Artificial intelligence – the next frontier in IT security?

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Security has always been an arms race between attacker and defender. He starts a war with a stick, you get a spear; he counters with a musket, you upgrade to a cannon; he develops a tank, you split the atom. While the consequences of organisational cyber-security breaches may not be as earth-shatteringly dramatic today, the arms race of centuries ago continues into the digital sphere of today.

The next challenge for companies with an eye towards the future should be to recognise that artificial intelligence (AI) is already entering the scene – with tools such as PatternEx focused on spotting cyber-attacks and Feedzai for fraud detection across the e-commerce value chain. The technology is developing so rapidly that it is too early to say whether the impact will be revolutionary or just the next evolution.

Artificial intelligence

Some AI evangelists argue that this new technological force could render all others seemingly irrelevant, given the scale of change, risk and opportunity it could bring about in IT security. This new dark art offering seemingly magical technological wizardry does indeed have the potential to change our world and – depending on who you choose to believe – either make life a little better, lead to total societal transformation or end humanity itself.

Artificial intelligence has the potential to disrupt all industry sectors – it is a field of computer science focused on creating intelligent software tools that replicate critical human mental faculties. The range of applications includes speech recognition, language translation, visual perception, learning, reasoning, inference, strategising, planning, decision-making and intuition.

As a result of a new generation of disruptive technologies and AI we are entering a fourth industrial revolution.
speed of development taking place in machine learning – a core AI technology. The board game Go has over 560 million possible moves – you cannot teach the system all the rules and permutations. Instead, AlphaGo was equipped with a machine learning algorithm that enabled it to deduce the rules and possible moves from observing thousands of games. This same technology can now be used in IT security in applications ranging from external threat detection and prevention to spotting the precursors of potentially illegal behaviour among employees.

### Current state of security

In 2015 in the US, the Identity Theft Resource Centre noted that almost 180 million personal records were exposed to data breaches and a PwC survey report highlighted that 79% of responding US organisations had experienced at least one security incident. Industry research indicates that while hackers exploit vulnerabilities within minutes of their becoming known, companies take roughly 146 days to fix critical vulnerabilities. With the average cost of a data breach estimated at $4m, there is growing concern over how companies can keep up with the constant onslaught of ever stealthier, faster and malicious attacks today and in the future.

As it stands, many firms focus more on reacting to security breaches than on preventing them and the current approach to network security is often aimed more at standards compliance than at detecting new and evolving threats. The result is an unwinnable game of whack-a-mole that could overwhelm companies in the future unless they are willing to adopt and adapt the mindset, technology and techniques used by the hackers. And there is very little doubt that hackers are – or soon will be – developing AI tools to increase the frequency, scale, breadth and sophistication of their attacks.

Organisations in this digital age create infinite amounts of data, both internally through their own processes and externally via customers, suppliers and partners. No one human is capable of analysing all that data to monitor for potential security breaches – our systems have simply become too widespread, data-laden and unwieldy. However, when combined with big data management tools, AI is becoming ever more effective at crunching vast amounts of data and picking out patterns and anomalies. In fact, with most AI systems, the more information they are fed, the smarter they become.

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