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Synopsis Presentation

Instant feedback system using Face recognition

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1. Introduction

- Face detection and emotion analysis have revolutionized diverse sectors, from security and healthcare to entertainment and customer experience
- These technologies offer a window into the incredible possibilities of artificial intelligence and machine learning
- The purpose of this project is to help various restaurants, malls and other shops to get a real time review of their services from their customers by reading their Face expression

Idea:

- We plan to build a system which reads two video footages (supposedly from a CCTV camera) and extracts frames (2D images) from them
- The Face expression of the customer in that frame is read and stored in the database
- A calculation based on the Face expressions captured in these two instances is made, and the result obtained by this tells us about the customer experience (i.e., whether it was positive, negative or neutral)

Execution :

- Face Detection — Ability to detect the location of face in any input image or frame. The output is the bounding box coordinates of the detected faces
- Face Recognition — Compare multiple faces together to identify which faces belong to the same person. This is done by comparing face embedding vectors
- Emotion Detection — Classifying the emotion on the face as happy, angry, sad, neutral, surprise, disgust or fear
- Saving in database — Storing the Realtime reviews of the customers

Applications:

- Customer feedback System is essential to guide and inform the decision making and influence innovations and changes/ modify to a product or service
- It is also essential for measuring customer satisfaction among the current customers
- FER system can be deployed at Receptions to measure the efficiency of responsible staff in handling the queries of Visitors
- Can be used for Drowsiness detection for drivers

2. Literature Survey

Foundational Paper:

- A Convolutional Neural Network Cascade for Face Detection

Deep learning using Face recognition:

- Face Expression Recognition

Real-Time Emotion Detection:

- Real-time Convolutional Neural Networks for Emotion and Gender Classification
- A Multi-Task Neural Approach for Emotion Attribution, Classification, and Summarization

3. Problem Statement

Research Gap:

- Investigating methods to enhance the system's accuracy in recognizing faces under challenging conditions, such as varying lighting, occlusions or different Face expressions
- Exploring ways to improve recognition performance for individuals with atypical Face features or Face abnormalities

Problem Statement

- In the realm of Face recognition systems, there exists a critical need to refine accuracy amidst adverse conditions, encompassing diverse lighting, occlusions and varied Face expressions.
- Furthermore, there is a distinct exigency to augment recognition proficiency for individuals exhibiting atypical Face features or abnormalities.

DATA SET :

- Face Emotion Recognition Dataset :

<https://www.kaggle.com/datasets/tapakah68/Face-emotion-recognition>

<https://www.kaggle.com/datasets/jonathanoheix/face-expression-recognition-dataset>

<https://www.kaggle.com/datasets/ananthu017/emotion-detection-fer>

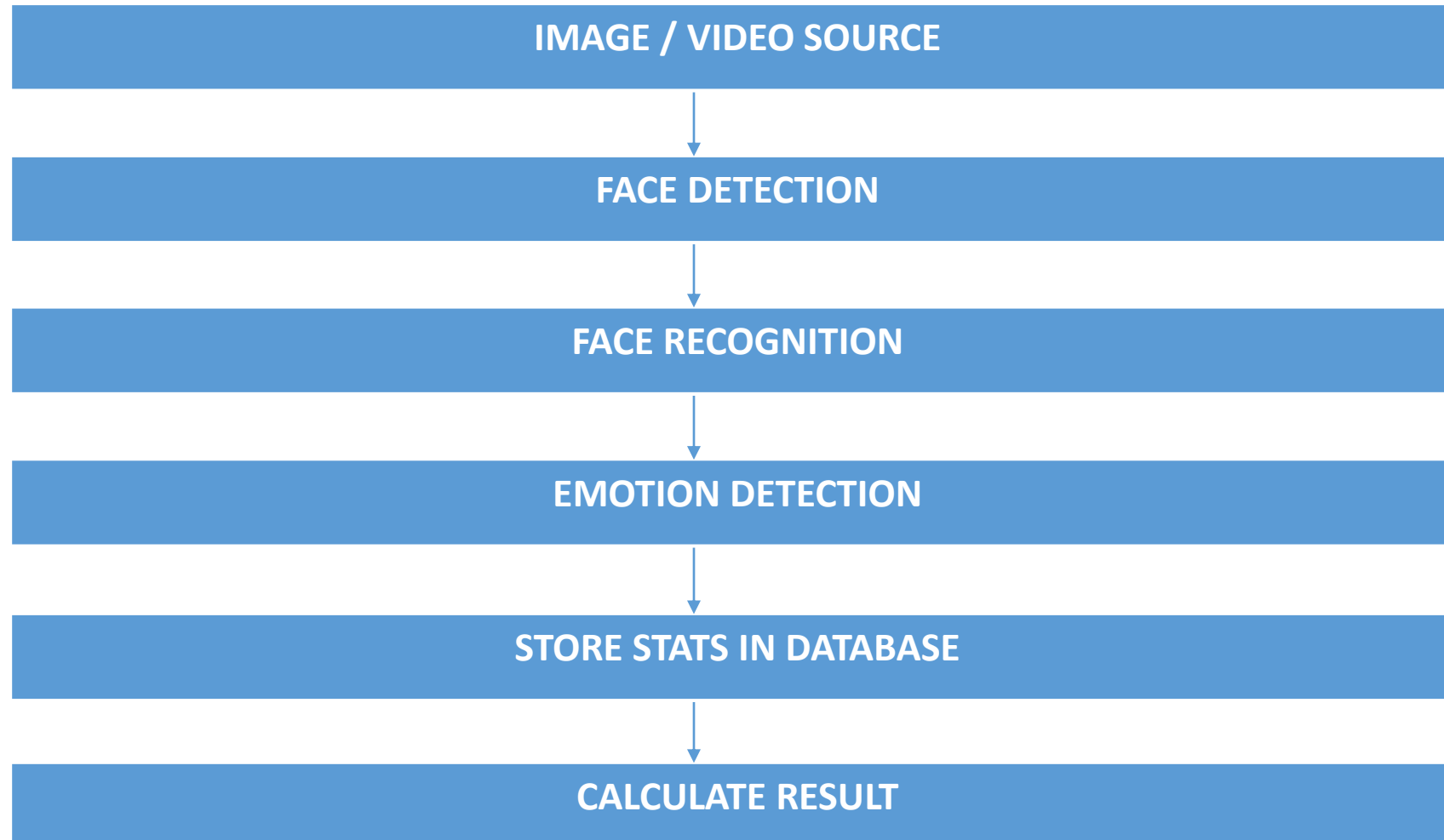
Objective:

- Implement advanced computer vision techniques, including Face detection, recognition, and emotion analysis, to enable real-time tracking of customer sentiments
- Provide businesses in various industries, including restaurants, malls, art galleries, and transportation services, with a comprehensive solution to enhance customer experiences

4. Research Methodology

- Utilize Python libraries such as OpenCV, face_recognition, Keras, and numpy for the implementation of Face detection, recognition, and emotion analysis algorithms
- Deploy CCTV cameras in diverse business settings to capture real-time video clips, extracting frames for analysis using computer vision techniques
- Integrate an SQLite3 database to store and manage customer feedback data, facilitating detailed analysis and providing valuable insights to businesses

Flow of the project



5. Progress Chart

Stages of research	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Selection of topic							
Data collection from sources							
Literature review							
Research methodology plan							
Selection of the Appropriate Research Techniques							
Analysis & Interpretation of Data							
Findings and recommendations							
Final research project							

6. Reference

Research Papers :

- **A Convolutional Neural Network Cascade for Face Detection** : Haoxiang Li, Zhe Lin, Xiaohui Shen, Jonathan Brandt, Gang Hua; Proceedings of the IEEE Conference on Computer Vision and Pattern Recognition (CVPR), 2015, pp. 5325-5334
- **Face Expression Recognition** : Face Expression Recognition: A Brief Tutorial Overview Claude C. Chibelushi, Fabrice Bourel Chibelushi, C.C. and Bourel, F., 2003. Face expression recognition: A brief tutorial overview. CVonline: On-Line Compendium of Computer Vision, 9
- **Real-time Convolutional Neural Networks for Emotion and Gender Classification** : Arriaga, Octavio, Matias Valdenegro-Toro, and Paul Plöger. "Real-time convolutional neural networks for emotion and gender classification." arXiv preprint arXiv:1710.07557 (2017)
- **A Multi-Task Neural Approach for Emotion Attribution, Classification, and Summarization** : G. Tu, Y. Fu, B. Li, J. Gao, Y. -G. Jiang and X. Xue, "A Multi-Task Neural Approach for Emotion Attribution, Classification, and Summarization," in IEEE Transactions on Multimedia, vol. 22, no. 1, pp. 148-159, Jan. 2020, doi: 10.1109/TMM.2019.2922129

Books:

- "Practical Python Projects" by Lee Vaughan (Chapter on Computer Vision)
- "Computer Vision: Algorithms and Applications" by Richard Szeliski

THANK YOU

