Deep Learning for 3D Medical Image Analysis

Group 2 - ASOCA challenge
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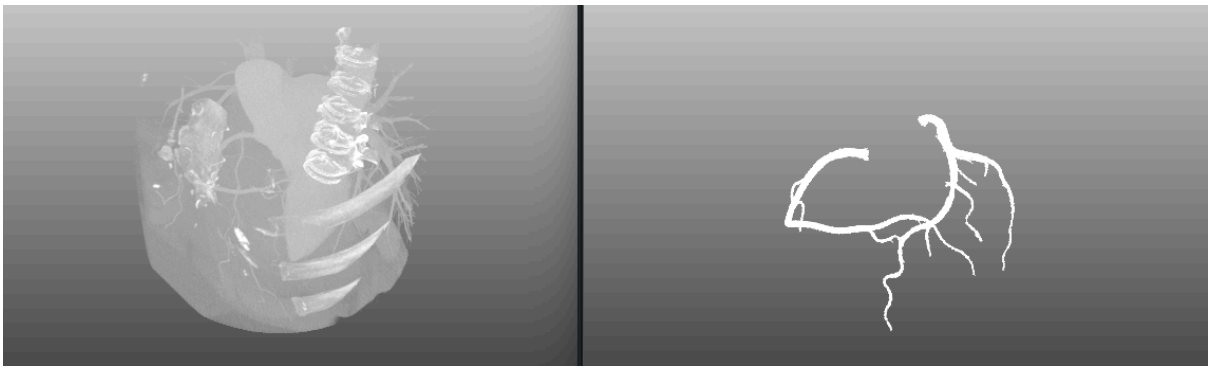
Visualization of data:



Visualization of the 3D CT-scan on the left and annotated data on the right, both visualized using Mip

Method:

We are provided a 3D image of a CT scan, where we have to segment the image between the background and the coronary arteries. To segment a 3D (medical) image, we can use 3D CNNs[1], and in particular we will use a 3D CNN with an encoder/decoder architecture. We will base our model (heavily) on the 3D U-net architecture[2].

Planning:

1. Week: Group forming
2. Week: Research methods, write plan of approach
   – Winter break –
3. Week: Import data, visualize data (incl. exploration), preprocessing
4. Week: Preprocessing, implement encoder-decoder architecture
5. Week: Implement encoder-decoder architecture, train model
6. Week: Train model, evaluate results, start working on report
7. Week: Evaluate results, adjust based on Q&A, write report
8. Week: Adjust based on Q&A, create poster, prepare presentation, write report
9. Week (9-11): Finish report, put code on github (/gitlab)

References:

[1] Use of CNN's for 3D image segmentation in medical context
https://www.sciencedirect.com/science/article/pii/S2405844024034297
[2] 3D U-net https://arxiv.org/pdf/1606.06650