

Article

Smart IoMT Framework for Supporting UAV Systems with AI

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Abstract: The health monitoring system is one of the most innovative technologies that has gained traction in the Internet of Medical Things (IoMT). It allows the connection of multiple sensors and actuators that can capture and monitor the data through the web page or mobile application. IoMT technology not only provides communications but also will provide monitoring, recording, storage, and display. IoMT in healthcare is used for measuring the vital signs of the human body, which allows medical professionals to assess the well-being of a patient. The doctor may recommend lifestyle modifications, prescribe more tests, or diagnose a disorder according to the results. This paper illustrates the remote-control health monitoring system (HMS) with the integration of a UAV, which allows the doctor to access the data and analyze the patient data remotely. Thus, the proposed HMS-UAV system aims to measure the temperature, humidity, blood pressure, heart rate, and SpO₂ and stores the data on the UAV. Several sensors were thus used namely DHT11, MAX30102, Myoware and K24C16, and the Raspberry Pi camera. Reduced hospital stays and avoidance of readmissions are benefits of remote patient monitoring with IoMT-based UAVs. Contrary to its advantages, IoMT has flaws in information processing since a huge volume of data are needed to be handled in a single environment. One major novel inclusion in this work is to measure multiple parameters and provide a comparative analysis for all of them. Furthermore, the functionality of video recorded and stored is included where the doctor can surveil the patient.

Keywords: healthcare; IoMT; machine learning; service oriented architecture; UAV (unmanned aerial vehicle)



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1. Introduction

Health is of major concern to the human body since it determines a person's well-being and ensures a prolonged lifespan. Over the years, the world has been facing the inability to cope with the spread of chronic diseases due to their more advanced and mutated versions constantly evolving. This makes it essential to combat major health issues all over the world. IoT has been majorly used in improving the technology of treating patients [1]. The growth of IoT over the past few years has been exponential. In 2012, there were 8.7 billion devices connected, but it grew exponentially and, in 2020, there are 50.1 billion devices connected [2].

In [3], it is further illustrated that the market share is anticipated to be held by the most prevalent IoT applications by the year 2025. It can be noticed that 41% of the market share is for healthcare applications while 33% is for manufacturing, 7% is for electricity and other applications such as security, infrastructure, agriculture, and resource extraction, and vehicles account for the other 19%. The range of the use of IoT in the healthcare sector is enormous. It has many different applications which include telemedicine, inpatient monitoring, clinical operations, workflow management, telemedicine, connected imaging, medication management, and other applications. In [4], it is established that inpatient monitoring has the largest market share among all different applications. Considering the

