

## China and artificial intelligence: the dragon seeks control

## China y la inteligencia artificial: el dragón busca el control

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**Lee K-F, Qiufan C.** *AI 2041: Ten visions for our future*. New York: Currency; 2021.

The experience of the last centuries has taught us that all speculation about the future is uncertain, exaggerated in some things and very blind in others. Jules Verne's successes are well known, but his failed predictions are not so well known. In our time, flying cars did not arrive, but the Internet did; a technology of military origin that connected a few universities in the sixties in the USA and revolutionized the way we shop, communicate and, without exaggeration, changed our way of life.

Well, despite the above, Kai-Fu Lee and Chen Qiufan, scientist and investor the former and science fiction author the latter, recently published a work of great impact that fantasizes about what the world will be like in 2041. From the present achievements in the field of Artificial Intelligence (AI), the authors venture to reflect on the

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coming changes in areas as different as banking, health, the arms industry, quantum computing and happiness.

The structure of *AI 2041: Ten Visions for Our Future* is light and easy to read, it tries not to go into great technical depths that would frighten the uninitiated and introduces each of its ten chapters with a short story written by Chen Qiufan. For example, set in the near future and guided by new technologies, it tells of the lives of Nayana and her family (chapter 1). The company *Ganesb Insurance* closely monitors, in order to fix the cost of their insurance, the diet of these people and their health and rest habits, causing profound changes in their way of life.

In the following, I briefly comment on the central parts of the work with clear ethical implications.

#### *Deep Learning and Neural Networks (Chapter 1)*

Deep learning is a recent advance in AI. The first academic papers describing this technology date back to the 1960s. It took almost fifty years for AI to flourish because it lacked the massive amount of data that we have today, which is now known as the *new gold* and is mined from information about all of us at the expense of our privacy and attention.

Deep learning builds networks of artificial neurons in our brains with layers of input and output. Data is fed into the input layer of the network and a result emerges from the output layer. Between these there can be thousands of other layers and hence the name “deep learning”. This makes it possible to classify and identify, for example, in a photo what is a cat and what is not, what is a lamppost and what is not. The real power of this technology lies in being able to make very complex classifications after passing the information through thousands of filters (layers). For example, cross-referencing many data to find out whether someone should receive a loan or a kidney transplant.

One of the many ethical and political challenges is the regulation of this field with regard to privacy. The paradox or contradiction seems to be the following: if we respect the privacy of our populations, we will not advance technically and economically —of which the European Union (EU) regulations are accused—<sup>1</sup>, and if we advance, it will be at the cost of not protecting our citizens, which is what China does (1), leading to serious personal damage of all kinds.

A second major ethical challenge is the elimination of biases in algorithms. The case of the Amazon algorithm in charge of the pre-selection of candidates to work in the company is well known. It reproduced the sexist and racist biases that had been present among previous recruiters.<sup>2</sup>

*Deep Fakes and natural languages (Chapters 2 and 3)*

“President Trump is a total and complete idiot,” said President Obama or a person who looked a lot like him. This video went viral in late 2018. It was a *deepfake* (a fake video made with *deep learning*) created by Jordan Peele and BuzzFeed. Previously, celebrities had appeared in fake porn videos. The authors predict the rise of such fakes and a promising industry aimed at detecting them.

The third chapter deals with a fascinating field, Natural Language Processing (*NLP*). The possibility of a voice assistant being able to fool us into thinking it is a person does not seem so far away. The authors wonder if this means passing the famous Turing Test. Does it mean that an AI will have general intelligence? However, they consider it unlikely.

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<sup>1</sup> The EU introduced the General Data Protection Regulation (GDPR) in 2018, known as the strictest privacy and security law in the world.

<sup>2</sup> At present, different options are being considered, such as constantly reviewing the algorithms, making them public, establishing by law the need for audits, forcing them to introduce new variables beyond profit, or teaching programmers and engineers about ethics.

*Health and brain-computer interface (Chapters 4 and 5)*

In the last century, human life expectancy increased from thirty-one years in 1900 to seventy-two years in 2017. Today we are at the beginning of another revolution for healthcare. Databases with medical records, clinical trials, and vaccine and drug supplies will be digitized giving a huge amount of data to AI to make discoveries. We will use wearable devices capable of measuring in real time our glucose or blood pressure. On the other hand, the pharmaceutical sector is already undergoing a revolution. It took a hundred years to develop and improve the meningitis vaccine. The vaccine against PCVID-19 was developed in months, although it did entail a huge economic expense (the US government alone spent more than 10 billion in 2020).

AI can greatly accelerate the speed and reduce the cost of drug and vaccine discovery. To determine protein folding in 2020 DeepMind developed Alpha Fold II, arguably AI's greatest contribution to science to date.

Chapter five delves into what the authors call the brain-computer interface. In 2020 *Elon Musk's* company *Neuralink* published the installation of three thousand very thin electrodes in the brain of a pig, i.e., a *Brain machine interfaces* (BCI). This could be useful for treating diseases such as Alzheimer's or spinal cord injuries. Kai-Fu Lee is skeptical that this is the first step towards being able to download consciousness into a computer.

*Autonomous Vehicles and Quantum Computing (Chapters 6 and 7)*

The Society of Automotive Engineers of the USA foresees a step-wise progression in the development of autonomous vehicles. They point out that these will progress from the mode of supplementary assistance to the human driver, in the manner of an on-board assistant, to eventually taking over the driving reins. For this, Kai-Fu Lee sees a profound modification of cities as necessary.

The ethical problems that have arisen with these vehicles are well known. The most famous one is actually a complex version of the streetcar dilemma first raised by Philippa Foot. Faced with a life-threatening situation for passers-by, whom should the vehicle run over or save? By what kind of criteria should one be guided: age, sex, health, nationality, or should one simply try to save the life of the vehicle's owner?

Other types of questions are: What will happen to the work of thousands of carriers? Should we use an AI that makes mistakes that human drivers now do not have if in five years the total number of deaths can be halved thanks to thousands of miles of experience? On the other hand, in relation to moral responsibility, will the automobile manufacturer be responsible for the possible deaths? The AI algorithm provider? The engineer who wrote the algorithm?

Chapter seven addresses quantum computing and its promises of an unprecedented increase in information processing power. Quantum computing has the potential to revolutionize machine learning and solve problems previously thought impossible. Despite major advances in this field in recent years, there is still a long way to go. Among the risks of this technology is its ability to break all the encryption systems we know today, even the famous block chain on which *Bitcoin* is based.

*Labor changes, privacy and new economic environments (Chapters 8, 9 and 10)*

The last three chapters deal with social and political aspects derived from this technology. The destruction of low-skilled jobs, described in chapter eight, is already a reality that the authors expect to increase in the coming years. Routine and dangerous tasks will disappear, as will those where AI is much more efficient, for example, where thousands of pieces of data are cross-referenced, such as in banking, insurance or customer service. On the other hand, those tasks that require creativity, empathy and dexterity, three skills that he considers distinctive to humans, will be difficult to replace.

The ninth chapter deals with a booming new happiness industry, derived from the reading of bodily expressions by electronic devices. For example, we easily detect macro-expressions (usually within 0.5 to 4 seconds) but cannot do the same for micro-expressions (0.03 to 0.1 seconds). This reading of emotions is already possible using AI.

Another problem addressed in this chapter is related to privacy. Already today, Google and Facebook have access to so much data that they can infer your home address, your ethnicity, or things you do not even know about yourself (2). Ethical questions about the collection, use and storage of data are already a reality today and are beginning to be addressed by legal systems.

Finally, the last chapter deals with the problem of energy. All this technology relies on huge amounts of electrical energy. Kai-Fu Lee is optimistic about renewable energy sources, speaking of a new era of energy “plenitude” and a revolution in the physics of materials.<sup>3</sup>

From a bioethical perspective, the book is interesting in that it includes forecasts on the evolution of healthcare systems. For example, the personalization of diagnoses will bring with it the possibility of preventing many diseases, but it will also require large investments of money to make this possible. Insurance companies will be able to know more about their clients, thus adjusting the price of policies in real time, at the cost of greater intrusion into clients’ private lives.

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<sup>3</sup> Back in 2011 President Obama announced the Materials Genome Initiative, a national effort to use open-source methods and AI to double the pace of innovation in materials science. Over the past ten years, this effort has created a massive database that has equipped scientists with the ability to build materials atom by atom.

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