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Hindi Handwritten Character Recognition System

Prof. Dr. Vinay Nagalkar, Vedant Shinde, Shivani Bhujbal, Shreya Darekar, Soham Sable
Computer Department
Ajeenkya DY Patil School of Engineering, Pune

Abstract: *This study presents the development of a Convolutional Neural Network (CNN) framework for the recognition of the handwritten Devanagari characters and digits. The proposed methodology leverages deep learning techniques, utilizing TensorFlow and Keras libraries to design and implement an end-to-end classification system. The dataset, organized into class-specific directories, is preprocessed and augmented to enhance model generalization. Two CNN architectures are investigated: a lightweight model inspired by LeNet and a deeper variant integrating batch normalization and dropout regularization for improved stability and performance. The models are trained and evaluated using standard metrics, with validation accuracy and loss trends analyzed to assess learning behavior. The optimal model is saved for deployment, and a prediction pipeline is constructed for inference on unseen data. Training histories are also preserved for subsequent performance visualization. Experimental results demonstrate the effectiveness of the approach, offering a robust solution for automated recognition of handwritten Devanagari script, with potential applications in digitization and language processing tasks*

Keywords: Convolutional Neural Network

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