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Deep Learning Based Handwritten Digit Recognition

Dr. Shiva Kumar V[1] and M Raghavendra[2]
Associate Professor, Department of Computer Science and Engineering, Kishkinda University, Ballari, India [1]
PG Student, Department of Computer Science and Engineering, Department, Kishkinda University, Ballari, India [2]

Abstract: *As computers play an increasingly vital role in human life and daily activities across various domains, humans have leveraged their intelligence and creativity to use computers in natural and effective ways. Hence, a reliable method for recognizing handwritten digits is essential. Handwritten Digit Recognition (HDR) can offer a clear benefit in this aspect. Deep Learning (DL) has been a powerful tool for solving various problems with high accuracy in recent years. This surveys the different methods for HDR that have been developed by various researchers. Machine learning has enriched this analysis with different approaches that involve supervised learning, unsupervised learning and reinforcement learning. Next, this project reviews the applications of deep learning methods to different languages in real-world scenarios. DL techniques are specially designed for handling complex data formats. Many natures inspired Convolutional Neural Network (CNN) models are discussed in this section.*

Keywords: Handwritten Digit Recognition, Handwritten Text Recognition, Pattern Recognition, Computer Vision, Image Processing, Deep Learning, Convolutional Neural Network (CNN), Neural Networks, Feature Extraction, Classification, MNIST Dataset, Image Preprocessing, Data Augmentation, Noise Removal, Segmentation, Real-Time Digit Recognition, Digital Whiteboard, Camera-Based Input, GUI, Text-to-Speech, Accuracy, Training Loss, Validation Loss, Robustness, Unit Testing

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