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*Abstract*

# Integration of IoT and Machine Learning for Real-Time Monitoring and Control of Heart Disease Patients †

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**Keywords:** heart disease; AI; deep learning; IoT; performance parameter (accuracy, precision, recall)

**Context:** In the 21st century, the integration of IoT and AI plays a vital role in the real-time monitoring and control of heart disease. As per the records, cardiovascular diseases persist as a significant global health challenge, impacting the lives of over half a billion individuals worldwide.

**Objective:** The main objective of this paper is to predict heart disease using deep learning techniques.

**Materials/Methods:** We have considered the performance metrics of deep learning algorithms (Artificial Neural Networks (ANNs), Long Short-Term Memory (LSTM), Multilayer Perceptron (MLP), and Convolutional Neural Networks (CNNs)) achieving accurate and efficient monitoring outcomes through accuracy, precision, recall, and F-measure. We have proposed one model that uses a deep learning algorithm.

**Results:** Our experimental result reveals that the deep learning algorithm CNN outperforms in comparison to other algorithms and it has achieved 96% accuracy. Another algorithm, ANN, achieved 92% accuracy indicating a balanced precision–recall tradeoff. We further compared our work with the state of the art, and CNN provides a promising result.

Comparison of the proposed work with existing state-of-the-art approaches.

**Conclusions:** We have collected the IoT sensory data from different patients and integrated them with the machine learning algorithms for real-time monitoring and control for heart disease patients. Our integration approach reveals that CNN is the best classifier that handles multidimensional data

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