

China Artificial Intelligence Index 2018¹

Summary

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The China Artificial Intelligence Index measures the development and impact of artificial intelligence technology in China over the past two decades. Comparing Chinese data with equivalent information from the US, it examines aspects such as research capacities, industry development, human capital stock, open source AI software development, and, public perception and media focus over AI technology. The 2018 findings are summarized below:

- 1) Research capacities: Chinese research on artificial intelligence (AI) has seen rapid development. For total papers published on academic journals and in conferences, especially since 2016, China is nearing US numbers. In recent years, the number of Chinese published papers on AI with low to medium citation rates have drawn close to that of the US. For the highly cited papers, however, the significant progress China has made does not disguise the fact that the US is still far ahead in producing original insightful findings. As for uncited papers as is often the case of limited application, China has published more than the US. In some areas of artificial intelligence such as machine learning, text mining, NLP, computer images and video analytics, virtual proxies and swarm intelligence, Chinese total papers and total citation numbers have almost closed the gap with the US in recent years. However, there remains a significant publication and citation gap between Chinese and US research for deep learning, robotic process automation, and other areas including machine reasoning.
- 2) Industry development: The last two decades have seen rapid development in entrepreneurial activities in AI sector in China. At its peak in 2016, there were more than 400 active AI firms in China. Prior to 2012, more AI startups were being set up in China than in the US. In 2012, the US replaced China as the industry leader (in terms of the total number of startups in AI). The gap between the two countries in entrepreneurial activities in AI has been further expanded since 2016. In 2017, more than 600 AI start-ups were registered in the US, while in China, the figure began falling in 2016, to as few as 185 in 2017.

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- 3) Human capital stock: The gap between the number of AI scholars in China and the US continues to narrow and China also has experts with the greatest influence. The number of Chinese scholars with published but uncited papers on AI has increased significantly in recent years, surpassing the US. When the most influential experts are taken into account however, far fewer are from China than from the US. As for the total number of AI experts in all areas and levels of academia and industry, China is lagged far behind the US: LinkedIn's talent databases list 50 thousand in China and a total of 830 thousand in the US. Moreover, China is substantially lack of senior AI experts (experts with more than ten years of industrial experience), comparing to the US.
- 4) Development of open source AI software: In the last three years, Chinese researchers have paid increasing attentions to applying open source AI software. By the fall of 2017, the total users of open source software in China exceeded that of the US. However, up to 93% of open source AI software packages employed by Chinese researchers were developed by US organizations. The most widely used package by both Chinese and American researchers is TensorFlow developed by Google. At the beginning of 2018, up to 9000 Chinese and 7000 US researchers were using TensorFlow.
- 5) Public perception and media coverage: AI application is still in its infancy. Its prospects and development are highly correlated to public perception. Using big data gathered from various media sources, we found that before 2014, there were moderately more positive than negative reports on AI in China. After 2014, the balance shifted and the number of negative reports dropped while the number of positive reports crept up year by year, minimalizing the overall impact of negative opinion. In comparison, most of the reports on AI by global English language media were found to be neutral. Between 2013 and 2015, the gap between positive and negative reports on AI decreased globally. After 2016, many more positive reports began to appear, while negative reports stayed fairly consistent, corresponding with a start-up boom in the US AI sector.