Job Title:	Software Engineer	HR Contact:	Mr Christian Lefebvre
Department/Group:	Centre d'Investigation Clinique et d'Innovation technologique (CICIT)	Job Code/ Req#:	
Location:	Hopital Raymond Poincare 104, boulevard Raymond poincare 92380 Garches (PARIS)	Travel Required:	NO
Level/Salary Range:	2,000€-2,500€ monthly net depending on experience	Position Type:	Full-time
Length:	1 year, renewable to 2 years	Date posted:	10th June 2010
Type:	CDD	Starting period:	1st Oct to 31st Jan 2010
External posting URL:			
Internal posting URL:			

Applications Accepted By:	
Fax or E-mail: Louis.mayaud@rpc.aphp.fr Subject Line: RoBIK: [Software Engineer Offer]	Interviews will most probably be carried out on September

Job Description

Environment

Paris Hospitals Trust

Heir of all institutions in charge of relief and social assistance, the Assistance Publique-Hôpitaux de Paris (AP-HP) is characterized by its historical and architectural prestige. Working in the AP-HP, it's taking part to centuries of evolution in social, medical and healthcare services in Paris and surrounding areas. Medical progress, teaching and research are axes around which, for decades, the AP-HP has traditionally gather his forces.

Raymond Poincare hospital

Since 2005, the Raymond-Poincare hospital in Garches and Berck Maritime Hospital (200 beds in rehabilitation), historically oriented in management of disability, is creating a Group 1800 Hospital staff with an annual budget approximately €100m. Today, the Hospital Group is organized around three poles designed to take care of people with disabilities (Rehabilitation), of children, especially suffering from neuromuscular disease (pediatric center) and acute conditions. Thus, while upholding its duties of care, teaching and research, it is consolidating its international reputation as a center of reference in

support of comprehensive and multidisciplinary disability.

The Centre for Clinical Investigation and Technological Innovation (CICIT)

Within the Hospital Raymond Poincare you will join the CICIT aiming to centralize research activities of the various clinical hospital services around three fields:

- Mobility: These projects focus on developing technologies to improve wheelchairs
- Communication: These projects are designed to promote communication interfaces for subjects with severe disabilities.
- Ventilation support: These projects involve both the development and the evaluation of mechanical ventilation device suitable for severely disabled patients.

Context

Robust Brain Computer Interface virtual Keyboard (RoBIK)

The principle of a Brain-Computer Interface or BCI is to control a device through the extraction and interpretation of signal features from electroencephalographic (EEG) collected on the surface of the scalp or by the mean of invasive measurements. This old idea of communication technique (Vidal 1973), offers the advantage to bypass need of muscle activity in the control chain and therefore is naturally presented as a promising alternative for restoration of control and communication of people with neuromuscular disabilities (Wolpow, et al. 2002).

However BCI technology remains an object of study for research laboratories, it is not spread out in patients' daily life. We have identified the lack of robustness and bad ergonomics of current BCI to be the main reasons of this situation. Therefore, despite the large number of research around this topic today, there is little offer of BCI system for disabled users. The project aims at developing a patient-dedicated application using the open-source project called OpenViBE.

OpenViBE

The OpenViBE software (http://openvibe.inria.fr) is a free and open-source software platform dedicated to designing, testing and using brain-computer interfaces. Brain-Computer Interaction (or BCI) corresponds to the direct use of brain signals to send "mental commands" to an automated system such as a robot, a prosthesis, or a cursor on a computer screen. Typical BCI applications are medical (assistance to disabled people, real-time biofeedback) and multimedia (virtual reality, video games).

Your Profile

Diploma and Experience

The candidate should have an engineer degree or a master thesis preferably in software engineering or related area.

Past experiences

At least a year in software development. Past-experiences in virtual reality, video games or any 3D programming is a plus.

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Skills

Software skills: C++, SVN, CSV, …

Virtual reality: OGRE, openGL, directX.

Others: EEG, signal processing, clinical

Your Mission

You will work at the Raymond Poincare Hospital and will have to develop the patient's interface as defined by medical staff in previous part of the project RoBIK. In order to do so, you will first have to go through the following steps:

1. Get some background on BCI and medical condition of patients
2. Talk to medical staff and engineers to better understand specifications of the application
3. Set your development environment (SVN accounts, Microsoft visual studio, …)
4. Go through tutorial and "How toes" for OpenViBE

You will then develop the application according to a calendar and will have to interact with the following people along the process:

1. The PFNT at the hospital that has defined the patients' need and that will check application stick to it
2. The Gipsa-Lab in Grenoble, partner on the project, with OpenViBE software engineers and researchers providing specifications about the BCI.

Reviewed By:	Marco Congedo	Date:	June 2, 2010
Approved By:		Date:	
Last Updated By:	Louis Mayaud	Date/Time:	June 3, 2010