Artifact Augmentation for Learning-based Quality Control of Whole Slide Images

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The acquisition of whole slide images is prone to artifacts that can require human-control and re-scanning both in clinical workflows and in research oriented settings. Quality control algorithms are a first step to overcome this challenge as they limit the use of low quality images. Developing quality control systems in histopathology is not straightforward, also due to the limited availability of data related to this topic. We address the problem by proposing a tool to augment data with artifacts. The proposed method seamlessly generates and blends artifacts from an external library to a given histopathology dataset. The datasets augmented by the blended artifacts are then used to train an artifact detection network in a supervised way. We use the YOLOv5 model for the artifact detection with a slightly modified training pipeline. The proposed tool can be extended into a complete framework for the quality assessment of whole slide images.