

News in Brief

MABEL World's Fastest

Bipedal Robot

Although Honda's ASIMO has been running around at speeds of up to 6 km/h (3.7 mph) since 2004, his style is more of a fast neat than a true running action.

Getting bipedal robot like ASIMO to run like a human is no easy feat—as C-3PO is sure to attest—but researchers in a University of Michigan (U-M) lab have done just that with a bipedal robot called MABEL, Gizmag wrote.

The researchers believe that MABEL, which can reach a peak pace of 10.9 km/h (6.8 mph), is the world's fastest bipedal robot with knees.

Built in 2008 by U-M Professor Jessy Grizzle working in collaboration with U-M doctoral students Koushil Sreenath and Hae-Won Park and then doctoral student at the Robotics Institute at Carnegie Mellon University, Jonathan Hurst, MABEL started out walking over flat surfaces before moving onto uneven ground.

The researchers spent years progressively improving the feedback algorithms that enable MABEL to keep its balance while reacting to its environment in real time and in July of this year the robot took its first real jog.

To enable MABEL's human-like gait, its weight is distributed like a person's, with a heavier torso and light, flexible legs with springs that act as tendons.

The researchers say that other running robots, such as ASIMO, are almost speed walking and their so-called flight phase when both feet are off the ground lasts less than 10 percent of each step. In contrast, MABEL is in the air for 40 percent of each stride.

"We envision some extraordinary potential applications for legged robot research: exoskeletons that enable wheelchair-bound people to walk again or that give rescuers super-human abilities, and powered prosthetic limbs that behave like their biological counterparts," said Hurst, who is now an assistant professor in the Department of Mechanical, Industrial and Manufacturing Engineering at Oregon State University.

With an estimated ground clearance of 7.6-10 cm (3-4 inches) at a speed of 7.2 km/h (4.5 mph), the researchers claim MABEL is better able to deal with uneven ground, travel inside places built for humans and clear obstacles more effectively than other running bipedal robots.



Sniffer Dogs Detect Lung Cancer

Sniffer dogs can be used to reliably detect lung cancer, according to researchers in Germany.

Writing in the European Respiratory Journal, they found that trained dogs could detect a tumor in 71 percent of patients, BBC reported.

However, scientists do not know which chemical the dogs are detecting, which is what they say they need to know to develop a screening program.

Cancer Research UK said that was still a "long way" off.

It was first suggested that dogs could "sniff out" cancer in 1989 and further studies have shown that dogs can detect some cancers such as those of the skin, bladder, bowel and breast.

It is thought that tumors produce "volatile chemicals" that a dog can detect.

Researchers trained four dogs—two German shepherds, an Australian shepherd and a Labrador—to detect lung cancer.

Three groups of patients were tested: 110 healthy people, 60 with lung cancer and 50 with chronic obstructive pulmonary disease, a narrowing of the airways of the lungs.

They all breathed into a fleece-filled tube, which absorbed any smells.

The dogs sniffed the tubes and sat down in front of those in which they detected lung cancer smells.

They were successful 71 percent of the time. The researchers showed the dogs were not getting confused by chemicals associated with chronic obstructive pulmonary disease or smoking.

Dr. Thorsten Walles, the report's author from Schillerhoehe Hospital, said, "In the breath of patients with lung cancer, there are likely to be different chemicals to normal breath samples and the dogs' keen sense of smell can detect this difference at an early stage of the disease."

"Our results confirm the presence of a stable marker for lung cancer. This is a big step forward."



Chew Sugarless Gum

Bacteria that contribute to dental plaque crave for sugar. These bacteria produce plaque acids that aid in tooth decay by breaking down tooth enamel.

Chewing sugarless gum, however, can help promote a healthier mouth, the American Dental Association says, HealthDay said.

The ADA mentions these possible benefits of chewing sugarless gum:

- Chewing helps boost the production of saliva, which can help wash away acids that can damage teeth.
- Increased saliva includes more calcium and phosphate, which can help strengthen tooth enamel.
- Sugarless gum contains sweeteners—such as aspartame, sorbitol or mannitol—that do not contribute to cavities.



Sun Storms Could Get Stronger

Within decades, solar storms are likely to become more disruptive to planes and spacecraft, say researchers at Reading University.

The work, published in Geophysical Research Letters, predicts that once the sun shifts towards an era of lower solar activity, more hazardous radiation will reach Earth, BBC wrote. The team says the sun is currently at a grand solar maximum. This phase began in the 1920s and has lasted throughout the space age.

Mike Lockwood, professor of space environment physics at Reading, said, "All the evidence suggests that the Sun will shortly exit from a grand solar maximum that has persisted since before the start of the space age."

"In a grand solar maximum, the peaks of the 11-year sunspot cycle are larger and the average number of solar flares and associated events such as coronal mass ejections are greater," he said.

"On the other hand, in a grand solar minimum, there are almost no sunspots for several decades. The last time this happened was during the Maunder Minimum, between about 1650 and 1700."

The research indicates that most radiation hits the Earth during periods of middling solar activity. Increased radiation is a particular problem for aviation and communications-technology that did not exist the last time the sun cycle ended its grand maximum.

The research is based on evidence from ice cores and tree trunks going back 10,000 years. The team measured levels of nitrates and cosmogenic isotopes that enter our atmosphere and are deposited in ice and organic material.

Ecstasy Can Treat Cancers

Ecstasy could be used to cure cancers after scientists modified the drug to increase its tumor-killing properties.

According to Telegraph, researchers from Birmingham University claimed the designer drug, also known as MDMA, could be used to treat leukemia, lymphoma and myeloma after making it 100 times more effective at suppressing growth.

Ecstasy was already known to be effective against more than half of white blood cell cancers, but previously the large dose required to treat a tumor would also have killed the patient.

In a study published in the Investigational New Drugs journal, the scientists said the new drug could be used by doctors to treat cancer if it can be produced in a safe form.

Lead author Professor John Gordon said, "This is an exciting next step towards using a modified form of MDMA to help people suffering from blood cancer."

"While we would not wish to give people false hope, the results of this research hold the potential for improvement in treatments in years to come."

Dr. Julie Sharp of Cancer Research UK said, "As MDMA is a dangerous drug, the researchers need also to find out if they can create safe versions to treat people with the disease."

"Although survival rates for leukemia have improved over the past 30 years, new approaches to treatment are still needed to tackle this disease even more effectively."



Dermal Effects Of Nanosilver Revealed

Following researches on the toxicity of silver nanoparticles, Iranian scientists at Tehran Medical University came to the conclusion that products containing silver nanoparticles, which are applied to the body's skin, should be used with caution.

The emergence of nanotechnology and its wide applications in different industries has drawn attention to its toxicology such that a new branch entitled nanotoxicology is introduced.

"Given the vast applications of nanosilver as an antibacterial substance and the lack of information on its toxicological aspects, it is necessary to first focus on the skin toxicity of this substance and second on the potential of its toxicity to organs affected by skin contacts," Ms. Mitra Karani, MSc in toxicology from Tehran Medical University, said in an interview with Iran Nanotechnology Initiative Council news service.

Karani stated that the aim of this study was to address the dermal and systematic side-effects of the long-term use of products containing nanosilver and its difference with silver nitrate.

She used the guinea pig as test animal because of its high skin sensitivity. Three concentrations of nanosilver as test groups and two positive (silver nitrate) and negative control groups were applied in this study.

The acute (14 days) and chronic (13 weeks) skin toxicity of nanosilver were then investigated.

Elaborating on the results of this study, Karani said, "Based on the results, we can say that caution should be taken in applying products containing nanosilver to the skin. However, a definite answer requires



Caution should be taken in applying products containing nanosilver to the skin.

more researches on more dilutions and other aspects of nanosilver toxicity like mutagenicity, carcinogenicity, teratogenicity and nervous toxicity."

Critters Moving Away From Global Warming

Animals across the world are fleeing global warming by heading north much faster than they were less than a decade ago, a new study says.

According to AP, about 2,000 species examined are moving away from the equator at an average rate of more than 15 feet per day, about a mile per year, according to new research published in the journal Science which analyzed previous studies.

Species are also moving up mountains to escape the heat, but more slowly, averaging about 4 feet a year.

The species—mostly from the Northern Hemisphere and including plants—moved in fits and starts, but over several decades it averages about 8 inches an hour away from the equator.

"The speed is an important issue," said study main author Chris Thomas of the University of York. "It is faster than we thought."

➤ Earlier Data

Included in the analysis was a 2003

study that found species moving north at a rate of just more than a third of a mile per year and up at a rate of 2 feet a year.

Camille Parmesan of the University of Texas, who conducted that study, said the new research makes sense because her data ended around the late 1990s and the 2000s were far hotter.

Federal weather data show the last decade was the hottest on record, and 2010 tied with 2005 for the hottest year on record. Gases from the burning of fossil fuel, especially carbon dioxide, are trapping heat in the atmosphere, warming the Earth and changing the climate in several ways, according to the overwhelming majority of scientists and the world's top scientific organizations.

As the temperatures soared in the 2000s, the species studied moved faster to cooler places, Parmesan said. She pointed specifically to the city copper butterfly in Europe and the purple emperor butterfly in Sweden. The comma butterfly in Great Britain has moved more than 135 miles in

21 years, Thomas said.

It's "independent confirmation that the climate is changing," Parmesan said.

➤ Movements Monitored

One of the faster moving species is the British spider silometopus, Thomas said. In 25 years, the small spider has moved its home range more than 200 miles north, averaging 8 miles a year, he said.

Stanford University biologist Terry Root, who wasn't part of this study but praised it as clever and conservative, points to another species, the American pika, a rabbit-like creature that has been studied in Yellowstone National Park for more than a century.

The pika didn't go higher than 7,800 feet in 1900, but in 2004 they were seen at 9,500 feet, she said.

For Thomas, this is something he notices every time he returns to his childhood home in southern England. The 51-year-old biologist didn't see the egret, a rather warm climate bird, in the Cuckmere Val-



ley while growing up. But now, he said, "All the ditches have little egrets. It was just a bizarre sight."

Thomas plotted the movement of the species and compared it to how much they would move based on temperature changes. It was a near perfect match, showing that temperature changes explain what's happening to the critters and plants, Thomas said. The match wasn't quite as exact with the movement up mountains and Thomas thinks that's because species went north instead or they were blocked from going up.

Want Diamonds? Light a Candle

The magical glimmer of candlelight could be explained by millions of diamond particles burning up within the flame, scientists have claimed.

Researchers from the University of St Andrews discovered that about 1.5 million tiny diamond nanoparticles are created every second as a candle burns, Telegraph said.

Evidence of diamonds was also discovered in tests on natural gas and wood flames, according to a study published in the Chemical Communications journal.

Prof Wuzong Zhou, who led the re-

search, said that if a way of extracting the particles is discovered, it could lead to new methods of manufacturing diamonds.

The twinkling of candlelight has been compared with diamonds by philosophers and scientists, including Michael Faraday.

Previous research had shown that hydrocarbon molecules at the bottom of candle flames are converted into carbon dioxide by the time they reach the top, but it was not known exactly what happens in between.

By removing particles from the center of the flame for the first time, Dr. Zhou identified samples of all four known forms of carbon, including diamond.

"Unfortunately, the diamond particles are burned away in the process and converted into carbon dioxide, but this will change the way we view a candle flame forever," Zhou said.

"My research shows that it is possible to see diamonds in flame, but this also gives us a chance to think about whether diamonds can be formed in a different way."

