

## ABSTRACT

Money is a tool of transactions that can be exchanged for things or services. Its importance is related to many cases of counterfeit money circulating in the community which have a bad influence for the country. Therefore, a tool based on technology is necessary to prevent money forgery.

This thesis reported a technology for detecting of IDR currency, using a template matching method and using OpenCV software for integrated on the Android. Oriented FAST and Rotated BRIEF (ORB) use image processing method to improve the quality of the image, therefore easier to be interpreted by the system. The goal of this research is to provide a fast and efficient alternative for users since everyone can use this system. With this method, the object retrieval using a phone camera, and then the first object is extracted from a set of images and stored in the database. The object is recognized by the new image by comparing each feature of the new image to the database. From a complete set of matches, a subset of intersections that approve objects and the location, scale, and orientation of new images are identified to filter out a good match. If it matches with the database, the output will produce a detected denomination, and vice versa it will produce No Matches, and the system will issue a vote according to the nominal value of the money object.

Objective of this research is to prevent the occurrence of fake banknotes ORB method and using the K-Nearest Neighbors classification that function to match feature extraction testing captured by camera phones. The obtained accuracy value is 82%, using a value of resizing 0.4, the K-Nearest Neighbor classification with  $k = 2$ , and Distance Euclidean value is 0.789% in 5 to 15 seconds.

**Keywords:** *Android, Banknote Detection, Image Processing, OpenCv, ORB, Knn-Matching.*