# Demo 1.4: Enhanced localization using vision sensors

Robust Localization

- Front camera provides images (see image (a))

- A Deep Learning (DL) Neural Network segments the left and right road boundaries (see image(b))

- Given the road boundaries prediction, we compute the relative position of the car with respect to the road using a classical computer vision lane fitting approach

- First, we introduce several synthetic corruptions (see images (c) and (d)), simulating possible camera failures, to benchmark the robustness of our DL method which segments the road boundaries

- To improve the robustness of our DL method, we employ AugMix, an image augmentation approach during training.

- By using AugMix, we also robustify the localization approach algorithm which relies on the DL model output
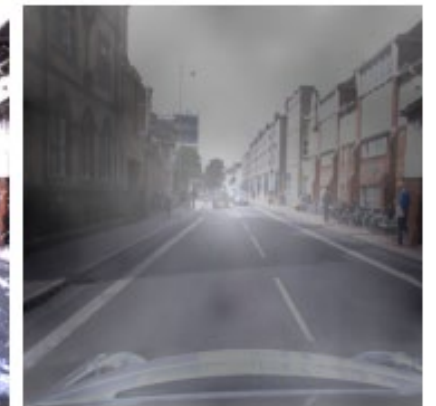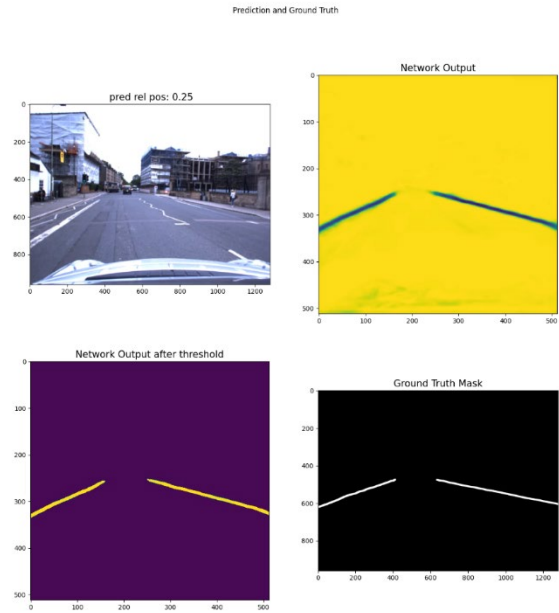

(a)
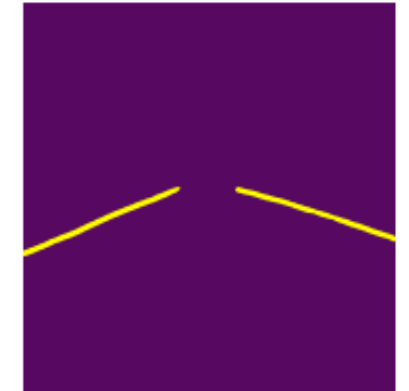
(b)
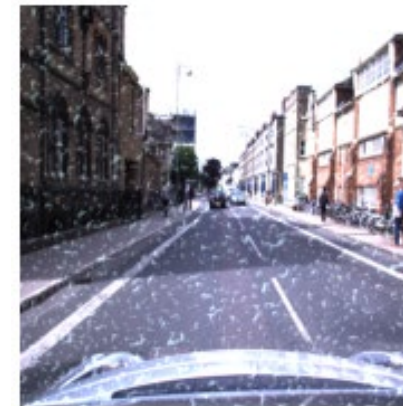
(c)

(d)

Results

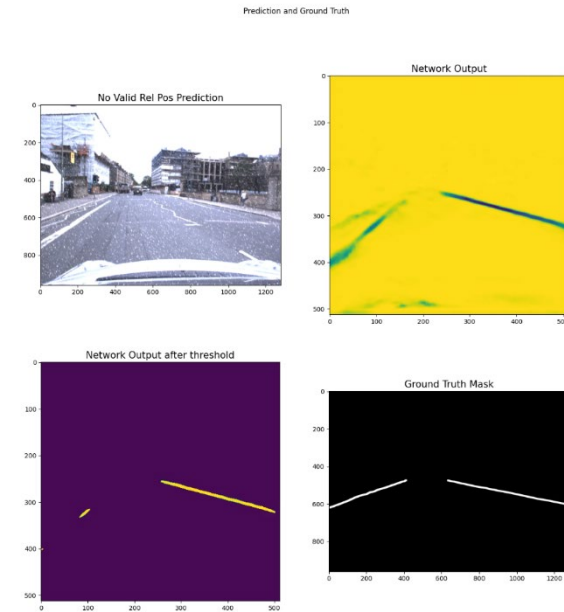Figure: ResNet-50 prediction with relative position on clean scenario (No AugMix)

Figure: ResNet-50 prediction with relative position on snow scenario (No AugMix)
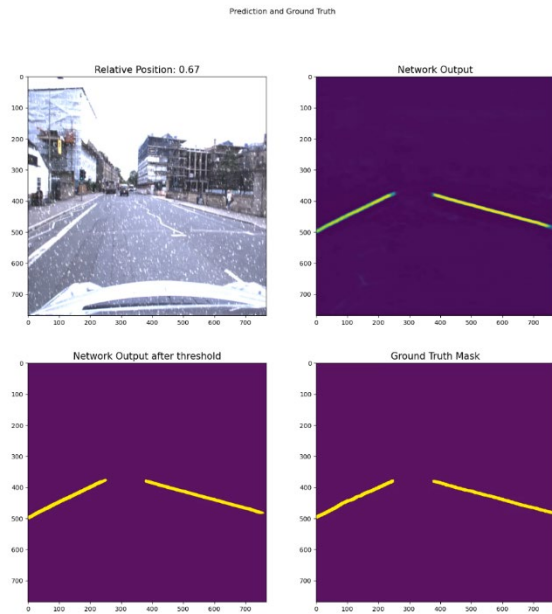
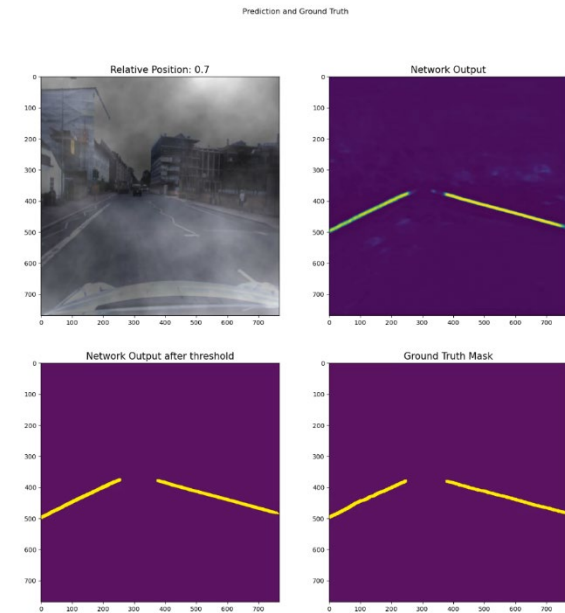INTERNAL

Results

Figure: Model with AugMix on Snow severity 1

Figure: Model with AugMix on Fog severity 5

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