

NIELIT, Gorakhpur

Course Name: A-level (1st Sem.)

Subject: IoT

Topic: AIoT

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AIoT is nothing but Artificial intelligence of things i.e penetration of Artificial Intelligence into IoT.

To fully understand AIoT, we should start with the internet of things. When “things” such as wearable devices, refrigerators, digital assistants, sensors and other equipment are connected to the internet and can be recognized by other devices and collect and process data, we called it as internet of things whereas Artificial intelligence (AI), also known as machine intelligence, is a branch of computer science which aims to imbibe software with the ability to analyze its environment using either predetermined rules and search algorithms, or pattern recognizing machine learning models, and then make decisions based on those analyses. AI attempts to mimic biological intelligence to allow the software application or system to act with varying degrees of autonomy, thereby reducing manual human intervention for a wide range of functions. Therefore, when artificial intelligence is added to the internet of things it means that those devices can analyse data and make decisions and act on that data without involvement by humans. Presently, some conditions are given by human being accordingly IoT devices act not by analysing data.

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 and generate higher performance and business insights and create data that helps to make better decisions and that the system can learn from.

Practical Examples of AIoT

Smart Retail

In a smart retail environment, a camera system equipped with computer vision capabilities can use facial recognition to identify customers when they walk through the door. The system gathers information about customers, including their gender, product preferences, traffic flow and more, analyzes the data to accurately predict consumer behaviour and then uses that information to make decisions about store operations from marketing to product placement and other decisions. For example, if the system detects that the majority of customers walking into the store are Millennials, it can push out product advertisements or in-store specials that appeal to that demographic, therefore driving up sales.

Drone Traffic Monitoring

In a smart city, there are several practical uses of AIoT, including traffic monitoring by drones. 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, and then AI can analyze the data and make decisions about how to best alleviate traffic congestion with adjustments to speed limits and timing of traffic lights without human involvement.

Office Buildings

Another area where artificial intelligence and the internet of things intersect is in smart office buildings. Some companies choose to install a network of 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. In another use case, a smart building can control building access through facial recognition technology. 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. In a similar way, 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.

Fleet Management and Autonomous Vehicles

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

Another way AIoT is used today is with autonomous vehicles such as Tesla's autopilot systems that use radars, sonars, GPS, and cameras to gather data about driving conditions and then an AI system to make decisions about the data the internet of things devices are gathering.

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.