

ABSTRACT

Currency is an important medium of exchange in everyday life because it provides a definite value for goods and services and serves as the identity of a country. However, as the circulation of money increases, cases of counterfeit money continue to be a significant problem. During the period from May 2023 to May 2024, counterfeit currency was found to range between 8,000 and 32,000 pieces per month, with a ratio of 1–5 counterfeit pieces per 1 million pieces of currency in circulation. The lack of public awareness in distinguishing between genuine and counterfeit currency, as well as manual methods such as visual inspection, tactile examination, and 3D analysis, which are considered ineffective, have driven the need for an accessible and flexible tool. This study aims to develop a currency authenticity detection application based on the YOLOv11 algorithm. This application is designed to identify currency security features, such as watermarks and security threads, by utilising a dataset of genuine and counterfeit currency. The dataset used for model training consists of 6,380 digital images, divided into 5,088 images for training (80%), 650 images for validation (10%), and 642 images for final testing (10%). System testing using the confusion matrix The results of the model training and testing show that the YOLOv11 algorithm is capable of detecting currency security features with good performance. The best model was obtained in the second experiment with an mAP value of 0.786 for the genuine class and 0.785 for the counterfeit class, indicating balance and reliability in classification. Additionally, the developed application successfully detected genuine and counterfeit currency accurately in 10 direct tests via camera. Thus, this system has proven capable of providing a practical and accurate solution to assist the public in independently verifying the authenticity of Rupiah currency.

Keywords: *currency, counterfeit currency, YOLOv11, security features, currency authenticity detection*