
An innovative approach in Offline Sinhala Handwritten Character Recognition using Feature Extraction Techniques and SVMs

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Offline Sinhala Handwritten Character Recognition (HCR) is a most challenging task due to the large number of characters with complicated structures and, similarity between characters, and there are intra-personal differences among the handwritten characters of the same person. This paper proposes a different approach for multiclass classification to recognize offline Sinhala handwritten characters using feature extraction technique and support vector machines (SVMs). The proposed method used a feature set: basic, density and histogram of oriented gradients (HOG). The proposed approach is optimally selected feature set at each decision node of Unbalanced Decision Tree (UDT). The dataset consist of 18 vowels of Sinhala handwritten characters and 25 samples per each vowel were considered for the experimental. One-Versus-One (OVO) yields a recognition rate of 83.34%, One-Versus-All (OVA) yields a recognition rate 86.11%, Directed-Acyclic Graph (DAG) yields a recognition rate 87.78%, and UDT yields a recognition rate 90.56%. The selection of optimal features using forward feature selection technique at decision nodes of UDT shows better recognition rate of 94.45%.

Key words: *HCR, Intra-personal difference, SVM, HOG*

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