

Article

Internet of Things for Artificial Intelligence

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How to cite this article:

Avinash K, Nanda I. Internet of Things for Artificial Intelligence. *J Adv Res Info Tech Sys Mgmt* 2019; 3(2): 15-17.

Date of Submission: 2019-12-03

Date of Acceptance: 2019-12-24

A B S T R A C T

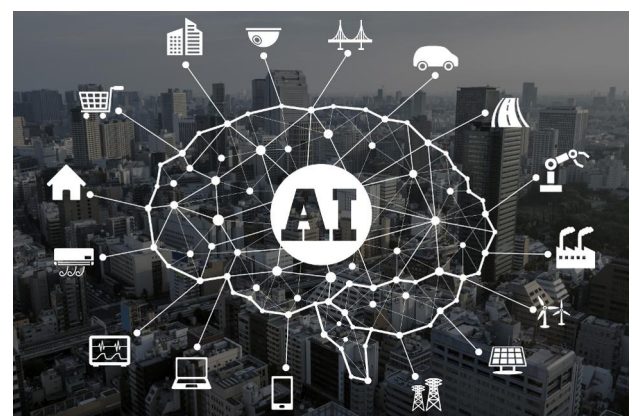
The effective use of internet is continuously transforming from the Internet of Computers (IoC) to the 'Internet of Things (IoT)'. The main problem is to handle this large amount of data generated with the much weaker prevailing computation power. The researchers of data science and Artificial Intelligence (AI) has been determined to provide solution to this problem. Thus, IoT with AI can turn out to be an enormous innovation. This article explains firstly about Internet of Things (IOT), its working and platforms accessible for IOT. Secondly, the detailing about Artificial Intelligence (AI) is presented, thirdly about Machine Learning and its type. It also explained about Neural Networks, working of AI and the linking of IOT with AI in the present scenario.

Keywords: Internet of Things (IOT), Artificial Intelligence (AI), Machine Learning

Introduction

Internet of Things (IoT), which means simply that any device that is connected to internet is known as IOT. The IOT is made by connecting the devices which has sensors in it, the sensor senses and sends the data to the cloud which will be used by us in IOT and after that by the received data the software now decides the action to be performed such as sending an alert to the users device or by performing action by itself without users input.

Artificial Intelligence (AI) is a machine which learns by itself with the data which is received. AI means to make a machine to learn. The AI can be used in bots, automated cars and etc. The AI is also learned by the received data so, by this we can understand that for anything the data is the most important thing that plays role whether in IOT or in an AI. In the present scenario, also many of us are using the technology which is made by IOT. For example: nowadays the AC's have come which controls it's temperature by comparing it with the environment or when we go out of our house and if we forget to turn off the ac, then an alert comes to the user's device asking that whether to turn off the ac or leave as it is, So it is also a technology which is using Internet of Things (IOT).



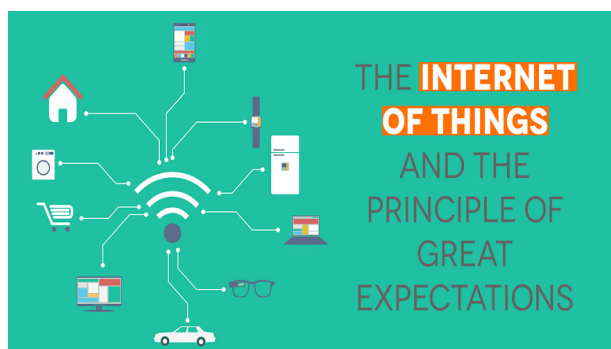
Functioning of IOT for AI IOT

Let's understand the operation of IOT. The user's device is linked with device which have the IOT facility in it, the device has the sensors arranged in it, then the sensors senses the surrounding atmosphere and gathers the data which it had sensed and after that by comparing data it alerts the user to take action accordingly or otherwise it can automatically take the decision without the users help.

For instance, an AC senses it's surrounding temperature and according to the temperature it adjusts the degrees of the AC. In IOT, we can send email alerts to the users, about the devices that are connected to the internet by using IFTTT and mat-lab software which can be found in the IOT platforms.

The IOT mainly uses the WIFI as user's technology to communicate with the device and the IOT device by connecting the sensor device to user's device. The data which is collected by the sensors are stored in the cloud. There are many cloud storages available online. The cloud storages that are available are:

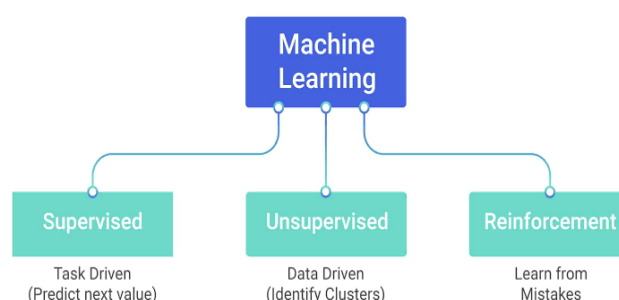
- Thingworx 8 IoT Platform
- Microsoft Azure IoT Suite
- Google Cloud's IoT Platform
- IBM Watson IoT Platform
- AWS IoT Platform
- Cisco IoT Cloud Connect
- Sales force IoT Cloud
- Kaa IoT Platform
- Thing speak IOT Platform
- Oracle IoT Platform



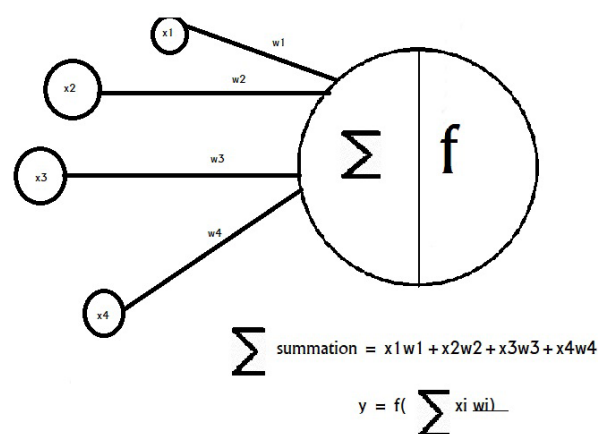
Artificial Intelligence

The AI is used to make machine to learn called as Machine Learning. The AI works with collection of the data and continuously update its knowledge and acts as an intelligent device. Till now, many companies had made AI for example: Facebook had made AI named as Alice and Bob. These two AI started talking in their own language which we can't be understood so, this gave rise to the problem for AI.

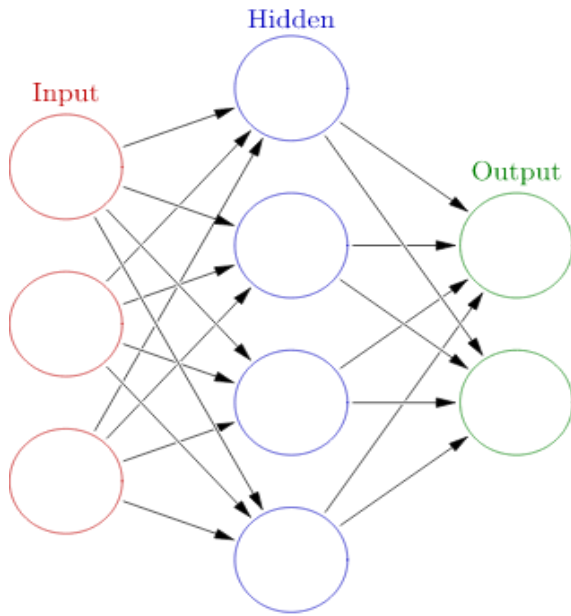
In the Machine Learning there are 3 types, the first type is supervised machine learning, second type is Un-Supervised Machine Learning and the third type is the Re-enforcement Machine Learning. In Supervised Machine Learning, the Machine is given input and the output is also well-defined. In Un-Supervised Machine Learning, the machine is given input and the machine have to find the output by itself, and in the Re-enforcement, Machine Learning the machine is left in the environment and the machine itself does activities and knows about the environment by doing activities and learns from its mistakes.



In Neural Network there is a node, to which the input is given and the output is received. In the node there are two parts known as "Summation" and "Activation Region". To input, a signal is given with the attached weight. The Summation is given by the product of the signal and its weight and like that all signal are summed of and the output is given from "Activation Region". In the Activation Region, there are three types, the output is given by getting the equation of the summation. The equation of summation can be a linear function, non-linear function and sigmoid function. Linear function like: $y=ax$, sigmoid function like: e^x/e^x+1 .

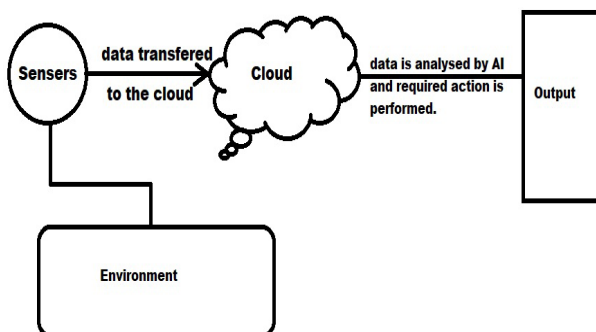


In the diagram, the input signal is given at input layer and output is gained by output layer, the whole analysis part is done in the hidden layer, the AI analyses the data provided and analyses the patterns from the data, in the hidden layer.



For instance: the automated car's which we see is can be made by AI because everything it acquires and it understands what action to be taken at which situation, so it can reduce the number of accidents in the world and automatically it reduces the number of deaths.

Flowchart for IOT based on AI



Conclusion

In current days everyone needs technology to make their life simpler and easier. For this, the combination of IOT and AI plays a decisive role for the progress of the technology and many things which are not probable can be made possible by this. This technology makes things smarter associate to the earlier things. In the future, this technology will be knowledgeable to everyone in the world.

The combination of AI and IOT can be utilized in numerous things like: Automated self-driving cars. In this the car will be receiving multiple data and it will be learning and will make itself an intelligent device and can reduce the number of accidents, by this the death ratio of the country will be reduced and people will be protected safely.

Future Scope

The overall development of artificial intelligence, faster-light communications, and logical IoT has become even more suitable. The efficient IoT devices are pleasing concluded practically every domain of technology.

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