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Automation: is it really different this time?

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Martin Ford **The Rise of the Robots: Technology and the Threat of Mass Unemployment** Oneworld Publications 2016.

Richard Susskind and Daniel Susskind **The Future of the Professions: How Technology will Transform the Work of Human Experts** Oxford University Press 2015.

Erik Brynjolfsson and Andrew McAfee **The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies** W. W. Norton & Company 2014.

John Urry **What is the Future?** Polity Press 2016.

1.
I have lost count of the number of conferences I have attended on Robots, Artificial Intelligence (AI), and the Future of Work. Predicting the future has once again become big business, a sure sign of which is the plethora of books appearing on this topic – those chosen above are but a tiny sample of the genre.

Such conferences have a common format. A few humanlike robotic heads, often with female nomenclature, are displayed and we are encouraged to interact with them for the wow factor. Then a panel of geeks tells us, the lay audience, about their amazing advances, and how close they are to passing the Turing test (making interaction with social robots indistinguishable from human interaction). This is followed by some economists estimating the dire consequences of advanced technology for job prospects. Finally, a few futurists are also included, some even from the so-called Singularity University.[i] I naively asked one of them where this university was based and was told 'it isn't really a university'! *It's a state of mind, man.*

So let me first sketch out the prevailing predictions about employment, then say something about the hyperbole on automation, robotics and AI, and finally why we need more books like Urry's *What is the Future?* that provide some critical distance on this futurist discourse.

2.
Let's begin with Ford's *The Rise of the Robots*, the *Financial Times* 2015 business book of the year. The book is laudable as a trade book, a pacey read about how an increasingly automated economy will affect modern workers. From manufacturing to services, from higher education to healthcare, myriad developments in AI are addressed that, according to Ford, will leave no occupation untouched. The scope of the book is impressive, not only in providing an accessible overview of the latest advances in automation, but also in comprehensively rehearsing the economic and policy debates about the future of work.

It is a thoughtful book and while history is not Ford's longbow, he does acknowledge that fears of technological unemployment are not new. Even the Luddites get a mention. The crux of his argument, however, is clear. All the books reviewed here say it with one voice: 'this time it is different'. Yes, the masses that were thrown out of agriculture found jobs in factories; yes, there was the expansion of the service sector. But this time it *really* is different. A new future is on its way, and it's *scary*. Ford's book is peppered with words and phrases like 'frightening', 'tipping point', and a 'perfect storm'.

According to Ford, information technology (IT) is the game changer, a uniquely disruptive force that has no historical precedent. This is because it is not only the low-skilled that will be displaced, but highly skilled professionals are also at risk of being displaced by machines. Where previous waves of automation ultimately created wealth and new sectors of employment, we are now witnessing a fundamental shift in the relationship between workers and machines. Machines are no longer tools; they are turning into the workers themselves. 'All this progress is, of course,' Ford writes, 'being driven by the relentless acceleration in computer technology' (p. xii). As usual, Moore's law is invoked to prove the inexorability of accelerating technical progress.

The popular commentators and journalists, not to mention the business consultants, seem to devour this bleak picture with a Frankensteinian relish. It is what Urry calls in his book the 'new catastrophism': we stand in awe - and terrified expectation - of what we have created, awaiting the devastating consequences.

So what is the empirical evidence for Ford's thesis? Interestingly, Ford pauses halfway through Chapter 2 to eschew a too simple narrative that puts advancing technology 'front and center' as the explanation for the troubling economic trends he identifies, but then quickly reasserts that IT's relentless acceleration sets it apart. Tellingly, he says, 'I'm content to leave it to economic historians to delve into the data'. Evidence is largely presented in the form of vivid stories about the feats of Big Data and 'deep' machine learning. Here pride of place is given to artificial neural networks – systems that are designed using the same fundamental operating principles as the human brain – that can be used to recognize images or spoken words, translate languages, etc. Such systems already power Apple's Siri and, potentially, could transform the nature and number of knowledge-based jobs. If IBM's Watson can win *Jeopardy!* and Google's AI can recognize cats' faces based on millions of YouTube videos, then, Ford surmises, few jobs will remain.

Like almost everyone else, he cites the Oxford Martin School's Frey and Osborne, whose line about half of US jobs being vulnerable to machine automation within the next two decades is endlessly repeated.[ii] This estimate, by the way, is based on an algorithm that predicts the susceptibility to automation of different occupations (rather than on the task content of individual jobs). That this methodology has been heavily critiqued has done nothing to halt its endless citation.[iii] They are both nice guys so good luck to them, but the uncritical

proliferation of their findings is further proof of the pleasure - even pride - we take in the idea that a man-made, robot-worked utopia/dystopia is on its way.

The hyperbole about AI has reached such proportions that even *New Scientist* (16 July 2016) recently asked 'Will AI's bubble pop?'. The author makes the point, familiar to sociologists of science, about the powerful role of metaphors in persuading us that these machines are acquiring human capacities. Yet artificial neural networks do not 'learn' like we do, 'cognitive' computing does not think, and 'neural' networks are not neurons. The language is purposefully saturated with anthropomorphism. Rather than worry about the dreaded moment of Singularity, we should be concerned about the dominance of a small number of corporations who have this computing power and about the social consequences thereof. Such political questions are too often lost in our obsession with the robotic revolution we are set to witness.

In the crystal ball of Susskind and Susskind, this imminent revolution is seen to be even more dramatic than the forecast of Ford. While Ford believes that higher education and health care professionals are relatively immune from automation, the authors of *The Future of the Professions* specifically include them in their sweeping diagnosis about the end of the professions as we know them. In the Internet society, they argue, we will neither need nor want doctors, teachers, accountants, architects, the clergy, consultants or lawyers to work in the way they did in the twentieth century. Although this will lead to massive job loss, this trend is a positive development as the Internet will ultimately democratize expertise and empower people.

With a nod to Abbott, they begin by outlining the historic basis of professionalism as the main way expertise has been institutionalized in industrial societies. Until now there has been no alternative, as only human professionals have had the complex combination of formal knowledge, know-how, expertise, experience and skills they refer to as 'practical expertise'. But now, echoing the books above, we are on the brink of a period of fundamental and irreversible change, driven by technology. The authors envisage increasingly capable machines– from telepresence to AI – that will bring fundamental change in the way that 'practical expertise' of specialists is made available in society. These smart machines, operating autonomously or with non-specialist users, will perform many of the tasks that have been the preserve of the professions. The result will be the 'routinization and commoditization of professional work', an argument much like Braverman's proletarianization thesis but without the political economy. Here the only actors are the machines themselves.

Richard Susskind has been a leading analyst of the impact of technology on the legal profession for several decades and he is a firm believer in the positive opportunities for information sharing afforded by the Internet. And the book's core moral argument is persuasive. Who would disagree that expensive and exclusive privileged elites need to be overhauled and instead we should promote the widespread distribution of expert knowledge? Indeed, the authors envision a model where most professional advice is delivered by automated IT systems, and it is available free to users (just like Wikipedia). Once again we are told about the

unprecedented acceleration in the capabilities of IT, AI, Watson, machine learning, Big Data and affective computing. The nub of the matter here though is the premise that intelligent machines, drawing on vast amounts of data, will make better decisions than do mere flawed human experts. The archetypal example is the lack of sound sentencing by tired judges after lunch. Perhaps non-alcoholic lunches would be a simpler solution!

3.
The fundamental problem we have is that technologies are only as good as their makers. There is mounting evidence that machine-learning algorithms, like all previous technologies, bear the imprint of their designers and culture. Whether it's Airbnb discriminating against guests with distinctively African-American names, Google showing advertisements for highly paid jobs primarily to men rather than women, or the use of data-driven risk-assessment tools in 'predictive policing', histories of discrimination live on in digital platforms and become part of the logic of everyday algorithmic systems.[iv] Even the much-lauded Wikipedia is skewed, in its representation of male to female scientists for instance. While the Susskinds are right to contest the power of the professions, they seem unconcerned with the rise of an even more powerful elite of male white Silicon Valley engineers whose values and biases will inevitable shape the technical systems they design. Making the politics of algorithms visible, explicit, and accountable may turn out to be even more difficult than calling, say, lawyers to account.

I'm with Brynjolfsson and McAfee who, in *The Second Machine Age*, argue that the most efficient future lies with machines and humans working together. Human beings will always have value to add as collaborators with machines. For a start, I do not believe that all the knowledge and experience, the 'practical expertise' of professionals, can be conveyed via online intelligent systems. Take the suggestion that even the problem of 'empathy' in delivering bad news in hospitals could be countered through an algorithm using consumers' 'psychological and emotional profiles'. Leaving aside the privacy issues this raises, the Susskinds do not grasp the nature of the 'unrecognized' emotional work that is already delegated to largely female para-professionals such as nurses.

Indeed, the social character of skill and expertise, let alone the way that the professions have traditionally been structured around a gendered division of labour, gets no mention in this book (or in any of the others for that matter). We may be 'suckers for the wide eyes and endearing giggles of affective robots', but to advocate the use of robots for empathetic care of the elderly mistakes the appearance of care with real empathy and genuine personal interaction. And anyway, as any roboticist will tell you, there is a huge chasm between the current claims about what these affective, sociable robots can technically feasibly do and what they really can do. Perhaps if eldercare was revalued and remunerated like say coding work, the putative labour shortages in this sector that robots are designed to alleviate would disappear. Or, more radically, if housing and cities were redesigned so that the elderly were not relegated to separate places but

were integrated into the wider civil society. But such thoughts are way beyond the scope of any of these books.

The Second Machine Age is the best of this bunch. While covering similar ground, Brynjolfsson and McAfee provide a much more balanced account of the pros and cons of automation on work. The book has been extremely influential, spawning a number of imitations (viz the Chair of DAVOS Klaus Schwab's *The Fourth Industrial Revolution*). The titles of these books are themselves worthy of an article. Here, the history of technology starts with the industrial revolution ('the first machines age') and our interest in AI dates from the 1950s. If you want to remind yourself of how much older our obsession with the vitality of machines actually is, I suggest a quick visit to the current exhibition on Robots at London's Science Museum.

Brynjolfsson and McAfee are ultimately optimistic about the jobs that will be created as a result of the digital revolution. Although agreeing that many jobs will be swept away by innovations like the driverless car and 3D printers, they argue that, with the right policy levers, such advances can bring forth a bountiful future of less toil, more creative work and greater human freedom. Intervention is crucial given the worrying trends they identify: the polarization of the labour market, the rise in income inequality, and the 'winner-take-all economy'. But, if we 'race with machines, instead of against them', we can take advantage of the uniquely human qualities of creativity, ideation, and communication to create more high quality jobs such as creative writers, digital scientists and entrepreneurs. While they too reify technology, treating it as a neutral inevitable force driving these changes, they are strong advocates of government investment in education and infrastructure to deal with its effects. For them, unlike Urry, the effects of technology are political but the causes are not.

Interestingly, like Ford, they propose a guaranteed basic income as one practical solution to the problem of technological unemployment. That this idea has once again become popular across the entire political spectrum makes me a little wary. It immediately conjures up a vision in which the Silicon Valley tech crowd continue to thrive on 24/7 working hours, while those left behind are paid to watch TV and sleep (judging by what the unemployed do now). This idea has a long and sound history and I am watching with interest the trials taking place in Finland and the Netherlands, for example. But in the current context, it is as well to focus on the huge unmet needs we have and the plentiful work that needs doing. Notwithstanding all these books, there is little convincing evidence that large-scale technological unemployment is actually happening or will happen in the immediate future. The real issue is the unequal distribution of work, time and money that exist already.

All these authors shy away from addressing the extent to which the pursuit of profit, rather than progress, shapes the development of digital technologies on an ongoing basis, and the ways in which these very same technologies are facilitating not less work but more worse jobs. It is the proverbial elephant in the room. They seem blind to the huge, casual, insecure, low paid workforce that powers the wheels of the likes of Google, Amazon, and Twitter. Information

systems rely on armies of coders, data cleaners, page raters, porn filterers, and checkers, subcontractors who are recruited through global sites such as Mechanical Turk and who do not appear on the company payroll. Even Brynjolfsson and McAfee overlook such classed, gendered, racialized data processing work as if algorithms trained, tuned and augmented themselves like magic.[v] While these kinds of jobs may well in turn be automated, other novel forms will be created in unexpected ways as capital seeks new ways to accumulate. As Suchman argues, the enchantment or magic of artifacts (such as AI and robotics) is brought about through the masking of labours of production in precisely this way.[vi]

4.
As someone immersed in these debates, I have been wondering for some time why this perennial anxiety about automation has come to the fore now. What is the cultural significance of all this breathless talk about AI? No amount of economic history shakes the certainty: *This time it really - really - is different.*[vii]

In this context, Urry's astute reflections in *What is the Future?*, published posthumously, could not be more apposite. The social sciences must reclaim the terrain of future studies, he argues, because future visions have enormously powerful consequences for society, carrying with them implicit ideas about public purposes and the common good. Thus, a 'key question for social science is who or what owns the future – this capacity to own futures being central in how power works' (p. 11).

The book begins with a comprehensive overview of the history of 'past futures', from More's *Utopia* (which depicted a six hour working day half a millennium before Keynes) to the remarkable explosion of new dystopian futures that emerged in the early years of this century. This new catastrophism in social thought is contrasted with the global optimism of the 1990s, especially the digital utopianism that accompanied the emergence of the World Wide Web. Haraway's upbeat 'manifesto for cyborgs', for example, celebrated the positive potential of technoscience to create new meanings and new entities, to make new worlds.

 So it is all the more striking that the Zeitgeist within the rich North so radically changed from 2003 onwards. Urry makes this point starkly by simply listing, on pages 36 and 37, the astonishing number of English language texts, films, art exhibitions, and research centres within this catastrophic mode. As he rightly argues, such dystopian writing induces a fatalism about the future, helps mobilize powerful interests to promote planetary technological fixes (especially for climate change), and is as much performative as analytic or representational. As I have already intimated, I share this same unease about the rash of books on technological unemployment.

While much of this is familiar territory, viz. the sociology of expectations and Jasanoff's writing on sociotechnical imaginaries[viii], Urry goes further in specifying how futures thinking as a 'method' is a way of bringing back planning, but under a new name. Planning, he says, has become an ideologically

contaminated term from the era of organized capitalism and social democracy. So this is a new form of planning, one that brings the state and civil society back in from the cold, and planning is crucial given the long-term wickedness of many problems such as climate change. Only by insisting that futures are always social can public bodies, rather than autonomous markets and endogenous technologies, become central to disentangling, debating and delivering those futures.

Urry was a leading figure in British sociology and, given the sheer range and magnitude of his outputs, it is hard to exaggerate his influence. He was wholly committed to the discipline, always energetically pursuing new ideas, and often prescient in identifying key under-explored social issues of the day. What many will be less aware of are his direct contributions to policy, both to the climate change area and transport. He was appointed to the UK Government's Foresight programme on transport and policy futures, which in turn led to his research on social futures, as well as his setting up an Institute for Social Futures at Lancaster University.

The book therefore builds on long-standing research projects, with substantial chapters on mobilities in the city, 3D printing and the future of manufacturing, and the futures of energy and climate change. Throughout, he manages to explain how social practices are constitutive of technology in clear, accessible prose, stressing how technological systems are always sociomaterial, that the process of innovation is complex and unpredictable, the importance of concepts such a path dependency and lock-in, and the need for what is often termed 'responsible innovation'. For him, these features are best captured by complexity theory that emphasizes how systems are dynamic, processual and unpredictable.

While I found the claim for the distinctiveness of this notion not altogether convincing, perhaps because the recent scholarship on infrastructures in science and technology studies is wholly compatible with his approach[ix], this is a minor quibble. I wholeheartedly agree with the spirit of his argument. The point of these scenario-building exercises is precisely to authorize the participation of a broad range of relevant actors typically excluded from processes of deliberation about the future. And this is turn would entail democratizing the whole organization of the making of technology and, with it, society.

The cover of *What is the Future?* features Antony Gormley's 'Another Place'. This work, located on the foreshore in Crosby Beach, Merseyside, consists of one hundred cast iron sculptures of the artist's own body facing out to sea. It is a fitting metaphor for a book that asks us to take seriously our role as sociologists in crafting the future. Evoking Walter Benjamin's Angel of History, we need to conjure up our own Angels of the Future, which stand on the shore of society, their gaze fixed on the horizon, alert to the winds of change. They must be both several and diverse. The homogeneity of the Silicone Valley creators is a more dangerous threat to the future than any perceived robotic apocalypse. Too often these purveyors of the future have their backs to society, enchanted by technological promise and blind to the problems around them. It will require more than robots to ensure that the future really is different this time.

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[i] Singularity being the term for Ray Kurzweil's prediction that machines will soon be smarter than humans.

[ii] Frey, CB and Osborne, MA 2105 'Technology at Work: The Future of Innovation and Employment', *Citi GPS: Global Perspective & Solutions*, February.

[iii] Arntz, M., Gregory, T., and Zierahn, U. 2016 'The Risk of Automation for Jobs in OECD Countries; A Comparative Analysis', *OECD Social, Employment and Migration Working Papers*, No. 189, OECD Publishing, Paris.

[iv] 'Special Issue: Governing Algorithms' (2016) ed. M. Ziewitz *Science, Technology, & Human Values*. 41(1).

[v] Irani, L. 2015 'Difference and Dependence among Digital Workers: The Case of Amazon Mechanical Turk', *South Atlantic Quarterly* 114(1): 225-234.

[vi] Suchman, L 2007 *Human-Machine Reconfigurations: Plans and Situated Actions*. Cambridge: Cambridge University Press.

[vii] See the excellent special section of the *Journal of Economic Perspectives* 2015 29(3), where Autor reminds us how regularly concerns about automation and joblessness recur.

[viii] Jasanoff, S. & Sang-Hyun, K. (eds) 2015 *Dreamscapes of Modernity: Sociotechnical Imaginaries and the Fabrication of Power*. Chicago: University of Chicago Press.

[ix] See the MIT Press book series on Infrastructures.