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MoneyRec:

A Money Recognition System for Visually Impaired People

A dissertation by

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Abstract

Money is still considered the primary mode of exchange despite the rise of online payments. Thus, the public uses it for most of their regular transactions. A normal person has no difficulty in identifying money used for their transactions. Yet, that is not the same with visually impaired people. It is challenging for visually impaired people to identify money. In Sri Lanka, several steps have been taken to make money distinguishable for visually impaired people. Embossed dots on currency notes are one such example. However, these dots get worn out with the usage. Thus, these inaccurate techniques have become more challenging for visually impaired people to identify money. This study aims to implement a Sri Lankan money recognition system for the visually impaired. In this context, money or currency is referred to as notes and coins.

To test the research hypothesis that using object detection techniques to accurately identify money, the author conducted a literature survey of the existing work for money recognition and possible object detection techniques that can be used to identify money. The author also observed the existing money recognition applications. Furthermore, formal interviews were conducted with visually impaired people as a part of the requirement elicitation.

The results disclosed that existing work and applications are limited to identifying a single currency at a time. The finding also revealed that the EfficientDet model, which incorporates EfficientNet, is the most accurate and efficient method for object detection. Furthermore, the findings disclosed that the existing systems require internet connectivity for predictions. Finally, it can be concluded that novel techniques used in this research help to implement an accurate and efficient money identification system for the visually impaired community.

Subject Descriptors: Computer Vision, Object Detection.

Keywords: Visually impaired people, Money Recognition, Object Detection, EfficientDet.