

Analysis Of Handwritten Character Recognition and Interpretation of Results

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ABSTRACT

Handwritten character recognition is a fundamental problem in the field of image processing and pattern recognition. With the increasing digitization of information, the accurate and efficient recognition of handwritten characters has gained significant importance. This paper presents an analysis of various techniques and approaches used for handwritten character recognition, focusing on both traditional methods and modern deep learning-based approaches and artificial neural networks (ANN), intelligent character recognition (ICR), and intelligent word recognition (IWR) as methods for identifying handwriting (IWR). Convolutional Neural Networks (CNNs), Recurrent Neural Networks (RNNs), and their variants have demonstrated remarkable performance in capturing complex patterns and hierarchies in handwritten characters. The paper delves into the architecture and functioning of these networks, emphasizing their ability to automatically learn relevant features from raw input data. Transfer learning and data augmentation techniques are explored as means to mitigate the challenges of limited training data. Multiple characters entered in a single picture, tilted image, and rotated image are all dealt with using additive image processing methods. With the unseen test picture, training system had a more than 95% accuracy on average. The objective of the research work is to analyse learn how to recognize handwritten characters and to investigate the current state of handwritten word recognition research.

1. Introduction

Handwritten character recognition is the task of converting handwritten text into digital format, holding great significance across various domains. It enables the digitization of historical documents, streamlines postal services, enhances banking processes, facilitates education, and improves personal device interactions. This recognition process is challenging due to the diverse nature of human handwriting, encompassing different styles and variations. The importance of accurate recognition lies in its ability to efficiently convert handwritten content into machine-readable data, thus enabling accessibility, searchability, and automation in fields ranging from document preservation to modern digital interfaces. The accuracy of text recognition in existing systems is strongly influenced by the caliber of the input document. To increase system accuracy, many classifiers use uppercase and lowercase English alphabets. Offline and online handwriting digital recognition are the two primary varieties of handwritten digital recognition. Although the latter is limited by the input device, the former is easier to distinguish than the latter. A scanner, digital camera, CCD, or other image capture device may be used as the latter. It is more extensively utilized since it is not limited by the input device. At the moment, the three primary features of handwriting digital recognition are as follows.