The Atlantic

China's Artificial-Intelligence Boom

The country's universities and tech giants are starting to surpass American ones when it comes to researching and implementing AI.

Chinese tech company Baidu has invested heavily in artificial intelligence research.

Aly Song / Reuters

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Each winter, hundreds of AI researchers from around the world convene at the annual meeting of the Association of the Advancement of Artificial Intelligence. Last year, a minor crisis erupted over the schedule, when AAAI announced that 2017's meeting would take place in New Orleans in late January. The location was fine. The dates happened to conflict with Chinese New Year.

The holiday might not have been a deal breaker in the past, but Chinese researchers have become so integral to the meeting, it could not go on without them. They had to reschedule. "Nobody would have put AAAI on Christmas day," says current AAAI president Subbarao Kambhampati. "Our organization had to almost turn on a dime and change the conference venue to hold it a week later."

The 2017 AAAI meeting—which ultimately relocated to San Francisco—wrapped up just last week. And as expected, Chinese researchers had a strong showing in the historically U.S.-dominated conference. A nearly equal number of accepted papers came from researchers based in China and the U.S. "This is pretty surprising and impressive given how different it was even three, four years back," says Rao.

China's rapid rise up the ranks of AI research has people taking notice. In October, the Obama White House released a "strategic plan" for AI research, which noted that the U.S. no longer leads the world in journal articles on "deep learning," a particularly hot subset of AI research right now. The country that had overtaken the U.S.? China, of course.

It's not just academic research. Chinese tech companies are betting on AI, too. Baidu (a Chinese search-engine company often likened to Google), Didi (often likened to Uber), and Tencent (maker of the mega-popular

messaging app WeChat) have all set up their own AI research labs. With millions of customers, these companies have access to the huge amount of data that training AI to detect patterns requires.

Like the Microsofts and Googles of the world, Chinese tech companies see enormous potential in AI. It could undergird a whole set of transformative technologies in the coming decades, from facial recognition to autonomous cars."I have a hard time thinking of an industry we cannot transform with AI," says Andrew Ng, chief scientist at Baidu. Ng previously cofounded Coursera and Google Brain, the company's deep learning project. Now he directs Baidu's AI research out of Sunnyvale, California, right in Silicon Valley.

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China's success in AI has been partly fueled by the government's overall investment in scientific research at its universities. Over the past decade, government spending on research has grown by double digits on average every year. Funding of science and technology research continues to be a major priority, as outlined by the the Five-Year Plan unveiled this past March.

When Rao first started seeing Chinese researchers at international AI meetings, he recalls they were usually from Tsinghua and Peking University, considered the MIT and Harvard of China. Now, he sees papers from researchers all over the country, not just the most elite schools. Machine learning—which includes deep learning—has been an especially popular topic lately. "The number of people who got interested in applied machine learning has tremendously increased across China," says Rao. This is the same uptick that the White House noticed in its report on a strategic plan for AI research.

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Chinese tech companies are part of the infusion of research dollars to universities, too. At Hong Kong University of Science and Technology, computer scientist Qiang Yang collaborates with Tencent, which sponsors scholarships for students in his lab.

The students get access to mountains of data from WeChat, the messaging app from Tencent that is akin to Facebook, iMessage, and Venmo all rolled into one. ("With AI, they can't do it without a lot of data and a platform to test it on," says Yang, which is why industry collaboration is so key.) In return, Tencent gets a direct line to some of the most innovative research coming out of academic labs. And of course, some of these students end up working at Tencent when they graduate.

The quantity of Chinese AI research has grown dramatically, but researchers in the U.S. are still responsible for a lot of the most fundamental groundbreaking work. "The very clever ideas on changing network architecture, I see those in the U.S.," says Ng. What Chinese researchers have been very good at doing is seizing on an idea—like machine learning—and cranking out papers on its different applications.

Yet as the research matures in China, Ng says, it is also becoming its own distinct community. After a recent international meeting in Barcelona, he recalls seeing Chinese language write-ups of the talks circulate right way. He never found any in English. The language issue creates a kind of asymmetry: Chinese researchers usually speak English so they have the benefit of access to all the work disseminated in English. The English-speaking

community, on the other hand, is much less likely to have access to work within the Chinese AI community.

"China has a fairly deep awareness of what's happening in the English-speaking world, but the opposite is not true," says Ng. He points out that Baidu has rolled out neural network-based machine translation and achieved speech recognition accuracy that surpassed humans—but when Google and Microsoft, respectively, did so, the American companies got a lot more publicity.

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And when it comes to actually shipping new features, China companies can move more quickly. "The velocity of work is much faster in China than in most of Silicon Valley," says Ng. "When you spot a business opportunity in China, the window of time you have to respond usually very short—shorter in China than the United States."

Yang chalks it up to China's highly competitive ecosystem. WeChat, for example, has built a set of features around QR codes (yes, really), chat, payments, and friend discovery that make it indispensable to daily life in China. American social media companies only wish they had that kind of loyalty. "Product managers at Tencent have good sense of what customers want, and they can can quickly turn technology into reality," says Yang. "This cycle is very short." And to stay competitive, they're primed to integrate AI to improve their products. Whether Chinese tech companies use the AI wave to break into the international market remains to be seen—but they're already using AI to compete for customers in China.

In the academic world, AAAI has now taken steps to make sure Chinese researchers have input on the meetings. The exact date of Chinese New Year changes every year, but it's always in January or February, when the AAAI meeting usually takes place. Can't have them conflicting again.

ABOUT THE AUTHOR

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