



Focus on Annual Breakthroughs: Fusion and innovation



Zhimin Li

Director of Center for Science and Technology Development Ministry of Education, People's Republic of China

The year 2019 marks the 70th anniversary of the founding of the People's Republic of China (PRC). After 70 years of ups and downs, China has developed into the world's second largest economy and the second largest scientific research output country. As 2020 approaches, we wish to highlight some of the technologies China worked on this year.

Better papers and better AI

The year of 2019 is a memorable year for Chinese science and technology, especially in terms of innovation. Chinese researchers made important discoveries in exploring natural science phenomena, put forward breakthrough ideas in scientific theories and doctrines, and offered original, cutting-edge solutions to major scientific and technological issues that restrict national economic and social development.

On November 19, the Institute of Scientific and Technical Information of China (ISTIC) released the "China Outstanding Paper Output Report." The report shows

that from 2009 to October 2019, Chinese scientific and technological personnel published a total of 2.61 million international papers, continuing to rank second in the world, with an increase of 14.7% over the 2018 statistics; In 2018, there were 315,900 outstanding scientific papers, with an increase of 12.4% over 2017. The citation numbers of papers in materials science, chemistry, and engineering technology ranked first in the world. These papers may not be a persuasive indicator, but to a certain extent this shows that China's scientific research output is of high quality, and that China has the ability to participate in international science collaborations.

On October 20, 15 world-leading technological achievements in the Internet were released at the 6th World Internet Conference, including the world's first brain-inspired computing chip from Tsinghua University. Supporting both machine learning algorithms and existing brain-like computing algorithms, this new chip is expected to clear the path for the development of more versatile artificial general intelligence (AGI) and hardware platforms as well as have a huge impact on industry and the economy.

Multiplying fields and talents

Many new disciplines have sprung up in the fields of natural sciences, humanities, and social sciences. In recent years, most of these new disciplines are created through the cross-fusion of the Internet and traditional disciplines, which is of great significance to the progress of disciplines and academic innovation. The "Wuzhen Outlook 2019 Report" released at the 6th World Internet Conference proposed that the deep integration of emerging technologies, such as artificial intelligence (AI), the Internet of Things (IoT), big data, cloud computing, and blockchain will create enormous opportunities to drive a new round of leaping social and economic developments.

Emerging technologies and industries provide a growing demand for interdisciplinary talent, as well as further integration of these interdisciplinary programs into higher education. China has rearranged the discipline construction of higher education institutions. According to the "List of Self-Set Interdisciplinary Programs for General Colleges and Universities" announced by the Ministry of Education of China, as of May 31, there are 508 interdisciplinary programs independently managed as secondary