails and the mission is compromised.

Both are maddening scenarios because the spacecraft probably could be easily fixed if engineers could just get their hands on the hardware for a few minutes, Physorg wrote.

Ali Akoglu and his students at The University of Arizona are working on hybrid hardware/software systems that one day might use machine intelligence to allow the spacecraft to heal themselves.

Akoglu, an assistant professor in electrical and computer engineering, is using Field Programmable Gate Arrays, or FPGA, to build these self-healing systems. FPGAs combine software and hardware to produce flexible systems that can be reconfigured at the chip level.

Because some of the hardware functions are carried out at the chip level, the software can be set up to mimic hardware. In this way, the FPGA 'firmware' can be reconfigured to emulate different kinds of hardware.

Akoglu explains it this way: There are general-purpose systems, like your desktop computer, which can run a variety of applications. Unfortunately, even with 3 GHz, dual-core processors, they're extremely slow compared with hardwired systems.

## Making Environmentally Friendly Plastics

Every year, more than 30 billion water bottles are added to America's landfills, creating a mountainous environmental problem. But if research at Missouri University of Science and Technology is successful, the plastic bottles of the future could literally disappear within four months of being discarded.

The Missouri S&T research team is constructing new breeds of biodegradable and bioavailable plastics in an effort to reduce the tons of plastic waste that ends up in the nation's landfills each year.

Bioavailable plastics contain substances that can be absorbed by living systems during their normal physiological functions, ScienceDaily reported.

By combining and modifying a variety of bio-based, oil-based and natural polymers, the team seeks to create optimal blends that can be used to make agricultural films, bottles, biomedical and drug delivery devices, and more.

The team is working under the direction of Dr. K.B. Lee, professor of chemical engineering at Missouri S&T, to improve the properties of the biodegradable plastics for real-life products. Although companies already sell biodegradable polymers, the products are often expensive, of poor quality or developed for specific applications.

That's why the team is investigating how bio-based fillers, such as starch and fibers, can be included to reduce the cost in a variety of commercial applications.

## Petal Effect Unveiled



Researchers provide the first description of the microscale surface of roses, composed of arrays of tiny, fleshy projections called micropapillae.

Chemists have found the physical basis for the rose's ability to grip water droplets in place, even when the flower is upside down.

In a study scheduled for the April 21 issue of ACS' Langmuir, a bi-weekly journal, this newly described "petal effect" could lead to unique new adhesive materials, coatings and fabrics, Physorg reported.

The study of biological microstructures has been a lively area of research, particularly in the design of biomimetic materials. But before the petal effect could be replicated in synthetic materials, an in-depth understanding of the rose's surface was needed.

Micropapillae form a seal with water droplets, allowing them to cling to the surface of the rose petal



Lin Feng and colleagues in China provide the first description of the microscale surface of roses, composed of arrays of tiny, fleshy projections called micropapillae. The micropapillae form a seal with water droplets, allowing them to cling to the surface of the rose petal. Using these new insights, Feng was able to create a synthetic rose petal surface with same properties.

"The simple duplication of petal surface provides us not only a theoretical explanation of the phenomenon but also an inspiration for the preparation of biomimetic polymer films, which should be of great biological and technological importance," says Feng.