Computing and the net books

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Review

The Rise of the Robots by Martin Ford / Humans Need Not Apply by Jerry Kaplan – review

Silicon Valley is out to disrupt entire industries – because that's where the big money is to be made. How long before we lose our jobs?

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远古时代：：：计算机只能做它们被编程去做的事情

I n 1960, IBM realised that its own customers were alarmed by its new data-processing equipment. If these machines really were as clever as advertised, wouldn't they threaten the jobs of the office managers buying them? In response, IBM came up with a phrase that still expresses what many of us think of as a central technological truth. "Computers," it assured its clients, "can only do what they are programmed to do."

Well, not any more. As both Jerry Kaplan and Martin Ford, old Silicon Valley hands, explain in highly readable books that are somewhere between the complementary and the almost entirely overlapping, computers have long outgrown this quaint summation. Instead, they can now work things out for themselves, proceeding by trial and error to develop their own programs according to their needs – in what Ford calls (I don't think metaphorically) "a process of Darwinian natural selection". They can also take a scientific interest in the world around them. In 2009, a computer at Cornell University faced with a double pendulum took only a few hours to formulate Newton's second law of motion – considerably less time than it took Newton.

达尔文式自然选择的过程

With our unshakeable urge to anthropomorphise, it's tempting to describe this sort of activity as "thinking", although the debate about whether we should or not rages on as inconclusively as ever. What does seem clear, however, is we now have computers that, in Ford's words, have "progressed beyond the control – and even comprehension" of the humans who designed them.

Most people are probably familiar with Moore's Law, which states that computing power doubles approximately every two years. Its implications, nonetheless, can be hard to take in. Ford points out that if you'd deposited a single cent at an equivalent interest rate in 1949 (the year of an early New York Times article worrying about a computer-dominated future), you'd now have $86m. When Kaplan took proud possession of his new Apple II in 1980, it could store one second of CD-quality music. Now his phone can hold 12 days' worth.

Both books are packed with such irresistible gee-whizz facts but, as their titles suggest, both are also anxious about what might happen next, especially to human employment.

The idea, once so amazing, of robots working on assembly lines is regarded these days as laughably primitive by those in business. Thanks to vast increases in dexterity and the ability to see in three dimensions, modern robots can cook and serve fast food; pick fruit, carefully distinguishing between the ripe and unripe; keep control of huge inventories and stack shelves accordingly.

But that's just for starters – because another thing on which these books agree is that those IBM customers were right to be nervous. "The machines are coming for the high-wage, high-skill jobs as well," Ford says. "Automation is blind to the colour of your collar," writes Kaplan, who also gives us the chilling information that "the holy grail of Silicon Valley entrepreneurs is the disruption of entire industries – because that's where the big money is to be made".

In the great tradition of revolutions swallowing their own, one high-skill group of workers to have suffered already is the members of IT departments. (No wonder that the sitcom The IT Crowd is starting to seem as historical as Dad's Army.) But they're not alone. Since 2000, the number of financial workers on Wall Street has fallen by 50,000 – around a third – as high-frequency trading programmes complete 100,000 transactions in a 10th of

second, while simultaneously seeking to mislead their electronic competitors. Now, according to Ford, "nearly any white-collar job that involves sitting in front of a computer manipulating information" is under threat.

And so it goes on. What legal firm will pay its juniors to sift through hundreds of documents when a computer can absorb millions in a few seconds? Who will trust their doctor's diagnosis when a neat bit of software can instantly sift every medical article ever published? Worse still, computers can now turn facts into perfectly serviceable journalism. All in all, a 2013 Oxford University study concluded, 47% of US jobs are at risk from automation.

The consequent mass unemployment, needless to say, will lead to even greater inequality. As Kaplan arrestingly puts it, Amazon's Jeff Bezos earns more on a Saturday playing golf than three average US college graduates will earn between them in a lifetime (if, that is, they hold on to their jobs). And without work, Ford wonders, how will people have enough money to support the mass consumerism on which any remaining jobs might depend?

At this point, the average reader might be tempted to abandon these books for something less gloomy: the music of Joy Division, say, or the later novels of Thomas Hardy. In fact, the longer you read, the more hope is inadvertently offered by what might be termed the small print.

Ford, in particular, gradually piles up so many qualifications to his headline facts that, while it would be an exaggeration to describe the second half of the book as a slow retreat from the cheerless certainties of the first, it wouldn't be a wild one. In his earlier, more confident chapters, he seems sure that, despite all those other premature warnings, this time computers really are poised for world domination. Later, he starts to use "if", "might" and "could" with increasing frequency – along with such slightly sheepish phrases as "these things may lie centuries in the future". Admittedly, about two-thirds of the way through, he briefly pulls himself together to depict a blood-curdling apocalypse in which "the plutocracy" will "shut itself away in ... elite cites, perhaps guarded by autonomous military robots". Even so, the qualifications soon return – until his final chapter brings us the somewhat anticlimactic news that "there is no question that the economy will remain heavily dependent on human labour for the foreseeable future".

Kaplan's style is distinctly breezier, with chapter titles such as "Officer, Arrest That Robot". His apocalypse is also less alarming, with robots merely choosing to "farm us or keep us on a preserve, making life there so pleasant and convenient that there's little motivation to venture beyond its boundaries". But he, too, often backtracks reluctantly from his more excitable early chapters. Tucked away on page 140, for example, is the surprising information that "only 6% of US retail sales are currently online".

In other words, although it may be difficult to overstate the dangers posed by the new technology, there's an unmistakable sense that both of these books have managed it. Which isn't to say that they're not well worth reading, especially by anybody who wants to go painlessly from a standing start to a pretty thorough grounding in a debate that's only going to intensify in the years ahead – even if there are more of those years than either author will readily admit.

To order *The Rise of the Robots* for £15.19 (RRP £18.99) or *Humans Need Not Apply* for £20 visit bookshop.theguardian.com or call 0330 333 6846. Free UK p&p over £10, online orders only. Phone orders min P&P of £1.99.

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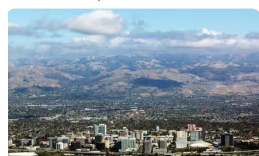
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