Enhancing Image Classification Performance: A Comparative Analysis of Optimization Algorithms

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Abstract: *In this paper, optimization algorithms are subjected to a comparative investigation. These include several optimization methods, including Adam, RMSprop, and SGDM, which might enhance the precision and discriminative ability of cutting-edge convolutional neural networks (CNNs).Adam excelled in performance in identifying different image classes with a 100% accuracy rate. In addition, Adam also achieved a mean ROC-AUC (Receiver Operating Characteristic - Area Under the Curve) score of 100%, highlighting their unmatched ability to discern between positive and negative cases. Moreover, the results of this work highlight Adam's potential as a strong tool for image classification jobs where high accuracy and reliable discrimination are essential. Adam's dominance over RMSprop and SGDM highlights its potential to improve face image classification tasks, pushing the limits of what is possible in the field of computer vision and deep learning.*

Keywords: Deep Learning, Image Classification., Optimization Algorithms, ResNet50

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