

Medphys-usct-registration deformation 的自动化流程

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Prerequisites for this pipeline:

1. The folder structure is the following

- root_path_spines directory:

<root_path_spines>/<spine_id>/ folders are already created

step1 : 需要创建 <root_path_spines>/<spine_id> 和 <root_path_spines>/sub-<spine_id> 的文件夹并且需要存放 CT nii.gz 文件 s

- root_path_vertebrae:

<root_path_vertebrae>/<spine_id>/<spine_id>*_msh.obj --> mesh files of individual vertebrae are used for deformation

Step2: 需要用 totalsegmentator 分割 CT nii.gz 文件生成 rawdata 中的 xx-seg nii.gz 文件(脚本)

--> to separate spine segmentations into vertebrae segmentations and transform segmentation to mesh check

- "https://github.com/miruna20/thesis/blob/main/separate_spine_into_vertebrae.py"

"https://github.com/miruna20/thesis/blob/main/convert_segmentation_into_mesh.py"

Step3: 执行脚本 generate.py 生成 segmentation 和点云 mesh file 生成执行脚本(脚本)

2. There exists a .txt file containing the verse names of the spines that will be processed

step4: 在小数据下可以手动输入到 txt 中，大数据可以遍历文件夹名读取 list.txt

3. The deformation pipeline should already have happened

step5: 根据脚本文件中的 00_deformation_pipeline.py 行的脚本，需要将 conda 环境调整至 sofa 环境下。在 SpineDeformation 文件夹下执行该脚本(脚本)

4. Folder containing the segmentation outputs from the Totalsegmentator

Steps of the pipeline:

#1. Crop ROI based on the position of Sacrum and T11

#2. Extrapolate the deformation to the whole image including the soft tissue

#3. replace the labels that we have from Totalsegmentator

#4. simulate ultrasound using imfusion

#5. make the raycasted images again using imfusion and save the labels for training the u-net for us segmentation

#6. extract all of the point clouds for each vertebra -> next is to run "Prepare for Network"

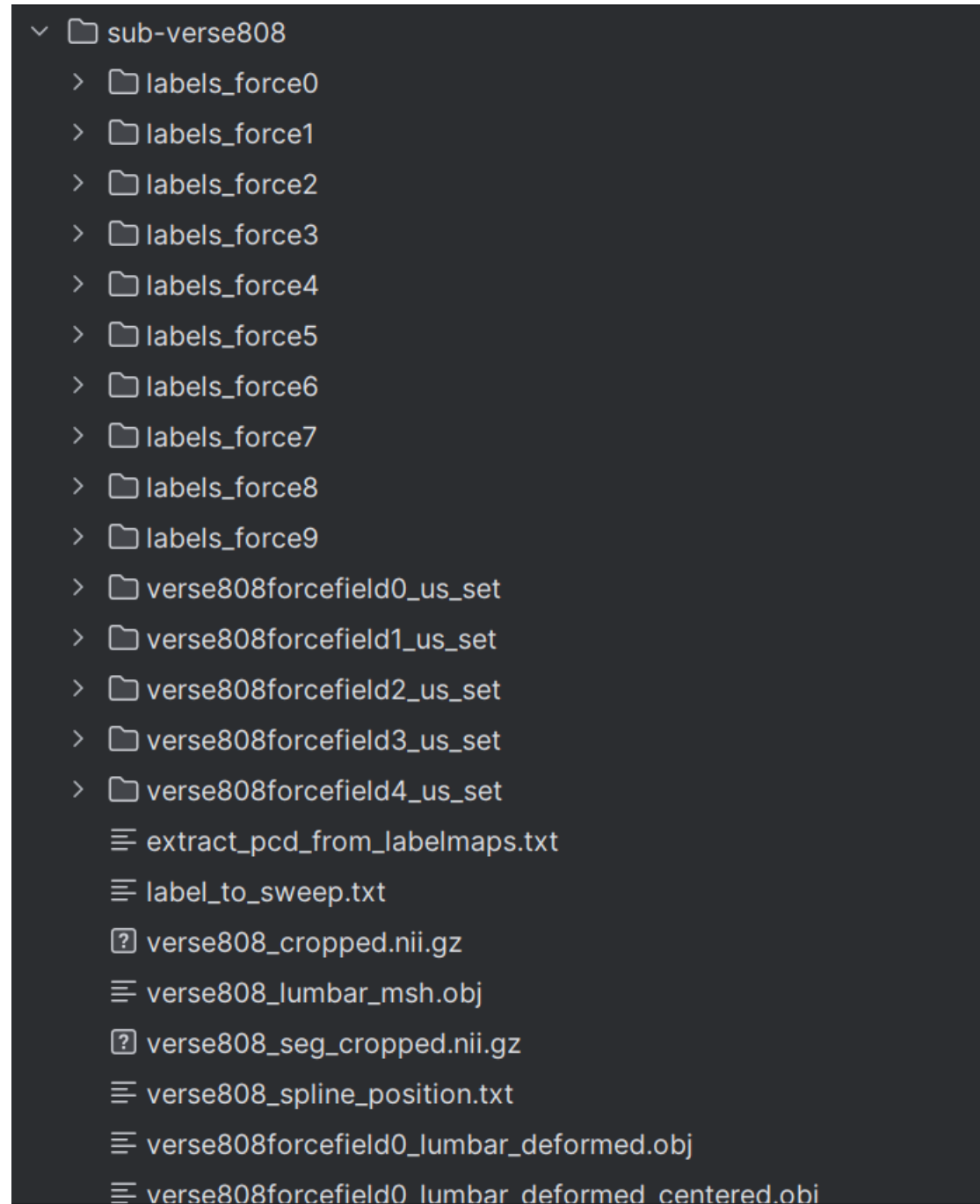
step6: 在 DeformSegmentationAndSimulate 文件夹下执行脚本 5

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该项目的文件存储格式:

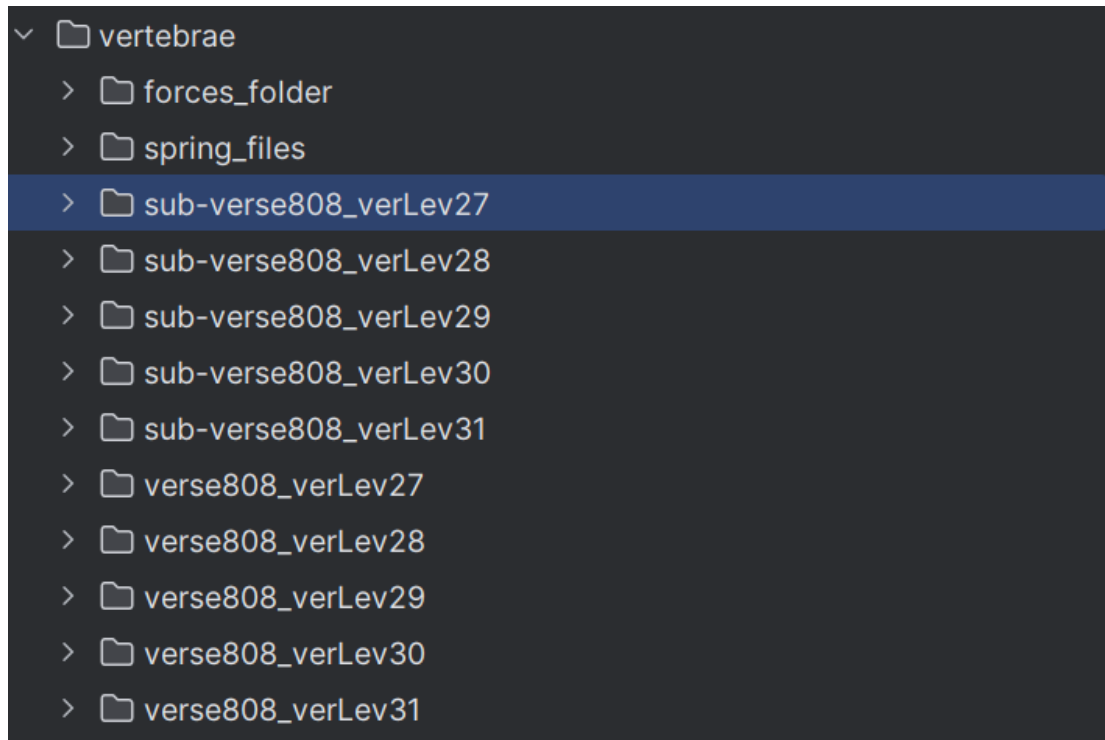
数据集文件夹下的树如图所示：

Rawdata 存放 spine 相关的所有数据，verse 文件夹存放原始数据，sub-verse 文件夹中存放所有项目中生成的变形及中间数据



Segs 文件夹中仅仅存放 segmentation 的结果

Vert 文件夹中存放所有经过 imfusion 根据 labelmap 提取的对应 T11-Sacrum 的中间结果以及弹簧信息。



脚本文件：

```
python C:\\Users\\Alienware\\Desktop\\workspace-xyx\\thesis-main\\generate_totalseg_cmd.py --segmentation_folder C:\\27 ^ ^ ^  
python C:\\Users\\Alienware\\Desktop\\workspace-xyx\\thesis-main\\separate_spine_into_vertebrae.py --root_path_vertebrae C:\\Use  
python C:\\Users\\Alienware\\Desktop\\workspace-xyx\\thesis-main\\convert_segmentation_into_mesh.py --root_path_vertebrae C:\\Us  
python C:\\Users\\Alienware\\Desktop\\workspace-xyx\\medphys_ct_us_registration-master\\DataGeneration_CT-US-Registration\\Spir  
python C:\\Users\\Alienware\\Desktop\\workspace-xyx\\medphys_ct_us_registration-master\\DataGeneration_CT-US-Registration\\Defc
```

从第一条依照顺序执行至最后一条