"Face detection in live video feed"

Real-time security requirements continue to increase due to the occurrence of various suspicious activities in open and closed environments. Day-to-day security threats may seriously affect everyone's life. The most significant part of the system consists of face localization, detection, and recognition. The system obtains underlined facial data through a video dataset or from a real-time environment. Subsequently, face/foreground and background keyframes are extracted from at-hand captured video data. Finally, extracted facial image data is compared with the facial images in the database. In case no match is found with the existing data, a security alarm or signal is generated, alerting security personnel to take action.

Facial recognition has significant applications in the domain of biometrics and several systems related to security and surveillance. And The facial recognition system was first developed through a semi-automated algorithm in 1960. Over the years, Viola and Jones improved continuous real-time facial identification with the wavelet-based function. In their framework, the first stage was movement and location detection. The rest of the stages depends exceptionally on facial detection and recognition.

In videos, detection, and localization of the moving human face are achieved through background subtraction models. Any object detection method is primarily built on this principle: at the start, a set of rules is applied to the frames obtained from the digital camera feed, utilizing the background subtraction models.

Face Detection Methods

There are two main approaches for Face Detection:

1. Feature Base Approach
2. Image Base Approach

Feature Base Approach

Objects are usually recognized by their unique features. There are many features in a human face, which can be recognized between a face and many other objects. It locates faces by extracting structural features like eyes, nose, mouth, etc., and then uses them to detect a face.

Image Base Approach

In general, Image-based methods rely on techniques from statistical analysis and machine learning to find the relevant characteristics of face and non-face images. The learned characteristics are in the form of distribution models or discriminant functions that is consequently used for face detection. In this method, we use different algorithms such as Neural-networks, HMM, SVM, AdaBoost learning.