**How look away is calculated:**

To checks whether a person is **"looking away"** from the camera in a particular video frame, following algorithm is based on the position of their facial features.

**Algorithm Parameters**

Following explains each of the parameters you're using:

|  |  |  |
| --- | --- | --- |
| **Parameter** | **Value** | **Explanation** |
| mode | "file" | The input is a **video file** (not a camera or live feed). |
| input | "data/videos/video5.mp4" | The path to the **video file** that will be analyzed for face and gaze direction. |
| look\_mode | “yaw\_pitch”  “yaw”  “gaze” | The program will detect "looking away" by checking both **horizontal (yaw)** and **vertical (pitch)** position of the **nose**. |
| frame\_skip | 5 | The program will **analyze every 5th frame** of the video to save processing time and increase speed. |
| look\_away\_threshold | 0.2 | If the **nose position moves more than 20%** away from the center (left/right or up/down), it will count as "looking away". |

**Parameters:**

* frame\_index: The number of the current video frame.
* landmarks: Facial landmarks (like eye and nose positions) detected in the frame.

**Logic:**

1. **Start with default values**:
   * result = False: Assume the person is **not looking away**.
   * deviation = 0.0: No deviation from the center yet.
2. **Check the chosen detection mode**:
   * The look\_mode setting tells the function how to detect looking away:
     + **"gaze"**: Based on the center between the eyes.
     + **"yaw"**: Based on the horizontal position of the nose.
     + **"yaw\_pitch"**: Based on both horizontal and vertical position of the nose.

**Mode Breakdown:**

**1. Gaze Mode:**

* Takes the positions of **left and right eyes** (landmarks[33] and landmarks[263]).
* Finds the **center point between the eyes**.
* Compares it to the center of the screen (0.5 is center).
* If it has shifted more than a threshold, the person is **looking away**.

**2. Yaw Mode:**

* Looks only at the **horizontal position of the nose**.
* If the nose moves too far from the center, it counts as **looking away**.

**3. Yaw-Pitch Mode:**

* Checks both **horizontal and vertical nose position**.
* If either one moves too far from the center, it’s **looking away**.

**Logging and Confidence:**

* If the person **is looking away**, log a message with the frame number and how far they deviated.
* Calculate a confidence score showing how strongly the person appears to be looking away. (1.0 means definite.)

**Return Value:**

* result: True if looking away, otherwise False.
* confidence: How confident the function is in that judgment.