

THIRD-EYE FORENSIC FACE SKETCH CONSTRUCTION AND RECOGNITION

Project Reference No: 49S_BE_6470

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Keywords:

Forensic AI, Face Recognition, Sketch Generation, Deep Learning, Computer Vision.

Introduction:

Criminal investigations often rely on eyewitness descriptions to identify suspects, which can be inaccurate and time-consuming when done manually by forensic artists. Traditional methods lack consistency and depend heavily on human interpretation. With the advancement of Artificial Intelligence and Computer Vision, automated systems can significantly improve the accuracy and efficiency of suspect identification.

The proposed system, “Thirdeye Forensic Face Sketch Construction and Recognition,” focuses on generating facial sketches using AI techniques and matching them with a database of real images. This approach enhances forensic investigation by reducing manual effort and improving identification speed. The system aims to bridge the gap between human description and digital recognition, making it a valuable tool for law enforcement agencies.

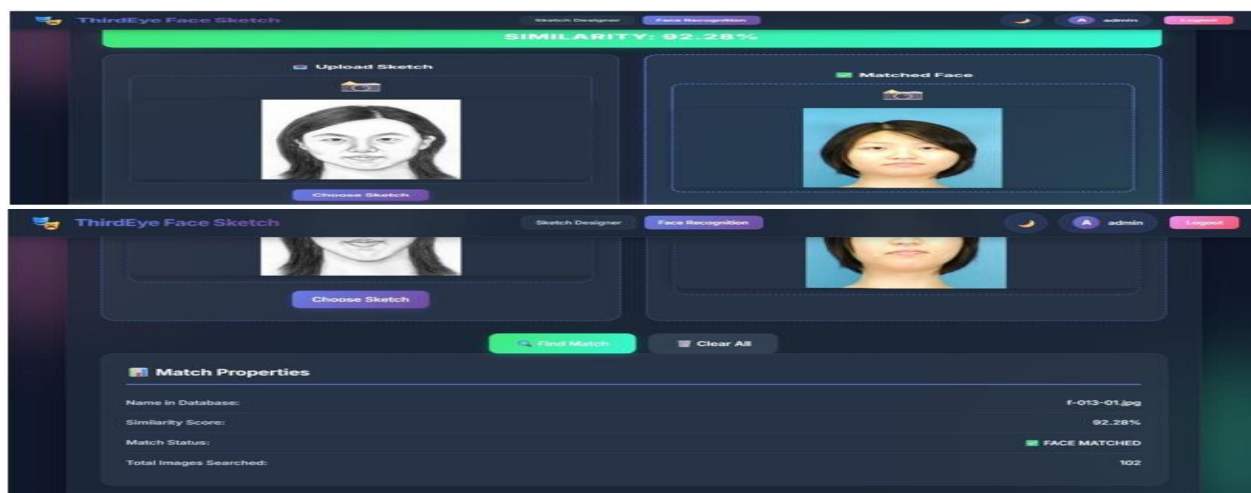


Figure 1: Face Sketch Matched to Database Record

Objectives:

1. To develop an AI-based system for forensic face sketch generation.
2. To implement face recognition for matching sketches with real images.
3. To improve accuracy and reduce identification time in investigations.
4. To design a user-friendly system for practical forensic use.

Methodology:

The project is implemented using Python and deep learning frameworks. Initially, a dataset of facial images is collected and preprocessed using techniques such as normalization and resizing. A sketch generation model (GAN or similar) is used to generate facial sketches based on input images or features.

For face recognition, Convolutional Neural Networks (CNN) are used to extract features from both sketches and real images. These features are compared using similarity measures to identify matching individuals. OpenCV is used for image processing tasks, while TensorFlow or PyTorch is used for model training and testing.

The system consists of modules such as data preprocessing, sketch generation, feature extraction, and matching. The final output displays the closest matching face along with a confidence score, improving reliability and efficiency in forensic analysis.

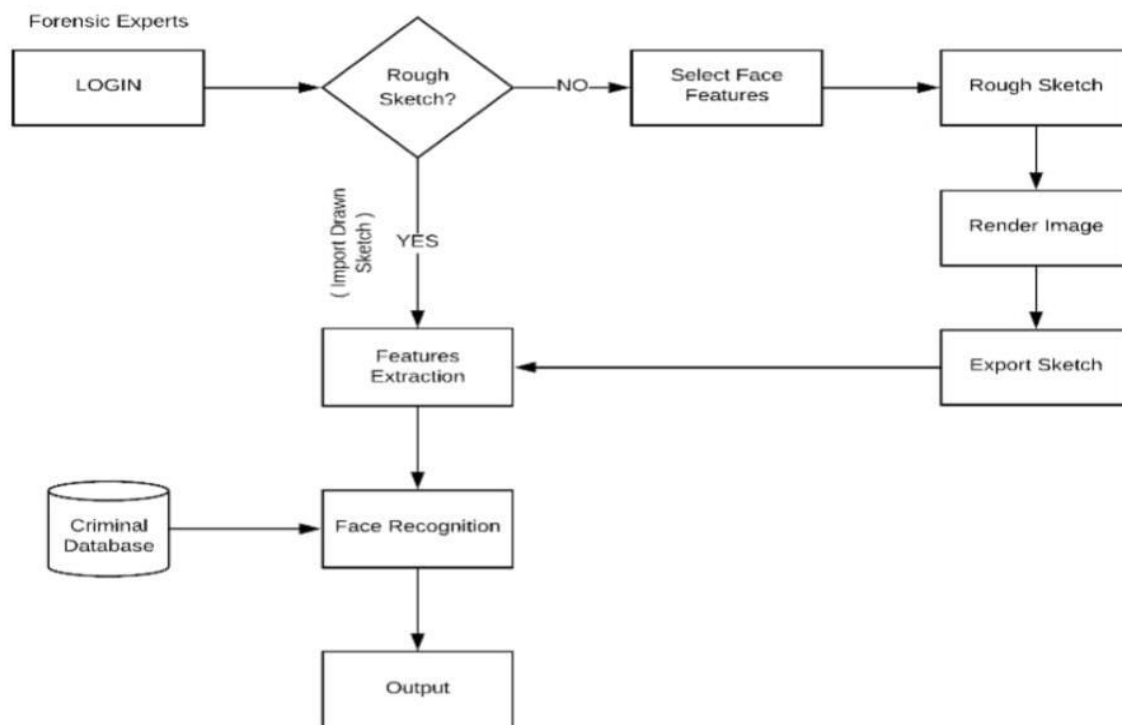


Figure 2: System Flow Chart of The Application

Result and Conclusion:

The system successfully generates facial sketches and matches them with stored images in the database. The results demonstrate improved accuracy compared to traditional manual methods. The project reduces the time required for suspect identification and enhances investigation efficiency.

In conclusion, the integration of AI in forensic sketching and recognition provides a powerful tool for law enforcement, offering faster and more accurate identification of suspects.

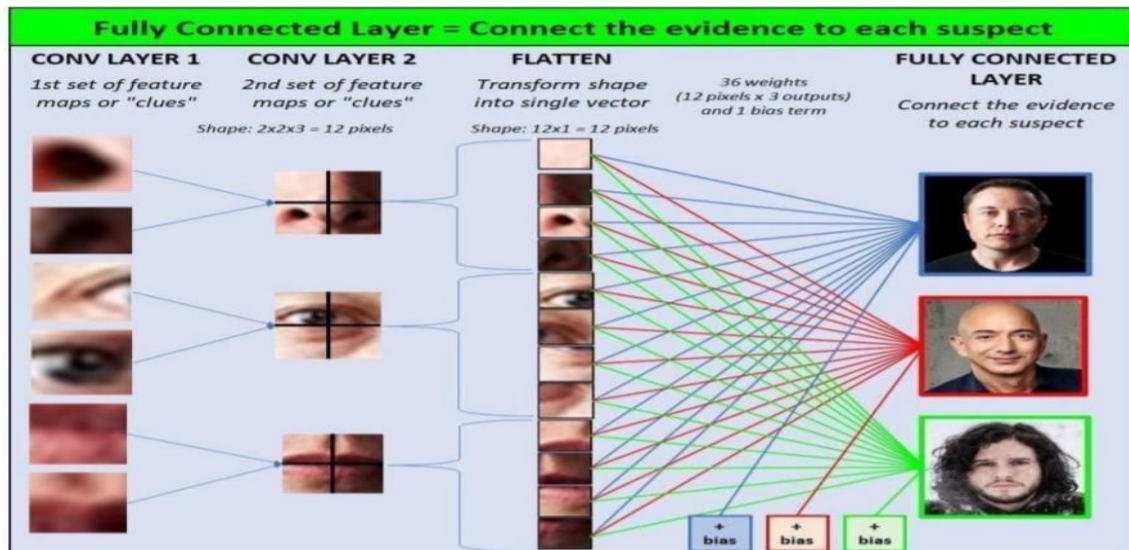


Figure 3: Feature Extraction and Database Matching Process

References:

1. Research papers on CNN for face recognition
2. GAN-based image generation studies
3. OpenCV documentation
4. TensorFlow / PyTorch official documentation

Future Scope:

1. Improving accuracy using larger and more diverse datasets.
2. Integration with real-time CCTV surveillance systems.
3. Development of a web or mobile-based application for wider accessibility.
4. Implementation of 3D face reconstruction techniques.
5. Integration with national crime databases for real-time investigation support.