

Keep an eye on AI and Big Data

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Even as all eyes have been trained on Singapore for the historic Trump-Kim summit, there is a rather more mundane, yet no less critical reason for the world to look more closely at this city-state. In an arguably far-sighted move, the Singapore government has announced its plan to establish a new Advisory Council on the Ethical Use of AI and Data. The impetus for such an advisory body is pressing, with AI, big data, machine learning and the Internet of Things being increasingly embraced as the country seeks to fulfil its ambitions of becoming a smart city.

Besides Singapore, the conversation on the ethical use of such technology is also rapidly gathering momentum around the world. Nightmare scenarios of AI failures are often invoked as cautionary tales of technology running amok if devoid of a moral compass. Reports of autonomous vehicles maiming hapless victims or factory robots wreaking havoc stoke visceral fears, further inflamed by dystopian science-fiction tropes. Yet the adverse impact of AI that contravenes ethical norms and social acceptability is often far less dramatic, considerably more insidious, and increasingly widespread. Indeed, there are three significant reasons why rapidly technologizing societies such as Singapore must establish data and ethics advisory bodies of this nature.

First, while many countries have promulgated data ethics guidelines that centre around the protection of personal data and privacy, the rising complexity of AI technology necessitates more robust and astute regulatory oversight. Simply ask a researcher working on AI to provide you with a simple explanation of Deep Learning. You will find it challenging to comprehend this most advanced machine learning paradigm, even at a foundational level. This is unsurprising given that the power of Deep Learning is derived from the outcome of a complex emergent process designed to mimic neuronal activity in the human brain. Such complicated technological processes considerably exceed the ambit of ethics guidelines and the capacities of policy makers. However, a data and AI ethics advisory council that is well-constituted, comprising domain experts from academia and industry, will be able to provide the requisite expert assessments on the ethicality of new technologies and their applications.

Second, AI is leaving the human-driven design era and entering the AI-driven self-design era. The essence of Deep Learning is that it programmes itself, thereby relieving the human programmer of the basic tasks of developing and coding algorithms for the systems we use and interact with in our daily lives. With self-programmed systems, it is highly likely that systems may generate errors that go unnoticed and unrectified. Indeed, the argument is often made that detecting an actual error with such AI-driven systems may be impossible due to their lack of 'explainability'. Since the developers and coders cannot fully comprehend the way the system processes the data, how can they distinguish between an error and a legitimate, yet unexpected, solution? How do we refine technological architectures to avert such problems that may have pernicious, broad-ranging impact?

Third, a paramount issue with AI is the biases inherent in the big data on which algorithms are based. These algorithms are used extensively across diverse industries, used to determine job placements, college admissions, insurance rates, health plans, retail prices, just to name a

few. Distortions in the data can lead to faulty algorithms that unfairly discriminate against particular segments of society, with negative consequences that may be pervasive, irreversible and indiscernible. As many critics have argued, the most egregious aspect of big data is the absence of a negative feedback loop that signals when an algorithm needs to be refined because it fails to cater to individual differences that render it inadequate or downright erroneous. In an era of big data coupled with machine learning, there is virtually no room for individual recourse in situations of error. Such 'data violence' may be exacerbated as technologically advanced societies amass data of an unprecedented magnitude, at an unprecedented rate. More worryingly, a vast proportion of big data now resides in the hands of powerful corporations, beyond the control of any state.

Besides the United Kingdom which has recently set up a Centre for Data Ethics and Innovation, and the European Union's Ethics Advisory Group, no other country has instituted a national level data ethics advisory body. Hence, the establishment of a data and AI ethics advisory council for a country like Singapore is both timely and strategic. Big, nay massive data, has started to assume growing importance in the daily functioning and management of all digitally-connected societies. Singapore in particular is actively expanding its digital and physical infrastructure to support the Internet of Things, starting with networks of smart lamp posts that will capture information on weather patterns and other physical phenomena, engage in real-time facial recognition and track human and vehicular traffic.

Such intelligent sensor networks, combined with the digital information flows that course through hyperconnected societies, will generate massive volumes of data that can be used by public and private organisations alike. It is imperative therefore that prudent and beneficial use of such data is facilitated, while breaches and abuses are prevented. As the fourth industrial revolution speeds inexorably forward, states must move beyond mere guidelines to establish agile and proactive advisory bodies that can provide the essential oversight to respond to the increasingly pervasive use of highly complex AI technology in our everyday lives. Given its culture of technology-orientation and regulatory oversight, perhaps Singapore's experience can provide pointers on the effective governance of ethics, AI and big data.

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