JOB OFFER
Engineer / Software developer

Analysis of multimodal longitudinal neuroimaging data in Alzheimer's disease

Keywords: image analysis, neuroimaging, software development, Alzheimer's disease

The topic:

The GRC n°21 Alzheimer Precision Medicine works on the evidence of biomarkers (imaging, fluids) that will help at defining and characterizing the earliest stages of Alzheimer's disease. Amongst this team, a subproject aims at identifying the factors of vulnerability of brain networks in the course of Alzheimer's disease using longitudinal multimodal neuroimaging data. This is based on the analysis of neuroimaging data of the INSIGHT cohort: a longitudinal cohort of 320 healthy aged subjects followed up during 7 years and accumulating brain lesions (measured using anatomical MRI, FDG PET, amyloid PET, DTI, functional MRI and vascular imaging, cerebrospinal fluid and plasma), cognitive impairment and for some of them Alzheimer's disease.

Your mission:

The first step of your mission will be to design an automatic pipeline for the processing of the longitudinal multimodal neuroimaging database. This pipeline focuses on the comparability of the different neuroimaging modalities for voxelwise analyses. This work has already been started in collaboration with the ARAMIS lab (www.aramislab.fr) at the Brain and Spine Institute (http://www.icm-institute.org), using the CLINICA platform (http://www.clinica.run/). The second step of this work will be to start the analysis of the network vulnerability mechanisms by identifying the networks (using fMRI and DTI) that evidence neurodegeneration during follow up and compare them to networks and that do not evidence neurodegeneration. Finally, the comparison between these networks will allow us to identify the networks properties (using Graph Theory analysis…), the local pathology characteristics (amyloid, vascular lesions…) and the genetic polymorphisms that explain the vulnerability of brain networks in the course of Alzheimer's disease.

A vibrant scientific, technological and clinical environment:

You will work within the Pitié-Salpêtrière University Hospital, in the GRC n°21 Alzheimer Precision Medicine, a young and dynamic research team on Alzheimer's disease (https://medecine.sorbonne-universite.fr/recherche/groupes-de-recherche-clinique/grc-21-apm/) and in collaboration with the ARAMIS lab (www.aramislab.fr) at the Brain and Spine Institute (http://www.icm-institute.org), one of the world top research institutes for neurosciences. The research team is located at the heart of the Pitié-Salpêtrière hospital,

downtown Paris.

You will be strongly involved in scientific aspects of the work, such as discussion of methodological issues and interpretation of results.

Your profile

- Engineer degree or PhD in computer science, electrical engineering or medical imaging
- Strong knowledge of digital image processing
- Strong programming skills, preferably in Python
- Training and/or experience in medical imaging would be strongly appreciated
- Good relational and communication skills to interact with professionals from various backgrounds.

Ready to take up the challenge?

send your CV to nicolas.villain@aphp.fr
https://www.researchgate.net/profile/Nicolas_Villain
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