Opinion on Different Classification Algorithms Used in Internet of Things Environment for Large Data Set

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ABSTRACT

Nowadays, IoT is an emerging technique and has evolved in many areas such as healthcare, smart homes, agriculture, smart city, education, industries, automation, etc. Many sensor and actuator-based devices deployed in these areas collect data or sense the environment. This data is further used to classify the complicated problem related to the particular environment around us, which also increases efficiency, productivity, accuracy and the economic benefit of the devices. The main aim of this survey article is how the data collected by these sensors in the Internet of Things-based applications are handled and classified by classification algorithms. This survey article also identifies various classification algorithms such as KNN, Random forest logistic regression, SVM with different parameters, such as accuracy cross validation, etc., applied on the large dataset generated by sensor-based devices in various IoT-based applications to classify it. In addition, this article also gives a brief review on advance IoT called CiIoT.

KEYWORDS

Agriculture, Efficiency, Health, Internet of Things, Large Data Set, Security, Smart City

1. INTRODUCTION

Ubiquitous Computing (Friedewald et al., 2011) is often referred to as a new age of computing and is expected to revolutionize the way we live. Researchers create machine-to máquina communication (Palaniswami et al., 2013) that does not require human-to-computer or human-to-human interaction through technology resulted in Ubiquitous computation. In ubiquitous computing, objects are embedded with very small microprocessors that communicate with each other. Also, these objects were equipped with various sensors (Mahdavinejad et al., 2017) that can record or sense the environment of the objects such as flame sensors can sense that flame from the particular distance that will help in processing and communicating computation. This sensor enabled the object to have the quality to know about their environment such as where they are, which other objects are in their surrounding etc. The ubiquitous Computing spread in all the aspect of the life of human being i.e. from health to business, office to home, TV to fridge, etc. (Mahdavinejad et al., 2017). Ubiquitous computing

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recognizes and processes the tasks without user intervention automatically and autonomously and also reduces the memory and storage requirement. It provides a support for the user anywhere and anytime by using information services. Ubiquitous computing collects the real-time data that helps the user for providing the correct and accurate information. In Ubiquitous computing, the computer hardware and computer software are embedded into various equipment and devices of daily uses (Palaniswami et al., 2013).

The main technology for growing the ubiquitous computing infrastructure is the Internet of Things (IoT) (Mahdavinejad et al., 2017). The IoT is a platform for devices to communicate electronically with the world around them through the internet. The result is a world that is alive with information as data flows from one device to another and is shared and reused for a multitude of purposes. IoT integrates the low-cost sensors, low-power processors, actuators, scalable cloud computing, and ubiquitous wireless connectivity (Mahdavinejad et al., 2017), with the devices. The IoT enables the smart devices to sense the data from the environment and transmit this data across the network this will diminish the manual interaction by the human and increase the efficiency of devices. To make the Internet of Things an essential part of our lives, we should have a comprehension of the characteristics of the IoT. IoT provides a unique identity to the things so that they can be discriminated from various entities in the network. It becomes complicated for developers to work with the entities which are not having a unique identification. The IoT enabled devices will work with various communication protocols and technologies, so things should be compatible with various communication technologies (Palaniswami et al., 2013).

Due to various sensors equipped on the device, the IoT enabled devices generated a huge amount of data in a very short period of time so it is necessary to manage and analyze this huge data for getting better, fast and accurate results that help the users in taking correct decisions related to the particular problem. The integration of the IoT with classification algorithms (Chen et al., 2015) solve this problem, many researchers applied classification algorithms in their research. The main target of this research survey is to analyze the IoT based applications in which we applied algorithms (Chen et al., 2015). The aim will be achieved by surveying or studying different research papers based on IoT applications in which Classification Algorithms applied to the data generated by the devices. The main contribution of this survey is the analysis of classification algorithms such as Support vector machine (SVM) (Verma et al., 2017), Decision Tree (DT), K nearest neighbor (KNN) Random Forest (RF), Naïve Bayes (NB) (Chen et al., 2015), etc., with multiple parameters in different applications of the Internet of things.

The rest of this survey paper is organized as follows. Applications of the Internet of things such as agriculture and smart city will be discussed in Section II, Section III will be discussed about the advance CIoT and related work in the field of healthcare, agriculture and smart city with comparison table will be discussed in Section IV, in Section V we will discuss the main conclusion of the paper.

2. INTERNET OF THINGS APPLICATION AREA

2.1. Agriculture

IoT plays a very important role in the agriculture sector (Sarangdhar et al., 2017) it has the ability to transform the farming into smart farming. The IoT in agriculture helps the farmers to enhance the productivity of the crops. With the help of IoT, farmers can monitor the crops, manage fertilizer requirements, etc., by deploying sensor-enabled devices into the farms. As shown in Figure 1, the Internet of things can deliver different types of services to the farming sector.

The farmers can also monitor the irrigation (Venkatesan et al., 2017) of the field through the help devices; farmers can also monitor field condition from anywhere. By using IoT based farming farmers can detect the leaf diseases (Sarangdhar et al., 2017) among the crops and take necessary
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