

## Task 7:

### Introduction

To support the navigation of a Blind or Visually Impaired Person (BVIP) on sidewalks, our pre-trained segmentation model will be fine-tuned to detect sidewalks more accurately. Currently, a model trained on the Cityscapes dataset primarily provides segmentation masks for road scenes. However, sidewalks, especially those centered in the image, may be incorrectly detected as roads. This misclassification is crucial for systems designed to aid BVIP navigation.

### Prepare Dataset

For fine-tuning, we have prepared a dataset with 1,000 images where the sidewalk is centered. The dataset includes 600 images for training, 200 for validation, and 200 for testing. It also contains a JSON file describing the RGB values and class IDs for the objects. Use this file to prepare the dataset for training. The corresponding masks for the images are labeled with RGB values. Prepare a script, `convert-masks.py`, which converts these RGB values into object IDs and stores the images as grayscale. These images are then ready for training. The dataset is available for download here: <https://faubox.rrze.uni-erlangen.de/getlink/fiCSvMhvKMiUox3LTMayzG/Mapillary-Vistas-1000-sidewalks.7z>

### Fine-Tuning

Prepare a data loader similar to the one implemented for the Cityscapes dataset. Use this data loader for training with your pre-trained weights from previous training sessions. Note that the object IDs in the Mapillary Vistas dataset differ from those in Cityscapes. Define the object IDs to match those in the Cityscapes dataset. Continue to use your previous scripts for training.

### Evaluation

Utilize the evaluation scripts to test your model on both the Cityscapes dataset and the fine-tuned model. Create an `eval_models.txt` file to store the scores from both models. If the training process is successful, you should observe an improvement in the scores.

The delivery date is Thursday, 25 January 2024, between 18:00 and 20:00. Our next meeting is scheduled for Friday, 26 January 2024, at 13:00. Good luck.