

ABSTRACT

Visually impaired individuals face challenges in independently recognizing and matching clothing colors, which affects their confidence and autonomy in daily life. This study aims to develop an Android-based prototype application that assists visually impaired users in detecting clothing colors using the YOLOv5 algorithm and providing voice feedback through a text-to-speech feature. The research adopts the CRISP-DM methodology, consisting of six stages, namely Business Understanding, Data Understanding, Data Preparation, Modeling, Evaluation, and Deployment. The dataset used includes 2,620 clothing images collected from Roboflow and the author's colleagues, which were annotated and augmented to a total of 6,283 images. The YOLOv5 model was trained over 200 epochs using specific hyperparameter configurations and evaluated using precision, recall, F1-score, and mAP. The training results showed that the model achieved a precision of 83.60%, recall of 81.89%, F1-score of 82.66%, and mAP@0.5 of 86.37%, indicating consistent and accurate color detection performance. The developed prototype was successfully implemented and provided verbal color information to users. Validation through interviews with visually impaired users and staff at Sentra Wyata Guna indicated that the system improved user efficiency, independence, and comfort in choosing clothes. This study demonstrates that computer vision technology can be inclusively adapted to support the needs of individuals with visual disabilities.

Keywords: *Visual Impairment, YOLOv5, Color Detection, Computer Vision, Text-to-Speech*