

## Disorderly measure beats encrypted viruses

Computer virus recognition needs an overhaul if online attacks are to be fought successfully, security expert Jim Butterworth told the Cyber Warfare conference.

A common way to fight viruses is to use an algorithm to create a "hash" signature - a number derived from a string of its instruction text - that uniquely identifies it.

To check for a particular virus, software only needs to look for this hash, rather than trawl through all its instruction code for all possible viruses. The problem, however, is that antivirus software won't recognise the virus if it has been encrypted. So multiple iterations

of viruses evolve, each needing to be assigned a unique signature before they can be stopped.

However, encrypting a virus does not change the degree of disorder, or "entropy", in its program code. By working out a figure for the disorder in the sequence of 1s and 0s that constitute a virus, Butterworth's firm, Guidance Software of Pasadena, California, assigns it an entropy value.

Paul Dickens, a cyber-operations planner with the UK's Ministry of Defence in Corsham, Wiltshire, believes it is an approach worth checking out. "Looking for a single score seems a good idea," he says.

found that 59 per cent of cyber-attacks involve custom-written programs that bypass existing security systems.

Some excellent programmers are behind these attacks, says Jim Butterworth, a director at computer forensics firm Guidance Software of Pasadena, California. "Some malware code has been through far more quality assurance than a lot of commercial software."

Developing countermeasures is being made tougher by the speed of online developments, says Yoran. The shift to mobile computing platforms and social networks such as Twitter helps malware to spread in milliseconds, he says.

The speed of cyber-attacks has also had an effect. In the US, the newly established 24th Air Force heads up the military's cyber security operation. Charles Shugg, the 24th's second in command, says his "hunter" teams, who fend off online attacks or preemptively seek out online vulnerabilities, often have no time to develop countermeasures. "Things happen so quickly in the cyber-domain that the hunter teams' offence and defence are often one and the same thing."

Tools such as Endgame's internet telescope may have a role to play in providing the intelligence needed to combat botnets as this type of location-aware technology may slash the number of bots available to launch cyber-attacks.

Without action, says Gerard Vernez, a cyber-security expert with the Swiss army, the networks we depend on will be vulnerable. "What are we doing now? I call it plug and pray," he says. ■



At risk from cyber-attack

## Software doctors bad photos to make them look like a pro's

IT MAY seem crude to reduce aesthetics to number crunching, but software can now manipulate an amateur's photographs to make them more pleasing to the eye.

Algorithms score a photo's aesthetics using simple composition rules widely used to guide budding photographers. The image is then automatically cropped, or parts of it moved and resized, to boost its score.

Developed by Daniel Cohen-Or and Lior Wolf at Tel-Aviv University, Israel, with colleagues at Zhejiang University in Hangzhou, China, the software spots the key features of an image based on their colour and shape. The positioning of those elements is used to judge a photo, then tweaked to improve it, says Wolf (see below). "In regions without key features,

any distortion is not so noticeable so there's more freedom to alter the size."

In trials, the team manually cropped professional photos to destroy their aesthetics. When the software processed the images, the

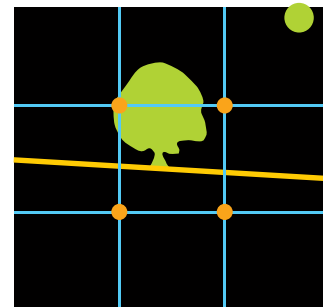
**"The image is automatically cropped, or parts of it moved and resized, to boost its aesthetic score"**

results were similar to the originals.

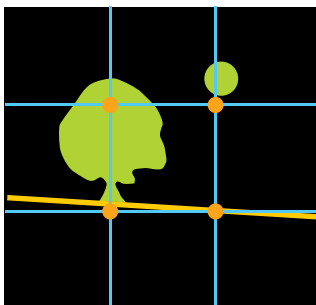
Martin Constable at Nanyang Technological University in Singapore says the new software fits with a recent trend for easy-to-use creative software. "This is a high-level example. Doubtless we will see such things in future versions of Photoshop." Colin Barras ■

### Photo composition by numbers

New software can alter a photograph taken by an amateur to obey some basic aesthetic guidelines on how to compose shots



One such guideline is the "rule of thirds". It says that the main elements of an image should be positioned near the four "power points" created by dividing it into nine equal parts using horizontal and vertical lines



The software recrops the image and will even move or resize individual elements to bring them closer to the power points. The result retains the features of the original image but should make for a better-looking photo

SOURCE: LUCANGIULI, RENJIE CHEN, LIOR WOLF AND DANIEL COHEN-OR