Machine Learning-Based Mobile Health Tracking System: Continuous Monitoring and Anomaly Detection for Chronic Patients

Nazli Tokatli
Assistant Professor, Department of Computer Engineering, Istanbul Health and Technology University, Türkiye

Muhammed Canpolat
Department of Computer Engineering, Istanbul Health and Technology University, Türkiye

Zeynep Dilara Karaca
Department of Computer Engineering, Istanbul Health and Technology University, Türkiye

Bedirhan Akarcesme
Department of Mechanical Engineering, Istanbul Health and Technology University, Türkiye

Meryem Sudenaz Kartal
Department of Computer Engineering, Istanbul Health and Technology University, Türkiye

Zemzem Ertekin
Department of Software Engineering, Istanbul Health and Technology University, Türkiye

Abstract:

This project aims to develop a mobile health tracking system designed for the continuous monitoring of individuals' health status, particularly for chronic patients. The system integrates wearable sensors, such as a wristband, oximeter, skin conductivity, and skin temperature sensors, to continuously record vital health parameters including oxygen levels, skin temperature, and perspiration. Data collected from these sensors will be transmitted to a mobile application, providing users with instant notifications and enabling rapid assessment of their health condition.

The system incorporates machine learning algorithms, developed using Python, to analyze health data for anomalies. These algorithms will examine time-series data to detect deviations from normal health values and alert users to potential issues. Firebase will be utilized for secure storage of health data, with MySQL database backups ensuring long-term analysis capabilities. The primary goal is to facilitate health monitoring for chronic patients, support healthcare professionals, reduce the workload in the healthcare sector, and enhance health awareness among individuals. The application will also be integrated with the Turkish Ministry of Health's e-Nabız platform to allow healthcare professionals

real-time access to patient data, ensuring comprehensive care and timely interventions. The project prioritizes data security and user privacy, implementing robust security infrastructure, including encryption algorithms, in addition to Firebase's secure data management.

Keywords:

Wearable Sensor, Mobile Health Tracking, Real-Time Data Analysis, Emergency Notification.