

ABSTRACT

Race is a classification system that used to categorize humans through phenotype characteristics, geographical origin, and physical appearance. In general, the human race is divided into 3, namely Mongoloid, Negroid, and Caucasian. Each race has physical characteristics that distinguish between one and another. Based on these characteristics, humans are able to distinguish races just by looking at their faces. Along with the current development, the world community has been heterogeneous means that both the Mongoloid, Negroid, and Caucasoid races already exist in the same area. This causes the identification of races based on physical characteristic is increasingly difficult for humans.

Based on these problems the author is interested in making an accurate and effective human race identification system that based on facial images. In this research there are two methods that will be used, namely Histogram of Oriented Gradient method and Linear Discriminant Analysis (LDA) method. The feature extraction process is perform using Histogram of Oriented Gradient (HOG) method whilst the classification process is perform using Linear Discriminant Analysis (LDA) method. This research used 150 images consisting of 90 training images and 60 test images. The training image consists of 30 facial images per class whilst the test image consists of 20 facial images of each class. The author added additional references to the race identification process to improve the system performance, namely the ratio of craniometric points. Craniometric points are measurement points on human skulls.

The results obtained from this final project are a Matlab-based system that can be used to identify and classify races based on 3 classes, namely Mongoloid, Negroid, and Caucasian. Based on testing and analysis that conducted, HOG and LDA methods are able to make a system that has a fairly good performance. The system results have 75% accuracy with 39.31 seconds computing time.

Keywords: *Race, Histogram of Oriented Gradient, Linear Discriminant Analysis*