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Ashish Kumar Luhach
Janos Arpad Kosa
Ramesh Chandra Poonia
Xiao-Zhi Gao
Dharm Singh *Editors*

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Abstract

Current research in OCR is focusing on the effect of multi-font and multi-size text on OCR accuracy. To the best of our knowledge, no study has been carried out to study the effect of multi-fonts and multi-size text on the accuracy of Devanagari OCRs. The most popular Devanagari OCRs in the market today are Tesseract OCR, Indsenz OCR and eAksharayan OCR. In this research work, we have studied the effect of font styles, namely Nakula, Baloo, Dekko, Biryani and Aparajita on these three OCRs. It has been observed that the accuracy of the Devanagari OCRs is dependent on the type of font style in text document images. Hence, we have proposed a multi-font Devanagari OCR (MFD_OCR), text line recognition model using long short-term memory (LSTM) neural networks. We have created training dataset *Multi_Font_Train*, which consists of text document images and its corresponding text file. This consists of each text line in five different font styles, namely Nakula, Baloo, Dekko, Biryani and Aparajita. The test dataset is created using the text from benchmark dataset [1] for each of the font styles as mentioned above, and they are named as *BMT_Nakula*, *BMT_Baloo*, *BMT_Dekko*, *BMT_Biryani* and *BMT_Aparajita* test dataset. On the evaluation of all OCRs, the MFD_OCR showed consistent accuracy across all these test datasets. It obtained comparatively good accuracy for *BMT_Dekko* and *BMT_Biryani* test datasets. On performing detailed error analysis, we noticed that compared to other Devanagari OCRs, the MFD_OCR has consistent, insertion and deletion type of errors, across all test dataset for each font style. The deletion errors are negligible, ranging from 0.8 to 1.4%.

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