

Visual Computing Project Abstract

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Project Name: Face2Feel

Abstract

Problem Statement

Traditional counseling often faces the problem of people being reluctant to approach counselors. This project aims to develop an AI-powered mobile counseling application that combines real-time emotion detection with conversational support, allowing for more private counseling.

Motivation

Mental health challenges are on the rise, yet many people struggle to express their feelings to human counselors. Using visual computing techniques for emotion recognition and conversational AI, the proposed system can provide context-relevant responses. This improves accessibility and comfort for users who might otherwise avoid seeking help for these reasons.

Challenges

The primary challenges include

1. achieving reliable emotion detection across diverse users, lighting conditions, and facial variations
2. integrating emotion recognition seamlessly with a conversational AI pipeline
3. ensuring that 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. For the conversational component, pre-trained 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 back-end 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

Effectiveness will be assessed with detection metrics (accuracy, precision, recall) and user feedback on empathy and usefulness.

Impact

This project is expected to contribute to making AI-driven counseling more accessible, private, and adaptive, enabling early detection of mental distress and providing immediate guidance for mental health.