**Team Member List**

1. Roshini Padmanabha (Team Leader)
2. Kiran Varma Kolukuluri
3. Sharon Sowmya Tolety

**Description**

This project was created by Roshini Padmanabha and her team as the Final Project for the **MIS-695 Business System Design and Analysis** class. The application allows users to upload images, detects faces using Deep Learning models from OpenCV, and retrieves potential matches from a database by comparing embeddings.

**Installation**

1. Use **Google Colab** as the development environment.
2. Install the necessary libraries:
   * OpenCV
   * PostgreSQL and pgvector extension
   * TensorFlow or any required libraries for deep learning
3. Load the Haar Cascade file and set up a PostgreSQL database for embedding storage.

**Inputs**

This project takes the following inputs:

1. **Group Image**: An image containing multiple people for face detection and cropping.
2. **Individual Image**: A single image used for similarity matching against the database.

**Outputs**

The project generates the following outputs:

* **Face Detection Results**: Individual faces detected and cropped from group pictures.
* **Embedding Generation**: Numeric embeddings for each detected face.
* **Database Storage Confirmation**: Status updates for successfully stored embeddings.
* **Similarity Retrieval**: Closest matches for the uploaded face image based on embeddings.
* **Similarity Scores**: Ranked list of matches with similarity percentages.
* **Matching Visualization**: Retrieved images matching the input face, highlighting recognized identities.
* **Processing Time Summary**: Metrics showing average time for detection, embedding generation, and matching.
* **Match Status Log**: Log of successful and failed detection and match attempts.

**Main Code File**

The main code file for this project is **Code.ipynb**, which contains the core logic for detection, embedding generation, and similarity matching. Additionally, the code file **FaceDetection.ipynb** is used for implementing the Haar Cascade model face detection.

**Running the Code**

1. Open the **Code.ipynb** file in Google Colab.
2. Execute the cells line by line to:
   * Upload images.
   * Detect faces and create embeddings.
   * Store embeddings in the database.
   * Perform similarity matching for uploaded images.
3. Review the outputs in the Colab notebook, including visualizations and logs.

**Deployment**

This project runs in a **Google Colab Notebook**. To execute:

1. Upload the Colab notebook and required files to your Google Drive.
2. Open the notebook in Google Colab and run the code as described in the **Running the Code** section.

**License**

This project is distributed under no specific license.

**Contact**

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Let me know if you need further adjustments!