Facial Detection and Recognition Steps and Features

Facial Detection:

* Goal:
  + Find a face in frame
  + Create a serial encoding of user’s face
  + Send the facial encoding to:
    - Facial Recognition
    - Backend service
* Preconditions
  + Images are in jpg format
  + Sufficient lighting
  + Proper libraries install (Libraries listed below)
* Steps:
  + Using Caffe based D2 face detector to find faces in an image
  + An embedder is used to extract features
  + From the embedded an ImageBlob is created
  + Filter out weak detections through a pre-defined confidence interval
  + Extract the Facial Vector of the face
  + If on Camera System
    - Send vector to the Backend
  + If on Backend
    - Send to Facial Recognition

Facial Recognition

* Goal:
  + Take in a vector to compare face with any known faces
  + Return a Statement of whether the face is Recognized or not.
* Preconditions
  + Input is in the correct format
  + There are Faces in the database to compare to
  + Proper libraries are installed
  + Facial Recognition model is trained
* Steps:

Train Facial Recognition Model

* Goal:
  + Train the model to accurately recognize faces.

<https://pyimagesearch.com/2018/09/24/opencv-face-recognition/>

<https://pyimagesearch.com/2017/11/06/deep-learning-opencvs-blobfromimage-works/>

<https://answers.opencv.org/question/220163/face-embedding-calculation-from-java/>

<https://github.com/opencv/opencv_zoo/issues/195>