

Motivation

Models deployed in the real-world need to handle all kinds of unknown unknowns and distributional shifts that it wasn't trained for. Data augmentation is a powerful technique of achieving robustness and improved generalization on unseen data and when combined with additional regularization loss functions, it helps even further.

Safety Hypothesis:

The method addresses the safety concern Brittleness of DNNs. It enhances the performance of deep neural networks in the presence of input corruptions, whereas the performance on clean data drops insignificantly.

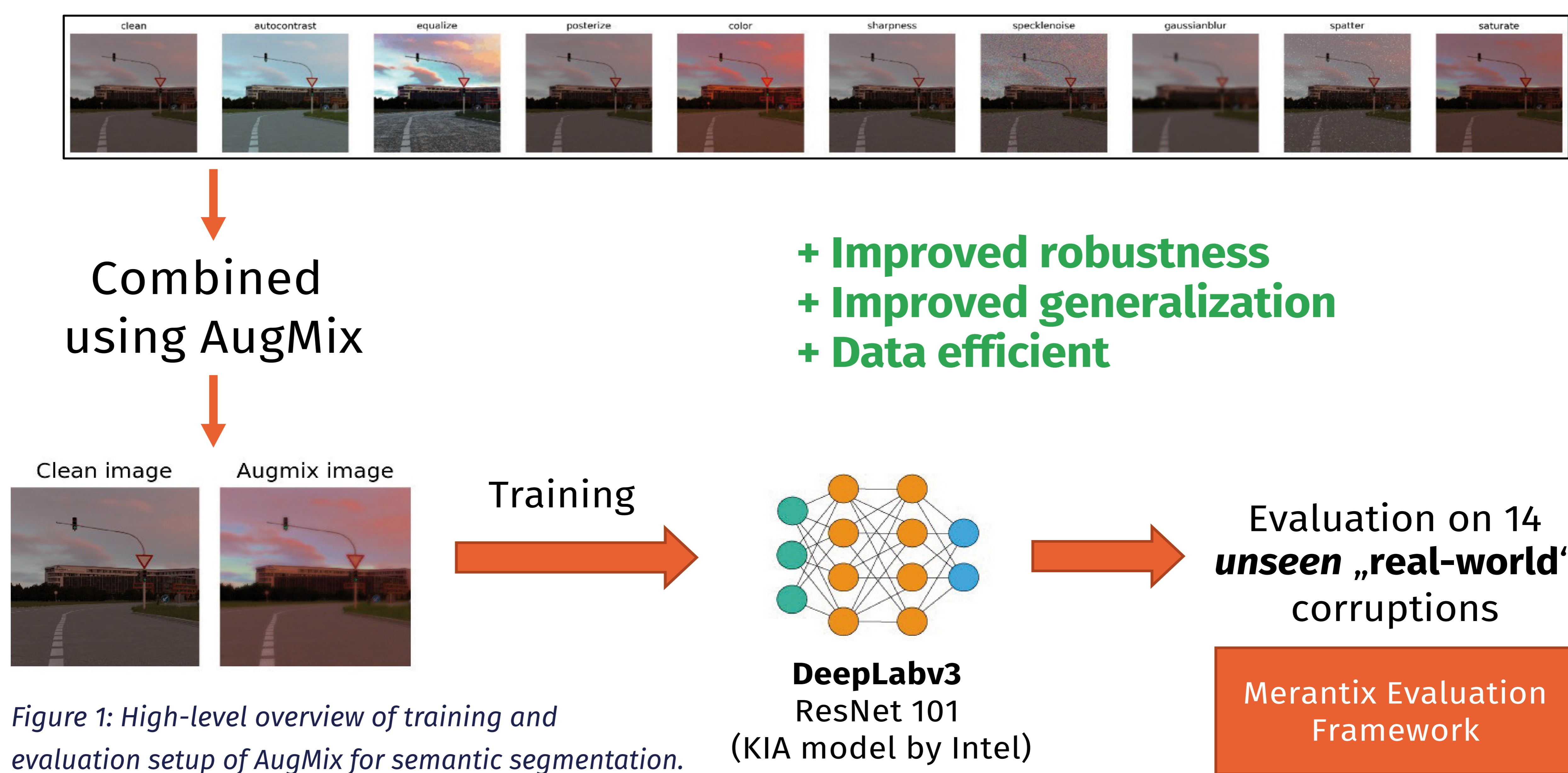


Figure 1: High-level overview of training and evaluation setup of AugMix for semantic segmentation.

AugMix Overview

Augmix is a state-of-the-art data augmentation technique that helps improve model robustness and slots in easily to existing training pipelines. It combines several augmentations that are sampled stochastically and layered together to produce high diversity of augmented images. Additional consistency loss functions such as jenson-shanon divergence loss helps learn consistent feature embeddings. The method helps improve model generalization on unseen data and cope with corner cases.

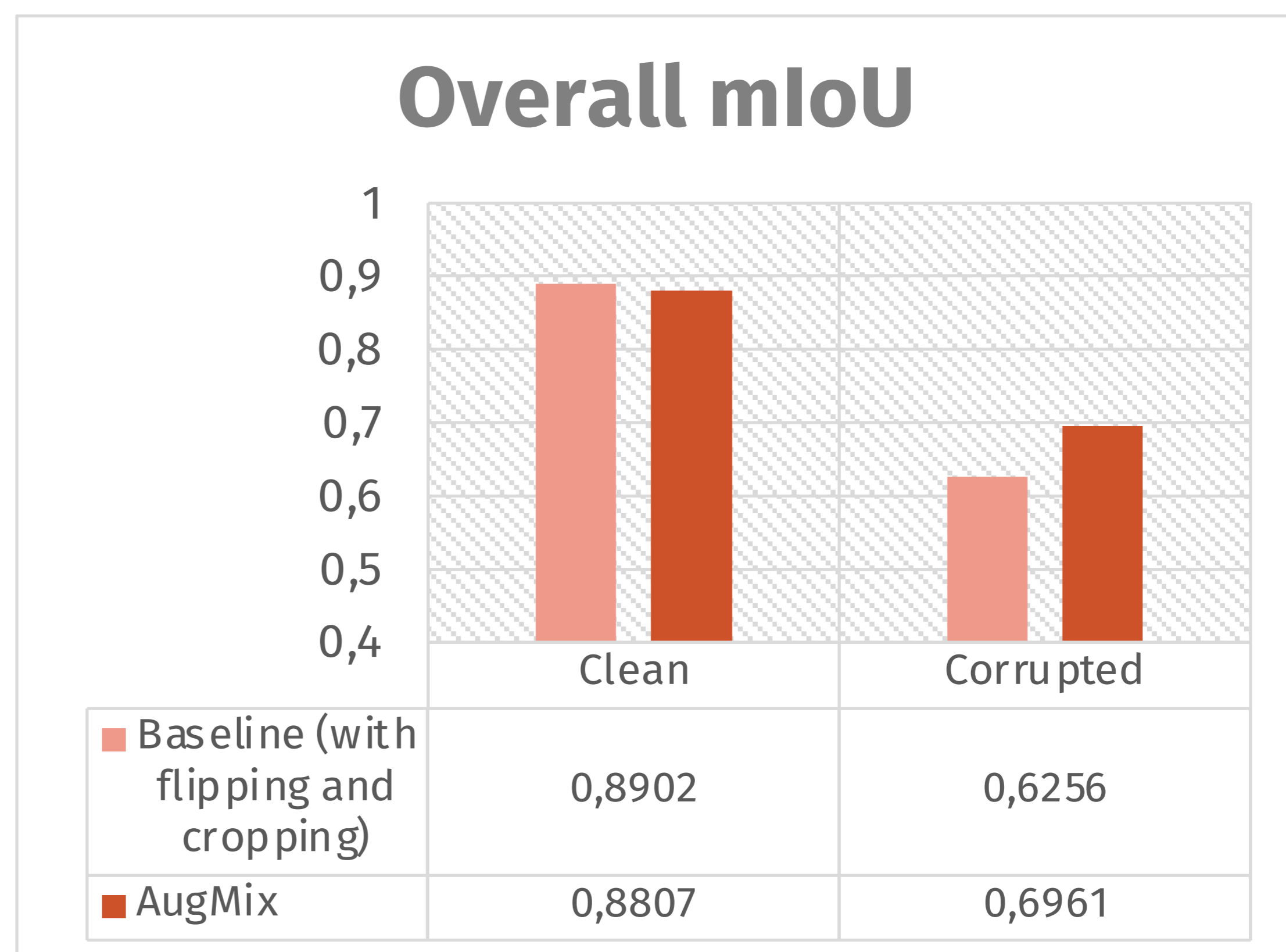


Figure 2: Averaged overall mIoU Results (based on Fig. 3)

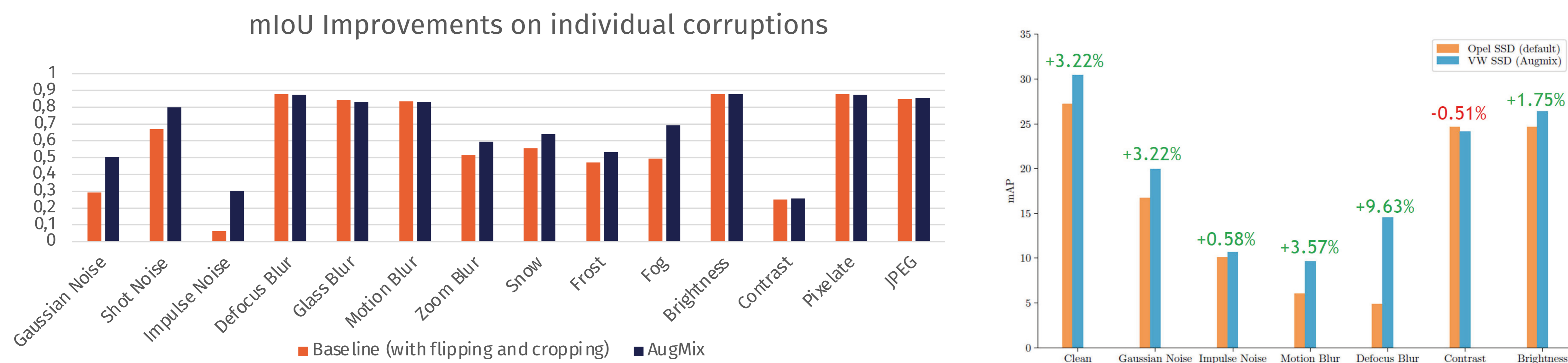


Figure 3: Results of Augmix trainings v/s Baseline (left: DeepLabv3+, right: OpelSSD r3v1)

References:

Hendrycks et al., „AugMix: A Simple Data Processing Method To Improve Robustness and Uncertainty“, Proc. Of ICLR-Workshop, May 2020, Addis Ababa, Ethiopia