

Abstract

Facial recognition software is becoming prevalent in many industries, however it has problems that prevent it from being perfect. There are occurrences where the current algorithms completely fail, and this project aims to fill these gaps. Such failures happen in situations such as when an individual's face undergoes significant enough facial change caused by anything such as plastic surgery, aging, or hormone therapy. These vulnerabilities ultimately slow down the process and make facial recognition an unreliable identification method.

This project focuses on recognizing transgenders, but the algorithms can be extended to recognize anyone who has undergone significant facial change. The project is partitioned into 4 phases: landmarking, training, classifying, and improvement. Landmarking consists of isolating features of the face that will be used for recognition. The training phase is where a dictionary of the features found in the landmarking phase is made. The classifying phase uses a linear classifier such as SVM to determine which test image belongs to which class by referring to the dictionary made in the training phase. The improvement phase is where small changes are made to improve recognition rates.

The results show that recognition under significant change is possible. Using only the eyes yield better recognition rates than using the entire face. Although the best recognition rate was only 30%, it is with high enough sample size that we can conclude the results are not random. With a better dataset as well as with more time, improvements can be made to further increase rates. The more we improve recognition rates the easier it will be to extend this application to other domains.