



SHIVA

université  
de BORDEAUX



## Computer Development Engineer / Image Analysis

**Main mission:** Development of processing chains and algorithms for automatic detection and quantification of MRI markers of small vessel disease

**Core activities:** Scientific computing software development

The candidate will join the team of the RHU project SHIVA<sup>3</sup>, which aims to stop cognitive decline and dementia by fighting cover cerebral small vessel disease. SHIVA is coordinated by Prof. Stéphanie Debette (BPH, VINTAGE team) and co-coordinated by Prof. Thierry Couffignal (Inserm U1034), and has been selected for €8.2M in funding under the call for projects "Hospital-University Health Research" (RHU) of the Programme d'Investissement d'Avenir (French governmental investment programme), which aims to support large-scale innovative research projects in the field of health.

The candidate will work within the Neurofunctional Imaging Group<sup>1</sup> of UMR5293 (IMN)<sup>2</sup> under the direction of Marc Joliot (CEA Research Director), co-director of the work package: "innovative imaging biomarker for the characterization and diagnosis of white matter defects". The project will be carried out in collaboration with the research and development team of the company Fealinx<sup>4</sup>, also a partner in the SHIVA project. He/she will integrate a local team including a post-doctoral fellow specialised in neuroimaging and a research engineer responsible for the management of the imaging databases.

The candidate will participate in the development, validation and publication of a three-dimensional magnetic resonance imaging (MRI) analysis software. The objective is the development of software for the segmentation of covert vascular brain injury that is not associated with a clinical stroke: white matter hypersignals, dilated perivascular spaces, covert brain infarcts and cerebral microbleeds.

The development will use deep learning methods and in particular transfer learning in a joint and simultaneous analysis of the available MRI modalities (from 2 to 4). Several imaging databases will be used for this project, notably MRi-Share (2000 subjects) and the UK-biobank (50,000 subjects) for development and the SHIVA database for analysis (400 subjects longitudinal acquisition starting in September 2021). An example of the work that will be required of the applicant can be found at the following address (<https://www.biorxiv.org/content/10.1101/2020.11.25.397364v1>).

**Contract start date:** September 2021, for a period of 12 months, renewable for a further 12 months.

**Working time:** 100%

**Recruitment level (cat. A, B or C):** A (Engineer)

**Proposed gross monthly salary:** according to experience (University of Bordeaux salary scale)

**Diploma and/or level of qualification:** Design or research engineer (minimum Master 2 or Grande Ecole)

**Main activity:** Confirmed experience in computer development or medical imaging. Software engineering; Develop test strategy, design, specify and execute functional and/or technical tests; Written and oral presentation of test results.

**Main skills:** Analysis and design method; Testing methodology; Python programming language and its scientific libraries (Numpy, Scikit, rapids.ai ...); Statistical analysis; English read/spoken/written.

**Skills:** Teamwork, communication, autonomy.

**Contact:** by email to Marc Joliot, [marc.joliot@u-bordeaux.fr](mailto:marc.joliot@u-bordeaux.fr), please indicate in the subject line "SHIVA Engineer".

Geographical location of the position: IBIO, IMN, 146 rue Léo Saignat, 33076 Bordeaux.

<sup>1</sup> <https://www.gin.cnrs.fr/fr/>

<sup>2</sup> <https://www.imn-bordeaux.org>

<sup>3</sup> <https://rhu-shiva.com/fr/>

<sup>4</sup> <http://www.fealinx.com>