

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

AI is the simulation of human intelligence processes by machines, especially computer systems and engineering that purposes to create intelligent machines. AI requires a foundation of specialized hardware and software for writing and training machine learning algorithms to have human-like intelligence, such as visual perception, speech recognition, natural language processing, decision-making, and learning. This involves developing algorithms, models, and architectures that enable machines to learn from data, and make decisions. AI can be applied in a wide range of domains, from healthcare and finance to transportation and entertainment, and has the potential to transform many aspects of our lives.

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

\* **Artificial intelligence (AI)** is a broad field of computer science that aims to create intelligent machines that can perform tasks that typically require human intelligence.

\* **Machine learning** is a discipline of computer science that uses computer algorithms and analytic to build predictive models that can solve business problems.

\* **Deep learning** is a subset of machine learning that deals with algorithms inspired by the structure and function of the human brain and can work with an enormous amount of both structured and unstructured data. Deep learning's core concept lies in artificial neural networks, which enable machines to make decisions.

Deep learning and machine learning are a subset of artificial intelligence.

**What are the similarities and differences between the three terms?**

**\* Similarities**

- Can learn from data without relying on rules-based programming.
- The process of imparting data, information.
- Uses computer algorithms and paralytcs to build predictive models that can solve business problems.

**\* Differences**

- Artificial Intelligence is ability of a machine to imitate intelligent human behavior.
- Machine Learning is applied to AI that allows systems to automatically learn and improve from experiences.
- Deep Learning is applied to Machine Learning that uses complex algorithms and deep neural nets to train a model.

**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.**

Describe in detail a field of AI application and its scenarios in real life :

**\* *Personalized Online Shopping***

A user has purchased a smartphone, the AI algorithms suggest various add-on products for the same model they purchased like screen guards, back covers, earphones, etc. If the algorithms are intrinsic and smart enough, they can also go on a step further in suggesting personalized products like compatible pairable devices, extended warranty plans, damage protection plans, and much more.

**\* *Smart Cars***

Self-driving cars are the most common existing example of applications of artificial intelligence in real-world, becoming increasingly reliable and ready for dispatch every single day. From Google's self-driving car project to Tesla's "autopilot" feature, it is a matter of time before AI is a standard-issue technology in the automotive industry.

**\* *Enhanced Images***

Cameras and apps use AI for applying different effects on images, refining their quality, and even suggest how to click them live. AI can help in object identification in images and also enhance the photograph to the maximum extent by identifying the depth, lighting, and scope of the picture, and helping capture every element in as much detail as possible. By using this feature, many apps and cameras let you add a variety of effects in your pictures

**\* *Agriculture***

With the increased demand for food, organizations are using automation and robotics technology with AI embedded in it to help farmers find more efficient ways to protect their crops from various elements like weather, weeds, market consumption rates, and much more. The latest artificial intelligence applications in the form of image recognition identify possible defects in the crops through images captured by the user's smartphone camera. Users are then provided with soil restoration techniques, tips, and other possible solutions to deal with the identified defects.

**\* *Customer Service***

There are many websites now that offer customers the ability to chat with customer support. It's one of the most general applications of artificial intelligence.

**\* *Video Games***

Over the past few years, artificial intelligence has become an integral part of the gaming industry. In fact, one of the biggest accomplishments of AI is in the gaming industry. The gaming world is the best example of

intelligent applications of artificial intelligence as it is at this platform where there are a lot of alterations in the purpose. AI is used for designing the game, developing the characters, and also frame the story to a certain extent.

#### **\* *Healthcare***

The Healthcare sector has been amongst the top adopters of AI technology. It boils down to the power of AI to crunch numbers fast and learn from historical data, which is critical in the healthcare industry. AI has taken a critical step in helping people with looking after patients as well. The automated bots and healthcare applications ensure proper medication and treatment of patients in the facilities. In certain cases, AI applications have also been known to provide operating assistance to the doctors.

#### **\* *Banks***

A lot of banks have already adopted AI-based systems or software to provide customer support and detect anomalies and credit card fraud. Another use of AI for banking, which is of far higher value for banks, is in fraud detection. It can be hard for humans to understand patterns, but machines are good at it. This is where fraud prevention AI comes into play.

#### **\* *Smart Homes***

The most advanced form of applications of artificial intelligence in the real-world are being implemented in homes, and are becoming smarter every day. Various devices like smart locks, smart switches, ect., are increasingly becoming compatible with various devices, and the application of smart homes is becoming more accessible to the general population every day. The past few years have witnessed many smart devices that can now learn your behavior patterns and help you save money by saving energy. These devices help you with a smarter way of living.

#### **\* *Chatbots***

Chatbots are able to extract information from the site and present it to you on request. Chatbots are needed to adapt as per the natural language.

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

The chip designed for deep neural networks and Ascend AI processors is the Ascend series of chips developed by Huawei, GreenWaves, Google:

- Ascend 710 (***Huawei***): This is a general-purpose AI chip that provides high performance for both inference and training tasks. It is designed for data center and cloud computing environments.

- TPU(***Google***): the TPU is a highly specialized and powerful piece of hardware that is specifically designed to accelerate machine learning workloads. Its high throughput, low latency, energy efficiency, tensor

support, and integration with TensorFlow make it an attractive option for large-scale machine learning applications.

- GAP8 (*GreenWaves*) : the GAP8 SoC is designed to provide a highly energy-efficient, flexible, and powerful platform for low-power edge computing applications. Its support for parallel processing, low latency, AI, and sensor integration make it well-suited for a wide range of IoT and sensor processing applications.

- Neural Processing Unit (NPU) (*Samsung*) : an NPU is a highly specialized chip that is designed to accelerate neural network computations for AI applications. Its high performance, low power consumption, scalability, flexibility, and on-device processing capabilities make it well-suited for a wide range of AI applications and devices.

**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 and health :***

The COVID-19 outbreak has attracted widespread attention in the medical industry. It's worth mentioning that the increasingly mature AI has played a great role in the fight against the pandemic. Telemedicine, intelligent imaging, medical robots, and pathology-assisted diagnosis have assisted clinicians this epidemic. In the control and prevention stage of COVID-19, machine learning algorithms that can identify the "asymptomatic infections" and "super spreaders" of the population who are most likely to be COVID-19 patients.

***\* Artificial intelligence + manufacturing :***

- Continued advances in deep learning: Deep learning has been one of the key drivers of recent breakthroughs in AI, and it is likely to continue to advance in the future. As more data becomes available and more powerful hardware becomes available, deep learning models are likely to become more accurate and efficient.

Beside, smart factory digital production lines, automated testing and real-time data interaction are being deployed in manufacturing sectors., Increasingly, data shows that the future market prospect of AI is very impressive, and it also creates more new opportunities for the development of intelligent manufacturing

***\* Artificial intelligence and environmental protection***

AI can replace manual environmental protection work where these operations have low efficiency, high costs, and high risks associated. Furthermore, AI technology and products can assist people in the prevention of environmental pollution and destruction, for example tracking deforestation with machine learning algorithms.

***\* Artificial intelligence and 5G wireless communications***

The commercialization of 5G has ushered an unprecedented huge network scale, complex network structure, and surge of network traffic of 5G. The use of AI can enable the network to achieve high efficiency of operation and maintenance, predictability of traffic, and precision of marketing, helping communication network operations face challenges related to traditional operation and maintenance management methods.