

Maternal Health Companion – AI Chatbot for Pregnant Individuals

Author: Ishan Shrivastava

Technology Stack: Python, Gradio, Gemini API, Hugging Face Transformers

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Abstract

This project introduces an AI-powered chatbot designed to assist pregnant individuals with emotional and medical support. Leveraging Google Gemini for smart responses and Hugging Face's emotion classifier, it tailors interactions based on user mood. The goal is to provide safe, empathetic, and informative support to expecting mothers through a user-friendly chat interface.

Introduction

Pregnancy can be emotionally and physically challenging. Many women feel confused, anxious, or overwhelmed. This chatbot serves as a supportive, non-judgmental assistant that provides mood-aware, helpful responses using modern NLP and LLM tools.

Tools & Technologies

- Python – Core programming language
- Gradio – Frontend for chatbot
- Google Gemini API – For generating smart, LLM-based responses
- Hugging Face Transformers – For detecting emotions from user input
- lru_cache – For caching and performance optimization

Architecture Overview

- User Input: Captured using Gradio's textbox
- Emotion Detection: Classifier predicts emotion label (e.g., scared, frustrated)
- Mood Analysis: Based on keyword and emotion, mood context is assigned
- Response Generation:
 - - If Gemini is available → Smart LLM-based response
 - - Else → Pre-defined response templates
- Chatbot UI: Displays conversation and mood indicator

Key Code Functions

`detect_emotion(text)`: Uses Hugging Face model to get emotion.

`analyze_mood(text)`: Maps emotion or medical keywords to chatbot context.

`generate_response(message, chat_history)`: Builds prompt and gets response using Gemini or fallback.

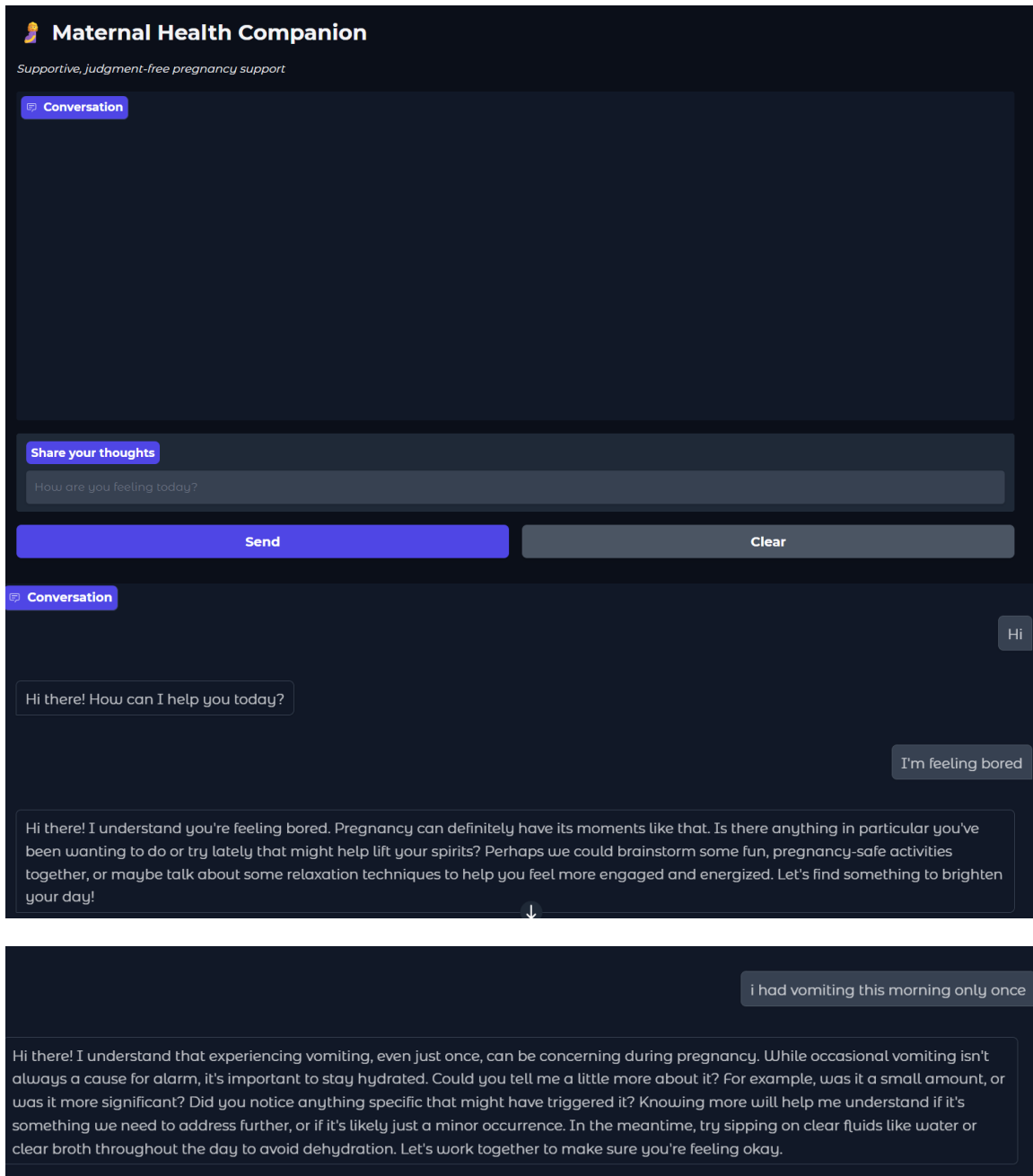
`respond(...)`: Updates Gradio chatbot interface with new messages and detected mood.

Sample Conversation

User: "I'm scared about my delivery."

Bot: "It's completely normal to feel scared during pregnancy. Many expectant mothers experience similar feelings. Try taking some deep breaths - inhale for 4 counts, hold for 4, exhale for 6."

Screenshots



Conclusion

The Maternal Health Companion chatbot successfully combines emotion detection and large language models to provide context-aware, empathetic responses to pregnant individuals. This can act as a virtual companion offering comfort and clarity throughout the journey of pregnancy.