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ARTIFICIAL INTELLIGENCE AND IOT

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Abstract-Investment in new technologies is needed to realize the future and the full potential of IoT devices. Combining artificial intelligence (IoT) with the Internet of Things (IoT) has the potential to change the way industries, jobs, and the economy work. The IoT uses artificial intelligence to produce smart technologies that mimic intelligent behavior and help make decisions with little or no human intervention. The combination of these two currents serves both ordinary people and professionals. While the Internet of Things is about devices connecting over the Internet, AI is about devices learning from their data and experiences. This blog explains why the Internet of Things and AI must work together.

I. INTRODUCTION

Individually, the Internet of Things (IoT) and Artificial Intelligence (AI) are powerful technologies. When you combine AI and IoT, you get AIoT—the artificial intelligence of things. You can think of the internet of things devices as the digital nervous system, while artificial intelligence is the brain of a system.

To fully understand AIoT, you must start with the internet of things. When “things” such as wearable devices, refrigerators, digital assistants, sensors, and other equipment are connected to the internet, can be recognized by other devices, and

collect and process data, you have the internet of things[1]. Artificial intelligence is when a system can complete a set of tasks or learn from data in a way that seems intelligent. Therefore, when artificial intelligence is added to the internet of things, those devices can analyze data, make decisions, and act on that data without involvement from humans.

These are "smart" devices, and they help drive efficiency and effectiveness. The intelligence of AIoT enables data analytics that is then used to optimize a system, generate higher performance and business insights, and create data that helps make better decisions that the system can learn from[2].

II. Practical Examples of AIoT

The combo of the internet of things and intelligent systems makes AIoT a powerful and essential tool for many applications. Here are a few:

a) Smart Retail

A camera system equipped with computer vision capabilities can use facial recognition to identify customers when they walk through the door in an intelligent retail environment. The system gathers intel about customers, including their gender, product preferences, traffic flow, etc. It analyzes the data to predict consumer behavior accurately and then uses it to make decisions about store operations, from marketing to product placement and other decisions. For example, suppose the system detects that most customers walking into the store are Millennials. In that case, it can push out product advertisements or in-store specials that appeal to that demographic, therefore driving up sales. Smart cameras could identify shoppers and allow them to skip the checkout, like, what happens in the Amazon Go store[3].

b) Drone Traffic Monitoring

In a smart city, there are several practical uses of AIoT, including traffic monitoring by drones[4]. If traffic can be monitored in real-time and adjustments to the traffic flow can be made, congestion can be reduced. When drones are deployed to monitor a large area, they can transmit traffic data. Then AI can analyze the data and decide how to alleviate the best traffic congestion with adjustments to speed limits and timing of traffic lights without human involvement[5].

c) **Office Buildings**

Another area where artificial intelligence and the IoT intersect is smart office buildings. Some companies choose to install smart environmental sensors in their office building. These sensors can detect what personnel are present and adjust temperatures and lighting accordingly to improve energy efficiency. A smart building can control building access through facial recognition technology in another use case[6]. The combination of connected cameras and artificial intelligence that can compare images taken in real-time against a database to determine who should be granted access to a building is AIoT at work. Similarly, employees wouldn't need to clock in, or attendance for mandatory meetings wouldn't have to be completed since the AIoT system takes care of it[7].

d) **Fleet Management and Autonomous Vehicles**

AIoT is used in fleet management to help monitor a fleet's vehicles, reduce fuel costs, track vehicle maintenance, and identify unsafe driver behavior. Through IoT devices such as GPS and other sensors and an artificial intelligence system, companies can manage their fleet better thanks to AIoT[8].

Another method AIoT today is self-propelled vehicles, like Tesla's autopilot systems, which use radar, sonar, GPS, and cameras to collect data about driving conditions. An AI system decides on the Internet on which devices are converging[9].

e) **Autonomous Delivery Robots**

Similar to how AIoT is used with autonomous vehicles, autonomous delivery robots are another example of AIoT in action. Robots have sensors that gather information about the environment the robot is traversing and then make moment-to-moment decisions about how to respond through its onboard AI platform[10].

III. conclusion

The Internet of Things is about using computing tools to automate real-world processes, and like all automation tasks, it is expected to reduce the need for direct

human involvement. Although the IoT is intended to reduce human labor, it does not eliminate the need for human judgment and decision-making. Artificial intelligence comes into play, and the IoT system can be significantly improved.

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