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Review Report

IoT-Based Heart Defect Monitoring Using a Pulse Sensor for Real-Time Health Management

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ABSTRACT

Increasingly prevalent cardiovascular diseases (CVDs) continue to be one of the leading causes of death worldwide, often complicated by the unnoticed development of critical heart rate irregularities. This study attempts to fill the gap in demand for constant and remote cardiac supervision by designing an IoT-based heart defect monitoring system using a non-invasive pulse sensor. The developed system offers a portable solution for real-time diagnosis and alerts of heart rate anomalies that is affordable and accessible, transforming patient monitoring as well as healthcare response times. The architecture of this system includes data acquisition with pulse sensor, signal processing with microcontroller Arduino UNO, anomaly detection, data transmission performed by ESP8266 Wi-Fi module, real time feedback on local LCD screen interfacing, visualization and analysis through the cloud platform Thing Speak, and remote access via Telegram Bot. Also, critical notifications can also be automatically sent without requiring prior request when abnormal pulses are detected. This makes it useful for health self-management systems, elderly care monitoring systems, and telemedicine systems.

Keywords: IoT, Heart Rate Monitoring, Pulse Sensor, Arduino UNO, ESP8266, Cloud Computing, Telegram Bot, Real-time Monitoring,Telemedicine.

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