

Training report for U-Net (3D) model (testmodel)

Date: 2024-12-19

Training time: 2.0hour(s) 36.0min(s) 14sec(s)

Information for your materials and methods:

The U-Net (3D) model was trained from scratch for 10 epochs on 53 paired image patches (image dimensions: (152, 314, 554), patch size: ((512, 512, 8))) with a batch size of 3 and a weighted_binary_crossentropy loss function, using the U-Net (3D) ZeroCostDL4Mic notebook (v 2) (von Chamier & Laine et al., 2020). Key python packages used include tensorflow (v 2.12.0), keras (v 2.12.0), numpy (v 1.22.4), cuda (v - No cuda found -). The training was accelerated using a - No GPU found - GPU.

Augmentation: The dataset was augmented by

- gaussian blur
- linear contrast
- additive gaussian noise

Parameters

Default Advanced Parameters were enabled

Parameter	Value
number_of_epochs	10
batch_size	3
patch_size	512x512x8
image_pre_processing	randomly crop to patch_size
validation_split_in_percent	20
downscaling_in_xy	1
binary_target	True
loss_function	weighted_binary_crossentropy
metrics	dice
optimizer	adam
checkpointing_period	epoch
save_best_only	False
resume_training	False

Training Dataset

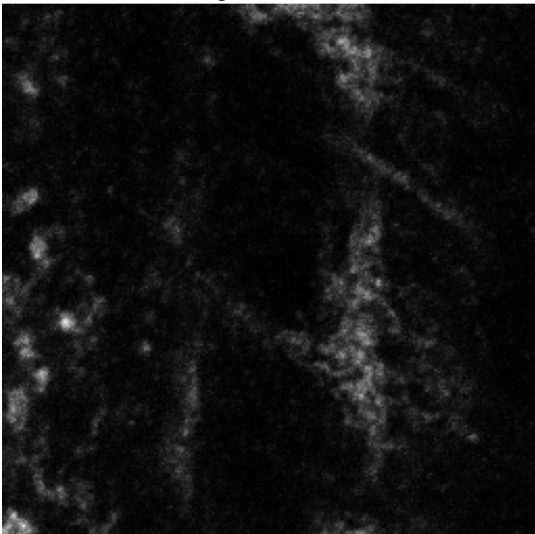
Training_source: data/source

Training_target: data/target

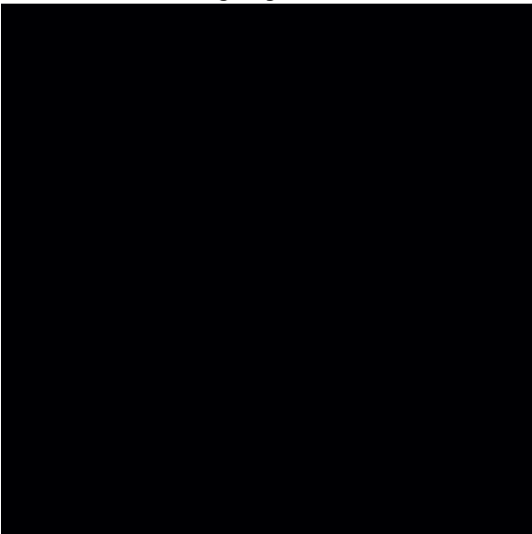
Model Path: data/test_model/testmodel

Example Training pair (single slice)

Training source (z = 76)



Training target (z = 76)



References:

- ZeroCostDL4Mic: von Chamier, Lucas & Laine, Romain, et al. "Democratising deep learning for microscopy with

ZeroCostDL4Mic." Nature Communications (2021).

- Unet 3D: Çiçek, Özgün, et al. "3D U-Net: learning dense volumetric segmentation from sparse annotation."

International conference on medical image computing and computer-assisted intervention. Springer, Cham, 2016.

Important:

Remember to perform the quality control step on all newly trained models

Please consider depositing your training dataset on Zenodo