



Total number of document(s): 1

COMMENT
P08

China Daily Hong Kong Edition

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2018-06-04

AI era calls for overhaul of undergraduate education

The government and technology sector have recently stepped up efforts to promote innovation and technology. In the 2018-19 Budget, the government even earmarked HK\$50 billion to support related projects with an emphasis on four major areas including artificial intelligence. In recent years, technological development of AI has advanced rapidly and humankind has entered the era of smart machines. AI will have a huge impact on people's work and life and it has also become a much-discussed topic.

In October last year *Hang Seng Management College* organized the world premiere of 7%, a documentary film by the award-winning director Zhou Hao, and a pre-screening workshop. The film was a story about the AI Go computer program "Jue Yi" created by Tencent early last year. In 2016, Google's AI AlphaGo defeated a 9-dan Go master; and Jue Yi last year defeated world-renowned Go champion Ke Jie in 13 consecutive games. This stunned the Go world. In some application areas, the computing power of AI is comparative to or has already outperformed that of the human brain.

Professional Go players were perhaps the first group of people to experience the subversive impact of AI on human lives. Their situation today leads us to think about the future relationship between AI and humanity. The documentary was named 7% because the Japanese Go player Hideyuki Fujisawa once said: "If there are 100 ways to play Go, I only know seven of them". Does human understanding of Go and the world really take up 7 percent? Will AI turn many people redundant and useless? How can AI raise human values and improve their wellbeing?

This year, *Hang Seng Management College* organized the President Forum on its founders' day on March 16, exploring the future of liberal arts education in a globalized and technological context. The forum invited Professor Jeffrey S. Lehman, the inaugural vice-chancellor of New York University Shanghai and the former president of Cornell University, as guest speaker. He also discussed this important topic with me. As leaders of universities, we are obliged to think about how these developments can reshape undergraduate education so young people in the 21st century can integrate into the new era of science and technology. This will help them have the necessary competencies to meet future challenges in work and life.

AI has already been used in domains such as robots, voice recognition, machine translation, human face recognition, self-driving cars, unmanned stores, credit risk assessment, financialmarket transactions, medical diagnosis, drug discovery, education management and media and advertising. The use of multi-layer neural networks, big data, cloud computing and super hardware enables the system to undertake deep learning on its own.

AI technology can bring us convenience, comfort and well-being, including the elimination of intermediaries and also more personalized experiences.

Nonetheless, it brings hidden concerns, including the loss of middleand low-level jobs, infringement of personal privacy, unreasonable program logics, more social inequality, more alienated relationships, and

ethical and legal disputes. It is not easy to achieve a balance between safeguarding individual social rights and expediting AI development. Excessive government regulation will also impede innovations.

Humankind also faces the inevitable contradiction. On one hand, they are worried AI will be too smart, beyond human control or even cause catastrophe. On the other hand, humans blame AI for not being smart enough. AI is largely constrained by manual coding; hence, AI may also make mistakes. Besides, if the input data is under-represented or biased, AI's computing or judgment will go wrong. Therefore, people should be cautious when applying AI to predict results and should not rely entirely on the result of AI computing for decisionmaking in important domains. Human operations, monitoring and judgment are still critical.

Stephen Hawking warned earlier that the biggest threat to humankind comes from progress in technology, including artificial intelligence. However, AI does not obscure the fact that humans are not trying to stop scientific and technological advancement. Instead, they must recognize and control the risks with a human-centered approach, and realize AI's contribution to human society.

After all, artificial intelligence was invented by humans. The algorithm behind it was designed by humans and it is a tool to serve people. It is difficult for AI to completely replace human intelligence, imagination, emotional feelings, care, aesthetic judgment, spirit of inclusion etc. Therefore saying "AI replaces people" or "AI outperforms humans" is still far-fetched at this stage and there is no need to worry about this too much. In this new era of AI, the greatest manpower requirement will be jobs that are unstructured and cannot be replaced by AI, especially those that can lead AI in a constructive direction.

Higher education institutions have all along been strengthening AI teaching and research but we don't need many of the next generation to become AI experts. A basic understanding of AI and its limitations will suffice. In contrast, in order to cope with future life-long changes and challenges of work and life confidently, I believe that institutions have the obligation to ensure university students of the iGeneration are equipped with the following five core transferable human qualities (5C qualities):

Critical thinking — Cross-disciplinary, rational, analytical, respecting different opinions, independent judgment
 Creativity — More contact with different people and matters, establishing an ideas bank, association, entrepreneurial spirit
 Caring — Human-centered, interpersonal communication and cooperation, empathy, cross-cultural competencies
 Character — Integrity, equality, justice
 Community engagement — Caring for and contributing to society, strive for win-win
 Lehman and I both agree that the revised liberal arts education model is the most effective way to cultivate students' key qualities as mentioned above. Higher education institutions should reform their curriculum, pedagogy and also students' all-round growth, structure, culture etc. This is in order to give students a more self-directed and individualized learning environment.

When promoting new developments of technology, we should not deviate from human nature, and should not lack human vision and qualities. Liberal arts institutions in the region should integrate humanities with technology, and combine the cultural values of East and West.

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DOCUMENT ID: 201806043101092

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