Paris Brain Institute (ICM) is recruiting a:

Engineer Development of AI for MRI segmentation (M/F)

As soon as possible

18 months (renewable)

A Paris 13ème

The Paris Brain Institute (ICM) is a private foundation recognized as being of public utility, whose purpose is fundamental and clinical research on the nervous system. On the same site, 700 researchers, engineers and doctors cover all the disciplines of neurology, with the aim of accelerating discoveries on the functioning of the brain and the development of treatments for diseases such as: Alzheimer's, Parkinson's, multiple sclerosis, epilepsy, depression, paraplegia, tetraplegia, etc.

POSITION

Context

The Paris Brain Institute is investing in cutting-edge technologies and expertise as part of its transversal approach to the discovery of new treatments for neurological diseases. The Data Analysis Core facility (DAC) mission within this ambitious program is to develop new tools and analyses, coordinate FAIR data governance across the institute, and accompany researchers in exploiting the full potential of the institute's technology and data ecosystem. The DAC consists of an enthusiastic interdisciplinary team of experts in biostatistics, bioinformatics, computational neuroscience, and data management. We accompany researchers throughout the research cycle, from idea to publication. We perform analyses, develop databases, and offer training in data analysis and good practices in data management. We are currently recruiting new team members to strengthen our expertise in bioinformatics (spatial transcriptomics), image analysis using deep learning (microscopy, histology, and neuroimaging), and research data governance. If you are interested in the brain and want to apply your skills in a stimulating research environment, the DAC could be the place for you.

Job description (mission)

Recent works (Billot et al., https://arxiv.org/abs/2107.09559 and https://github.com/BBillot/SynthSeg) have proposed a contrast- and resolution-agnostic segmentation approach based on synthetic data, which gives efficient and robust results. We are looking for an enthusiastic engineer with experience in deep learning to adapt this approach to MRIs acquired at the imaging platform (CENIR) of the Institute. The main goals are to:

- Develop and deploy AI models (Billot et al.) for segmentation of (sub)cortical structures of interest
- Extend the method to include regions of interest
- Extend the method to include multi-contrast dimensions
- Explore its applicability to non-linear inter-subject registration of anatomical images compared to classical normalization algorithms (ANTS, SPM12, FNIRT)

PROFILE

Know-how (Savoir-faire)

- Experience in analyzing medical/volumetric (MRI) images
- Advanced knowledge in machine learning (supervised and unsupervised), deep learning (CNN)
- Knowledge in MRI segmentation and MRI co-registration is desired.
- Mastery of Python (preferably PyTorch)
- Fluency in reading and writing academic English

Knowledge (Savoir)

- Bac+5 (master or engineer) in deep learning / machine learning / AI

Soft skills (Savoir-être)

- Ability to integrate into a multi-disciplinary team with team spirit, and collaborative work style
- Ability to communicate with researchers from various scientific and clinical backgrounds

Conditions

The position will be closely coordinated (shared) with the CENIR imaging platform, allowing integration with researchers working on related topics. CENIR is equipped with two 3 Tesla MRIs, an 11.7 Tesla MRI, 3 Tesla PET-MRI, as well as a stereotactic imaging platform activity. The team includes 4 permanent engineers dedicated to supporting the analysis of acquired MRI.

Please send your CV and letter of motivation (in English), indicating name and contact details of two references (incomplete dossiers will not be considered) to recrutement@icm-institute.org *and* stephen.whitmarsh@icm-institute.org with the subject: "Engineer Development of AI for MRI segmentation".