Date __/__/____

Saathi

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Topic: Reduction of class activation uncertainty with background information

Abstract:

Multi-task learning is a popular approach to training high performing neural networks with improved generalization. In this paper, we propose a background class to achieve improved generalization at a lower computation compared to multi task learning to help researchers and organisations with limited computation power. We also present a methodology for selecting background images and discuss potential future improvements. We apply our approach to several datasets and achieved improved generalization with much lower computation. We also investigate class activation mappings (CCAMs) of the trained model and observed the tendency towards looking at a bigger picture in a few class classification problems with the proposed model training methodology. Applying transfer with the proposed background class, we receive state-of-the-art performance on the STL-10, CIFAR-10, CIFAR-100, Oxford-102, Caltech-101 and CINIC-10 datasets. Example scripts are

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Conclusion:

In this work, we have proposed background classes to reduce class activation uncertainty without significantly increasing the training time. Our theoretical study has also indicated an improved generalization while using an optimal background class. We have written a short methodology for developing background classes. According to our experiments, on several publically available datasets, we have achieved superior performance in most situations while using traditional CNNs. Applying ViT-L/16 transformer with the background class, we have achieved significant performance enhancement. However, we haven't obtained CAM with the transformer, as transformers are not yet well explainable. Future researchers may obtain CAM and deep feature factorization with transformers.