
ErrorAug: Making Errors to Find Errors in Semantic Segmentation

Here we include additional visualizations of our swapping transformations applied over real images and segmentation maps(Section 6), and visualizations of conditional generative models applied over a shifted distribution (Section 7).

6 SWAPPING TRANSFORMATIONS

In Figure: 6, we illustrate the effects of applying our swapping transformations on various images from Cityscapes.

7 SWAPPING TRANSFORMATIONS

In figure 7 , we observe some of the synthetic images generated by the generative model (SPADE [Park et al. \(2019\)](#)) of SynthCP. It illustrates stylist differences in the data distributions the models are evaluated over. Furthermore we see the large proportion of errors in the predicted segmentation maps and show how *ErrorAug* does a better job at identifying contiguous error regions.

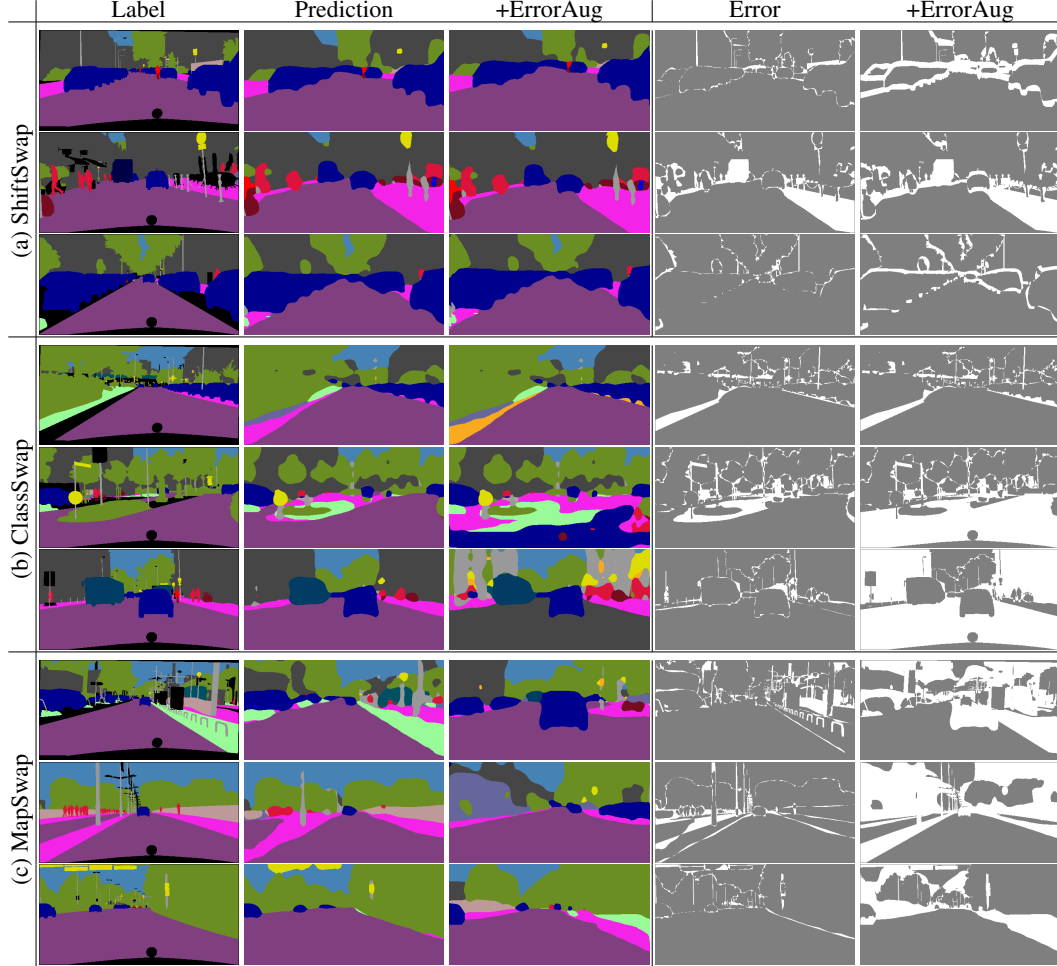


Figure 6: The three swapping operations of ErrorAug are illustrated above. The upper rows illustrate ShiftSwap, which moderately shift the locations of the predictions in this segmentation map. The ErrorAug induced error maps in the far right illustrate an increase in errors at the borders of objects. The middle rows demonstrate ClassSwap, which swap the class probabilities throughout an segmentation map. The illustrated error maps for this augmentation involve large spatially coherent regions which previously correctly classified becoming errors. MapSwap is represented in the last rows, where we observe that despite replacing this semantic segmentation map with one derived from another image there are still significant regions of semantic overlap and the errors present in complex ways.

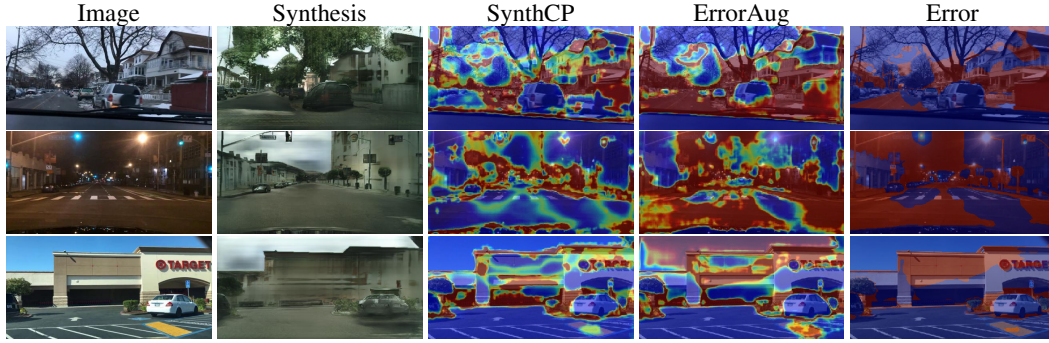


Figure 7: Evaluating both SynthCP and ErrorAug as they attempt to predict errors on BDD100k, a different domain from which they were trained on. ErrorAug better able to predict erroneous regions, especially spatial cohesive regions than SynthCP. The synthesized image generated as an intermediate step of SynthCP gives insight into how well the generative model works on the shifted domain.