

Novel Digital Ants To Protect Computers Against Viruses

Washington: (IANS) In the never-ending battle to protect computer networks from intruders, security experts are deploying a new defense, modeled on one of nature's hardest creatures — the ant.

Unlike traditional security devices, which are static, these "digital ants" wander through computer networks looking for threats, such as "computer worms" — self-replicating programmes designed to steal information or facilitate unauthorised use of machines.

When a digital ant detects a threat, it doesn't take long for an army of ants to converge at that location, drawing the attention of human operators who step in to investigate.

The concept, called "swarm intelligence", promises to transform cyber security because it adapts readily to changing threats.

"In nature, we know that ants defend against threats very successfully," explains Errin Fulp, computer science professor and expert in security and computer networks, at the Wake Forest University (WFU).

"They can ramp up their defence rapidly, and then resume routine behaviour quickly after an intruder has been stopped. We were trying to achieve that same framework in a computer system," he says.

Current security devices are designed to defend against all known threats at all times, but the bad guys who write malware — software created for malicious purposes — keep introducing slight variations to evade computer defences.



As new variations are discovered and updates issued, security programmes gobble more resources, antivirus scans take longer and machines run slower — a familiar problem for most computer users.

Glenn Fink, research scientist at Pacific Northwest National Laboratory (PNNL) in Richland, Washington, came up with the idea of copying ant behaviour. PNNL, one of 10 Department of Energy (DoE) labs, conducts cutting-edge research in cyber security.

Fink was familiar with Fulp's expertise developing faster scans using parallel processing — dividing computer data into batches like lines of shoppers going through grocery store checkouts, where each lane is focussed on certain threats.

He invited Fulp and Wake Forest graduate students Wes Featherstun and Brian Williams to join a project there this summer that tested digital ants on a network of 64 computers.

Swarm intelligence, the approach developed by PNNL and Wake Forest, divides up the process of searching for specific threats, says a WFU release.

"Our idea is to deploy 3,000 different types of digital ants, each looking for evidence of a threat," Fulp says.

Fulp introduced a worm into the network, and the digital ants successfully found it. PNNL has extended the project this semester, and Featherstun and Williams plan to incorporate the research into their master's theses.

Mobile Phone To Verify Indian Identity: Nilekani

New Delhi: (IANS) Move over passport and PAN card! Identity authentication at banks, gas connection centres or while providing rural jobs will just be an SMS away, Unique Identification Authority chief Nandan Nilekani said recently.

"Our project will provide a unique identification (UID) number, not a card. The authentication will be made by using mobile phones," Nilekani said.

"Once the numbers are issued, we will go for online authentication. Lets say, you are asking for a job under the National Rural Employment Guarantee Scheme (NREGS).

The authorities will send your UID number to the designated points through mobile phone message. A message will be returned saying 'Yes' or 'No'," Nilekani said.

"The fingerprint of the person can be sent to the central database and receive the authentication within minutes. This will verify whether you are the person you are claiming to be," the former Infosys managing director said, delivering the Foundation Day lecture of the Council of Scientific and Industrial Research (CSIR).

"This will not require much personal details to be divulged. It will help provide portability to

our farmers, labourers. When they move from state to state, this UID will help them get employment without hassles."

He said banks, mobile service providers, LPG gas connection counters and many more partner organisations can use this UID to verify their customer. "With the growing mobile phone network, this will become an easy process for authorities to verify people."

He said his team will roll out the first batch of UIDs in the next 12 to 18 months. "In five years from now, we will issue at least 600 million UIDs," he added.

"It will cut down the fake or duplicate records. This will enhance the efficiency of flagship programs like NREGS (National Rural Employment Guarantee Scheme), NRHM (National Rural Health Mission) and other such projects," Nilekani stressed.

He said later when banks or other such organisations seek to identify their possible customers, "they will be charged to recover the cost".

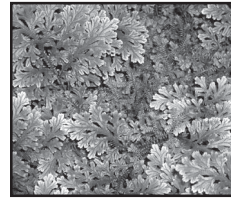
He said the Unique Identification Project (UIP) is a "huge challenge".

"Providing UID to 1.2 billion people is a huge challenge. There will be security issues too. I think this project is 10 times bigger than any such ongoing task in the world."



Scientists Trying To Identify 'Sanjivani' Herb

Lucknow: (IANS) The 'sanjivani' may not be just myth. Scientists are now busy trying to identify the magical herb, which according to the Indian epic Ramayana brought back to life Lord Ram's dying brother Lakshman.



Having found a few Himalayan herbs that match the description of the sanjivani, a team of five scientists at the National Botanical Research Institute (NBRI) here is working on identifying the properties of each of these.

"We are engaged in a genetic analysis of these herbs to zero in on what we are looking for in a true sanjivani herb," team leader P.N. Khare told IANS.

What has made the task difficult is the lookalike features of several different herbs found at high altitudes in the Himalayas from where monkey god Hanuman is understood to have fetched the herb to save the life of Lakshman who was injured in battle. One of the herbs which appeared to be very close to the sanjivani, as identified in the Ramayana, has a very special property: no matter how dead it might appear, on being kept under dry conditions, it revives within minutes of being exposed to moisture.

"In fact, we are looking into this unique feature, which is quite rare and appears to be the key factor for its hidden rejuvenating strength," Khare said.

While NBRI scientists are engaged in the project, ayurvedic researchers at yoga guru Baba Ramdev's Pantajali Ashram in Rishikesh claim to have already found the right herb.

"We do not dispute their claim, but as far as we are concerned we would not like to make any claim without substantiating it with laboratory proof," Khare said.

Microchip To Detect Cancers, Other Diseases

Toronto: (IANS) In a major breakthrough in the detection of cancers and other deadly diseases, Canadian researchers have developed an inexpensive microchip that is sensitive enough to detect the type and severity of the illness.

The microchip has been successfully tested on prostate cancer, and head and neck cancer models. It can also be used to diagnose other cancers, as well as infectious diseases such as HIV and the H1N1 flu.

Researchers at the University of Toronto here used nanomaterials for the first time to build the sensitive microchip. In their work reported in Nature Nanotechnology this week, the researchers say the new device will make sophisticated molecular diagnostics easily available soon.

"The remarkable innovation is an indication that the age of nanomedicine is dawning," David Naylor, who is president of the University of Toronto and professor of medicine, was quoted as saying in a university statement.

The device quickly picks up the 'biomarkers' that hint at the presence of cancer at the cellular level, even though these biomolecules - genes that indicate aggressive or benign forms of the disease - are generally present at low levels in biological samples, the statement said. Analysis can be completed in 30 minutes, compared to days taken by the current diagnostic procedures.

"Today, it takes a room filled with computers to evaluate a clinically relevant sample of cancer biomarkers and the results aren't quickly available," said research leader and medicine professor Shana Kelley.

"Our team was able to measure biomolecules on an electronic chip the size of your fingertip and analyse the sample within half an hour. The instrumentation required for this analysis can be contained within a unit the size of a BlackBerry," she said.

Are Psychosis, Creativity Two Sides Of Same Coin?

London: (IANS) History is teeming with examples of great artists and men who acted in peculiar ways, signifying either madness or sheer brilliance. In an attempt to understand whether psychosis and creativity are two sides of the same coin, a Hungarian psychiatrist has examined the link between the two.

"Molecular factors that are loosely associated with severe mental disorders, but are present in many healthy people may have an advantage, enabling us to think more creatively," says Szabolcs Keri of Semmelweis University, Hungary.

Keri focused on neuregulin 1, a gene that normally plays a role in vital brain processes, including development and strengthening communication between neurons (nerve cells).

However, a variant of this gene (or genotype) is associated with a greater risk of developing mental disorders, such as schizophrenia and bipolar disorder.

Accordingly, researchers recruited volunteers who thought they were very creative and accomplished. They underwent a battery of tests, including assessments for intelligence and creativity.

They were asked to respond to a series of unusual questions (suppose clouds had strings attached to them which hang down to earth. What would happen?) and were scored based on the originality and flexibility of their answers. They also completed a questionnaire regarding their lifetime creative achievements before the researchers took blood samples.

The results show a clear link between neuregulin 1 and creativity. Volunteers with the specific variant of this gene were more likely to have higher scores on creativity assessment and also greater lifetime creative achievements than volunteers with a different form of the gene.

Keri points out that this is the first study to show that a genetic variant associated with psychosis may have some beneficial functions.

