

# Health Monitoring System for Heart Attack Risk Prediction using IoT and Machine Learning

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**Abstract:** *The initiative centers on the creation of a health monitoring system utilizing Internet of Things (IoT) technology, designed to forecast the likelihood of a heart attack by assessing critical physiological indicators, including Blood Oxygen Saturation (SpO<sub>2</sub>), Heart Rate (BPM), and Body Temperature. These metrics are collected through a NodeMCU ESP32 microcontroller, which is equipped with a MAX30102 Pulse Oximeter and Heart Rate Sensor, as well as an MLX90614 Infrared Temperature Sensor. The gathered data is subsequently transmitted to a Firebase Realtime Database for processing, utilizing the Arduino IDE. On the client side, an Android application accesses the data from Firebase and employs a Decision Tree Machine Learning Algorithm to evaluate the heart attack risk. The system classifies the risk into three categories based on the input parameters: No Risk, Medium Risk, or High Risk. The objective of this project is to facilitate real-time monitoring and provide early alerts to individuals at risk of cardiovascular complications, thereby allowing for prompt medical response.*

**Keywords:** Health monitoring system, heart attack prediction, heart rate, blood oxygen saturation, body temperature, firebase real-time database

