

IBM's Brain-Like Chip Reshapes the AI Industry

Recently, IBM's new NorthPole chip has gained attention for its ultra-fast AI image recognition capabilities.

HONG KONG, CHINA, October 23, 2023 /EINPresswire.com/ -- Recently, IBM's newly developed NorthPole brain-like chip has attracted widespread attention for its ability to run AI image recognition algorithms at ultra-fast speeds. This is a brain-inspired chip architecture that combines computation and [memory](#), processing data efficiently with low power consumption.

Unlike traditional chips that separate memory from processing circuits, the NorthPole chip combines the two, much like synapses in the brain, saving and processing information based on connections with other neurons.

It's worth noting that the chip's computing speed is 22 times faster than commercial chips, and its energy efficiency is improved by 25 times. Without using the most advanced process, the power consumption of the NorthPole chip is 1/5 of that of AI chips using the most advanced technology.

IBM researchers demonstrated how the new chip can run general image recognition AI faster and more efficiently than any commercial chip on the market, even beating the latest chip from leading graphics processing unit manufacturer NVIDIA.

They also showed that NorthPole can economically run artificial intelligence for speech recognition and natural language processing.

In addition, the NorthPole chip has 22 billion transistors and 256 cores. Of course, there are chips with more transistors and more cores. But NorthPole's unique architecture results in an exponential increase in running efficiency when processing tasks such as moving images.

Compared to similar chips with "12nm silicon technology process nodes and an equivalent number of transistors, NorthPole's frames per joule increased by 25 times". If you want to connect many such [devices](#) in an enterprise cloud environment to run generative AI programs like ChatGPT, you can significantly reduce the cloud scale.

The design inspiration for the IBM NorthPole chip comes from how the human brain works. Unlike the previous TrueNorth chip, NorthPole translates this concept into a digital architecture compatible with the silicon chip technology used in contemporary computers.

The chip is composed of a series of interwoven computing cores and storage blocks, innovatively enabling each computing core to easily access remote storage blocks just like accessing adjacent storage blocks.

The emergence of this new technology is expected to be applied to various fields, such as medicine, autonomous driving, the Internet of Things, etc., to bring faster and more efficient solutions for the application of artificial intelligence technology.

Although the NorthPole chip prototype is unlikely to be commercialized immediately, this digital architecture is very important for the efficient operation of artificial intelligence on autonomous driving and aviation computing hardware.

It is reported that IBM established the IBM Research AI Hardware Center in early 2019 to conduct AI Chip research in cooperation with the State of New York, the New York State Polytechnic Institute, and technology companies such as Mellanox, Samsung, and Synopsys. At the same time, the center is also developing new digital and analog AI cores to achieve these innovations. The development blueprint ultimately creates a new core made of existing special materials that have not yet been used in semiconductor manufacturing.

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