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PROSPECTS OF NEUROMORPHIC TECHNOLOGIES AND ARTIFICIAL INTELLIGENCE IN THE EDUCATIONAL PROCESS

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Abstract:

This article discusses the possibilities of both artificial intelligence and neuromorphic technologies that should be used in the educational process to improve the skills and competencies of students in the educational process.

Keywords: neuromorphic technologies, artificial intelligence, cognitive functions, neurophysiology, neural networks.

Introduction

Neuromorphic technology is a way to create computers that work like our brains. This will require the development of special computer chips that have the same basic structure as the neurons in our brains and the synapses connecting them. These chips give the human brain the ability to process information, making it more efficient at certain activities such as pattern recognition and decision making. Simply put, it is the technology to create computers that can “think” and “learn” more like humans do, in an instant, while using less energy. It can be compared to artificial intelligence (AI), but instead of using complex algorithms, it imitates how our brains work.

For neuromorphic technology to work, it is necessary to create special computer chips that have the same basic structure as the neurons in our brains and the synapses connecting them. These chips have the same information-processing ability as the human brain, making them more efficient at certain activities such as pattern recognition and decision-making. Simply put, a chip is a technology designed to act as a network of synapses connecting neurons in the brain. Just as the brain processes information, the chip has the ability to process information in parallel. In addition to being energy efficient, the chip can analyze data and draw conclusions instantly while consuming less power than conventional computer processors. Consider using neuromorphic technology to create a computer that can identify a dog in an image. Each artificial neuron in the network of chips is responsible for scanning an image for a specific feature, such as that dog's fur, four legs, or tail. When many of these neurons see the same

details in an image, they send a signal to another neuron. Real use of neuromorphic technologies. Today there are many practical applications such as robotics: the movements and behavior of robots can be controlled using neuromorphic systems, and these systems allow robots to make decisions based on sensor data.

Autonomous systems. Neuromorphic technology can be used for real-time decision making, motion planning and control, and perception in self-driving cars, drones, and other autonomous systems. Image and voice recognition. Neuromorphic systems are valuable in applications such as security systems, image search and retrieval systems, and speech recognition devices because they are very effective in tasks such as object recognition. face recognition and speech-to-text conversion. IoT devices such as cameras, microphones and sensors can analyze data locally using neuromorphic technology, eliminating the need to send large amounts of data to the cloud.

Finance: Real-time financial data analysis, fraudulent transaction detection and investment selection can be done using neuromorphic technology.

Healthcare. Neuromorphic systems can be used to improve assistive technologies such as prosthetic limbs and cognitive aids, as well as medical imaging, diagnosis and therapy.

Artificial intelligence is the replication of human intelligence in machines designed to think and gain knowledge like humans. It involves the development of computer systems capable of performing operations that require human intelligence, such as understanding speech, recognizing images, and making quick decisions about various problems. The technology that allows robots to think and learn like humans is called artificial intelligence (AI). It can be used to build computers and other devices capable of performing human-like tasks such as speech understanding, facial recognition and reasoning. Artificial intelligence (AI) and neuromorphic technologies are closely related, but are separate subjects. The goal of neuromorphic technology, a branch of electronics, is to use specialized equipment to simulate the functioning of the human brain. In contrast, the field of artificial intelligence is broader and includes a wide range of technologies and methods for creating intelligent robots. This may include techniques such as artificial intelligence, computer vision and natural language processing.

One of the main differences between neuromorphic technology and AI is that neuromorphic systems are specifically designed to mimic the neural structure of the brain, while AI systems can be built using different designs. This means that neuromorphic systems may be more capable than standard AI systems at some tasks, but at the same time they may be more limited. Another important difference is that neuromorphic systems are often less flexible than AI due to their design to perform a limited set of actions and possible difficulties in quickly adapting to new tasks. However, neuromorphic systems can work well in real-time applications that require energy-efficient and fast decision making, such as in robots and self-driving cars.

Here are some important points to consider:

• While artificial intelligence (AI) is a more general field that includes various technologies and strategies for creating intelligent machines, neuromorphic technology is a type of electronics that attempts to imitate the operations of the human brain using specialized hardware.

• In activities traditionally associated with human intelligence, such as speech recognition, image recognition, and decision making, neuromorphic systems are designed to be highly efficient. On the other hand, artificial intelligence systems can be used to perform various tasks that traditionally require human intelligence.

• Although artificial intelligence systems can be built using a variety of designs, neuromorphic technology uses artificial neurons and synapses designed to work in a similar way to how real neurons and synapses work.

• Neuromorphic systems are designed to be highly efficient at activities traditionally associated with human intelligence, such as speech recognition, image recognition, and decision making. On the other hand, various tasks that traditionally require human intelligence can be performed using artificial intelligence systems.

• Neuromorphic technologies can be used to create incredibly efficient and adaptive intelligent systems, and AI can be used to perform tasks that are difficult or impossible for humans to complete alone.

• Artificial intelligence (AI) and neuromorphic technologies can be used to create robust intelligent systems capable of performing many tasks that typically require human intelligence. Artificial intelligence (AI) and neuromorphic technologies are two exciting and fast-growing areas of research and development. Neuromorphic technologies are expected to become more efficient and powerful in the future . This could lead to new ways of making decisions in real time and low power consumption in areas such as robotics, self-driving cars and home automation and education. In addition, neuromorphic processors are expected to be used in various embedded systems and IoT gadgets, including cameras and sensors, for local data analysis and delivery of necessary information to the cloud. These innovations make artificial intelligence systems stronger, more accurate and more transparent. Additionally, the use of artificial intelligence is expected to grow in a number of industries such as healthcare, education, banking and logistics. AI can be used, for example, to automatically detect fraudulent financial transactions or analyze large volumes of medical data to help doctors make more accurate diagnoses. AI is also expected to play an important role in the creation and development of assistive technologies, including prosthetics, cognitive aids and virtual assistants.

In short, for the artificial intelligence sector to be fully effective, neuromorphic hardware requires a new type of technology. Neuromorphic processors seem to be the best option for this , and several companies are trying to develop this technology and the future of hardware artificial intelligence. As a result, the world of education can be changed thanks to AI developers.

Literature

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