

High Tech Vision to Detect Currency Denomination and Virtual Wallet to Retrieve the Monetary Position for Visually Debilitated People

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The transformation of currency notes and coins denomination recognition to an automated system as a solution for visually debilitated individuals to overcome the difficulties facing when handling monetary transactions. This research presents a model to detect currency notes and coins to visually debilitated individuals and to retrieve the current monetary position of them as per their obligation and provide audio output in the Sinhala language. The general procedure of the system includes digital image processing, convolutional neural network, voice identification algorithm, and monetary position calculation algorithm. Sri Lanka currency notes and coins images were captured in a wide variety of environments, in association with lighting conditions and background to make the data set, using the image preprocessing technique. The YOLOv2, R-CNN network model which is a high speed, real-time object detection algorithm to verify objects as currency notes and coins. Then by using Keras Xception model, predict images, feature extraction and fine-tuning have been done to train the data set. The Computer vision used to improve machine perception to retrieve real-time detection. The detected currency notes or coins denomination is provided as an audio output, then retrieves the obligation of the user, which is whether to debit, credit or to retrieve the current monetary position. The monetary position provides audio output in the virtual wallet as a substitute for a real-world wallet since impairments have a scarcity in memorizing their actual balance. The study revealed a system to detect and retrieve the currency denomination and monetary position of blind individuals with the overall accuracy rate of 100% in algorithm experiments.

Keywords: Visually debilitated individuals, Currency recognition, Virtual wallet, monetary position