ABSTRACT

Color blindness is a condition that limits an individual's ability to distinguish between certain colors. In general, people with color blindness will have difficulty identifying specific colors. Therefore, a system capable of automatically detecting and classifying color patterns on color blindness test tools is necessary.

In this study, a color pattern detection system was developed using the K-Means method based on OpenCV. The K-Means method is used to perform color Clustering on images from the color blindness test by dividing the image pixel into several main color clusters based on a predefined number. The process begins with image acquisition using a camera, followed by preprocessing stage to enchance image quality before performing color clustering.

The results show that the K-Means method is capable of clustering colors with high accuracy, allowing the color patterns on the color blindness testing tools to be clearly detected. The OpenCV based implementation makes the system efficient and easy to integrate with other applications. System evaluation indicate that the digit recognition accuracy reaches 93.33% from a total 15 test data, with an average error rate of 6.67%. This system is expected to assist individuals with color blindness in automatically interpreting the results of color blindness tests and minimizing potential errors during the examination.

Kata Kunci: *Color Blindness, K-Means, OpenCV, Clustering*