Abstract

In this paper a support vector machine based handwritten numerals recognition system of Manipuri Script (Meetei Mayek) is investigated. We have used various feature extraction technique such as background directional distribution (BDD), zone based diagonal, projection histograms and Histogram Oriented Gradient features. In Background Directional Distribution (BDD) features background distribution of neighboring background pixels to foreground pixels in 8-different directions is considered forming a total of 128 features. For the computation of diagonal features, the whole image is divided into 64 zones of equal dimension each of size 4×4 pixels then features are extracted from the pixels of each zone by moving along the diagonal, thus consisting of 64 features in total. Projection Histograms count the number of foreground pixels in different directions such as vertical, horizontal, horizontal, left diagonal and right diagonal creating a total of 190 features. The HOG based feature is computed over the validation data set, was achieved by means of 9 rectangular cells and 9 bin histogram per cell. Different combinations of these features are used for forming various feature vectors. These feature vectors are classified by using SVM classifier as 5-fold cross validation with RBF (radial basis function) kernel. Experimental results show that the proposed system performs well with the combined features and is robust to the writing variations that exist between persons and for a single person at different instances, thus being promising for user independent recognition of
Meetei Mayek numeral.

References

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**Index Terms**

Computer Science  
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**Keywords**

BDD Feature; Projection Histogram; Zone based diagonal Feature; HOG; Support Vector Machine; Meetei Mayek Script  
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