

Enhancing Transfer Learning Techniques for Improved Medical Imaging Analysis

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The growing implementation of machine learning and deep neural networks in healthcare demonstrates a pressing need to refine computational methods for medical image analysis. Researchers have employed standard pretrained models, often originating from natural image repositories, to guide diagnostic tasks involving radiologic images. One such dataset used to pretrain radiological classification models is RadImageNet [4], performing better than ImageNet in several transfer learning applications. We aim to enhance the performance of RadImageNet pretrained models in these same transfer learning applications. We evaluated three different methods, a modern architecture (EfficientNetv2), advanced data augmentation when finetuning, and the addition of new modalities to pre-training. In the four transfer learning applications, EfficientNetv2 performs worse than the older base architectures evaluated in the original RadImageNet paper, and models trained on the augmented data performed better than models trained on the unaugmented data. When adding new modalities to pretraining, InceptionResNetv2 achieved the best training metrics.