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## Comparative Performance of Deep Learning and Machine Learning Algorithms on Imbalanced Handwritten Data

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### Abstract

Imbalanced data is one of the challenges in a classification task in machine learning. Data disparity produces a biased output of a model regardless how recent the technology is. However, deep learning algorithms, such as deep belief networks showed promising results in many domains, especially in image processing. Therefore, in this paper, we will review the effect of imbalanced data disparity in classes using deep belief networks as the benchmark model and compare it with conventional machine learning algorithms, such as backpropagation neural networks, decision trees, naive Bayes and support vector machine with MNIST handwritten dataset. The experiment shows that although the algorithm is stable and suitable for multiple domains, the imbalanced data distribution still manages to affect the outcome of the conventional machine learning algorithms.

### Keywords

**Author Keywords:** [Deep belief networks](#); [support vector machine](#); [back propagation neural networks](#); [imbalanced handwritten data](#); [classification](#)

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