

# ■ Health for All - Advanced Hackathon Project Ideas

This document presents advanced-level project ideas for hackathons under the theme "Health for All". Each idea combines cutting-edge technologies like AI, IoT, Blockchain, and Big Data to make healthcare more accessible, affordable, and inclusive for everyone.

## 1. AI-Powered Disease Prediction & Prevention Platform

**Concept:** Build an ML model to predict diseases (like diabetes, heart disease) using health data and lifestyle inputs.

**Key Features:**

- AI model predicts early risk and offers lifestyle advice
- IoT or manual data collection
- Dashboard for users and analytics for doctors
- Integration with health centers for follow-up

**Tech Stack:** TensorFlow / PyTorch, Django / FastAPI, React / Flutter, AWS / GCP, PostgreSQL

## 2. Blockchain-Based Universal Health Record System

**Concept:** Create a decentralized health ID system where patients control and securely share their data.

**Key Features:**

- Blockchain ledger for tamper-proof storage
- Smart contracts for data sharing and consent
- AI summaries of health history
- Multi-language access for inclusivity

**Tech Stack:** Ethereum / Polygon, Solidity, React, Node.js, IPFS / MongoDB

## 3. AI-Driven Remote Health Diagnostics using Image Recognition

**Concept:** Use AI to detect diseases from images like skin lesions, dental, or retinal scans.

**Key Features:**

- Computer vision model trained on medical data
- App for uploading and analyzing images
- Doctor verification dashboard
- Telemedicine integration

**Tech Stack:** TensorFlow / OpenCV, Flask / FastAPI, React Native / Flutter, GCP / AWS SageMaker

## 4. IoT + AI Emergency Health Monitoring Network

**Concept:** Develop smart wearables for continuous monitoring and real-time emergency alerts.

**Key Features:**

- IoT sensors for heart rate, ECG, SpO<sub>2</sub>
- Edge AI for anomaly detection
- Cloud-based emergency alert system
- Hospital dashboard monitoring

**Tech Stack:** Arduino / ESP32, TensorFlow Lite, MQTT / Firebase, Node.js, AWS IoT Core

## 5. AI-Enhanced Holistic Health Companion

**Concept:** An app that unites mental health, fitness, and diet tracking using AI personalization.

**Key Features:**

- AI wellness assistant using LLMs
- Sentiment analysis for stress detection
- Personalized meditation and fitness plans
- AR visual posture/breathing guidance

**Tech Stack:** OpenAI / LangChain, BERT, ARCore / Unity, FastAPI / Firebase

## 6. Predictive Public Health Dashboard (AI + Big Data)

**Concept:** Analyze datasets to predict disease outbreaks and hospital capacity trends.

**Key Features:**

- Predict flu/COVID trends from climate and data
- Heatmap visualization of affected areas
- Government-use analytics dashboard
- SMS alerts for outbreak zones

**Tech Stack:** Python (Pandas, NumPy), LSTM, Plotly / Tableau, Flask / Streamlit, GCP BigQuery

## 7. AI Sign-Language Translator for Healthcare

**Concept:** Build an AI translator that converts sign language to text/speech for medical consultations.

**Key Features:**

- Camera-based gesture recognition
- Real-time translation to text/speech
- Offline AI using TensorFlow Lite
- Supports regional sign languages

**Tech Stack:** MediaPipe, TensorFlow Lite, OpenCV, Flutter / React Native, FastAPI