PH.D. POSITION @
GIGA IN SILICO MEDICINE &
GIGA CRC IN VIVO IMAGING GROUPS

*Topic.*
Data management and processing, neuroimaging database, MR imaging, machine learning, “search light” approach.

*Background.*
The MEMODYN project aims at studying memory, in its natural dynamic setting, as a journey in the making. The two key characters in this journey are learning and consolidation; these processes are known to interact but have hitherto been studied in isolation. The perspective of this project enables them to be understood, for the first time, under the influence of their inherent interactions, and in the context of brain maturation and ageing.

The MEMODYN project is funded by both the F.R.S.-FNRS and the FWO during four years (about 1M€/ year). The MEMODYN consortium brings together four Belgian universities (ULB, ULiège, UGent and KULeuven) and one partner outside Belgium (UCLondon, UK). MR imaging (structural, functional, diffusion weighted, spectroscopic) and electrophysiological (EEG/MEG) data from children, young adults and elder volunteers will be acquired in the four Belgian centres and analyzed in collaboration by the research teams of all the partners.

*Ph.D project.*
The goal of the Ph.D. project will be twofold: first, implement a multimodal data management and sharing system for the whole MEMODYN consortium and, second, tailor machine learning algorithms for the classification MR images.

The database part will rely on the open-source Orthanc ecosystem for medical imaging, with support provided by the Osimis spin-off company.

The machine learning part will focus on the improvement of so-called “searchlight” (SL) approaches for the decoding of (functional) MR images. As they consist in exploring the whole brain volume by highlighting only a small region around each voxel, this processing is computationally expensive. From a theoretical point of view, the influence of some parameters (machine used, size of the SL…) and the interpretation of the maps derived have not been fully explored (see for example Etzel et al., 2013).

*Qualifications and requirements.*
Advanced knowledge in computer programming is requested, with knowledge of Matlab and/or Python a plus. Experience in medical database organization, neuroimaging and/or machine learning would be advantageous. Mastery of English is also requirement. Candidate should be skilled, highly motivated, have excellent communication and organizational skills, able to work independently and as part of a
team.

The candidate should have a Master degree in a discipline related to the topics of the call, i.e. computer science or engineering, or be ready to demonstrate their programming skills. He/she should also be interested in uncovering mechanisms underlying the human memory. Prior knowledge of this particular research area is not mandatory though.

**Contract starting date and duration.**
The position is advertised for 2 years, extendable to 2 more years, and starts as soon as feasible. Salary will be according to Belgian regulations.

**Work environment.**
The candidate will integrate two research teams from the GIGA institute, the “CRC in vivo imaging” and the “in silico medicine” units, based on the Sart Tilman campus of the University of Liège, Belgium. Together the 2 teams count more than 60 researchers with expertise in neuroimaging data acquisition and processing, and computer science but also neuroscience. Visits to and close collaboration with all the other members of the MEMODYN consortium is also expected. Next to the academic partners, the candidate will also interact with the Osimis team.

The project will be directly supervised by Drs Christophe Phillips and Steve Majerus, from ULiège, and Dr Sébastien Jodogne, from Osimis.

**Application.**
Applicants are invited to respond as soon as possible and no later than June 30, 2018, by submitting a curriculum vitae (including relevant courses), a one-page summary of research interests and expertise, and names and contact details of two referees to c.phillips@uliege.be.

Yours sincerely,

Christophe Phillips

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