Development of AI-Based Personalized Health Monitoring System (P2)

A Project Report

submitted in partial fulfillment of the requirements

of

AICTE Internship on AI: Transformative Learning
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by

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Under the Guidance of

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ABSTRACT

In today's fast-paced world, continuous health monitoring is crucial to ensure early detection of potential health risks and to promote proactive health management. This project focuses on the development of an AI-based personalized health monitoring system that utilizes real-time health data from wearable devices or smartphones. The system collects data such as heart rate, sleep patterns, and physical activity, and leverages machine learning algorithms to analyze and generate personalized health insights. The main objective is to provide users with real-time health monitoring, early warning alerts for abnormalities, and lifestyle recommendations. The system also features an intuitive user interface, health dashboards, and notification services. The project uses React.js for the frontend, Spring Boot for backend APIs, Python-based machine learning models, and integrates with Google Fit API for data collection. This solution aims to empower users to take charge of their health, reduce healthcare costs, and improve overall well-being through AI-driven insights.

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Introduction

1.1Problem Statement:

The lack of continuous and personalized health monitoring solutions prevents individuals from recognizing early signs of health issues, often resulting in delayed medical intervention. Manual tracking of health data is inefficient and lacks analytical support for decision-making.

1.2Motivation:

With increasing health awareness and wearable tech usage, there's a demand for systems that not only track data but analyze and personalize it using AI. This project can help improve public health, reduce hospital visits, and encourage preventive care.

1.3Objective:

- Develop a platform to collect real-time health data.
- Apply AI models to provide personalized health insights.
- Generate alerts for abnormal health patterns.
- Offer lifestyle recommendations for better health.

1.4Scope of the Project:

- Real-time data collection from wearable APIs.
- AI-powered data analysis and predictions.
- Mobile/Web interface for user interaction.

CHAPTER 2

Literature Survey

2.1 Several health apps collect data but lack personalized AI analytics.

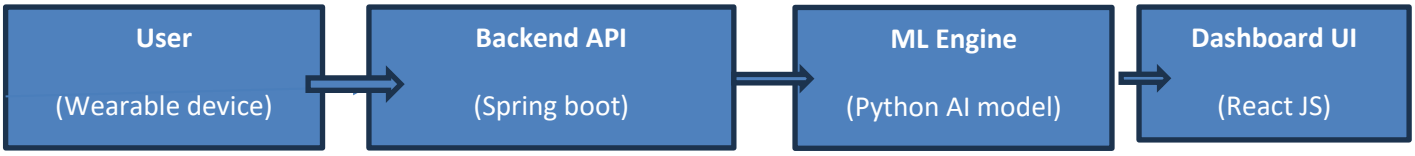
2.2 Existing systems like Google Fit and Apple HealthKit offer raw data visualization without predictive analysis. Mention any existing models, techniques, or methodologies related to the problem.

2.3 Highlight the gaps or limitations in existing solutions and how your project will address them.

CHAPTER 3

Proposed Methodology

3.1 System Design



Explanation:

- Users provide consent to access data via wearable API.
- Backend stores data securely and sends it to the ML model.
- AI engine processes and analyses data.
- Results are displayed on the dashboard, with alerts as needed.

3.2 Requirement Specification

3.2.1Hardware Requirements:

- Smartphone or wearable device with sensors
- Internet connectivity
- Server/Cloud hosting

3.2.2 Software Requirements:

- Frontend: React.js / Flutter
- Backend: Spring Boot / Node.js
- Database: PostgreSQL / MongoDB
- ML: Python (scikit-learn / TensorFlow)

- APIs: Google Fit API, Firebase

Fig: **Tech Stack:**

Component	Technology
Frontend	React.js / Flutter (Web/Mobile)
Backend API	Spring Boot / Node.js / Django
Database	PostgreSQL / MongoDB
Machine Learning	Python (scikit-learn / TensorFlow)
Real-time Data	Firebase / MQTT / WebSocket's
Wearable Integration	Google Fit API / Apple HealthKit
Hosting/Deployment	AWS / Azure / Firebase

CHAPTER 4

Implementation and Result

4.1 Snap Shots of Result:

Kindly provide 2-3 Snapshots which showcase the results and output of your project and after keeping each snap explain the snapshot that what it is representing.

4.2 GitHub Link for Code:

CHAPTER 5

Discussion and Conclusion

5.1 Future Work:

Future Work:

- Expand to include mental health analytics using mood tracking.
- Integration with telemedicine platforms.
- Advanced predictive analytics for chronic disease management.

5.2 Conclusion:

This project successfully demonstrates the integration of AI with health monitoring to offer personalized, real-time insights. It has potential to transform preventive healthcare and improve individual well-being through timely interventions

Summarize the overall impact and contribution of the project.

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