

## **An Intelligent Postal Mail Sorter: Sinhala Hand Written Address Recognition Method Using Geometric Feature Extraction Technique and Artificial Neural Network**

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The main objective of this study is to develop a methodology to recognize Sinhala handwritten characters that can be used in postal mail sorting. The Department of Posts, Sri Lanka uses the manual sorting mechanism, while most of the developed countries are using automated sorting machines. The main reason for not having such types of machinery in local postal collecting and distribution centers is the initial cost of implementation. The machines have to be tailor-made due to the localized language. The proposed methodology is based on the geometric feature, such as Corner detection, Curve fitting and Edge detection, extraction technique and Artificial Neural Network backpropagation technique. The benchmarking of the classification system is carried out using 34 Sinhala characters that are mostly related to the district names. The neural network consists of three layers, where the input layer with 108 input nodes, the output layer with 34 nodes and a hidden layer of 78 nodes. The training and testing are performed by 850 characters and 510 characters, respectively. The accuracy of the system is around 78% of giving a correct answer. The resultant set of characters then be extracted and used to control the sorting machine. In order to prove the concept, an embedded system is developed using Arduino microprocessor. The sorting mechanism is simulated by using a servomotor that indicates the relevant mail bucket using a rotating arm.

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