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Project Name : FACE2FEEL

Abstract

Problem Statement:
Traditional counseling often faces the barrier of individuals being unwilling or hesitant to openly communicate their emotions. This project aims to develop an AI-powered mobile counseling application that integrates **real-time facial emotion detection** with **interactive conversational support**, thereby making counseling more adaptive, anonymous and empathetic

Motivation:
Mental health challenges are on the rise, yet many individuals struggle to express their feelings to human counselors. By leveraging visual computing techniques for **emotion recognition**, the proposed system can detect hidden emotional signs and provide personalized, non-judgmental responses. This enhances accessibility and comfort for users who might otherwise avoid seeking help due to these reasons.

Challenges:
The primary challenges include (i) achieving reliable emotion detection across diverse users, lighting conditions, and facial variations, (ii) integrating emotion recognition seamlessly with a conversational AI pipeline, and (iii) ensuring the generated counseling responses remain contextually sensitive and ethically safe.

Data Requirement:
The project requires facial emotion datasets containing images/videos labeled with emotions (e.g., happiness, sadness, anger, fear, surprise, neutral). Publicly available datasets such as **FER-2013** or **AffectNet** will be used for training, supplemented with real-time face captures during testing. For the conversational component, pretrained dialogue models accessible via APIs will be utilized.

Techniques/Algorithms:
The system will use **Convolutional Neural Networks (CNNs)** or **transformer-based models** (e.g., Vision Transformers) for emotion recognition. A **FastAPI-based backend pipeline** will connect the emotion detection model (Python) with a chatbot API for context-aware counseling responses. The mobile interface will be built in **Flutter**, ensuring cross-platform accessibility.

Evaluation:
Performance will be evaluated through (i) quantitative metrics such as accuracy, precision, and recall of emotion detection and optionally (ii) qualitative feedback via user studies measuring satisfaction, perceived empathy, and counseling effectiveness.

Impact:
This project is expected to contribute toward making **AI-driven counseling more accessible, private, and adaptive**. By bridging visual computing with conversational AI, it can support early detection of emotional distress and provide immediate guidance, thus enhancing mental health support in both personal and clinical contexts.

Flutter App → Camera Input → FastAPI → Emotion Detection Model → Predicted Emotion

→ Chatbot API → Counseling Response → FastAPI → Flutter App (UI)