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DETECTION OF CARDIOVASCULAR DISEASES USING ARTIFICIAL INTELLIGENCE

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ABSTRACT
Cardiovascular diseases (CVDs) remain a leading cause of morbidity and mortality globally. Timely detection and intervention are crucial for managing CVDs effectively. With advancements in artificial intelligence (AI), particularly machine learning and deep learning techniques, there is a growing interest in leveraging these technologies for early detection and risk assessment of CVDs. This abstract provides an overview of recent research and developments in the field of using AI for the detection of cardiovascular diseases.
The utilization of AI in CVD detection encompasses various modalities, including analysis of medical images such as echocardiograms, electrocardiograms (ECG), and cardiovascular imaging. Machine learning algorithms are trained on large datasets containing clinical, genetic, and imaging data to develop predictive models for identifying individuals at risk of developing CVDs or those already affected by them. Deep learning techniques, particularly convolutional neural networks (CNNs) and recurrent neural networks (RNNs), have demonstrated promising results in extracting intricate patterns and features from diverse data sources, aiding in accurate diagnosis and prognosis of CVDs.

Keywords:
ECG sensor, Arduino UNO, Node MCU, Cloud Data , ECG Data.

INTRODUCTION
The proposed work aims to address these challenges by developing a smart health monitoring system with real-time heart disease prediction. The system will leverage wearable devices and advanced analytics techniques to monitor heart health in real-time, enabling early detection and prevention of heart disease. By providing personalized recommendations based on an individual's unique health profile, the system has the potential to improve outcomes for patients and reduce healthcare costs.

OBJECTIVES
Develop AI systems capable of identifying cardiovascular diseases at an early stage, enabling timely intervention and treatment initiation before symptoms become apparent. This objective aims to improve patient outcomes and reduce the risk of complications associated with late-stage disease. Enhance the accuracy and efficiency of cardiovascular disease detection compared to traditional diagnostic methods. By leveraging machine learning and deep learning algorithms, AI systems can analyze complex biomedical data with precision, leading to more reliable diagnostic results and potentially reducing the need for invasive procedures or unnecessary testing.

LITERATURE SURVEY
Bharti et al. compared machine learning and deep learning methods on the UCI heart disease dataset to predict two classes. The deep learning method achieved the highest accuracy rate of 94.2%. In their architecture of deep learning model, they used three fully connected layers. Kiranyaz et al. proposed a CNN that consisted of three layers of an adaptive implementation of Authorized licensed use limited to: PES University Bengaluru. Downloaded on November 22,2023 at 08:52:09 UTC from IEEE Xplore. Rahman et al. [33] provided a deep CNN transfer learning approach to predict COVID-19 and four major cardiac abnormalities using ECG images.

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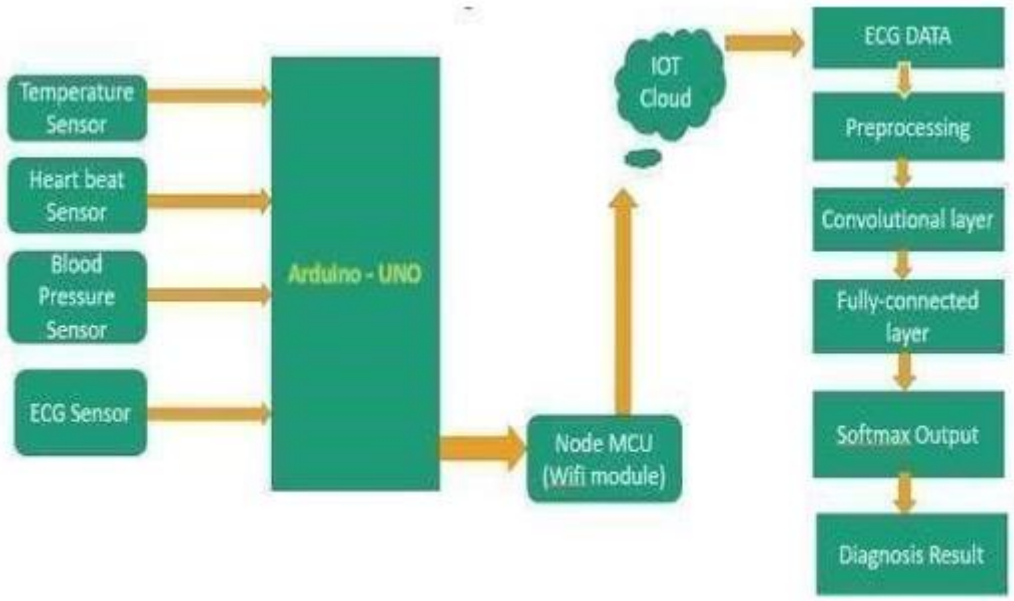

Figure 1 Block diagram of Proposed System

COMPONENTS USED

- Tools and Libraries
- Arduino IDE
- TensorFlow
- Python
- NumPy
- Matplotlib
- Pandas
- ECG Sensors
- Wi-Fi, Bluetooth or Cellular Data
- Application Programming Interface (API)

CONCLUSION

The proposed project represents a significant stride towards revolutionizing healthcare through the integration of Internet of Things (Iota) technology in a comprehensive health monitoring system. The convergence of microcontrollers, various sensors, and cloud-based analytics not only aligns with the global shift towards preventative healthcare but also addresses the critical need for real-time monitoring, particularly in the context of cardiovascular diseases (CVD). Recognizing the importance of user engagement, the project emphasizes a user-friendly interface. This ensures that individuals can easily interpret and act upon the health data generated by the system.

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