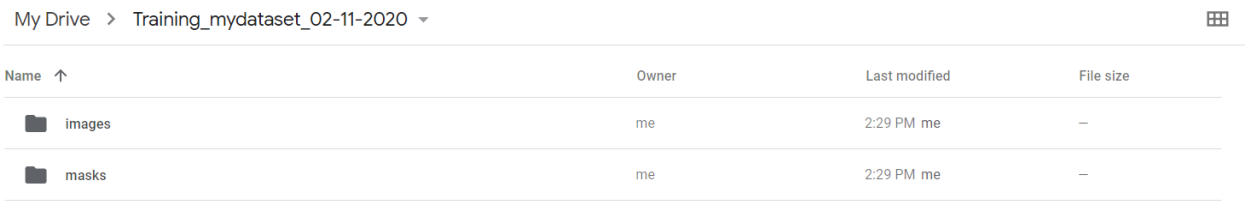
Tutorial:

How to train your own StarDist 3D model using google colab

Please first follow the tutorial how to generate 3D training samples using LabKit to train a StarDist model.

1) Open you google drive account: https://drive.google.com/drive/my-drive
2) Import the input images and masks folder



Images must be .tiff files and input images and masks **must have the same filename.** Remember that the input images must only have the DAPI channel.

Example:

Input images:
C:\Users\fabbe\Desktop\MyDataSet\Training**images\Image00.tif**
C:\Users\fabbe\Desktop\MyDataSet\Training**images\Image01.tif**

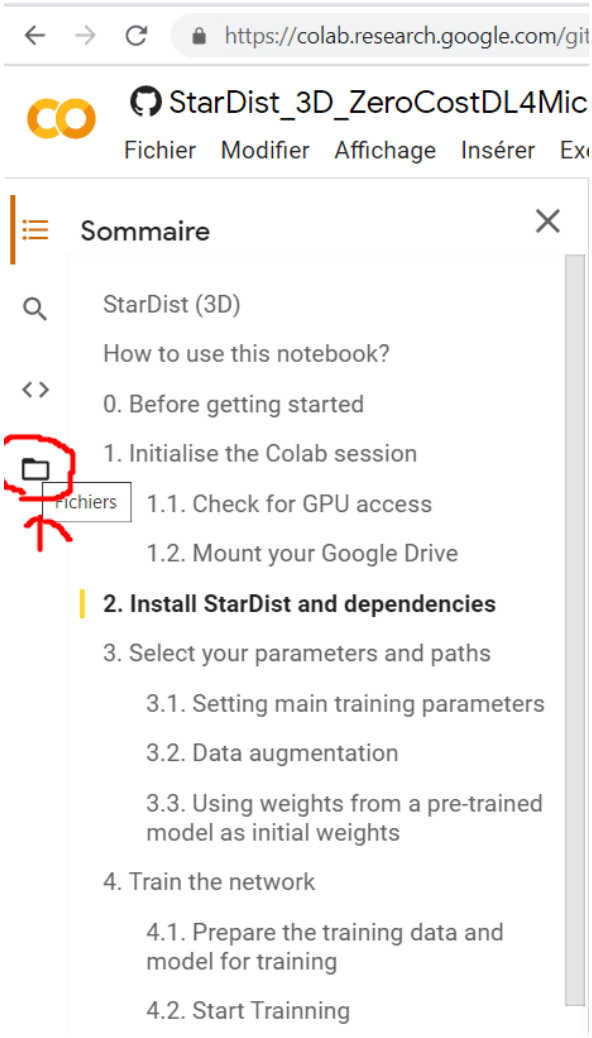
Masks:
C:\Users\fabbe\Desktop\MyDataSet\Training**masks\Image00.tif**
C:\Users\fabbe\Desktop\MyDataSet\Training**masks\Image01.tif**

3) Open the google colab notebook (if the link is dead please go to the github link below): https://colab.research.google.com/github/HenriquesLab/ZeroCostDL4Mic/blob/master/Colab_notebooks/StarDist_3D_ZeroCostDL4Mic.ipynb#scrollTo=4waLStm0RPFo

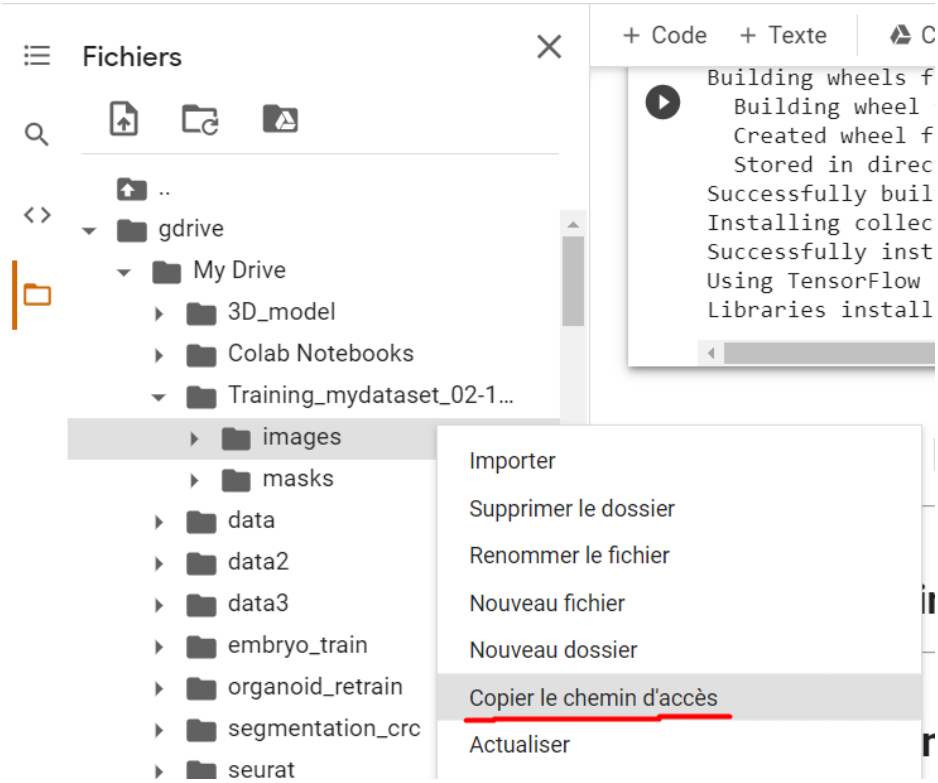
Additional informations about it and acknowledgements:
https://github.com/HenriquesLab/ZeroCostDL4Mic

4) Go through the notebook as explained, some additional information about each step:

   Step 3.1
   To go through your google drive file click the folder icon as shown below



1) Navigate through your folders to copy the path containing the Training_source (images of nuclei) and Training_target (masks).
2) The model path is the path where the model folder will be created.
3) The model name is the folder name that will be created for your model, you don't need to create manually this folder it will be created automatically.
4) Don't forget to uncheck the Use_Default_Advanced_Parameters cell!
5) Set the percentage_validation as 0
6) Recommendation: set n_rays as 192
7) Set the patch_size (xy)and patch_heigh (z) as big as possible (it shouldn't be larger and deepest than your smallest image)



Step 3.2

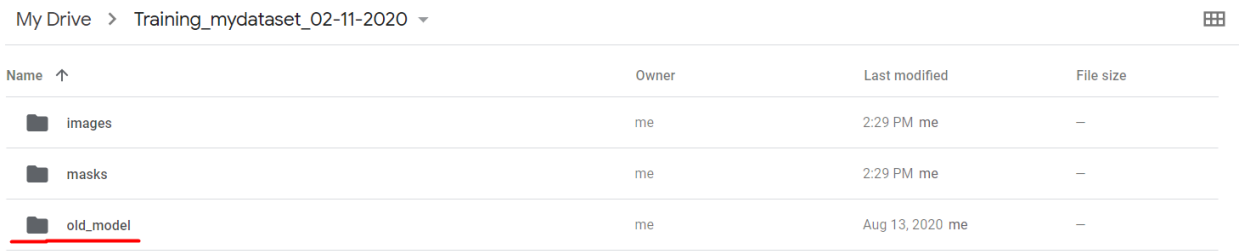
You should use the data augmentation, don't forget to activate the Use_Data_augmentation cell.

1) Deactivate the elastic transformation cell
2) Activate the rotation cell
3) Activate the flip cell
4) Deactive the save_augmented_images cell

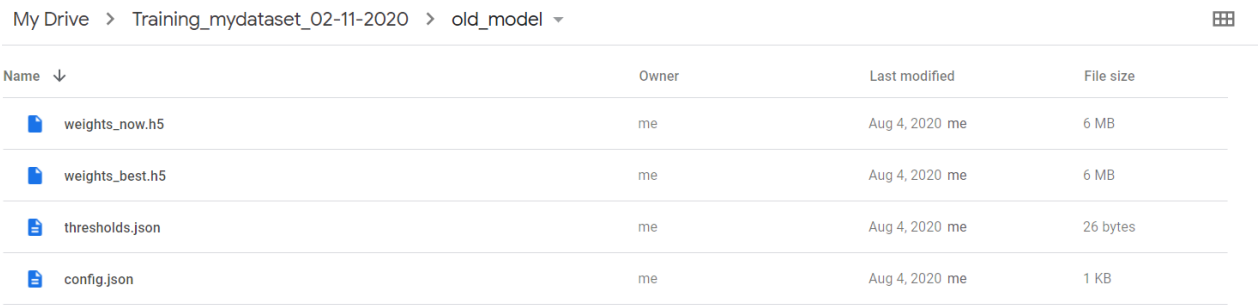
Step 3.3

If you train your model from scratch, deactivate the Use_pretrained_model cell. Otherwise if you have already trained a model and want to refine it, considers training from your pretrained model as it can lead to better results.

If you decide to train a model from a previous model, put your model in google drive as show below and copy the path in the pretrained_model_path cell.



The folder model should contain the following files:



Step 4.2

Once done you can download your new model in your google drive in the folder model name located in model path (see steps 3.1)