HOMEWORK 1

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1. There are different interpretations of artificial intelligence in different contexts. Please elaborate on the artificial intelligence in your eyes.

Artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems. Specific applications of AI include expert systems, natural language processing, speech recognition and machine vision.

AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms. No one programming language is synonymous with AI, but a few, including Python, R and Java, are popular.

AI programming focuses on three cognitive skills: learning, reasoning and self-correction.

AI is a broad field that encompasses many different disciplines, including computer science, data analytics and statistics, hardware and software engineering, linguistics, neuroscience, and even philosophy and psychology.

2. Artificial intelligence, machine learning and deep learning are three concepts often mentioned together. What is the relationship between them? What are the similarities and differences between the three terms?

1. Difference between AI - Machine Learning - Deep Learning

In the current 4.0 technology era, everyone must have heard of the concept of Artificial Intelligence or AI, Machine Learning, Deep Learning, right? Concepts seem simple but are quite ambiguous and easy to confuse people.

AI - Artificial Intelligence is considered as human intelligence that is simulated and used by machines.

Meanwhile, Machine Learning is a method to conquer AI, making it possible for machines to simulate that intelligence.

Finally, Deep Learning is a technique to realize Machine Learning

The relationship between these three concepts can be explained by thinking of them as circles, where AI - the earliest idea - is the largest circle, followed by machine learning - the concept that comes after. , and finally deep learning - which is driving the current AI boom - is the smallest circle.

2. AI - Artificial Intelligence

Concept

AI is the simulation of human intellectual processes by machines, especially computer systems.

AI makes it possible for machines to learn from experience, adjust to new inputs, and perform human-like tasks.

AI is an area of computer science that emphasizes the creation of intelligent machines that act and react like humans.

Specific applications of AI include natural language processing, speech and vision recognition, system management, and more.

In education

For the education industry, artificial intelligence is also increasingly showing its importance as well as its outstanding benefits. AI can automate grading quickly and accurately. It saves a huge amount of time that educators have to spend on this activity. AI tutors can provide additional support to students, ensuring they stay on track. And it could change where students learn and even replace some teachers.

In addition, it can also assess the level of learners. Thereby self-adjusting to the appropriate level, providing additional support, ensuring learners stay up to speed and stay on track.

3. Machine Learning

Concept

A subfield of AI that uses algorithms that allow computers to learn from data to perform tasks instead of being explicitly programmed.

It has the ability to self-learn based on input without having to be programmed specifically.

Using

A machine that performs chess (task T), can learn from data from previous games, or play against an expert (experience E). The ability of the machine to play is the ratio of the number of games it wins when playing against humans (performance P). High level of information security, information security for customers

For example: The system accepts reviews of a food product. It is important to determine whether the reviews are positive or negative.

The task of the problem is to label each review. The experience here can be the set of reviews and its corresponding label. Performance is measured by the percentage of correct label predictions on new reviews.

4. Deep Learning

Concept

As a method of Machine learning

Allows us to train an AI that can predict outputs based on a set of inputs.

Help the computer solve a series of complex problems that cannot be solved.

It is like a “neural network” that can process data similar to a human brain can in that the machine trains itself.

Requires a lot of input and computing power.

3. After reading the artificial intelligence application scenarios in this chapter, please describe in detail a field of AI application and its scenarios in real life based on your own life experience.

Artificial intelligence changes the field of education

Artificial Intelligence (AI) makes education accessible to students with smart devices, if they cannot attend a traditional classroom.

AI has great potential in automating and performing administrative tasks for teachers. Specifically, teachers often spend a lot of time grading homework, evaluating essays, and grading students' assignments. Meanwhile, AI can automate the grading process on multiple choice tests, allowing teachers to spend more time with their students.

AI can also help digitize textbooks or create digital interfaces for learning, applicable to students of all ages and grades. Another platform, called Netex Learning, allows teachers to design curricula and digital content across multiple devices, including video, audio, and online support. Virtual content like digital lectures and video conferences is also powered by AI.

In addition, while it cannot completely replace teachers, AI has created virtual instructors and facilitators that can think, act, and react to humans, using gesture recognition technology. only spontaneously, responding to both verbal and nonverbal cues.

4. Which chip is for deep neural networks and Ascend AI processors. Please brief these four major modules.

The software stack of the Ascend AI chip consists of four layers and an auxiliary toolchain. The four layers are the application enabling layer (L3), execution framework layer (L2), chip enabling layer (L1), and computing resource layer (L0).

L3 application enabling layer: It is an application-level encapsulation layer that provides different processing algorithms for specific application fields. L3 provides various fields with computing and processing engines. L2 execution framework layer: encapsulates the framework calling capability and offline model generation capability. After the application algorithm is developed and encapsulated into an engine at L3, L2 calls the appropriate deep learning framework, such as Caffe or TensorFlow, based on the features of the algorithm to obtain the neural network of the corresponding function, and generates an offline model through the framework manager. After L2 converts the original neural network model into an offline model that can be executed on Ascend AI chips, the offline model executor (OME) transfers the offline model to Layer 1 for task allocation.

L1 chip enabling layer: bridges the offline model to Ascend AI chips. L1 accelerates the offline model for different computing tasks via libraries. Nearest to the bottom-layer computing resources, L1 outputs operator-layer tasks to the hardware.

L0 computing resource layer: provides computing resources and executes specific computing tasks. It is the hardware computing basis of the Ascend AI chip.

5. Based on your current knowledge and understanding, please elaborate on the development trends of artificial intelligence in the future in your view.

Artificial intelligence is an issue that has been discussed by many people nowadays. Some people may think that advances in technology won't be beneficial for society and that computers can't substitute the human workforce. However, others believe that it will have a positive impact on everyone's life. I strongly agree with this last opinion and the reasons will be explained in this essay.

On the one hand, the advances in technology can help and improve the outcome in many professions. For example, complex surgeries now can be performed by robots instead of human hands. This new feature brings more efficacy to the treatment and surgeries can be more precise with better results for the patients. In addition, with the introduction of robots performing surgeries, a surgeon can command the machine from abroad while the patient is in the operation room with robots. Consequently, the risk of infection during surgeries will decrease significantly besides the other benefits of the results.

On the other hand, when machines start substituting man workforce, some people will probably lose their jobs. For instance, machines are now used for self-checkout at grocery stores eliminating the need for humans at the checkout. Then, some employees will end up being fired and the rates of unemployment will grow. Furthermore, with this trend, poverty will also increase in societies, and governments will have to invest in new strategies to contain this wave.

In conclusion, although some people are worried about the threats that AI will cause to the world, I personally believe that developments in this technology will bring huge benefits to our lives.