Chapter 14
Perspectives of Machine Learning and Deep Learning in Internet of Things and Cloud:
Artificial Intelligence–Based Internet of Things System

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ABSTRACT

This chapter brings out the perspective outcomes of combining three terminologies: artificial intelligence, cloud, and internet of things. The relation between artificial intelligence, machine learning, and deep learning is also emphasized. Intelligence, which is the capability to attain and apply knowledge in addition to skills, is analysed in the following sections of the chapter along with its categories that include natural intelligence, artificial intelligence, and hybrid intelligence. Analysis of artificial intelligence-based internet of things system is deliberated on two approaches, namely criterion-based analysis and elemental analysis. Criterion-based analysis covers the parameter-based investigation to highlight the relation between machine learning and deep learning. Elemental analysis involves four main components of artificial intelligence-based internet of things system, such as device, data, algorithm, and computation. Research works done using deep learning and internet of things are also discussed.

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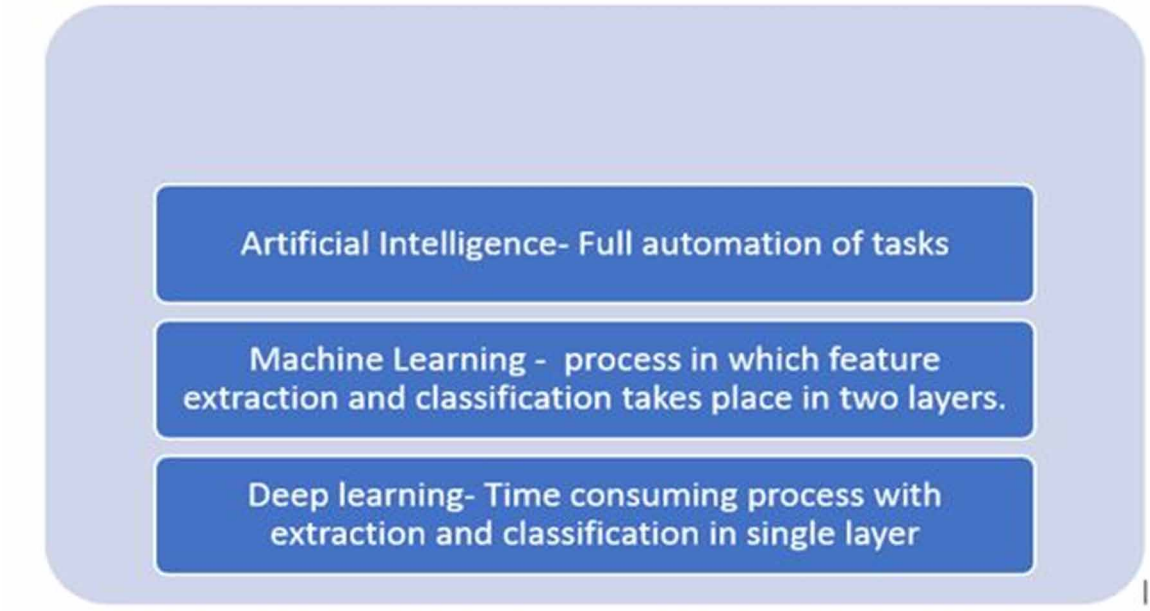
INTRODUCTION

Artificial intelligence is a part of computer science that deals with empowering skills and knowledge to the inhuman things in the world. It mainly encompasses two noteworthy thrill terms, namely, machine learning and deep learning. A profound scrutiny of three reckoning terms such as Artificial intelligence, machine learning and deep learning are laid out. A streamlined implementation of deep learning algorithm in Raspberry Pi with Beings classification algorithm of accuracy 98% is achieved.

Machine learning is an outlet of artificial intelligence that enables prediction of the actions and enrich the learning capability of a physical system. It depends on formerly educated features from the training data (Xin et al., 2018). Multi layered function in machine learning is achieved with the help of deep learning; which is a novel machine learning technique; which works with neural networks that are similar to the neuron structures of the human brain. The alliance between three terms, namely, Artificial Intelligence, Machine learning and Deep Learning indicates the benefit that deep learning has use of unsupervised or semi-supervised feature learning and hierarchical feature extraction for automatic and resourceful swapping of features (Deng et al., 2014). The relationship and differences between three terms artificial intelligence, machine learning and deep learning is put up in Figure 1.

Figure 1. Relation and Differences among Artificial Intelligence, Machine Learning and Deep Learning



INTELLIGENCE

Intelligence is the most fascinating factor for a human as well as a machine in the present state. It can be described as the capability to estimate, reason, distinguish relations and analogies, study from practice, store and retrieve information from memory, resolve difficulties, comprehend multifaceted ideas, practice