Automated Attendance System Using Face Recognition

Damera Aravind - AP23110011645

Vuyyuru Shruthi Deepika - AP23110011584

Peddoju Durga Sravanthi - AP23110011597

Kilari Joshitha - AP23110011641

01

PROJECT OVERVIEW

Current Issues:

Manual attendance is time-consuming and error-prone.
Proxy attendance and lack of real-time tracking.

Solution:

Real-time face recognition + Cloud database (Supabase).
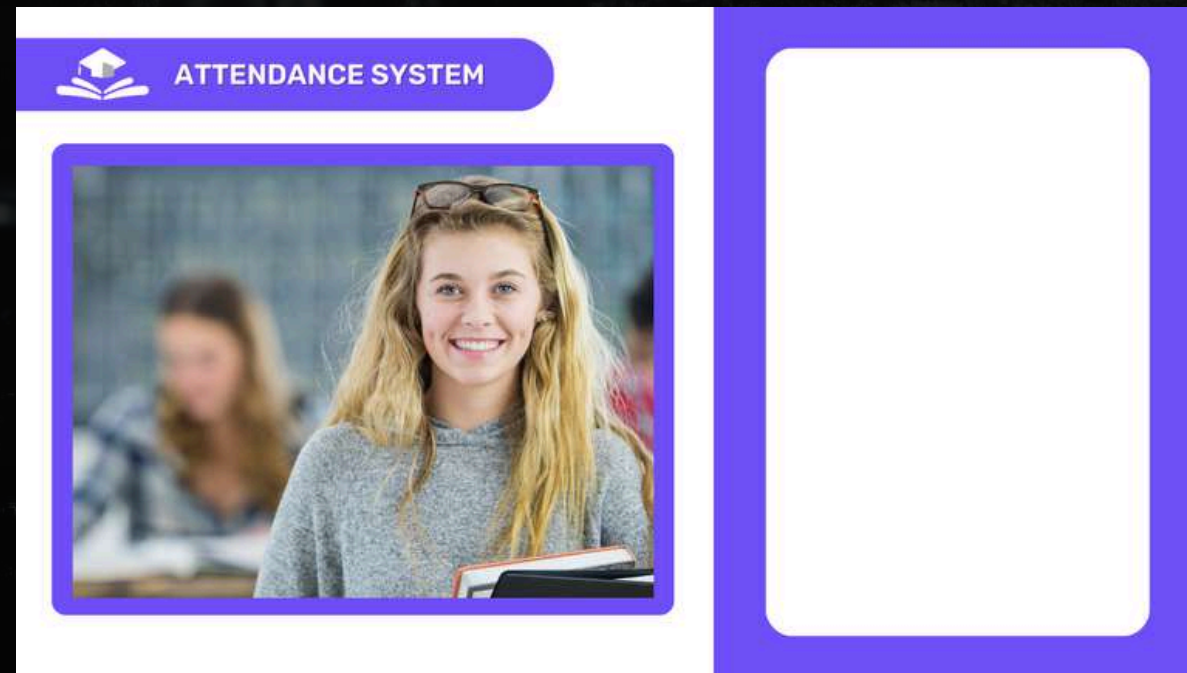+attendence email report for faculty.

KEY FEATURES

1. Real-time face detection with OpenCV.
2. Student data management via GUI .
3. Daily Excel reports sent via email .
4. Secure cloud storage using Supabase .

SYSTEM ARCHITECTURE

- Frontend: Camera feed + GUI (OpenCV).
- Backend: Face encoding (encodegenator.py), Supabase queries.
- Database: Supabase tables (students) and storage (images bucket).

TOOLS AND TECHNOLOGIES

Tool	Role
OpenCV	Face detection and live video processing
face_recognition	Generates 128D facial embeddings
Supabase	Stores student data and images
pandas	Generates Excel reports
smtplib	Sends email alerts
NumPy	Handles numerical operations and array manipulations for image processing

WORKFLOW

- Registration:

Upload images → Generate encodings (EncodeFile.p).
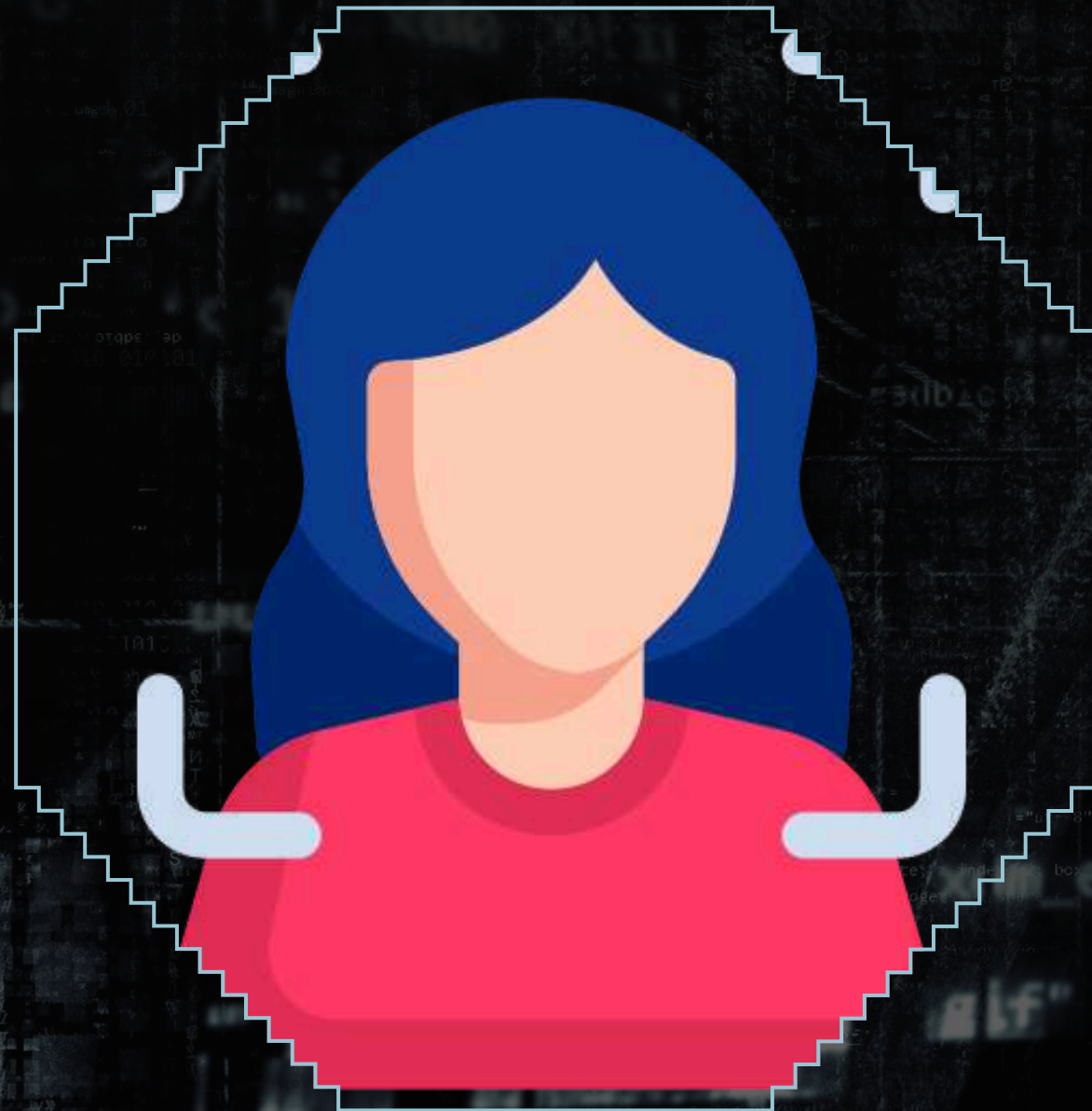
Insert data into Supabase (upload.py).

- Attendance:

Detect faces → Match with encodings → Update Supabase (main1.py).

- Reporting:

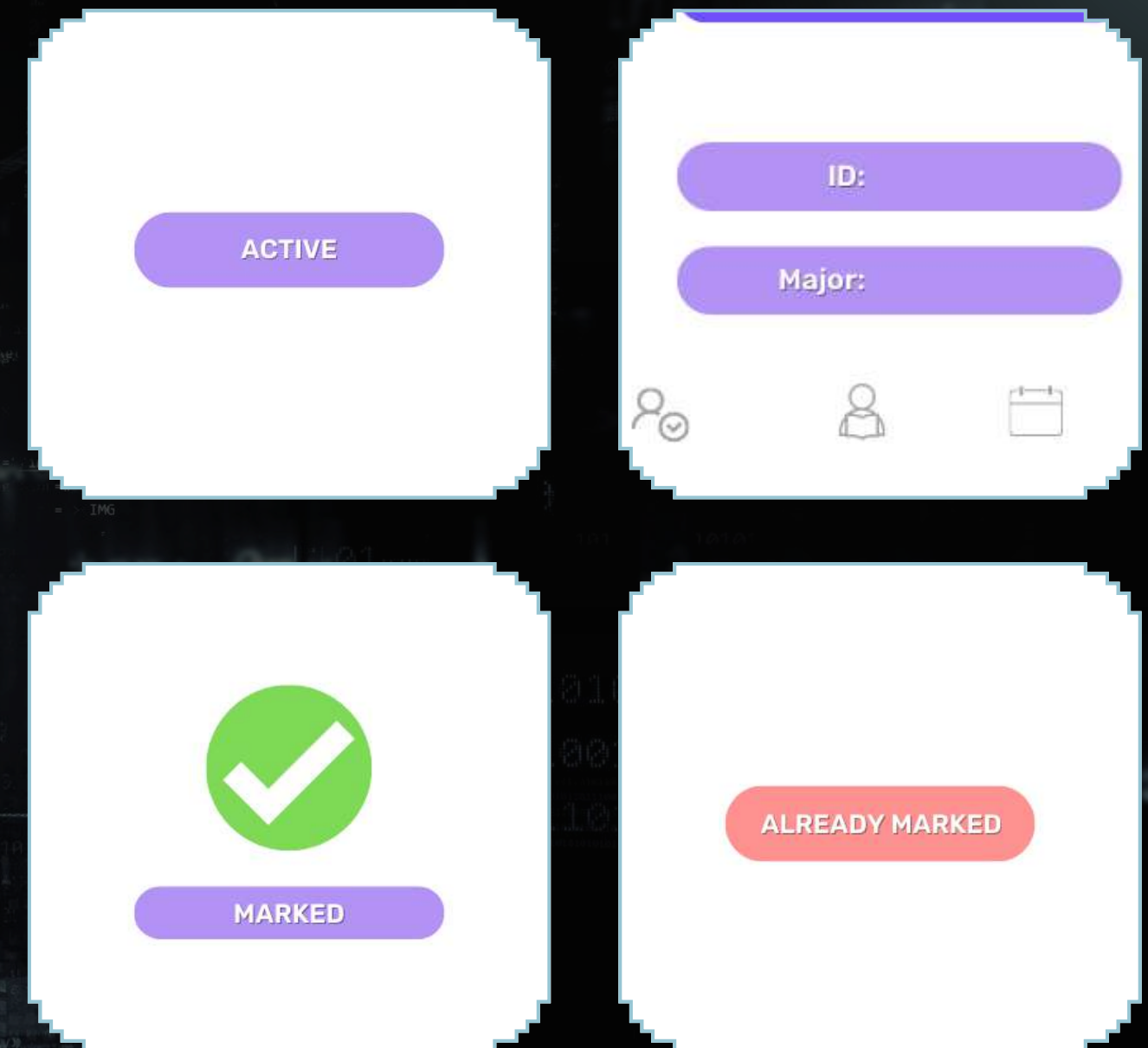Daily Excel report → Email faculty (report_sender.py).

FACE RECOGNITION PIPELINE

1. Image Preprocessing: Convert to RGB, resize.
2. Encoding Generation: HOG + face_recognition.face_encodings().
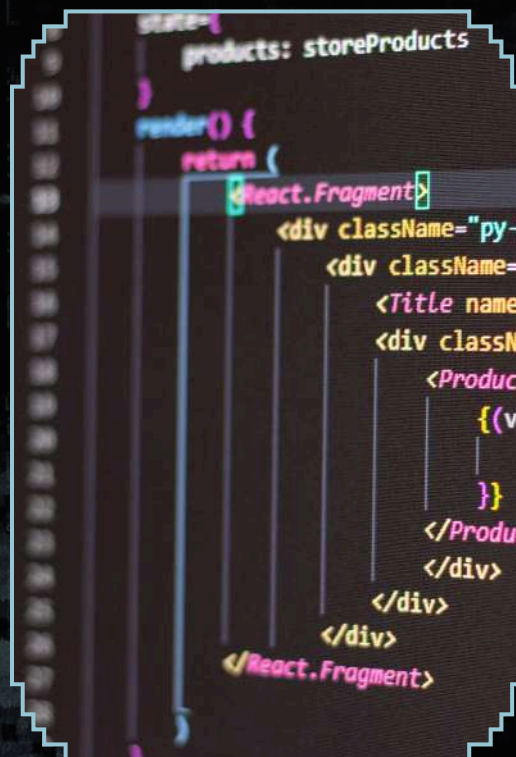3. Matching: Compare live encodings with stored data (Euclidean distance).

User Interface:

Features:

- Live camera feed with face tracking.
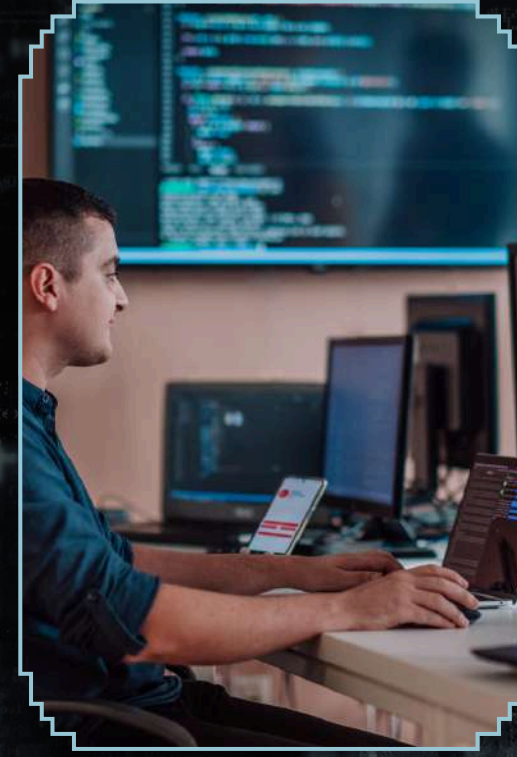- Student dashboard (name, attendance count, image).

SUPABASE INTEGRATION & EMAIL REPORTING
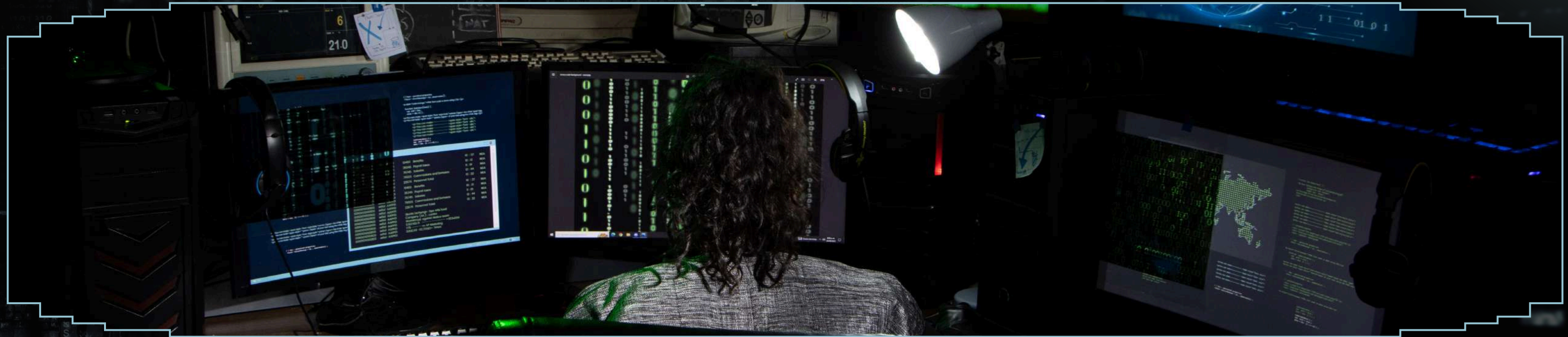

SUPABASE INTEGRATION

- Database: Stores student profiles (students table) and attendance logs.
- Storage: Hosts student images linked to registration_number.
- Operations:
  - Insert data: supabase.table("students").insert().
  - Fetch data: .eq("registration_number", id).

EMAIL REPORTING

- Workflow:
  a. Fetch Supabase data → Create Excel report with pandas.
  b. Attach report → Send via smtplib (Gmail SMTP).

CHALLENGES & LIMITATIONS

- Challenges:
  - Lighting conditions affect accuracy.
  - Single-face detection per frame.
- Limitations:
  - Requires stable internet for Supabase.