

Science, Technology, Education and Health News from China Number 161 – November 2017

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Introduction

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Story of the Month

China recruits Baidu, Alibaba and Tencent to AI 'national team'

(SCMP, 21-11-2017)

The Chinese government has named its first batch of national champions in artificial intelligence as partners in an ambitious strategy to accelerate the country towards global technology leadership.

China's Ministry of Science and Technology identified internet giants Baidu, Alibaba Group and Tencent Holdings – collectively known as BAT – and voice intelligence specialist iFlyTek, as the first group to spur development of next generation AI technologies that are vital to everything from voice activated digital assistants to self-driving cars.

A notice published on the official ministry website on 20 November said the four companies would leverage their respective strengths to build “open innovation platforms” in four different fields.

Baidu's focus will be on autonomous driving; the cloud computing division of Alibaba is tasked with a project called “city brains”, a set of AI solutions to improve urban life, including smart transport; Tencent will focus on computer vision for medical diagnosis; while Shenzhen-listed iFlyTek, a dominant player in voice recognition, will specialise in voice intelligence.

Representatives from Baidu and iFlyTek confirmed they were chosen for the “national team” when contacted by the South China Morning Post, while Tencent and Alibaba were not available for comment at press time.

“The launch of the platforms indicates the development of AI has been upgraded and pushed ahead at a national level,” said Raymond Wang, a partner at consultancy Roland Berger.

The announcement follows a meeting with the companies and ministry last week to discuss “fully kicking off the operation of the next generation AI development plan”, the statement said. The move comes one month after Chinese President Xi Jinping's opening speech at the 19th party congress which called for deeper integration between the real economy and advanced technologies, including internet, big data and AI.

China's ruling Communist Party released a three-step road map in July with the goal of making the country a global leader in the technology by 2030.

“It is the first time some of the country's biggest companies have been named in such a strategy,” Wang said, adding that the government's blessing could give Baidu a leg-up when it came to cooperating with carmakers on self driving vehicles, and provide Tencent with wider access to hospital data.

However, he noted that while national endorsement can accelerate the AI projects of these companies, “it could impact market vitality, posing a challenge to industry latecomers”.

In comparison, the US and European countries foster industry growth through governmental research funding and legislation but would never elevate individual companies like Google to lead national platforms, he said.

Japan, which is also keen to develop AI, said in August it would invest billions of yen to fund next-generation semiconductors and other technologies critical to AI development. But the funding is going to start-up companies and researchers, enabling them to devise new technologies and develop world-class AI experts.

While some question the strategy of naming national champions, Yu Kai, the founder of start-up Horizon Robotics and former head of the Baidu Institute of Deep Learning, said the four Chinese companies are only responsible for building the open platforms. “The technologies and resources of the platforms will be open to everyone, which will benefit the entire industry. AI start-ups still have their chance,” said Yu, who took part in the ministry meeting last week as a member of China's newly established AI strategy consultancy committee.

Hu Yu, executive president of iFlyTek, said in a statement that the company will use open innovative platform to help China become a world-leading player in voice intelligence and other applications of artificial intelligence.

New York-listed Alibaba, which owns the Post, announced in October that it would invest US\$15 billion over the next three years in “cutting-edge technologies”, including AI, through its global research effort called Discovery, Adventure, Momentum and Outlook (Damo) Academy. The company has already used AI technology to crack down on fake products sold online and to improve the e-commerce shopping experience through AI-enabled digital assistants.

Baidu, which has staked its future on transforming into an AI-driven business, is working to bring autonomous driving cars to China’s road before the end of 2018.

In May Shenzhen-based Tencent set up an AI research lab in Seattle, in the US state of Washington, led by former Microsoft scientist Yu Dong. On the Chinese mainland it has hired more than 50 AI researchers, supported by about 200 engineers.

<http://www.scmp.com/tech/china-tech/article/2120913/china-recruits-baidu-alibaba-and-tencent-ai-national-team>)

News

1. Nation's papers gain global credibility

(China Daily, 1-11-2017)

China's academic science papers have moved into second place for global citations, behind the United States, according to a report released on 31 October.

The 2017 edition of Statistical Data of Chinese Science and Technology Papers shows that the nation's science papers have been cited more than 19.35 million times over the past decade, ahead of those from the United Kingdom and Germany.

It also shows the number of highly cited Chinese papers rose 18.7 percent compared with last year's report, reaching 20,131 papers and accounting for 14.7 percent of the global total.

The report has been released annually since 1987 by the Ministry of Science and Technology's Institute of Scientific and Technical Information.

"China's science academic literature has been steadily improving both in quantity and quality in recent years," said Dai Guoqiang, director of the institute.

"It showcases Chinese science workers' increased innovation and research capabilities, which will help transform China into a global technology powerhouse."

Academic paper citation is an indication of a paper's quality. The number of citations has long been treated as a reflection of a nation's strength in scientific research.

China is now the world's most cited country in material science research, with eight other research fields ranking second globally. These are agriculture, chemistry, computer science, engineering, environmental science, mathematics, physics and pharmaceuticals.

China also ranks second behind the US for the seventh consecutive year in the number of articles published in the world's most prestigious science journals, such as Nature and Science.

Regarding global science projects, Chinese scientists contributed to about 25 percent of all the joint science papers in 2016, and cooperated with scholars from 155 countries. China's top six science partners are the US, Australia, the UK, Canada, Japan and Germany.

"China is now fully capable of participating in large-scale global science projects," said Dai, adding that such projects, in fields ranging from astrophysics to biomedicine, typically involve more than 1,000 scientists and 150 organizations around the world.

In these types of projects, China contributed to 225 papers in 2016, a 20 percent year-on-year increase. "Chinese scientists will continue to cooperate with scientists in China and abroad to facilitate scientific development," Dai said.

The report pointed to some shortcomings in China's scientific literature. In recent years, China's research has grown rapidly in applied science and engineering, but medicine and other health fields lag behind the US and European countries.

The report also showed that universities, research institutions and enterprises are the three mainstays of Chinese innovation. However, about 76 percent of the high-quality papers were generated by universities, with around 43 percent of these papers supported by the National Natural Science Fund.

(http://www.chinadaily.com.cn/china/2017-11/01/content_33969546.htm)

2. China ranks second in global science innovation

(China Daily, 2-11-2017)

The annual Research Fronts report, which tracks the hottest and emerging topics in frontier science, has ranked China No 2 in the world for cutting-edge innovation.

China, second only to the United States, leads the world in 25 of 143 topics in frontier natural and social science, according to the 2017 report released on 2 November.

Frontier science refers to cutting-edge data, hypotheses and models that have not been widely tested or accepted.

The report, now in its fourth year, is compiled by the Chinese Academy of Sciences and Clarivate Analytics, a global analytics firm, and is based on citation analysis of papers published from 2011 to 2016.

Frontier research topics — which are divided into 10 broad categories — reflect global interests and scientific development trends, said Bai Chunli, president of the CAS. Topics can range from nanomaterial assembly and smog formation to superconductors for computers.

"China's scientific development has entered a new era, with emphasis on making breakthroughs in fundamental scientific research," Bai said, adding that the Chinese government may support many of the identified areas over the next decade. "These breakthroughs might change the future pattern of the world."

Six countries — the US, China, Britain, Germany, France and Canada — made the greatest contributions in the 143 research topics, according to the report.

Of the 10 major scientific categories, the US leads in eight categories, ranging from physics to biology. China leads in two: material science and computer engineering.

China has entered the second tier of global science innovation and research, but there is still a significant gap with the US, the report said.

(http://www.chinadaily.com.cn/china/2017-11/02/content_34024975.htm)

3. China expected to extend electric vehicle tax rebate

(SCMP, 5-11-2017)

China is planning to extend a tax rebate on the purchase of new-energy vehicles after the incentive helped the country become the world's biggest market for clean fuel automobiles, according to people with direct knowledge of the matter.

China's government will continue to exempt the 10 per cent purchase tax on new-energy vehicles at least through 2020, the people said. The current tax rebate policy is due to expire at end of this year.

Shares of electric-vehicle makers jumped as extending the tax rebate will give a fillip to China's development of the NEV industry, a term used to refer to electric vehicles, plug-in hybrids and fuel-cell cars.

The surge in demand for such vehicles in China has attracted billions of dollars of investments from companies such as Volkswagen and Ford Motor Co while Tesla is considering setting up a factory in the country. The Chinese government has recently announced a series of measures regarding manufacturing licenses and joint ventures that would allow foreign companies to set up solely owned assemblies.

Sales of NEVs surged 53 per cent to 500,700 units last year and boosted the overall ownership of such vehicles in the country to over a million units. That is more than triple the tally in 2015, according to the China Association of Automobile Manufacturers.

China's government is working with regulators on setting a deadline for ending production and sales of internal-combustion vehicles, Xin Guobin, the vice-minister of industry and information technology, said in September. The world's second-biggest economy, which has vowed to cap its carbon emissions by 2030 and curb worsening air pollution, joined the UK and France in seeking a timetable for the elimination of vehicles using petrol and diesel.

"China wants the number of NEVs to grow, and I'm sure they'll take many additional steps if they're not meeting their targets," said Yunshi Wang, director of the China Centre for Energy and Transportation at the University of California, Davis. Eliminating the tax incentives abruptly would mostly hurt older manufacturers whose technology and manufacturing efficiency can't match new entrants in China's auto market, he said.

While the government wants to encourage consumers to buy more electric vehicles, the authorities are also concerned about overall subsidies. Different arms of the government have been working on plans to scale back overall subsidies on purchase of NEVs next year and a consensus has not yet been reached, according to people familiar with the discussion.

The government is also considering a resumption of new permits to make electric vehicles as early as the first half of 2018, a move that would clear the way for Ford and Tesla as well as a string of local manufacturers to start production, Bloomberg reported last month.

<http://www.scmp.com/tech/enterprises/article/2122887/china-expected-extend-electric-vehicle-tax-rebate>

4. China invests 4 bln yuan in ITER project in decade

(Xinhua, 28-11-2017)

China has invested four billion yuan (about 600 million U.S. dollars) in the International Thermonuclear Experimental Reactor (ITER) project in the past 10 years, the Ministry of Science and Technology (MST) announced 28 November.

The largest international scientific cooperation project in the world, the ITER is a France-based international nuclear fusion research and engineering project that explores commercial uses of fusion power.

It is jointly funded by China, the EU, India, Japan, Republic of Korea, Russia and the United States.

"Since 2008, China has carried out nearly 120 fusion power projects and has made leading achievements," said Luo Delong from the MST.

Chinese scientists set a record by achieving 101.2 seconds of steady-state H-mode operation of the tokamak in July, an experimental device designed to harness the energy of fusion.

China's Experimental Advanced Superconducting Tokamak (EAST) -- the "artificial sun" -- was the first tokamak device to break the 100-second barrier.

According to the ITER's plan, the construction of the "artificial sun" will be completed by 2025, and the commercial uses of fusion power is expected to be available around 2050, said Pan Chuanhong from the MST.

(http://news.xinhuanet.com/english/2017-11/28/c_136785941.htm)

5. World's first smart ship developed and built in China

(China Daily, 3-11-2017)

The world's first smart ship, developed and built by China State Shipbuilding Corp, has started its first trial voyage in Guangzhou, capital of Guangdong province, according to the State-owned shipbuilder.

The 38,800-metric ton bulk carrier, named Great Smart, started a weeklong trial on 31 October off Guangzhou and will be delivered at the end of this year to an unidentified lessee, CSSC said in a statement.

It was designed primarily by Shanghai Merchant Ship Design and Research Institute and built by Huangpu Wenchong Shipbuilding Co in Guangzhou. The two entities are subsidiaries of CSSC.

The ship is a modified version of the Green Dolphin fuefficient bulk carrier concept. The company calls it the world's first smart ship because it is the first seafaring vehicle awarded the "cybersafe", "cyber-perform" and "cyber-maintain" smart-vessel notations by the British maritime classification society Lloyd's Register, one of the top maritime technical standards services.

Great Smart also has the "intelligent ship" notation from China Classification Society, according to CSSC.

Three ships built by South Korean shipyard Hanjin Heavy Industries and Construction have been certified with the "cyber-safe" notation by Lloyd's Register but cannot be considered smart ships, said Gu Yiqing, a chief designer of smart ships at the Shanghai Merchant Ship Design and Research Institute.

Gu said Great Smart has a set of integrated information systems capable of autonomously monitoring, recording and analyzing the conditions and operations of major equipment such as engines and propeller shafts. The data reduces the crew's workload, improves efficiency and avoids misjudgments, she said.

The designer said the digital transformation has not resulted in a smaller crew size on Great Smart compared with similar vessels because the number of sailors for each class is stipulated by regulations. But further technological and regulatory developments will allow such reductions, she said. Large-scale application of smart technologies will enable ship owners to save costs in ship maintenance and fleet operations, Gu said.

Wang Yi, deputy general manager of Huangpu Wenchong, said smart ships have expanded capabilities since they consume less fuel and can operate with higher reliability and safety.

Great Smart will apply up-to-date information technology, including real-time data transmission and collection, large-capacity calculations, digital modeling and remote control, according to a news release published by Lloyd's Register. "All of this is designed into the ship to better guarantee navigational safety and improve operational efficiency of the vessel," it said.

Gu said China is at the forefront in research and development on smart ships while shipbuilding giants in Europe, Japan and South Korea have also invested heavily in this field.

(http://www.chinadaily.com.cn/china/2017-11/03/content_34055628.htm)

6. Xi'an university pioneers an AI school

(China Daily, 6-11-2017)

The School of Artificial Intelligence (AI) was established at Xidian University on 2 November in Xi'an, Northwest China's Shaanxi province, opening the field of AI at the faculty level for universities directly under the Ministry of Education.

Xidian University intends to build a research-oriented AI school dedicated to basic study, technology development and talent cultivation. It will also establish practice bases and platforms to accelerate the transformation of scientific and technological achievements in the service of social development.

Based on undergraduate majors, such as intelligent science and technology, data technology and big data technology, the school plans to open experimental classes to train innovative builders in AI.

Xidian University has laid a solid foundation for AI study and research. Over 2,000 students have taken bachelor's degree-level courses and 1,600 students have received master's degrees in intelligent science and technology since the 1990s, said university President Zheng Xiaojing.

"We will lose no time in building a high-level faculty, keeping abreast of trends in the AI industry, seeking technological breakthroughs and striving to build the institute into a competitive advantage of our college," Zheng added.

China has a great shortage of AI talents. The shortfall is about 1 million people every year, one-sixth of the total demand for information talent, according to statistics announced at the inauguration ceremony.

http://www.chinadaily.com.cn/china/2017-11/06/content_34198265.htm

7. Airbus to set up innovation center in Shenzhen

(Xinhua, 17-11-2017)

Airbus 16 November announced that its second global innovation center will be established in Shenzhen, south China's Guangdong Province, with the aim to accelerate innovation and shape the future of flight.

The Airbus China Innovation Centre will serve to strengthen the European aviation giant's plan to shape a future-oriented worldwide innovation ecosystem following its A3 innovation center located in Silicon Valley.

"China will be the leader of the future flight. Airbus is willing to define and build the future of the global sky in joint hands with China," said Paul Eremenko, chief technology officer of Airbus.

The new innovation center will benefit from the advantages of policy planning, talent resources, and a favorable investment and financing environment in Shenzhen to impact global aviation innovation, Eremenko said.

In July 2017, Airbus appointed Luo Gang as CEO of the Airbus China Innovation Centre, without confirming where the center would be located. Luo's team has already set up a number of ongoing initiatives in autonomous flight, unmanned vehicle, and in-flight experience.

As a pioneering city in China's reform and opening-up, Shenzhen boasts global competitive advantages in technology research and development, industrialization, and international expansion.

Airbus on 16 November signed a memorandum of understanding (MOU) with Invest Shenzhen to establish a long-term strategic partnership on innovation.

According to the MOU, both sides will work together to accelerate research and development, application, and industrialization of in-flight experiences, connectivity, new energy, and urban air mobility (UAM).

Both sides will be devoted to cultivating an integrated hardware and software ecosystem, relying on Shenzhen's high-end aviation research and development and advanced manufacturing industry value chain.

"China will surely become a pivotal power in defining the future of the world's skies," said Eric Chen, president of Airbus China. "Airbus will continue to deepen mutually-beneficial and multi-dimensional cooperation with China."

By the end of August, the Airbus fleet in China had exceeded 1,480 aircraft, around half of the country's in-service civil airplanes.

(http://news.xinhuanet.com/english/2017-11/17/c_129743015.htm)

8. China aims to be world-leading space power by 2045

(China Daily, 17-11-2017)

China plans to grow into a global leader in space technology by 2045, according to a route map drawn up by China Aerospace Science and Technology Corp, the major contractor of the country's space programs.

The following are the milestones China is expected to achieve in the following three decades.

-2020: Long March 8 carrier rocket, a medium-size launch vehicle, will make its debut. The application of the new rocket will significantly lower the cost of sending a satellite into low-medium orbit, boosting the country's ability to provide commercial launch services.

-2025: Suborbital spaceflight will be realized. Suborbital spaceflight reaches an altitude between 20 and 100 kilometers, often described as between the highest altitude an airplane can reach and the lowest level a satellite operates.

A suborbital carrier vehicle is able to fly in suborbit, allowing common people to go into space, Lu Yu, a senior rocket engineer from CAST, was quoted as saying by China News Service.

-2030: The 100-ton heavy-lift carrier rocket will be launched. According to the plan, the heavy carrier rocket will have a carrying capacity of 100 tons, compared with the 20-ton-level rocket used currently.

Lu said the heav-lift carrier rocket will provide strong support for the country's manned lunar-landing mission and the Mars probe's return journey. He said China will by then join the ranks of world-leading countries in space transport capabilities.

-2035: The reusable carrier rocket will be developed. The route map shows an intelligent carrier rocket equipped with advanced power will be widely used in space transport by 2035.

By then, common people will be able to take reusable carrier vehicles to travel in space, Tang Yagang, the director of carrier rocket development at the China Academy of Launch Vehicle Technology, was quoted as saying by China News Service.

-2040: The nuclear-powered space shuttle will be built. It will enable large-scale resource exploration in space and mining on asteroids, as well as the building of space solar-power stations. Lu said between 2040 and 2045, a future generation of carrier rockets will be used in longer-term and multiple space trips.

-2045: China will become an all-round world-leading country in space equipment and technology. By then, it will be able to carry out man-computer coordinated space exploration on a large scale, Wang Liheng, a member of the Chinese Academy of Engineering, told China News Service.

Lu Yu forecast that by 2045, with advanced space transport capabilities, China will be able to carry out large-scale exploration on planets, asteroids and comets in the solar system, as space exploration enters a stage of rapid development.

(http://www.chinadaily.com.cn/china/2017-11/17/content_34653486.htm)