

Task 8:

To begin with this task, we first will describe how to use the environment for training we have prepared.

Environment

1. Create an account for the CIP pool desk if you do not already have one. The link can be found at [0](#). (An account should exist at the latest after about 15 minutes.)
2. Log in via SSH or XPRA. If there are any difficulties, instructions can be found at [1](#). Please choose a computer with a GPU. You can find them at [2](#).
3. Load the necessary modules. Instructions in case of difficulties can be found at [3](#). The commands are: `module load python module load cuda`
4. Know that the training data is located in the folder `"/proj/rsu-vi"`. There, the training data is in folders named `"Mapillary-Vistas-1000-sidewalks"` and `"trainvaltest"`. In the folder named `"trainvaltest"`, there are two folders named `"gtFine_trainvaltest"` and `"leftImg8bit_trainvaltest"`. Important! The directory for the training data is not visible at first. Enter the command `cd /proj/rsu-vi` for that. Afterward, the directory is mounted and visible for your login session.

Training pipeline

Use your current pipeline to train your model on the Cityscapes dataset. If they do not exist, introduce checkpoints to store your training parameters. At the start of the training, your script should check if these checkpoints exist and load them to resume from your last training status. This allows you to continue your training from the last status, for instance, if your last login session was closed. Also, introduce the possibility to store your training and validation accuracy and loss. You need this information to get an overview of your training, such as identifying the epoch at which your model achieves the highest accuracy. For this purpose, you can store these values in a dictionary and, at the end of the training, save this information to a file. To improve accuracy, you don't need to use all classes! For this task, use only the following classes: 0. void (all classes not used) 2. road

1. sidewalk
2. car
3. person

4. traffic sign
5. traffic light
6. bicycle

Training on the Mapillary dataset

To train on the Mapillary dataset, you need to convert the labeled RGB images into grayscale images. Each grayscale value defines the ID of the class. You can define your classes similar to the previous listing. Please do not use all classes from the Mapillary dataset. Using all classes can decrease the accuracy of your model.

Evaluation of your models

For every training session, store your training and validation accuracy and loss as previously described. Also, create a model-IOU.txt file to have an overview of your training. If the training was successful, you will see an improvement in the IOU (Intersection Over Union) of the road and sidewalk classes.

Delivery

Submit your Python scripts: `training_pipeline.py`, `convert_masks_to_grayscale.py`, and `inference.py` files, along with the trained models (please provide them as FAU Box links), by Thursday (08.01.2024) between 18:00 – 20:00. If you have questions about this task, please write your questions as comments on this issue. Good luck.