

# **A Comprehensive Investigation of Image Classification Algorithms for Early Detection of Learning Disabilities using Visual Data**

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## **Abstract**

In the pursuit of inclusive education, early detection of learning disabilities plays a pivotal role. Traditional methods of identification often fall short due to their subjective nature and limited ability to capture nuanced behavioral and cognitive patterns. This study delves into the practical implementation of image classification algorithms, specifically Convolutional Neural Networks (CNNs), for early detection. Building on existing research, the study investigates the adaptability of CNNs to diverse cultural contexts and emphasizing the importance of transparent algorithms. By analyzing behavioral patterns, emotional cues, and handwriting traits, the study aims to identify early signs of learning disabilities. The research not only contributes to the growing body of knowledge in educational technology but also offers actionable insights for educators, policymakers, and technologists, fostering an inclusive learning environment where every student's needs are proactively met.

**Keywords:** Visual data, Image classification, Convolutional Neural Networks