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WHAT IS THE RELATIONSHIP BETWEEN AI AND THE INTERNET OF THINGS?

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Abstract: Connected devices that can communicate and gather data form what is known as the Internet of Things (IOT). The massive amounts of data generated by these devices need the use of artificial intelligence (AI) to collect and analyze. This article offers a concise introduction to the Internet of Things (IoT), artificial intelligence (AI), algorithms, the problems with IoT, and how AI systems are used in IoT applications. Two essential components of the AI Internet of things are the software-defined network and the self-optimizing network.

Keywords Connected Devices, Online Data, and AI

INTRODUCTION

One of the members of the RFID development group first introduced the phrase "Internet of Things" (IOT) in 1919. Recent years have seen an increase in the IoT's practical importance as a result of developments such as ubiquitous and embedded connectivity, cloud computing, data analytics, and the proliferation of mobile devices [1].

The term "internet of things" is often used to describe a system of linked physical objects. A wide variety of gadgets, including smartphones, automobiles, toys, medical devices, cameras, household appliances, industrial systems, people, animals, and even buildings, are now connected to the internet. Smart reorganizations, placement, and sharing of data are made possible by these devices' ability to communicate and exchange data in accordance with established protocols. tracking, security, and control; online updates; process management; administration; and even individual real-time monitoring [2, 3].

The foundation of every Internet of Things system should be self-optimizing networks and software-defined networks. Having a system and router update the router's table is the key to an autonomous network. In the long run, this helps the network handle massive amounts of data with ease. The system will compute and find the shortest route for the data to flow [4].

The vast amounts of data produced by interconnected IoT devices might be analyzed and learned from using AI algorithms and techniques, leading to the creation of public services and value. The Internet of Things is greatly improved by the growing usage of artificial intelligence, which opens up additional opportunities for sophisticated data analytics.[14] The discipline of artificial intelligence (AI) is concerned with developing intelligent machines or, more precisely, with imbuing computers with intelligence; "artificial intelligence is the science and engineering of making intelligent machines" is a common definition of AI.[8] The study of how computers can learn and solve problems is known as artificial intelligence (AI).

Many AI textbooks use the term "the study and design of intelligent agents" [10] to describe human intelligence. A system that is able to perceive its environment and take actions that optimize its chances of success is called an intelligent agent [11]. In 1955 [12], the word was defined by its inventor, John McCarthy, as "the science and engineering of making intelligent machines."in [13] Incorporating an AI system into IoT networks requires familiarity with certain terminology and concepts. The two most common approaches to AI are neural networks and fuzzy logic [6]. A wide range of problems may be addressed using various artificial intelligence methods, including genetic algorithm, depth-limited search, bidirectional search, uniform cost search, and depth-first search.

Architectural Alternatives for AI in IOT

AI approaches can be extracted to address any problem in terms of a two-stage process. The first stage of process, a set of AI models are built , these model are built by machine learning algorithms with a set of training data , the best models are built with a large amount of training data . Once these models are built, they can be used to make inferences from the sensor input data, and guide the operation of the system [5].

Challenges in AI with IOT

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There are difficulties with both AI and IOT; these difficulties increase in complexity when we combine the two technologies. A few of these difficulties are [7]:-

1. Safety: Since AI and IOT are gathering sensitive and vital user data, we need to make sure that the information is safe.

2. Compatibility and Complexity: The Internet of Things (IOT) has various devices that are connected to each other and employ a variety of technologies. This can lead to a number of issues when merging these devices.

3. Concealed Stupidity: Artificial stupidity refers to the inability of an AI program to do fundamental tasks flawlessly. To make more accurate and logical conclusions, AI systems' algorithms must be well-developed and able to comprehend and analyze data.

4. Insufficient Self-Belief: Given that IoT is a relatively new technology, both organizations and consumers are quite concerned about its security and lack complete faith in its ability to protect IoT devices and on integrity of the produced data.

5. Cloud Attacks: As cloud computing technologies evolve quickly, malicious viruses are focusing their attention there. Because IoT requires a lot of data, which is stored in the cloud, there is a higher danger of data security.

6. Technology: Compared to other issues, we can state that this one is the biggest because it involves rivalry for all technologies. However, it is not a simple task to face these challenges and give competition to all technologies.

Some applications of artificial intelligence system in the IoT

Following are some of the applications of AI in the IOT

1. Home automation: This is an embedded system that employs a PIC microcontroller to deliver intelligent energy preservation. It is an Internet of Things-based monitoring and control system for

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home automation. With an easy-to-use android interface on a smart phone, it can automatically turn on and off the majority of household appliances, including fans and lights [9].
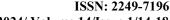
2. Oil field production: To maximize oilfield production, an oil and gas business uses IoT. In order to achieve this, the business measures well pressure, temperature, oil extraction rates, and other factors using sensors [9].

3. Smart hotel: offering its patrons AI-based IoT Intelligent reservation system, Adaptability in controlling the temperature in the room, Useful information selection based on clientele, Re-synchronization of customer history by returning visitors Customers can get real-time assistance online to address their issues. [9].

Conclusion

Even if the Internet of Things is quite stunning, it is not really useful without a strong artificial intelligence system to make use of it. For both technologies to perform as well as we believe they should, they must both reach the same stage of development.

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