FACIAL RECOGNITION USING AI

PRESENTED BY

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OUTLINE

PROBLEM STATEMENT

- Traditional security systems rely on manual identification methods such as ID cards or passwords, which are vulnerable to theft, loss, and misuse. There is a growing need for a secure, automated, and contactless identification method that is both fast and reliable. Facial recognition, powered by AI, offers a solution by identifying or verifying individuals based on facial features.

PROPOSED SOLUTION

The proposed system uses artificial intelligence and computer vision to detect and recognize human faces from live camera feeds or images. It leverages deep learning models trained on large facial datasets to ensure high accuracy. The system includes:

- Face detection using algorithms like Haar Cascades or MTCNN.
- Feature extraction using deep CNN models like VGG-Face or FaceNet.
- Face recognition via vector comparison or classification models.
- User interface for adding and managing known faces.

SYSTEM APPROACH

Data Collection: Gather images of faces under various lighting and expressions.
Preprocessing: Resize, normalize, and align faces.
Model Training: Use pre-trained models (e.g., FaceNet, Dlib) or train custom models with a labeled dataset.
Integration: Connect the recognition model to a real-time camera feed using OpenCV.
Testing & Evaluation: Test with known and unknown faces, evaluate accuracy and speed.

ALGORITHM & DEPLOYMENT

Algorithm:
•Face Detection: MTCNN / Haar Cascade
•Feature Extraction: FaceNet / Dlib
•Classification: Cosine similarity / SVM

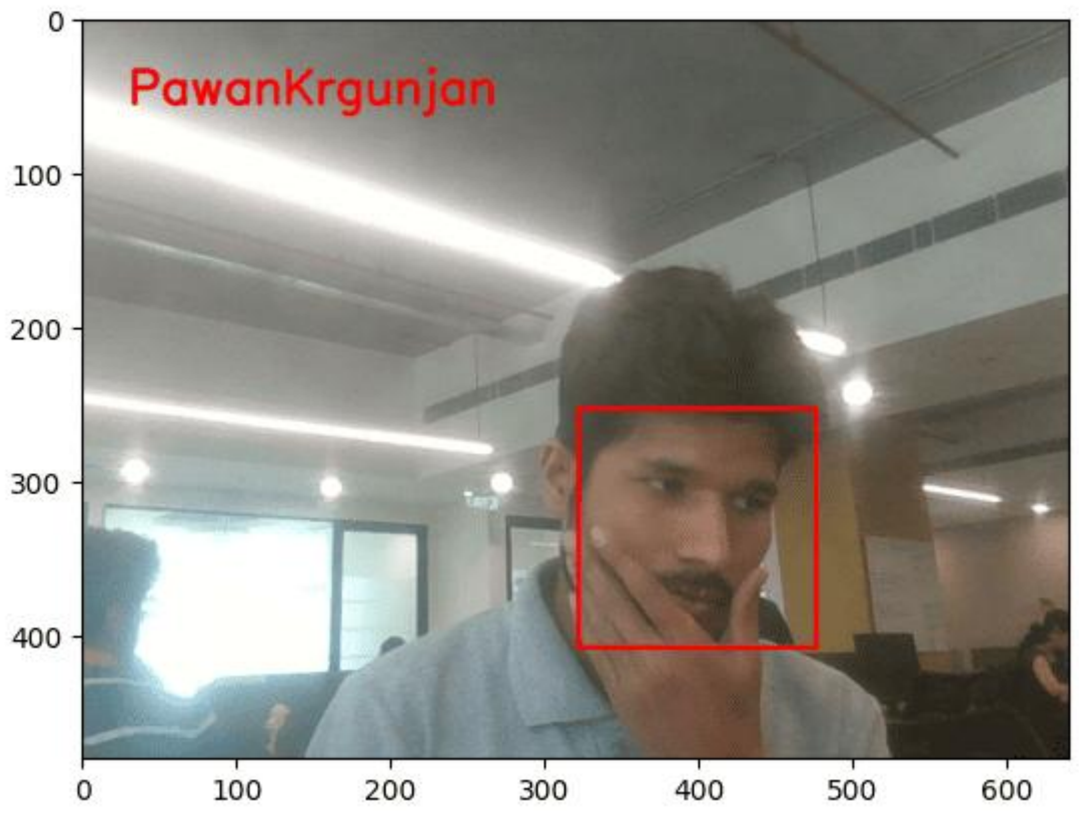
Deployment:
•Platform: Python (Flask for web integration or standalone app)
•Libraries: OpenCV, TensorFlow/Keras, NumPy, Dlib
•Device: Laptop/PC with webcam or embedded systems (Raspberry Pi with camera module)

RESULT

The output image displays the recognized face with a bounding box and label (e.g., person’s name or “Unknown”) in real time. Confidence scores may be shown. The system runs with low latency and can recognize faces from various angles and distances.

Output:

Pawan Kumar Gunjan Enter….



CONCLUSION

This facial recognition system successfully implements AI for secure, fast, and contactless identification. It demonstrates reliable performance in both controlled and moderately varied environments. The system can be integrated into security systems, attendance management, and personalized services.

FUTURE SCOPE

- Enhance recognition in low light or occluded conditions.
- Integrate liveness detection to avoid spoofing (e.g., printed photos).
- Deploy on mobile or edge devices for greater portability.
- Use in multi-camera networks for crowd surveillance.
- Incorporate other biometric methods for multi-factor authentication.

REFERENCES

•Schroff, F., Kalenichenko, D., & Philbin, J. (2015). *FaceNet: A Unified Embedding for Face Recognition and Clustering*.
•OpenCV Documentation – https://docs.opencv.org
•Dlib Library – http://dlib.net
•MTCNN for Face Detection – https://github.com/ipazc/mtcnn
•TensorFlow & Keras – https://www.tensorflow.org

Thank you