

**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 -ls -n 1 -W 4:00 -R "rusage[mem=12000,ngpus_excl_p=1]" bash`
    - ii. `make`
5. Change .cfg file → yolo3-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/yolo3-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/yolo3-obj.cfg backup/yolo3-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 created
14. MAP calculation on validation set
  - a. setting IOU threshold  
`./darknet detector map data/obj-120.data cfg/yolo3-obj.cfg backup/yolo3-obj_4000.weights -iou_thresh  
 0.5 >map_validation100ad20asl.txt`