

IMPACT OF CLASS IMBALANCE ON CONVOLUTIONAL NEURAL NETWORK TRAINING IN MULTI-CLASS PROBLEMS

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Abstract

Image classification is the process of assigning an image one or multiple tags that describe its content. To perform the classification, a model must be designed for learning the labels to be assigned to a given image. The assignment is made through a learning process that uses a set of previously labeled training images, which must be large enough to guarantee efficient training. Many approaches have been researched to find optimal solutions to classification problems, however, databases with large amounts of images and the increased processing power of GPUs have made convolutional neural networks (CNNs) the best choice, as they outperform traditional algorithms. This paper presents a systematic analysis aimed at understanding how the issue of class inequality affects the efficiency of a convolutionary neural network trained for a task of image classification, and presents a technique for correcting the overtraining and that the network generalization.

Keywords

Convolutional neural network, Impact of class imbalance, Multi-class problems