Abstract: Deep-learning on Lossily Compressed Pathology Images

Adverse Effects for ImageNet Pre-trained Models

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Digital whole slide imaging (WSI) systems allow scanning complete probes at microscopic resolutions, making image compression inevitable to reduce storage costs. While lossy image compression is readily incorporated in proprietary file formats as well as the open DICOM format for WSI, its impact on deep-learning algorithms is largely unknown. We compare the performance of several deep learning classification architectures on different datasets using a wide range and different combinations of compression ratios during training and inference. We use ImageNet pre-trained models, which is commonly applied in computational pathology. With this work, we present a quantitative assessment on the effects of repeated lossy JPEG compression for ImageNet pre-trained models. We show adverse effects for a classification task, when certain quality factors are combined during training and inference. This work was published on the International Workshop on Medical Optical Imaging and Virtual Microscopy Image Analysis [1].

References

1. Fischer M, Neher P, Götz M, Xiao S, Almeida SD, Schüffler P et al. Deep-learning on lossily compressed pathology images: adverse effects for ImageNet pre-trained models. Medical Optical Imaging and Virtual Microscopy Image Analysis. Ed. by Huo Y, Millis BA, Zhou Y, Wang X, Harrison AP, Xu Z. Cham: Springer Nature Switzerland, 2022:73–83.

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