IoT-Based Remote Health Monitoring System for Real-Time Patient Data

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Abstract

This project presents an IoT-based solution to assist and enhance patient care by empowering medical professionals with a tool that enables timely, proactive and necessary medical intervention. Our project encompasses multidisciplinary research spanning across various fields. The system includes various biosensors to monitor critical vital signs such as body temperature, heart rate, oxygen level, and ECG continuously. The readings are sent through a Wi-Fi microcontroller to a secure hospital server, providing real-time data retrieval for healthcare professionals. A machine learning model utilizes real-time ECG data to identify abnormalities early. A React-built web application provides an easy-to-use interface to create real-time visualizations for clinicians, track trends, and receive emergency notifications. It provides a cloud-based deployment that provides security, reliability, and healthcare standard compliance. Its versatility allows it to be applied to a wide range of applications - telemedicine, ambulance-to-hospital workflow, and large scale remote monitoring of health. It can also be considered an essential tool in many cases such as in a pandemic world, emergency medicine and rural health. This AI-based solution introduces general healthcare practices to a new world where it bridges the gap between precise health monitoring and modern predictive tools. It promises the potential of transforming contemporary patient care with reliable real-time insights, early and prioritized interventions and improved clinical outcomes.

Keywords

Emergency response system, Internet of Things (IoT), Remote patient monitoring, Early detection.