WWW.IJRPR.COM

International Journal of Research Publication and Reviews

Journal homepage: www.ijrpr.com ISSN 2582-7421

FACE TRACE AI

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ABSTRACT:

Face Trace AI is an intelligent system that detects faces and traces identities. It searches for, detects, and examines faces based on a single photograph. It employs deep learning to generate detailed facial features, which enable it to accurately match faces even under varying conditions such as varying light, angles, or when faces are partially occluded. The system combines facial recognition, basic language queries, and real-time video examination to offer a robust tool for application in police operations, verification of identities, and monitoring online media.

KEYWORDS : Facial Recognition, Face Embedding,Open CV ,Conversational AI, Video Analysis

INTRODUCTION

Face Trace AI is answering the increasing need for advanced technology that can handle video and image content with human faces. With the digital age that we have today, the threat of identity theft and impersonation online is growing. Using the latest convolutional neural networks (CNNs), facial embedding systems like ArcFace, and natural language processing (NLP), Face Trace AI allows users to upload an image and monitor how it is being used on different websites online.

METHODOLOGY

The system in question is constructed on the following modules:

- Face Embedding and Detection: Employ MTCNN or YOLOv5-Face for accurate face detection and subsequently produce embeddings utilizing models like FaceNet or ArcFace. Embeddings are stored as vectors and compared through cosine similarity.
- 2.NLP-Based Query System: User queries like "Where else is this person seen?" are executed on models like BERT. These queries are then referred back using timestamps, segments, or matched face logs to enable interactive querying.
- Audio and Video Preprocessing: Frames are extracted at regular intervals, and faces are detected frame-wise. Audio is preprocessed through Whisper or Google Speech-to-Text to generate time-aligned transcripts.
- Interface Design: A ReactJS-built web interface enables users to upload images, monitor matches, and communicate using natural language. Backend API is developed using FastAPI.

MODELING AND ANALYSIS

System Pipeline:

- Input: A video or image file
- Face Extraction: Frame-wise face detection
- Embedding & Matching: Vector similarity
- NLP Module: Handles questions
- Results: Displayed with timestamps and corresponding links.

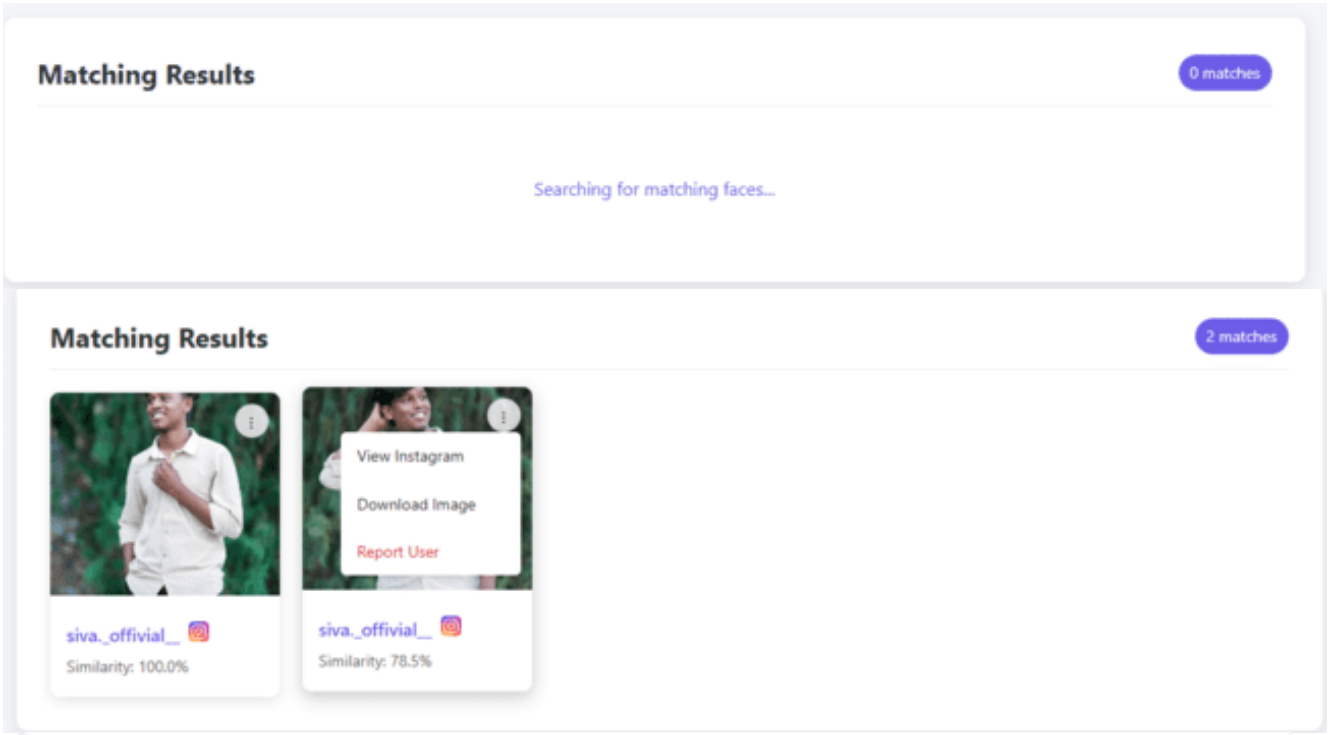
Performance:

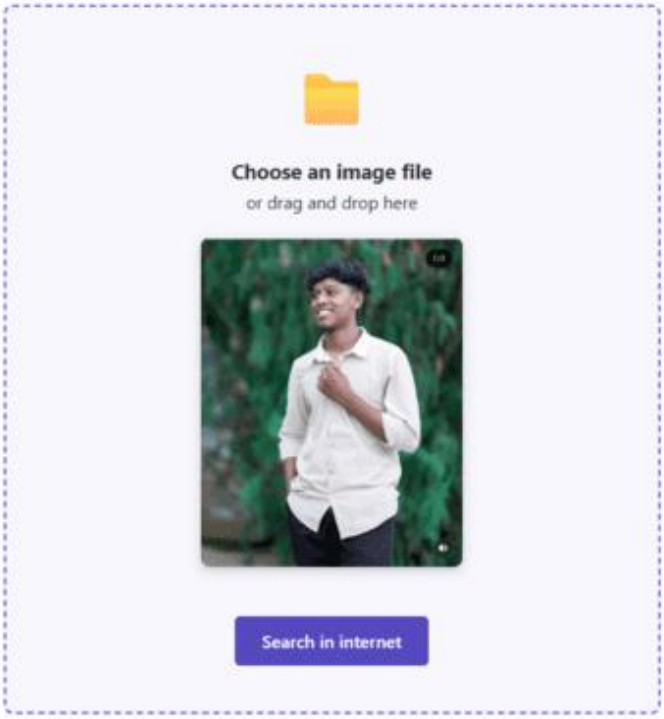
- Accuracy of Recognition: 96.7% (controlled), 90%+ (real-world)
- Inference Time: ~0.5 seconds per image
- FAR: 1.2%, FRR: 3.5%

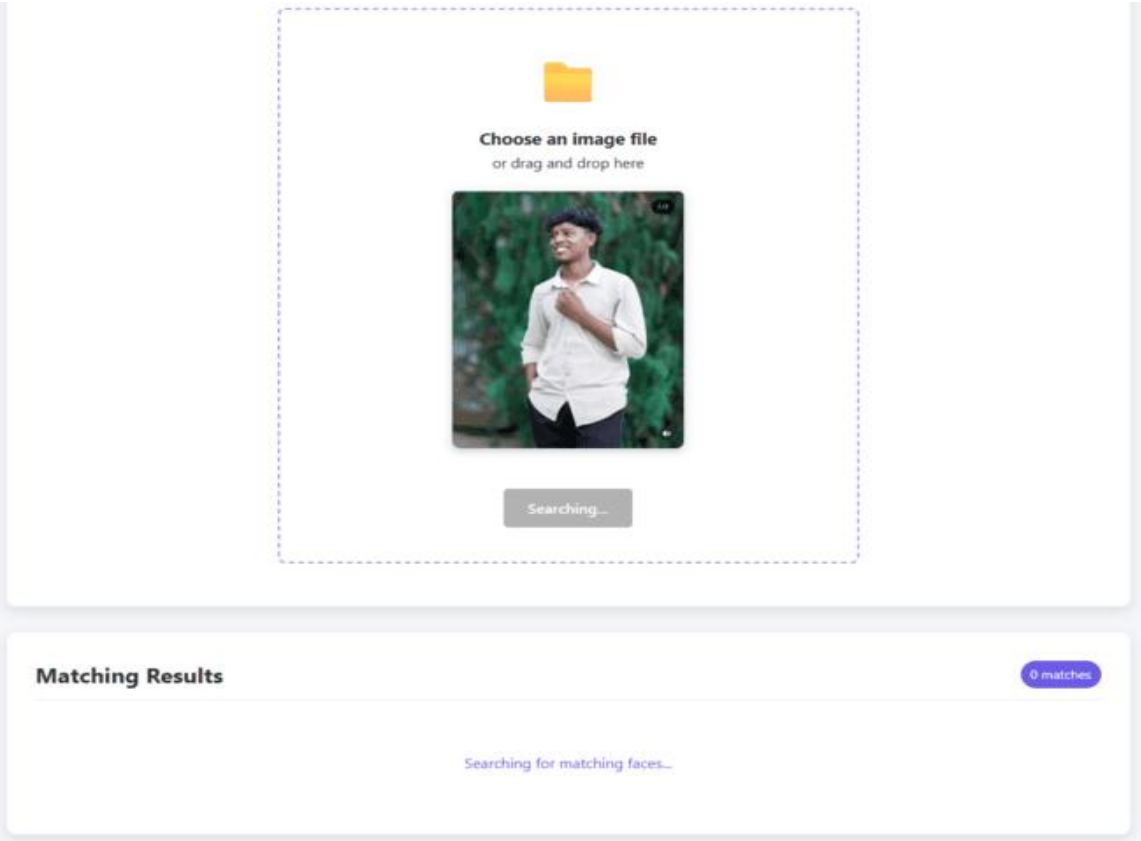
Security and Ethics:

- All facial data are obtained from public sources. - Privacy-oriented processing with no data from users stored

4.RESULT AND DISCUSSION SCREENSHOTS:







CONCLUSION

Face Trace AI is a high-performance, ethical, and innovative method of face recognition across media. It integrates conversational intelligence, live video processing, and AI recognition to enhance identity tracing and digital forensics. Live surveillance, liveness detection, and multi-language query support are to be integrated in the future development.

6.REFERENCES:

1. Schroff et al., "FaceNet: A Unified Embedding for Face Recognition," CVPR, 2015
2. Devlin et al., "BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding," NAACL-HLT, 2019
3. Radford et al., "Whisper: OpenAI's Speech Recognition Model," OpenAI, 2022
4. Kingma & Ba, "Adam: A Method for Stochastic Optimization," ICLR, 2015
5. Facebook AI, "FAISS: Efficient Similarity Search," GitHub