Chapter 7
Machine Learning– Driven Internet of Things (MLIoT)–Based Healthcare Monitoring System

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ABSTRACT

Healthcare organisations frequently use Machine Learning(ML) to generate precise and timely results. Doctors can make preliminary choices to save patients' lives thanks to early disease predictions. The power of Machine Learning(ML) applications in healthcare is being increased thanks in part to IoT- Internet of Things. ML-Machine learning techniques are utilised to analyse the data collected from IoT sensors about patients. The principal objective of the endeavour is to develop ML-based healthcare Framework that can reliably and early identify various diseases. Adaptive boosting, Random Forest, Decision Trees, Support Vector Machines, Naïve Bayes, Artificial Neural Networks & K-Nearest Neighbor are seven ML classification algorithms used in this work to predict nine fatal diseases: Blood Pressure, Diabetes, Hepatitis, and Kidney Disorders. The performance metrics—likes Accuracy, Precision, and Recall stand used to assess effectiveness of suggested model.

INTRODUCTION-

A functional and effective healthcare system is becoming more and more necessary since healthcare is a basic component of every society by Nagare (2014,2015). Healthcare monitoring systems are now an essential instrument for raising the caliber of healthcare services as a result of technological advancements by Kazi K S (2022, 2023).

A healthcare monitoring system consists of an all-inclusive and integrated platform that sends data to a central database from a variety of medical equipment and sensors, including glucose, heart rate, and blood pressure monitors. After analysis, this information is utilized to track the wellness of a person, spot possible health concerns, and assess how well a treatment is working according to Kutubuddin S. L. (2022a), Kazi (2022).

The ability of a system for healthcare monitoring to deliver real-time data is key advantages. This implies that medical professionals can keep an eye on patients from a distance and act quickly to treat them if needed. For patients who need ongoing care due to chronic diseases, this is especially important. By providing patients with prompt medical attention, a healthcare monitoring system lowers the likelihood of problems and enhances overall health outcomes.

Healthcare monitoring systems may help in spotting possible health problems before they worsen. These technologies are able to identify patterns and trends in data across time that can point to a possible health issue. This lowers the likelihood of hospitalization and enhances the quality of life for patients by enabling healthcare professionals to take preventive actions and offer early interventions as per Ravi (2022).

The capacity of healthcare monitoring systems to enhance patient participation and self-management is another benefit. Patients can simply track their individual health information and maintain contact with their healthcare professionals by using wearable technology and smartphone applications by Altaf (2023). This gives people the ability to take charge of their health and enables medical professionals to track their progress and offer individualized care.

Furthermore, the effectiveness and affordability of healthcare services can be enhanced via healthcare monitoring systems. These technologies can reduce time and costs associated with in-person visits and hospital stays for patients as well as healthcare providers. Patients who live in rural or isolated locations and may not have easy access to medical facilities would particularly benefit from this.

Healthcare monitoring systems will assist healthcare providers efficiently manage their workload and resources in addition to providing patient care. These technologies can open up healthcare workers' time by automating data gathering and processing, enabling them to concentrate on giving their patients high-quality care.

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