Setup to Train on own Dataset with Darknet Detector

1. Download GitHub fork https://github.com/andreasmarxer/darknet

2. Log in on Leonhard HPC cluster from ETH

3. Load the following modules on cluster
   a. module load/cuda/9.0.176
   b. module load/cudnn/7.0
   c. module load gcc/4.8.5

4. Build the Darknet detector
   a. start an interactive shell and build with make
      i. *bsub -Is -n 1 -W 4:00 -R "rusage[mem=12000,ngpus_excl_p=1]" bash*
      ii. *make*

5. Change .cfg file → yolov3-obj.cfg
   a. copy and set parameters for training: **bs=64, subdivision = 16**, …
   b. **SAVE in: cfg/**

6. Change .data file → obj-120.data
   a. copy and specify classes=1, train and valid data
   b. **SAVE in: /data/**

7. Create .names file → obj.names
   a. copy and name the 1 class we have
   b. **SAVE in: /data/**

8. Put image-files (.jpg) of your objects in the directory
   a. **SAVE in: /data/obj-120/**

9. Put annotations in txt yolo format in the directory
   a. **SAVE in: /data/obj-120/**

10. Download pre-trained weights for the convolutional layers
    a. **SAVE in: backup**

11. Kick of training
    *bsub -n 4 -W 12:00 -R "rusage[mem=2048, ngpus_excl_p=1]" ./darknet detector **train** data/obj-120.data cfg/yolov3-obj.cfg backup/darknet53.conv.74 -dont_show -mjpeg_port 8090*

12. Weights are saved in:
    a. yolo-obj_last.weights will be saved to the **darknet/backup/** for each 100 iterations)
    b. yolo-obj_xxxx.weights will be saved to the **darknet/backup/** for each 1000 iterations)

13. Predict all images in *validation_window100ad20asl.txt* to the file results.txt:

    a. without showing and save predicted boxes in txt file
    *./darknet detector **test** data/obj-120.data cfg/yolov3-obj.cfg backup/yolov3-obj_4000.weights -dont_show -ext_output < data/validation_window100ad20asl.txt > result.txt*

    b. for getting one text file per image as needed for the Depth Completion in MATLAB use the shell script **predict_lish.sh** created

14. MAP calculation on validation set

    a. setting IOU threshold
    *./darknet detector **map** data/obj-120.data cfg/yolov3-obj.cfg backup/yolov3-obj_4000.weights -iou_thresh 0.5 >map_validation100ad20asl.txt*