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CV Part 2 Deliverable

Algorithms and Reasoning

In this stage, we have applied viola jones for face detection and will be refining LBP for feature extraction.

The face image is first located with the viola jones algorithm and then is resized with some padding to crop out the extra background and noise. Viola jones algorithm is good at detection of features in real-time as it detects the image in grayscale and then finds it bin the colored image. It searches for haar-like features to determine where the face is located. This stage of preprocessing is finalized by resizing, normalizing, and turning the image into a grayscale image.

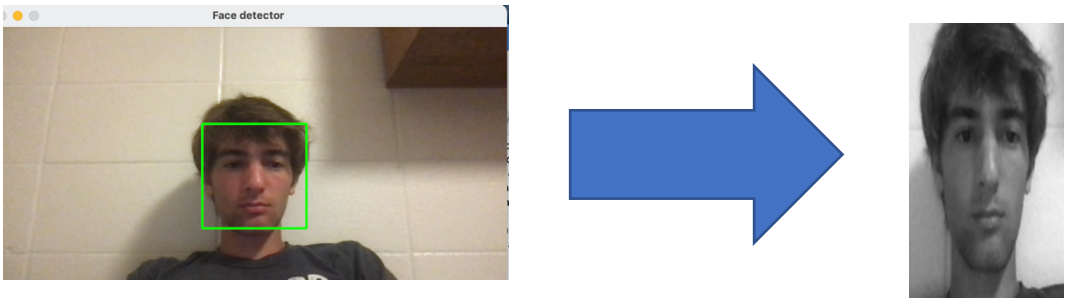
We will also be considering aligning the face if it is not centered, but this has not been implemented.

LBP will be used for feature extraction so the features can be compared later. LBP is good at creating a mapping of the distinct features so they can be compared with other features from detected faces. The smaller the comparison output, the more likely it is to be a matching face. It is an efficient texture operator that labels the pixels of an image by thresholding the neighborhood of pixels and considers the result as a binary number. This can be paired nicely with histograms to represent the face images.

Our training data will be used to refine the tools and values in the LBP program. This will save the features into a folder so they can be later accessed for comparisons.

Illustrated Example

Viola Jones and preprocessing:



LBP (example from web):