Scientists Writing Foolproof Computer Security Code

Washington: (IANS) We often see websites asking us to key in wavy letters into a box to prevent computer robots from hacking into servers and databases. But these codes, which are becoming increasingly complex for an average person, are not immune to security breaches.

A project led by Danny Cohen-Or, computer science professor at the Tel Aviv University (TAU), shows how a new kind of video captcha code may be harder to outsmart. Captcha technology is intended to block spam e-mail and automated systems.

"Humans have a very special skill that computer bots have not yet been able to master," says Cohen-Or. "We can see what's called an 'emergence image' - an object on a computer screen that becomes recognisable only when it's moving - and identify this image in a matter of seconds."

"While a person can't 'see' the image as a stationary object on a mottled background, it becomes part of our gestalt as it moves, allowing us to recognize and process it."

The study was co-authored with colleagues in Taiwan, Saudi Arabia and India. Cohen-Or describes a synthesis technique that generates pictures of 3-D objects, like a running man or a flying airplane.

This technique, he says, will allow security developers to generate an infinite number of moving "emergence" images that will be virtually impossible for any computer algorithm to decode.

'Emergence,' as defined by researchers, is a unique human ability to collect fragments of seemingly useless information, then synthesize and perceive it as an identifiable whole.

So far, computers don't have this skill. "Computer vision algorithms are completely incapable of effectively processing emergence images," says Cohen-Or's colleague and study co-author Lior Wolf.

The scientists warn that it will take some time before this research can be applied in the real world."We're not claiming in our research paper that we've developed a whole new captcha technology," says Cohen-Or.

"But we are taking a step towards that - something that could lead to a much better captcha, to highlight the big difference between men and bots," concludes Cohen-Or.

"If it were to be turned into a solution, however, we wouldn't be able to give humans a multiple choice answer or common word answer for what they see, so we'll need to develop a way to use it. We have a few ideas in the works."

The researchers are also developing methods of automatically generating "hidden" images in a natural background, like a pastoral mountain setting - a digital "Where's Waldo?" game.

Mobility & Green Technology Will Rule The Next Decade

BY PRASANTO K. ROY

Technology in the second decade of this millennium will build on the foundation laid in the first 10 years for mobility, cloud computing and green technology that saw the birth of the iconic iPhone, third generation telephony, notebooks, netbooks and the iPod with a camera.

Here's a peek into what's in store:
Third Generation Telephony: Finally, India goes 3G. If the auction happens before February as planned, it ends a forgettable episode in Indian telecom, 11 years after 3G's birth. If you ignore the 3G services of state-run firms — both amazing failures — then 3G should be on our phones by end-2010. The iPhone, too, will rise with 3G. With under five percent global share, the iPhone accounts for half the world's mobile data traffic.
Mobile Data Boom: Only five percent of India's 500 million mobiles are data-enabled smart-phones. That's changing. Starting 2010, the decade will see an explosion of mobile data applications.
The Netbook Will Rule: Four-fifth of personal computers in India are desktops, versus two-third globally. That's changing, too. Annual laptop sales are now nearly a third of total personal computer sales. Laptops and now netbooks have the edge in power-starved India. Now, with Rs.15,000-netbooks and power-packed laptops at Rs.30,000, there's little reason to buy desktop computers. While desktops will still log high sales, thanks to large business and government buyers, laptops and netbooks should match their numbers in 2011, saving, by the way, 100 MW of electricity. Up ahead in 2010: the smart-book, a smartphone-netbook crossover, that will run a full day on a battery charge.
Cloud Computing: Services delivered over the internet already serve the public at large with Webmail, photo sharing & web services. The cloud is evolving into a simple, pay-per-use way to get services on tap, just like electricity, for businesses. A billion mobile & desktop devices will tap into the cloud. The cloud is also the greenest way to go.
Green Building: Environment-friendly features are finally getting into office buildings. House-owners are using power-saving techniques, such as high-albedo reflective paint, which drops rooftop temperature 20 degrees, CFL lamps, and natural light.
Green Software: The biggest impact on green tech and energy efficiency will come not from electronics and hardware but from smarter software — software that controls electrical grid, uses sensors data to smartly control building lighting and cooling, improves efficiency of car engines, or runs power management for computer networks.

Caution Against Vitamin E Overuse

Washington: (IANS) One of the most comprehensive and accurate studies of clinical data on vitamin E shows that indiscriminate use of the antioxidant does more harm than good.

"There were so many conflicting reports about vitamin E and its effect on various diseases, particularly heart disease, that we wanted to set the record straight, says Dov Lichtenberg, professor at the Tel Aviv University (TAU) Sackler School of Medicine.

"Our new study shows that some people may be harmed by the treatment, whereas others may benefit from it. Now we're trying to identify groups of people that are most likely to benefit from the effects of Vitamin E," adds study co-author Ilya Pinchuk.

Applying a very different approach than any previous study, the team put its head together to draw definitive conclusions about vitamin E, said a TAU release. Analysis of the results revealed that subjects who did not take a vitamin E supplement enjoyed more quality-adjusted-life-years (QALY), a standard parameter used in medicine to assess the effect of medical interventions.

Revolutionary Surgery May Cure High BP

London: (IANS) British medical scientists have demonstrated a revolutionary new operation that can effectively "cure" persistent high blood pressure and takes under an hour to carry out.

The surgery, described as relatively straightforward and cheap, could reduce the risk of a major heart attack or stroke in those patients on whom medication has no effect.

Although doctors say there is no substitute for diet and exercise, one in 10 of the 15 million Britons suffering from high blood pressure - also known as hypertension - either do not respond to medication or cannot tolerate drugs. The new procedure, called renal sympathetic-nerve ablation, involves placing tiny burns in the nerve responsible for hypertension in some people, The Daily Telegraph reported. It disrupts signals from the brain telling the kidneys to keep blood pressure raised. Initial tests suggest it can be effective within three months, scientists said.

"This is the most exciting development in hypertension since the advent of anti-hypertensive medication 50 years ago. It is hard to forecast the limitations and it could eventually be compared to medication," said Mel Lobo, a doctor and specialist in clinical hypertension with Britain's National Health Service.

The Daily Telegraph said its reporter watched the operation being performed on a 68-year-old London chef, who is diabetic and has already suffered a stroke and a deep vein thrombosis.

The patient was awake throughout the procedure carried out at the London Chest Hospital - the first such in Britain and part of an international clinical trial.

Although the patient was kept in the hospital overnight, once greater experience is gained with the technique, patients will be able to go home the same day. His blood pressure has come down just two weeks after the operation and it is thought most patients will see an improvement within three months, the paper said.

Disinfectants Promote Growth Of Superbugs?

London: (IANS) Using disinfectants could cause bacteria to become resistant to antibiotics as well as the disinfectant itself, according to new research, a finding that may have important implications on how the spread of infection is managed in hospitals.

National University of Ireland (NUI) researchers found that by adding increasing amounts of disinfectant to lab cultures of Pseudomonas aeruginosa, the bacteria could adapt to survive not only the disinfectant but also ciprofloxacin - a commonly-prescribed antibiotic - even without being exposed to it. Gerard Fleming of NUI, who led the study, said: "What is more worrying is that bacteria seem to be able to adapt to resist antibiotics without even being exposed to them."

The adapted bacteria also had a mutation in their DNA that allowed them to resist ciprofloxacin-type antibiotics specifically. Pseudomonas aeruginosa is an opportunistic bacterium that can cause a wide range of infections in people with weak immune systems and those with diseases such as cystic fibrosis and diabetes. It is a cause of hospital-acquired infections. Disinfectants are used to kill bacteria on surfaces to prevent their spread. If the bacteria manage to survive and go on to infect patients, antibiotics are used to treat them. Bacteria that can resist both these control points may be a serious threat to hospital patients, said an NUI release. The study showed that when very small non-lethal amounts of disinfectant were added to the bacteria in culture, the adapted bacteria were more likely to survive compared to the non-adapted bacteria.

Gorging When Full? Blame It On Hormone

Washington: (IANS) Hunger hormone ghrelin might drive people to eat even when they are full, says a new study. "What we show is that there may be situations where we are driven to seek out and eat very rewarding foods, even if we're full, for no other reason than our brain tells us to," said study co-author Jeffrey Zigman. Scientists previously have linked increased levels of ghrelin to intensifying the rewarding or pleasurable feelings one gets from cocaine or alcohol. Zigman, assistant professor of psychiatry at University of Texas (UT) Southwestern Medical Centre, said his team speculated that ghrelin might also increase specific rewarding aspects of eating. Rewards, he said, generally can be defined as things that make us feel better.

"They give us sensory pleasure, and they motivate us to work to obtain them," he said. "They also help us reorganise our memory so that we remember how to get them."

Mario Perello, postdoctoral researcher in internal medicine, study co-author, said the idea was to determine "why someone who is stuffed from lunch still eats - and wants to eat - that high-calorie dessert."