

# **A Review on AI-Handwritten Text Recognition Using GEN-AI**

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**Abstract:** *Handwritten text recognition (HTR) represents a significant challenge in the field of document digitization and information retrieval due to the inherent variability and idiosyncrasy of handwriting patterns across individuals and contexts. This technical treatise presents a comprehensive examination of HTR systems leveraging advanced artificial intelligence and generative AI methodologies. The document delineates the complete processing pipeline, encompassing image preprocessing, feature extraction, neural network-based classification, and post-processing optimization techniques. We propose a hybrid deep learning architecture integrating Convolutional Neural Networks (CNNs) and Long Short-Term Memory (LSTM) networks to address the multifaceted challenges of character segmentation and word-level classification. The methodology encompasses rigorous data preparation protocols, sophisticated feature engineering strategies, and systematic performance evaluation metrics. This work demonstrates the efficacy of advanced neural architectures in achieving robust handwritten character recognition while discussing contemporary computational challenges and optimization strategies for real-world deployment scenarios.*

**Keywords:** Handwritten Text Recognition (HTR), Generative AI, Convolutional Neural Networks, Long Short-Term Memory Networks, Image Processing, Computer Vision, Optical Character Recognition (OCR), Support Vector Machines, Feature Extraction, Neural Architecture Design

