



CertiViBE, a medically certifiable core for
OpenViBE, the software for Brain Computer
Interfaces and Neuroscience research

Project description – two engineer positions

Rennes, May 2015

Inria-Hybrid team (Rennes, France) is recruiting 2 engineers : 1 software development engineer and 1 quality/assurance engineer, for accompanying the medical certification effort related to OpenViBE software, in collaboration with Mensia Technologies startup company (www.mensiatech.com). OpenViBE (<http://openvibe.inria.fr>) is a leading free software for Brain-Computer Interfaces and Neuroscience research.

If interested, please submit your full CV and cover letter at :

- Inria on-line application website : <http://www.inria.fr/institut/recrutement-metiers/offres/ingenieurs-recherche-et-developpement-confirmes-et-specialistes>
- Anatole Lécuyer, Inria : anatole.lecuyer@inria.fr
- Mensia Technologies : jobs@mensiatech.com

Project description :

Inria has been hosting and supporting the well-known OpenViBE software since 2009. OpenViBE (<http://openvibe.inria.fr>) is an open-source software for the development, testing and using of Brain-Computer Interfaces and neuroscience research. Founded in 2012, Mensia Technologies is a medical-device spin-off of Inria owning an exclusive worldwide license of the OpenViBE software for commercial applications. So far, OpenViBE has raised a lot of interest in the research community, especially on medical applications. However, OpenViBE being a research-software, it does not yet matches the requirements of medical devices in terms of stability, performance, documentation, as well as engineering processes in general, slowing down the transfer of OpenViBE-based medical research to the industry. Within the CertiViBE project, Inria and Mensia Technologies are putting their task forces and respective expertise together to deliver a certifiable core for the OpenViBE software. While the OpenViBE software will continue to be published as an Open Source software, the project will dramatically facilitate the transfer of the research made with OpenViBE as it will be built on ready-to-certify foundations, following the processes and normative regulation of medical devices development including risk analysis, quality assurance and medical device software development and maintenance.

Engaged resources :

In addition to Inria's research teams and Mensia Technologies Quality Assurance (Q/A) and Engineering teams, Inria is looking for two additional engineers :

- 1) one engineer in quality assurance
- 2) one engineer in software development

The two engineers will benefit from immersion in the regulatory processes and medical device development being primarily located in Mensia's offices. Location of the jobs is Rennes area, France, and initial contracts duration is of 12 months (renewable).

Both profiles are expected to have the following education and soft-skills:

- A minimum of Engineering Degree,
- 2 to 8 years of experience post-graduation in software engineering and/or Q/A,
- Excellent written and verbal communication skills in English,
- Ability to act and communicate in a professional manner, both internally and externally to business, scientific and technical audiences,
- Ability to imagine and propose solutions to complex problems and ensure their seamless adoption by engineering team through negotiation and power of conviction,
- Thorough and attention to details with high conviction of the value of quality-driven products.

The specific missions of the **Q/A Engineer** are:

- Defining and writing the functional requirements and validation plan of the technology,
- Writing and integrating the functional, integration and edge-case tests in the Continuous Integration platform to maximize software testing coverage,
- Executing and reporting on the validation plan and functional conformance of the technology, as well as on-going issues,

- Writing user documentation and supporting users (research teams and community) in their daily use of the technology,

This requires the following hard-skills:

- Skilled in software development with high-level languages e.g Python, Javascript,
- Skilled with concurrent software development / Q/A tools (Git, GitHub, Jenkins, Testlink)
- Experience with desktop and mobile Operating Systems
- Ability to write extensive regulatory documentation

The specific missions of the **Software Development Engineer** are:

- Designing, adapting and documenting the software architecture,
- Writing and integrating unit tests in the Continuous Integration platform to maximize software testing coverage and facilitate the conformance evaluation of the Q/A team,
- Publishing of the certifiable core to the research community.

This requires the following hard-skills:

- Highly skilled in C/C++ programming,
- Highly skilled in software architecture design and design patterns,
- Experience with concurrent software development tools (Git, GitHub)
- Capacity to write extensive technical documentation
- Experience in standard-driven software development would be a plus, especially standards related to medical devices

Travel in France will be required, international travels will occasionally be required.

Partners :

1) Inria : Hybrid team

The research activity of Hybrid team (<http://team.inria.fr/hybrid/>) belongs to the field of Virtual Reality and 3D interaction with Virtual Environments. Our objective is to invent novel 3D interactive techniques with virtual environments exploiting both the body and brain of the user. We focus on novel user inputs in virtual reality such as coming from full-body tracking or brain-computer interfaces. Applications of our research program are for industry (virtual prototyping), medicine (surgical simulation, rehabilitation and reeducation), design (architectural mock-up), art or videogames and entertainment. Hybrid was created in January 2013.

Since 2009, Inria/Hybrid has published OpenViBE, an open-source software for the development, testing and using of Brain-Computer Interfaces and neuroscience research (<http://openvibe.inria.fr>).

2) Mensia Technologies SA

Mensia Technologies (<http://www.mensiatech.com/>) is a revenue-stage, software start-up developing medical solutions leveraging non-invasive real-time neuromodulation for the central nervous system. Our first product, ADHD@HOME, is a mobile and personalized neurofeedback training system for the treatment of Attention Deficit Hyperactivity Disorder (ADHD). ADHD is a major Public Health issue affecting 5% of children and a fast growing therapeutics market estimated to reach \$10B by 2020. On a 5-year horizon, and beyond ADHD, we intend to leverage our proprietary, real-time EEG signal-processing technology and know-how in neuromodulation and neurofeedback to develop, or co-develop, additional game-changing medical devices in underserved pathologies such as the cognitive impairment of seniors, sleep pathologies or the real-time monitoring of sedation and consciousness.

Contacts :

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