Abstract

This paper presents approach for the recognition of handwritten Marathi consonants. In order to recognize handwritten Marathi consonants, a database of handwritten Marathi consonants is developed to carry recognition experiments. Problem of handwritten Marathi consonant recognition is simplified using multilevel classification which improves recognition rate. Total 36 Marathi consonants are transformed using instance simplification technique into six sub classes depending on special property of consonants. Suitable features are extracted from different sub classes and further classification is carried out using SVM and k-NN classifiers. We have used database of 7920 characters for testing and found recognition accuracy 78.27% using SVM classifier and 73.29% using k-NN classifier.
References

- Gaurav Agrawal, Kshitij, Amitabha Mukerjee, Nimit Kumar, "Handwritten Devanagari Script Segmentation Using Support Vector Machines"
- Holambe A. N., Thool R. C., Shinde U. B. And Holambe S. N., "Brief Review Of Research On Devanagari Script"
- J. Pradeep, E. Srinivasan, S. Himavathi, "Diagonal Feature Extraction Based Handwritten Character System Using Neural Network"
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- Gaurav Agrawal, Kshitij, Amitabha Mukerjee, Nimit Kumar, "Handwritten Devanagari Script Segmentation Using Support Vector Machines"
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- J. Pradeep, E. Srinivasan, S. Himavathi, "Diagonal Feature Extraction Based Handwritten Character System Using Neural Network"
- Gaurav Agrawal, Kshitij, Amitabha Mukerjee, Nimit Kumar, "Handwritten Devanagari Script Segmentation Using Support Vector Machines"
- Holambe A. N., Thool R. C., Shinde U. B. And Holambe S. N., "Brief Review Of Research On Devanagari Script"
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- Gaurav Agrawal, Kshitij, Amitabha Mukerjee, Nimit Kumar, "Handwritten Devanagari Script Segmentation Using Support Vector Machines"
- Holambe A. N., Thool R. C., Shinde U. B. And Holambe S. N., "Brief Review Of Research On Devanagari Script"
- J. Pradeep, E. Srinivasan, S. Himavathi, "Diagonal Feature Extraction Based Handwritten Character System Using Neural Network"
- Gaurav Agrawal, Kshitij, Amitabha Mukerjee, Nimit Kumar, "Handwritten Devanagari Script Segmentation Using Support Vector Machines"
- Holambe A. N., Thool R. C., Shinde U. B. And Holambe S. N., "Brief Review Of Research On Devanagari Script"
- J. Pradeep, E. Srinivasan, S. Himavathi, "Diagonal Feature Extraction Based Handwritten Character System Using Neural Network"
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- Sandhya Arora, Debotosh Bhattacharjee, Mita Nasipuri, Dipak Kumar Basu, Mahantapas Kundu, “Combining Multiple Feature Extraction Techniques For Handwritten Devnagari Character Recognition”, 2008 IEEE Region 10 Colloquium And The Third ICIIS, Kharagpur, INDIA December 8-10, 2008
- Veena Bansal And R. M. K. Sinha, “Segmentation Of Touching Characters In Devanagari”;
- Veena Bansal And R. M. K. Sinha, “SEGMENTATION OF TOUCHING AND FUSEDDEVANAGARI CHARACTERS”;

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