

Deep learning for automatic image segmentation

6 month Internship for an M2 student during the school year 2018-2019
CENIR, ICM, Paris 13

The CENIR is the MRI acquisition facility at the ICM with 2 MRI 3T scanners. We optimize the acquisition parameters and propose advanced pre-processing pipeline to improve data quality <http://www.cenir.org/>

Context

In brain imaging studies there are still challenging segmentation tasks, especially for small brain structures visible on specific acquisitions, and for pathological areas (tumor, stroke ...). As we run different clinical studies, we have accumulated a large number of manually segmented masks that will be useful for training a convolutional neural network.

Subject

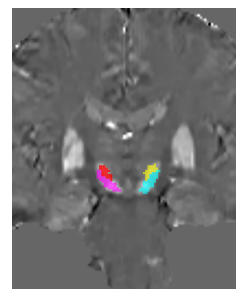
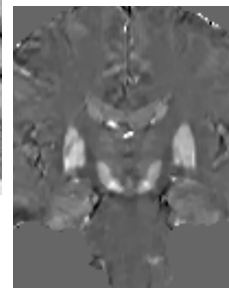
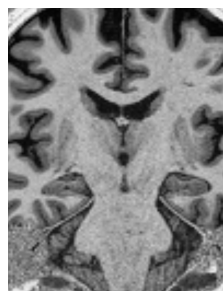
The internship will consist of testing different network architectures and to evaluate their performance.

U-net shape networks have been shown to be very effective, but in the case of small regions we may need to add a detection or attention network to first localize the region of interest.

We are also interested to specifically study the generalization of the CNN through transfer learning from other MRI segmentation tasks. This will be investigated to see if one can reduce the number of manually segmented masks.

Skill

- Python programming
- Image processing
- Experience in deep learning
- Autonomy and appetite to learn



Contact

Primary

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