

ABSTRACT

Human face contains a variety of demographic information, such as age, sex, and race. Race is a category of individuals who hereditary have the same physical and biological characteristics. The limitation of human ability in recognizing races suggests that more accurate and measurable techniques are needed in the process of race identification. The presence of an automated, measurable and accurate race identification system will also give positive impacts through its application in various fields, such as law enforcement, human-computer interaction, and social media.

The race identification technique developed in this research begins with observing facial images characteristics or features of individuals from various races to be able to make estimations based on the characteristics. The characteristics or features of the facial images are extracted using discrete cosine transform method which is then classified to the corresponding race by using decision tree algorithm. In addition, image registration and craniometric points detection algorithm were also developed in this research to rotate oblique face images and detecting the position of *craniometric points* on the face images as an additional reference in identifying race.

The three types of races that are the focus of this research are Caucasian, Mongoloid, and Negroid race. Based on the conducted test result using 60 facial images of individuals consisting of the three different races, it was found that the accuracy of the created system in estimating race reached 93.33% which is considered as favorable.

Keywords: *discrete cosine transform, decision tree, image registration, craniometric points.*