MediLinkAI 🏥

AI-Powered Remote Health Monitoring & Emergency Alert System for Rural Areas

🚀 Overview

MediLinkAI is an intelligent healthcare solution designed to bridge the gap in medical access in remote or underserved regions. The system uses machine learning and AWS services to analyze patient health data in real-time, detect emergencies, and trigger automatic alerts to both medical professionals and emergency contacts.

Built for low-resource environments, MediLinkAI empowers community health workers and rural clinics with early diagnosis, offline functionality, and edge AI support.

🌍 Problem Statement

In rural and low-infrastructure regions, delayed medical response and lack of real-time diagnostics often lead to preventable deaths. Limited access to professional care, diagnostics, and emergency services makes timely health intervention impossible.

💡 Solution

MediLinkAI offers:

- A **Streamlit-based web app** where patient vitals can be entered manually or via connected devices.
- A **machine learning engine** that evaluates vital signs and flags critical conditions.
- **Amazon SNS** integration to send emergency alerts via **email** and **SMS**.
- Future-ready features including **offline mode**, **on-device AI**, and **SMS input** for remote areas.

🧠 AI/ML Features

- Trained classification models to detect abnormal or emergency health patterns.

- Customizable thresholds for real-time health score evaluation.
- Scalable design for multiple diseases and condition monitoring.

🧰 Tech Stack

Technology	Purpose
Python & Pandas	Data handling and ML logic
Scikit-learn	ML classification model
Streamlit	Web UI
Amazon SNS	Emergency email alert system
AWS DynamoDB *(planned)*	Patient record storage
AWS Lambda *(planned)*	Serverless function triggers

📦 Features

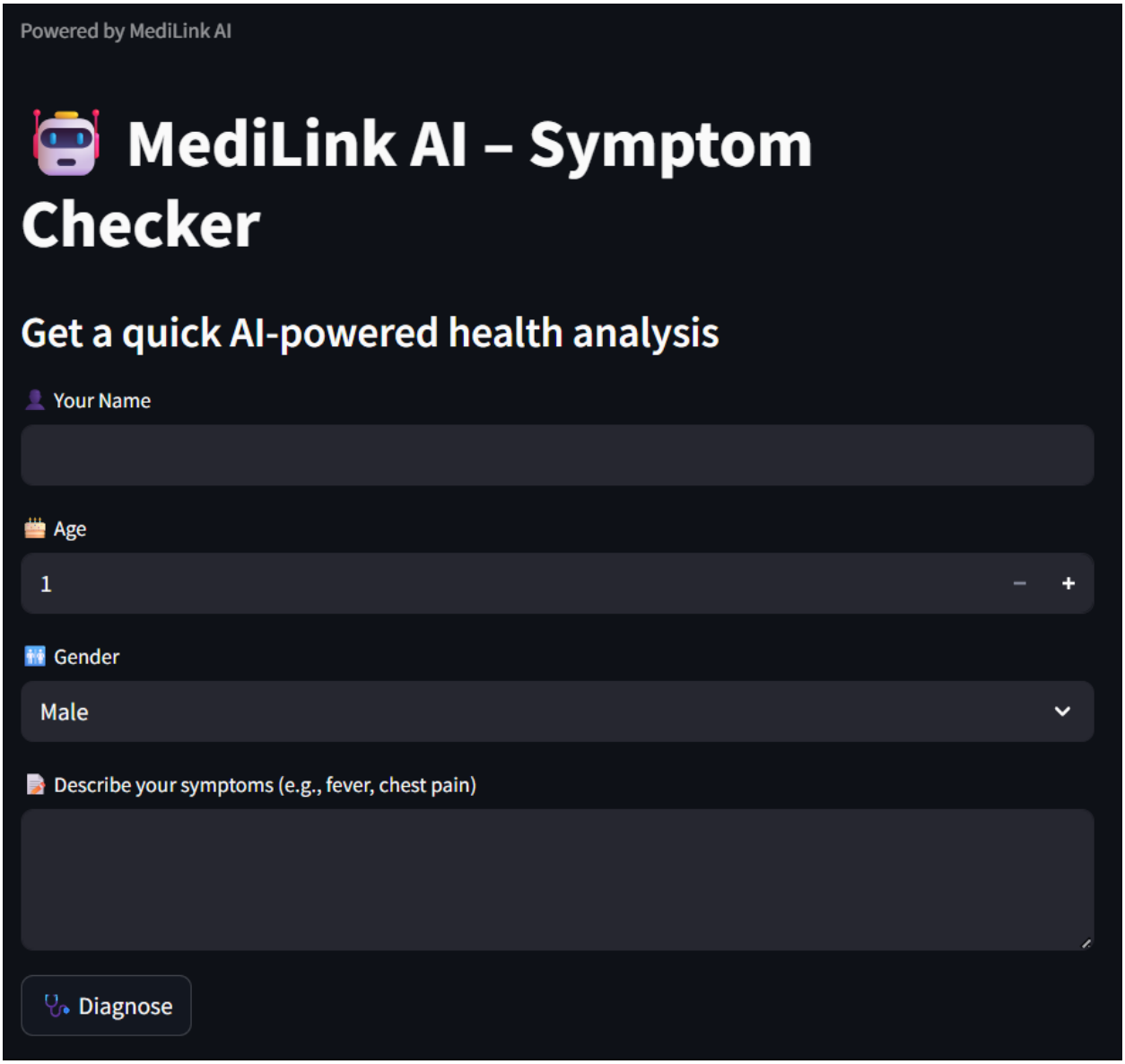
- ✅ Real-time health analysis
- ✅ Emergency detection and alert system
- ✅ Lightweight and cloud-deployable
- 🚧 Offline/Edge AI capability *(WIP)*
- 🚧 Patient history logging with DynamoDB *(WIP)*
- 🚧 SMS-based alerts *(WIP)*

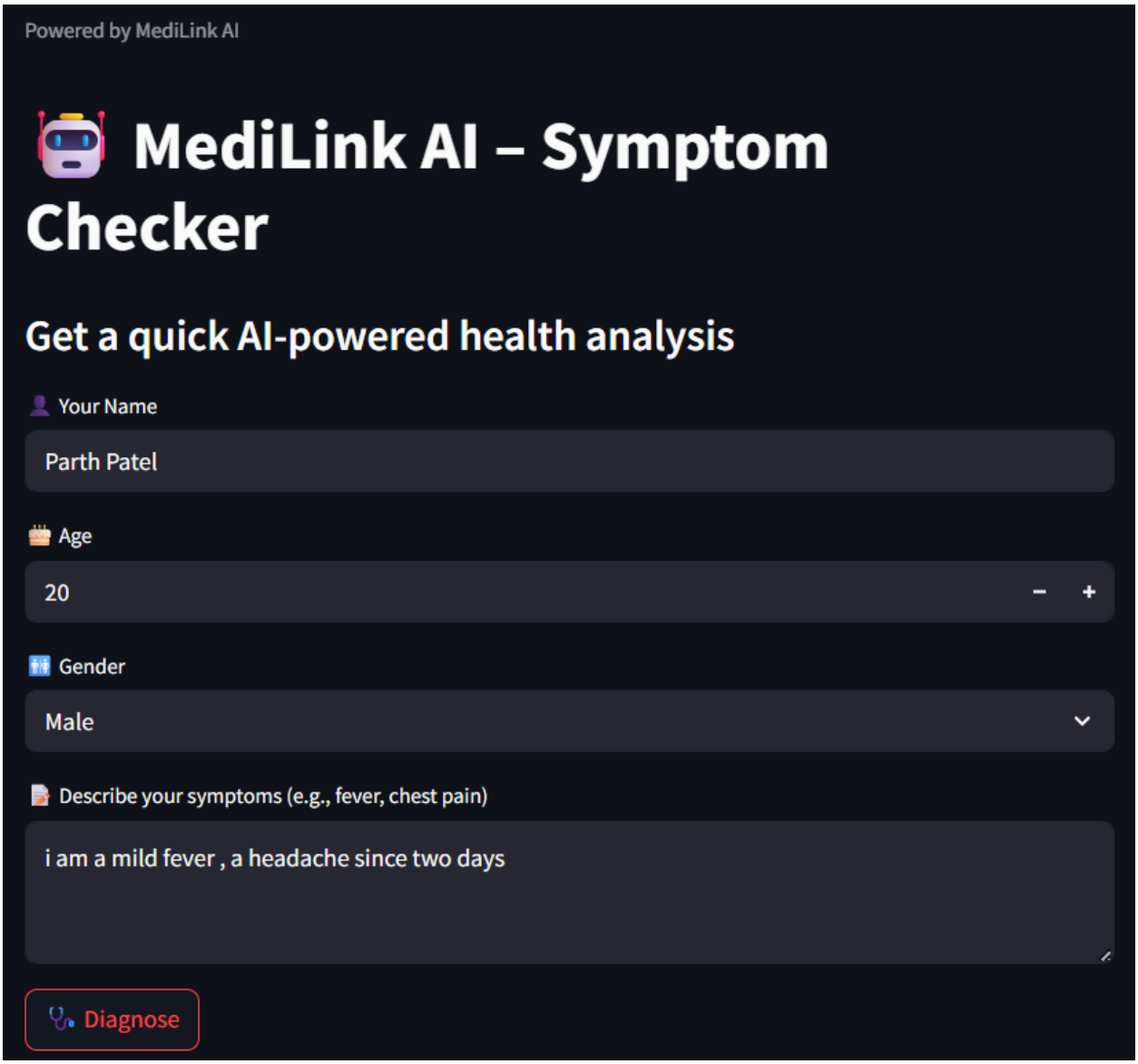
📊 How It Works

1. User enters vitals like heart rate, SpO_2, and temperature.
2. ML model predicts health status: Normal, Warning, or Critical.
3. If critical:
    - Trigger **Amazon SNS** to notify emergency contacts/doctors.
    - Display alert to the user interface.

4. Data is planned to be stored in DynamoDB for future insights and patient monitoring.

📸 Screenshots




Powered by MediLink AI
MediLink AI – Symptom Checker
Get a quick AI-powered health analysis
Your Name
Parth Patel
Age
20
Gender
Male
Describe your symptoms (e.g., fever, chest pain)
i am a mild fever , a headache since two days
Diagnose

✅ AI Diagnosis Complete

🧠 **AI Health Insight:**

Here is a possible cause and general self-care advice for the patient's symptoms:

Possible cause: The patient may have a viral infection, such as a cold or flu. General self-care advice:

1. Stay hydrated by drinking plenty of fluids.
2. Get plenty of rest.
3. Take over-the-counter medications, such as acetaminophen or ibuprofen, to relieve fever and headache.
4. Avoid alcohol and caffeine, which can dehydrate the body.
5. Eat a healthy diet that includes fruits, vegetables, and whole grains.
6. Practice good hygiene, such as washing your hands frequently and avoiding close contact with others who are sick.
7. If symptoms worsen or persist, seek medical attention.

It is important to note that this is general information and may not be specific to the patient's individual situation. If the patient is experiencing severe symptoms, such as difficulty breathing or chest pain, they should seek immediate medical attention. Additionally, if the patient is taking any medications, they should consult with their healthcare provider before taking any new medications or supplements.

🧪 Use Cases

- Village clinics with no diagnostic labs
- Community health workers
- Temporary camps or mobile healthcare vans
- Post-disaster zones and war-torn areas

🚀 Future Enhancements

- Integrate **Twilio** for global SMS alerts.
- Deploy **on edge devices** using TensorFlow Lite.
- Add **multi-language support** for local outreach.
- Enable **data visualization** of historical vitals.

🔐 Ethical and Privacy Considerations

MediLinkAI manages potentially sensitive medical information. Future versions will include:

- Encrypted data transmission
- Consent-based alert dispatch
- HIPAA-aligned design principles

🛠️ Getting Started

Prerequisites

- Python 3.8+
- AWS account with SNS topic and verified email

Installation

git clone https://github.com/CodingRaemajor/MediLinkAI.git

cd MediLinkAI

pip install -r requirements.txt

python app.py

Configure AWS SNS

- Set your AWS_ACCESS_KEY_ID and AWS_SECRET_ACCESS_KEY in environment variables.
- Replace the SNS topic ARN in the code with your own.

🏆 Built For

- **AWS Breaking Barriers Challenge**

📜 License

This project is licensed under the **MIT License**.
See LICENSE for more details.

🙌 Acknowledgements

- AWS for the cloud infrastructure
- Streamlit for rapid UI development
- Scikit-learn for the ML pipeline
- All healthcare workers fighting for underserved communities