KARACHI INSTITUTE OF ECONOMICS & TECHNOLOGY
College of Engineering

(Software Engineering)

PROJECT PROPOSAL

Course: "Artificial Intelligence & Neural Networks"

Semester: Spring 2024

Project Title: "Real -Time Face Movement Tracking"

Students Name & IDs:-

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Engineering Program: BESE

Submitted To: Fayyaz Khan **Date: May 7, 2024**

OBJECTIVE:

The objective of this Python project is to develop a system for real-time movement tracking using nose detection. This involves utilizing the HaarCascade Frontal Face Detection model to identify facial features, particularly the nose, and tracking its movement in a given video stream or webcam feed. The project aims to provide a foundation for various applications such as surveillance, human-computer interaction, and gesture recognition.

DESCRIPTION:

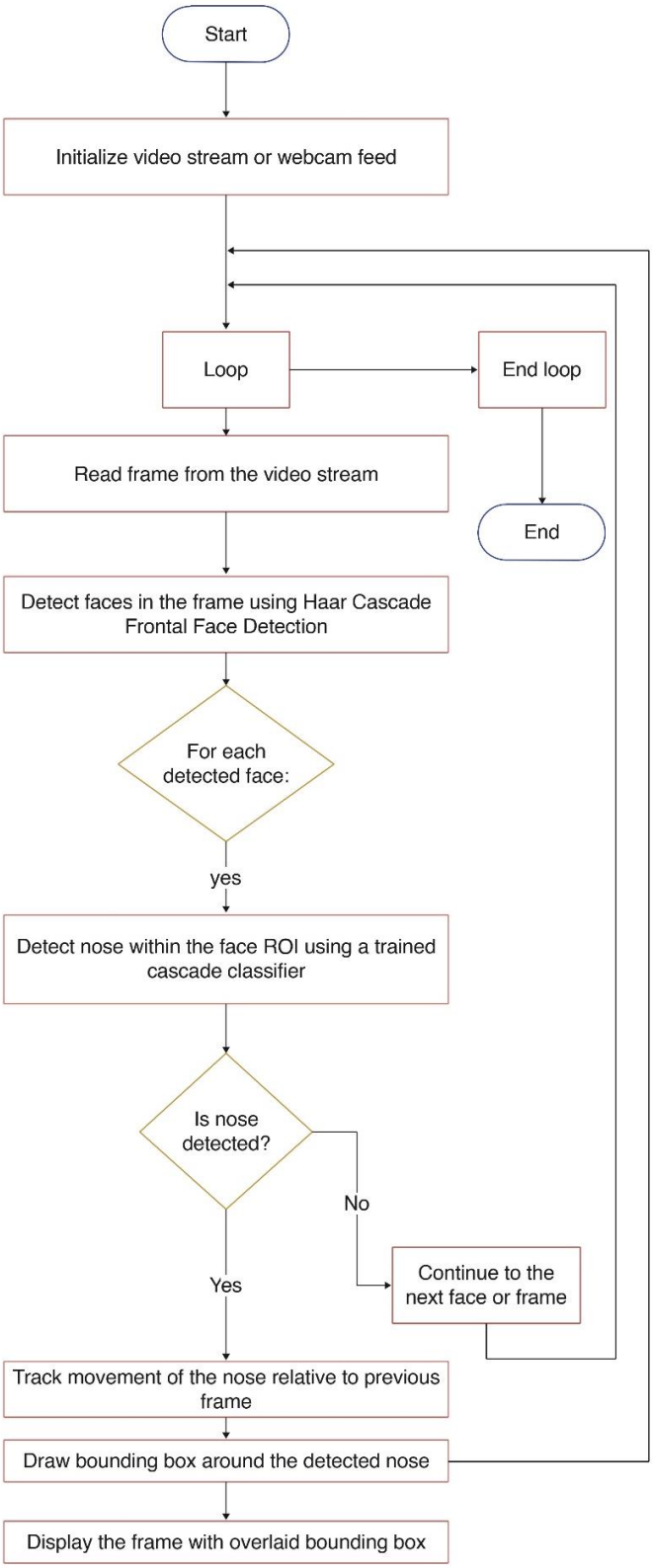
The project utilizes computer vision techniques and machine learning algorithms to detect and track the movement of the nose in a live video feed. The steps involved in the implementation of this project are as follows:

1. **Face Detection:** Initially, the project utilizes the HaarCascade Frontal Face Detection model to detect faces within the video feed. This step is crucial as it provides a region of interest (ROI) where the nose is expected to be located.
2. **Nose Detection:** Once the face is detected, the project focuses on identifying the nose within the ROI. This is achieved by training a cascade classifier specifically for nose detection using a dataset containing positive and negative images of noses.
3. **Movement Tracking:** After successfully detecting the nose, the project employs motion tracking techniques to monitor its movement across consecutive frames of the video feed. This involves calculating the displacement of the nose relative to its position in the previous frame.
4. **Visualization:** To provide a visual representation of the movement tracking, the project may draw a bounding box around the detected nose and display it overlaid on the video feed in real-time.

SOFTWARE USED:

1. VS CODE
2. PYTHON

FLOWCHART:


Start
Initialize video stream or webcam feed
Loop
End loop
Read frame from the video stream
End
Detect faces in the frame using Haar Cascade Frontal Face Detection
For each detected face:
yes
Detect nose within the face ROI using a trained cascade classifier
Is nose detected?
No
Yes
Continue to the next face or frame
Track movement of the nose relative to previous frame
Draw bounding box around the detected nose
Display the frame with overlaid bounding box