



Team ID : T037

Team Name : NEXUS TECH

PS Number : PY060

PS Title : FACIAL RECOGNITION FOR ATTENDANCE

Domain : COMPUTER VISION

Category : SOFTWARE



Problem Statement:

- **WHAT PROBLEM ARE YOU SOLVING?**

- ➔ This problem statement mainly focuses on developing a **facial recognition system** to the process of **attendance tracking** in schools and colleges.
- ➔ Schools and colleges struggle with maintaining accurate attendance record and analyzing presence effectively using conventional methods.
- ➔ By Implementing a facial recognition-based attendance system can streamline the process by automatically detecting and verifying students' faces using **3D (depth) analysis**.

- **WHO IS YOUR TARGET AUDIENCE?**

Our target audience includes:

- **Educational Institutions** – Schools & colleges needing fraud-proof attendance.
- **Corporate Offices** – Companies wanting secure employee check-ins.



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Proposed Solution and overview:

- **HOW DOES YOUR AI/ML SOLUTION ADDRESS THE PROBLEM?**

➔ This facial recognition system **uses camera** to capture images of the students using 3D depth and motion analysis and matches those images with the students image in the **database** to confirm their presence.

➔ The **output is connected to the e-portals** (for attendance) and automatically marks absent for the students who are not in class and uploads the data after the verification of the faculty.

➔ Using **3D facial recognition** it enhances attendance more accuracy, secure, and fraud-prevention.

- **BRIEFLY MENTION THE AI/ML MODEL OR APPROACH USED**

* **DEEP LEARNING-BASED FACE RECOGNITION** : Uses DeepFace for facial verification.

* **AI-POWERED ANTI-SPOOFING** : Implements motion-based liveness detection (blink/head movement) and depth estimation (MiDaS, Mediapipe Depth API) to prevent fraud.



Data And Model :

- **DATA SOURCES:**

- ➔ The dataset consists of facial images of students captured from cameras including multiple images per student to account for variations in expressions, lightings, hairstyle.

- **MODEL:**

- ➔ A deep learning model using **FaceNet** and **DeepFace** verifies and recognizes students identities.
 - ➔ **Facial Recognition & 3D Analysis** : Yolo, OpenCV, DeepFace, dlib, Mediapipe Face Mesh, MiDaS, OpenPose for accurate face matching and depth detection.
 - ➔ **Backend, Security & Automation** : Django for back-end process, FastAPI, PostgreSQL, Firebase, AWS/GCP for data management, with PyJWT, bcrypt, Cryptography ensuring secure authentication and encryption.

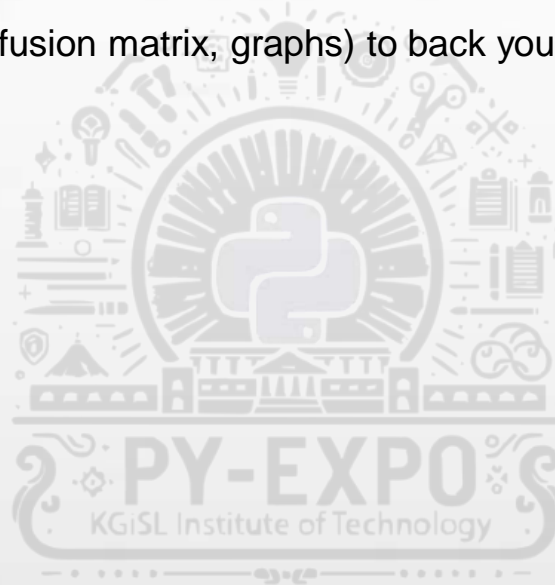
- **TRAINING METHODS :**

- ➔ Training utilizes transfer learning with models like **FaceNet** with **TensorFlow** and **PyTorch**. OpenCV for detection and ONNX Runtime & JWT Authentication for optimized real time performance.



Result & Evaluation:

- Show performance metrics (e.g., accuracy, F1-score, ROC curve).
- Visualizations (e.g., confusion matrix, graphs) to back your claims.



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Impact and Benefits:

- **IMPACTS:**

ENHANCED SECURITY : Prevents **identity fraud** in attendance system.

INCREASED EFFICIENCY : Automates attendance tracking, reducing manual errors.

- **BENEFITS:**

ECONOMICAL : Eliminates the need for physical **ID cards and manual verification**, **reducing operational cost**.

ENVIRONMENTAL : Reduces **paper and plastic** waste from traditional ID system.

SOCIAL : Ensures fair attendance tracking and improving accountability in workplace and institutions.

Ethical Considerations & Real-world Applications:

- **ETHICAL CONSIDERATIONS:**

➔ Ensuring students facial data **is securely stored for only attendance** purpose and educating students about how facial data is collected, stored and used.

- **REAL-WORLD APPLICATIONS:**

➔ Automated Attendance, Exam and test Authentication, Campus security, Hostel and cafeteria management, Library and resource Access.



Team Member Details:

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THANK YOU!

