SOFTWARE ENGINEER

Title	Software engineer for Brain-Computer Interfaces and Open-source Software OpenViBE Keywords : Brain-Computer Interfaces, C++, OpenViBE, open-source software, virtual reality
Location	**INRIA Rennes - Bretagne Atlantique** Campus universitaire de Beaulieu 35042 Rennes Cedex France
INRIA Research Team	BUNRAKU team
Duration	12 or 24 months
Starting	September-December 2009
Salary	2 475,32 euros / months (before taxes)
Diploma	Master Thesis, or Engineer Degree
Environment and context	INRIA, the French national institute for research in computer science and control, is dedicated to fundamental and applied research in information and communication science and technology (ICST). INRIA has a workforce of 3 800 working in 150 research project-teams. The INRIA Rennes - Bretagne Atlantique Research Centre has 30 research teams, involving more than 600 employees. The BUNRAKU research team of INRIA Rennes has been conducting research in the field of Brain-Computer Interaction at INRIA Rennes since more than 5 years. The main objectives of this research are twofold. First, we intend to study the use of BCI to improve interaction with Virtual Environments. Second, we intend to study the use of VR technology to improve the efficiency of the BCI, notably to improve the learning of the BCI by using immersive, engaging and realistic virtual displays of cerebral activity. In addition to this activity in the field of BCI, the BUNRAKU has been conducting research since 15 years in the field of Virtual Reality interfaces and interaction techniques. This research activity explores multi-sensory interaction with virtual worlds, through the study and use of several types of information, e.g., visual (immersive visual peripherals), haptic (tactile or force-feedback devices), and auditory (spatialized sound). 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). The software engineer will work in close collaboration within a team of engineers, researchers, students working on the OpenViBE software and on Brain-Computer Interfaces, in the BUNRAKU team but also in other INRIA Centers (Nancy, Sophia), and other partners (INSERM, CEA, UBISOFT) ; notably in the frame of a collaborative project OpenViBE2 involving 10 partners and focusing on the use of Brain-Computer Interfaces for video games.

Mission	The software engineer will work on development and scientific research related to BUNRAKU team activities and OpenViBE software. Main missions will be to extend the functionalities of the OpenViBE software and ensure its support and deployment. We hope OpenViBE will become a standard software in the scientific communities working on BCI. For this aim, the main tasks of the successful will consist in : (1) develop novel functionalities of the software to match users needs (for instance : increase of computational capabilities, advanced 3D brain visualization, compatibility with other software and machines) (2) ensure support, maintenance and spreading of the software (forge, website, forum, training session, etc).
Activities	The software engineer will be involved in an activity of research and experimentations inside a research team. This will induce : • Software development and experimentations : design, programming, testing, documentation ; • Participation to the technical decisions (languages, architecture, tolls) with the scientific leader ; • Participation to all tasks related to the support and deployment of the software (update and support of the forge, animation of the website, animation of the forum/hotline, development of technological demonstrators, preparation and organisation of training sessions and seminars)

Background of the candidate	• Studies in Computer Science, excellent skills in software development and associated tools (version, compilers, documentation, tests, debug, etc) • Programming Languages : C, C++ ; • Knowledge in 3D graphics programming : OpenGL, etc • Excellent in technical and scientific English • Other potential knowledge : signal-processing, MATLAB, virtual reality, haptic feedback
How to apply?	Interested candidates should send CV, motivation letter, and names of references (optional), directly to : anatole.lecuyer@irisa.fr