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Last week, I finished the knn component of my project. However, it was not detecting gestures properly. I suspected that the problem was caused by principal component analysis. The standard way of using pixel based knn performs a principal component analysis on the image before knn to reduce dimensions. So, I used principal component analysis on the feature vectors. I lost too much information during the process. My gesture detector worked better after I removed the principal component analysis step. I’m using a list of tuples containing distance between each point and the center of the face instead. It works with smile and neutral now. I thought about storing the feature vector of training image for knn, but I lose some flexibility by doing this. Calculating feature vector and showing images can help me visualize potential bugs. Also, I can’t modify how I calculate feature vector and easily test it if I store feature vector directly. I will only store feature vector in final version to get a performance boost.

I experimented with 3 gestures this week. It’s somewhat working, but it has some misdetections. Although my code is able to detect different gesture, it has a limitation: it’s limited by the accuracy of the key point detection. Misdetection are typically smaller than the real face. I will try to filter out some of the misdetections by observing some patterns.

In the next couple of weeks, I will work on improving the accuracy of gesture detection using key points, making a GUI for capturing and recording gestures, and trying the pixel based knn approach.

