**AI Friend Chatbot: Integrating Emotion Recognition for Empathetic Conversations**

*Oki Sugiyama*

**The Challenge: Emotional Disconnect in Digital Communication**

Digital interactions often lack the emotional nuance that in-person conversations offer, leading to disconnected and impersonal communication. This gap is particularly noticeable in AI-driven chatbots, which, despite their growing popularity, still struggle to understand and respond to human emotions effectively.

**Project Overview**

My project, the **AI Friend Chatbot**, aims to bridge this emotional gap by integrating facial expression recognition AI with a chatbot system. The chatbot will be able to detect users’ emotions through their facial expressions and adjust its responses accordingly, providing a more empathetic and human-like interaction. This concept builds on three years of AI research I conducted alongside a university professor.

**Key Features**

1. **Emotion Detection:** The AI will analyze users' facial expressions in real-time to detect emotions such as happiness, sadness, anger, and more.
2. **Empathetic Responses:** Based on detected emotional cues, the chatbot will tailor its responses to provide comfort, support, or encouragement, resulting in more emotionally aware conversations.
3. **User-Friendly Interface:** The chatbot will feature a simple and intuitive interface, allowing users to interact easily in real-time without needing technical expertise. I haven’t decided whether to use website, software, or web browser extension for this project.

**Technologies and Tools**

* **Backend:**
  + **Python**: Used for developing the facial expression recognition AI. I have experience from my previous AI research.
  + **OpenAI API**: For generating natural language responses in the chatbot. While it’s straightforward to implement, I may explore alternative APIs to manage costs, such as:
    - **Dialogflow (Google)**
    - **Wit.ai (Facebook)**
    - **Rasa**
* **Frontend:**
  + **React.js**: For creating a responsive and user-friendly interface. I have some experience building simple websites with React but will need guidance to make the interface more polished and accessible.
  + **TypeScript: To avoid issues.**
  + **WebRTC API**: To enable real-time camera access for emotion detection through facial expressions. Using an API is new territory for me, so I’ll need support in this area.
* **data:**
  + **Firebase:**
* **Project support:**
  + **Docker:**

**Project Roadmap**

1. **Research and Model Training**
   * I’ll leverage my existing research and AI models to develop the emotion recognition component.  
     *Estimated Time: 1 week*
2. **Chatbot Development**
   * Using the OpenAI API (or an alternative), I’ll create the basic chatbot functionality.  
     *Estimated Time: 1-2 weeks*
3. **Frontend Development**
   * I’ll build the user interface (website, software, or web browser extension) using React.js and WebRTC API to enable real-time interaction.  
     *Estimated Time: 1 month*
4. **Integration of AI Chatbot and Frontend**
   * The emotion recognition AI and chatbot will be integrated with the frontend to create a seamless user experience.  
     *Estimated Time: 1 month*
5. **Deployment and User Feedback**
   * The project will be deployed on a cloud platform, and I’ll gather feedback to iterate and improve the system.  
     *Estimated Time: time remaining in the semester*