



| INTERVIEW |

Embrace the wisdom of the machine

People are flawed – it's what makes us interesting. But our propensity for errors is opening doors to hackers. Is it time that the computers took over?

It's time for humans to accept the inevitable and cede more decision-making to computers? It's a controversial question, but ethical hacker turned neuroscientist Professor Moran Cerf thinks the answer is 'yes'.

"My view is that we should outsource more of the bottom line decision-making to machines," says Cerf. "Humans still think we are the smartest and the best – the pinnacle of evolution. But there is more and more evidence that humans are our own worst enemies. We should be involved in policy discussions, but the actual decision should be taken by artificial intelligence."

The problem, Cerf says, is particularly acute in one of his own areas of special interest, cybersecurity. Even the best security technology is powerless in the face of simple human error, which still accounts for the most successful hacks.

"Knowledge doesn't help us," he says. "We know we should replace all our passwords every week, just like we know what we should do to

be healthy and fit. But we don't do it. If we had AI to replace our passwords for us then it might do a better job."

Cerf – who worked for the Israeli military and ran his own cybersecurity business before becoming a neuroscientist – says there are more parallels between hacking into a company's online systems and studying the brain than you might think.

When a cybercriminal first hacks into, say, a bank, usually via its website, they will find themselves operating in the dark and will use trial and error to figure out its systems and databases.

To a neuroscientist, the brain is another puzzle, whose workings can be figured out in a similar way. "That's how we study the brain," says Cerf. "We show people pictures or ask them questions and try to infer how the brain works from what they say or do in response."

In a previous life Cerf worked as an ethical hacker – an information security expert who, with the owner's permission, breaks into a computer system to find out and test its weaknesses. Now he's the professor of

neuroscience and business at the Kellogg School of Management, part of Northwestern University in Evanston, Illinois.

Although he admits that the handing over of decision-making to a computer may be too much of a leap for most people, Cerf is clear that at least something should be done about that scourge of the virtual world – the password.

People are rubbish at them, he says. "It doesn't matter whether you are logging in using Facebook or

whatever. It's still you that's having to choose a password, and the chances are that you will choose a bad one."

The problem is that good passwords are both very long and very random – two things that the human brain struggles to cope with. And even good passwords are bad, says Cerf, because you can still give them to someone else – either on purpose or under duress.

He and his team, therefore, came up with a novel way to create a long and complicated password that you can

remember and use without ever actually knowing it. It sounds crazy, but, apparently, it works. "It is stored not in your conscious memory but in your subconscious muscle memory," he says. By playing a game, "a bit like Guitar Hero, but where you can use all the keyboard, not just the four buttons on a plastic guitar", subjects can learn to accurately repeat a string of up to 80 characters.

"Every time they play the game, they type the same characters, even though they can't remember them or write them down. The sequence," Cerf says, "is in your brain, but even under torture you wouldn't be able to say what the sequence is."

He admits that it takes quite a few goes to learn it so it's unlikely to catch on as a means to log into your email. "It's not practical for everyday security, but would be for situations, such as workers at a nuclear plant"

Technology, he says, is also affecting our mental capacity. "Our memory is diminishing. When I was a kid you had to remember all your friends' phone numbers for example. Now you don't even have to remember your own phone number."

And virtual reality (VR), may even be undoing millions of years of evolution. "You can put on a VR helmet, stand on the top of a mountain and step off into thin air," he says. Do that often enough and you may lose your fear of heights.

12345

the world's favourite password

But surely it's good to overcome such fears? "The point is that we don't really know whether fear is good or bad, so we are playing God. And unless the world becomes one big simulation there will still be high places that are dangerous."

Cerf says people need to radically re-evaluate their approach to the risks as well as the benefits of new technology, otherwise a truly calamitous hack could be on the cards. "Technology makes things easier for everyone, including robbers. I believe there'll come a day when a fraud will threaten the fabric of a country's economy. I really do."

Join the debate

Technology leaders from Britain's most powerful companies will address The Times and The Sunday Times Tech Summit, on Tuesday, September 18. Speakers, such as the former minister for internet safety and security Baroness Shields, Darktrace's Poppy Gustafsson, and Ali Parsa, the founder of digital healthcare company Babylon, will debate the issues transforming business, such as cybersecurity, collaboration and technology in healthcare.

To register your interest in attending the summit, email techsummit@thetimes.co.uk



'We should all be involved in the discussion, but the actual decision should be taken by artificial intelligence'