Maternal Health Companion – Al Chatbot for Pregnant Individuals

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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.

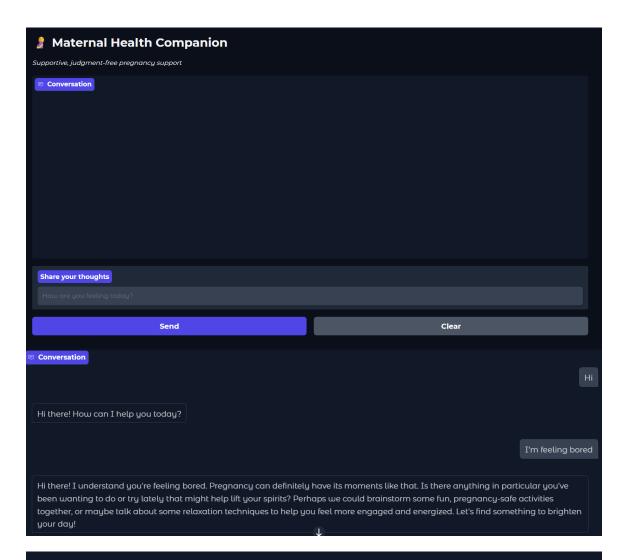
respond(...): Updates Gradio chatbot interface with new messages and detected mood.

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



i had vomiting this morning only once

Hi there! I understand that experiencing vomiting, even just once, can be concerning during pregnancy. While occasional vomiting isn't always a cause for alarm, it's important to stay hydrated. Could you tell me a little more about it? For example, was it a small amount, or was it more significant? Did you notice anything specific that might have triggered it? Knowing more will help me understand if it's something we need to address further, or if it's likely just a minor occurrence. In the meantime, try sipping on clear fluids like water or clear broth throughout the day to avoid dehydration. Let's work together to make sure you're feeling okay.

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.