

Artificial Intelligence Witnesses a Bright Prospect, yet Human Being is in Ultimate Control of the Whole Course

Zhang Wenqiang, *Director of Laboratory of Artificial Intelligence Study, Fudan University*

AlphaGo's victory over Lee Sedol, not surprising

Of the two games on March 9 and 10 with AlphaGo – a computer program developed by Google DeepMind, versus Lee Sedol – a top professional go player worldwide, the artificial intelligence harvested a complete victory over human player. But such a result, for Mr. Zhang Wenqiang, the director of Laboratory of Artificial Intelligence Study at Fudan University, is no surprise. Mr. Zhang gave the example of IBM's Deep Blue – a typical representative of artificial intelligence earlier – winning over Garry Kasparov, a world-renowned chess grandmaster back in 1997 to indicate that the then global eye-catching event, when looking back from now, is just another progress in the history of technological development.

Disparity on artificial intelligence study exists between China and the US. For China to catch up, the key lies in coordination between industrial, academic and research circles through mechanism innovation.

Mr. Zhang pointed out that for the US to take the lead in artificial intelligence study globally, there are two reasons. First, innovation from universities proves to be a strong catalyst. Research institutes at Stanford and MIT, for instance, provide a huge talent pool and theoretical support for the development of AlphaGo. Second, the industrial circle also invests extensive financial and human resources in the cause. Mr. Zhang pointed out that technological giants such as Google and Facebook all have their own laboratories to conduct research and study on artificial intelligence. Therefore, a close cooperation between the academia and the industrial circle serves as the key for the US to be in the leading place in artificial intelligence studies.

During the interview, Mr. Zhang gave comment on the efforts in promoting “Internet +” and artificial intelligence study in China in recent years. He believes that the current efforts will be blessing for further development. China's artificial intelligence study witnesses a bright prospect.

Meanwhile, Mr. Zhang also told that disparity on artificial intelligence study exists between China and the US. He further pointed out that

AlphaGo's defeat of human go player is just another proof of technological development. A disparity on artificial intelligence study exists between China and the US, for China to catch up the key lies in coordination between industrial, academic and research circles through mechanism innovation. Future development of artificial intelligence still relies on improvement in both hardware and algorithm. During the course it is difficult for machine to replace human brain; ultimately human being would be in whole control.

the fundamental problem lies in the mechanism for innovation. In Mr. Zhang's viewpoint, China needs to learn from the Western countries in terms of building a systematic mechanism for innovation.

Mr. Zhang shared his thoughts on how to make up the difference from three aspects. Firstly, on the state level, the government should list development of "Internet +" and artificial intelligence into top priorities. Secondly, academic circle should act as a talent source for innovation for innovative achievement would be a natural outcome once with the great support from the talented professionals. Lastly, the industrial circle should cultivate the foresight and patience when investing in artificial intelligence. Huge amount of money is a must when the development is in its infant stage during which the newly emerging technology is not expected to generate fat profit margins. Mr. Zhang believes that China has the chance to chase up the US if it can make the full use of the synergy from the academia, research circle and industry.

Development of artificial intelligence: the basic lies in the hardware while the core relies on algorithm.

Mr. Zhang pointed out reasons for the fast development in artificial intelligence in recent years from two aspects. On the hardware level, rapid achievement has been realized in computing capacity and computing resources. Algorithms that required long time to calculate out results in the past now give answers within moments. On the theoretical level, Deep Learning – the artificial neural network of AlphaGo – is greatly different from those shallow ones in the past. AlphaGo's win has fully shown the great and beyond-human effectiveness of big data sample learning and reinforcement learning, behind which is the extensive data of historical game records, a collection of human wisdom and talent. For future development of artificial intelligence, Mr. Zhang believes that it is essential to push forward the progress on both hardware and algorithm. To put it more specifically, enabling hardware to process complex algorithms at a lower cost and improving the smartness of machine will be significant. Mr. Zhang even assumed that whether robots could have emotion would be a research direction in the future.

For computers to replace human brain? Rather difficult.

Mr. Zhang believes that it is very difficult for computer to replace human brain. Based on his many years' experience he told us that the more we learn about artificial intelligence, the more we know about the deficiencies of artificial intelligence. At present development of artificial intelligence worldwide is still in an early stage. Even for top machine like AlphaGo, it is only possible for it to defeat human brain in some respects – the rule-based fields such as computing and searching. Mr. Zhang further points

out that currently as the developers of artificial intelligence are not fully clear about how human brains work, it is not very possible to completely empower robots the way as a human brain does.

Artificial intelligence also needs to obey ethical principles. Ultimately human being will have it all in hands.

Mr. Zhang told us that during the robot research there is a set of ethical rules to guide and set the bottom line for robot behaviors so as to avoid the risk of evildoings. But to ditch the research just because there is potential risk would simple equals to throwing the baby out with bathwater. The easiest way to stop wrongdoing is just to unplug the power, Mr. Zhang joked. In general, neither pessimism nor exaggeration is helpful; ultimately human being is in control of the whole course.

Translator/Wen Jieling