



Integrated Health Monitoring System for Preventive Care and Doctor-Patient Interaction

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Diabetes, hypertension, and cholesterol disorders are some of the major chronic diseases globally. Early diagnosis, continuous monitoring, and strong doctor-patient communication are essential for controlling these diseases. While existing digital health systems focus on either medical data or lifestyle monitoring, they lack an integrated approach for preventive care. This system proposes a personalized health monitoring system combining medical data tracking, nutritional monitoring, and interactive doctor-patient communication. The system is built using Node.js, React/React Native, and Firebase, enabling real-time data management. The system has two types of users: patient and doctor. Patients can enter or upload their medical records into the system, including details related to blood pressure, blood sugar, lipid profile, and full blood count. They can monitor their dietary intake manually or by uploading pictures of consumed food. A convolutional neural network trained on 5,000 labeled food images across five food classes was used to recognize food items and estimate nutritional parameters such as calories, sugar, and cholesterol, achieving a validation accuracy of approximately 90%. The estimated values are compared with recommended daily intake limits, and warning messages are generated when thresholds are exceeded, providing actionable insights to support healthier dietary choices. A dedicated dashboard enables doctors to view patient medical histories and provide feedback. The system supports active patient engagement through continuous self-monitoring and timely remote medical feedback. By enabling early identification of potential health issues and remote consultations, the system reduces unnecessary hospital visits, while the integrated real-time chat platform facilitates efficient doctor-patient communication. Overall, the system supports personalized health monitoring and preventive healthcare through integrated data tracking and interactive digital communication.

Keywords: Doctor-Patient Communication, Health Monitoring, Convolutional Neural Network, Preventive Healthcare, Nutrition Analysis