

Vibee

Culmination Project Design Document

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Course: MTEC 3501

Project: Culmination Project

Project Overview

Vibee is a simple AI prototype that detects facial emotions using a laptop webcam. The goal of this project is to understand how computer vision and machine learning tools can work together in real time.

This document explains what the prototype does, how it works, what tools were used, and what the next version of the project will focus on.

Project Goals

- Use a webcam to detect a face
 - Analyze facial expressions in real time
 - Show a basic emotion on screen
 - Build a working prototype that is easy to understand
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Current Prototype

The current version of Vibee detects one face at a time and labels the emotion as:

- Happy
- Neutral
- Frowning

The system runs locally and processes video live.

Tools Used

Python

- Main programming language
- Controls how everything runs
- Connects OpenCV and DeepFace

OpenCV

- Turns on the webcam
- Reads video frames
- Detects faces

DeepFace

- Analyzes facial expressions
- Predicts basic emotions

System Workflow

1. Webcam captures video
2. Python runs the program
3. OpenCV processes the video
4. A face is detected
5. DeepFace analyzes the face
6. An emotion is predicted
7. The result appears on screen

OpenCV vs DeepFace

- OpenCV handles video and face detection
- DeepFace handles emotion detection

OpenCV finds the face, DeepFace decides the emotion.

Development Timeline (Prototype 1)

September 2025

Idea and research

October 2025

Learning OpenCV and webcam setup

November 2025

First working emotion detection

December 2025

Cleanup and presentation prep

Current Limitations

- Only basic emotions
- Depends on lighting and camera quality
- One face at a time

Next Prototype Plan (Emotion + Music)

Jan–Feb 2025

Planning and research

March 2025

Add music playback

April 2025

Testing and UI improvements

May 2025

Polish and final demo

Acknowledgements

- ChatGPT was used to help with Python code and debugging
- Final code was tested and adjusted by the developer

Conclusion

Vibee is a small but functional prototype that shows how AI can be used for real-time emotion detection. This project helped build skills in Python, computer vision, and working with AI libraries, and it sets the foundation for a more advanced version in the future.