Software Requirement Specification (SRS) –

Project Title:-Zoom Emotion Tracker App

Team Name:-Team -02

1. Introduction

1.1 Purpose

The purpose of this project is to design a Zoom-based emotion tracking application that detects and analyzes students' emotions during online classes. The system helps teachers monitor student engagement, identify learning difficulties, and improve interaction in virtual classrooms.

1.2 Scope

The system will:

- Capture live video and audio streams from Zoom meetings.
- Use AI/ML models to detect emotions (happy, sad, confused, bored, engaged, neutral, etc.).
- Provide real-time feedback to teachers about the overall emotional state of the class.
- Generate post-session reports summarizing emotional trends of students.
- Ensure student privacy through secure data handling.

1.3.Definitions & Acronyms

- FER – Facial Emotion Recognition
- ML – Machine Learning
- API – Application Programming Interface

1.4.References

- zoom API &SDK documentation
- OpenCV and deepface facial emotion recognition
- media pipe,google (real time face detection)
- FER+Dataset for training or testing
- IEEE papers on emotion detection in e-learning

1.5.Overview

The zoom emotion tracker app is AI based tool that integrates with zoom to detect students emotion(happy,sad,bored,confused,engaged).It provides real time dash boards for teachers and session reports to track engagement.The system uses computer vision and machine learning while ensuring student privacy and data security.

2. Overall Description

2.1 Product Perspective

Works as a Zoom plugin or external application integrated with Zoom API/SDK.
Collects non-intrusive video frames/audio for emotion recognition.
Provides a teacher dashboard for visualization.

2.2 Product Functions

- Capture student video streams.
- Detect facial Emotions using computer vision.
- Optionally Analyse voice tone for emotion recognition.
- Display class emotion statistics in real-time.
- Provide downloadable reports with emotion timelines

2.3 User Characteristics

- **Teacher:**Require easy to readRequire easy-to-read visualizations (graphs, alerts).
- **Students:** Passive users; no additional action required.
- **Administrators:** Configure app settings, manage reports.

2.4 Constraints

- Must comply with privacy regulations (GDPR, FERPA).
- Limited bandwidth in online classes.
- Accuracy depends on camera quality and student visibility.

2.5 Assumptions and Dependencies

- Zoom API access is available.
- Students have webcams enabled.
- Pre-trained FER models (like OpenCV, DeepFace, or MediaPipe) can be integrated.

3. Specific Requirements

3.1 Functional Requirements

- Detect and classify emotions from facial expressions in real-time.
- Aggregate and display classroom emotion metrics (e.g., percentage engaged vs. Bored).
- Generate automated session reports.
- Provide teacher notifications when student disengagement rises.

3.2 Non-Functional Requirements

- Performance: Emotion detection latency < 2 seconds.
- Security: Encrypted data processing, no storage of raw video without consent.
- Scalability: Handle up to 100 participants in a Zoom class.
- Usability: Simple dashboard for non-technical teachers.

4. System Design

4.1 System Architecture

- **Frontend:** Dashboard (React or Angular).

- **Backend:** Flask/Django API for processing.
- **ML Models:** Emotion detection (CNN, Transformer-based).
- **Database:** PostgreSQL for reports.
- **Integration**:Zoom SDK/API

4.2 Process Flow

- Capture student video/audio via Zoom API.
- Run real-time FER + voice emotion analysis.
- . Aggregate results and display on teacher dashboard.
- Store summaries for post-session reports.

5. Feasibility and Risks

5.1 Feasibility

- Achievable using existing FER models and Zoom SDK.
- Can start with facial-only detection, later expand to multimodal (voice + face).

5.2 Risks

- Privacy concerns (must anonymize data).
- Misclassification of emotions (accuracy ~70–85%).
- Zoom API limitations.

5..3 Mitigation

- Use edge processing (process locally, not on cloud).
- Collect feedback from teachers to improve model performance.

6. Impact and Benefits

- **Educational**: Helps teachers adapt teaching styles in real-time.
- **Social:** Supports student mental well-being.
- **Technological:** Encourages AI adoption in online learning.

Appendices

- Zoom video communications Inc.,Zoom API & SDK Documentation, https://developers.zoom.us/docs/
- G.Bradski,”The openCV Library “,Dr.Dobb’s Journal,2000.
- S.Serengil & A.Ozpinar,”LightFace : A Hybrid Deep Face Recognisation Framework”Proc . ASYU 2020 ,pp. 23-27
- Google Reasearch ,MediaPipe Framework, https://mediapipe.dev/
- E. Barsoum et al., Training Deep Networks for Facial Expression Recognisation,”Proc. ACM ICMI, 2016.