Ph.D. position

(biomechanical or mechatronics eng.)

Brain imaging headgear design

The laboratory

The Research Group for the Multimodal Analysis of Cerebral Function (GRAMFC-INSERM U 1105) conducts application-oriented research in the multimodal analysis of the cerebral dysfunction in newborns and children, as well as more fundamental research on new functional neuroimaging. We participate in European projects and work closely with academic and industrial partners in functional neuroimaging, with an emphasis on neurodevelopmental applications.

The project

The goal of this project aims for the development of multimodal high-density probe (i.e., helmet) allowing simultaneous measurement and analysis of modification in electrical and local hemodynamic cerebral activity during different clinical and cognitive task in a population at risk (i.e., premature and neonates). The focus of the innovate technology will be on a joined experimental and theoretical investigation on development and application of state-of-the-art combined Electroencephalography /Near-Infrared spectroscopies (cooperation with the Seenel Imaging® Company). In addition, to find the appropriate solutions by the interplay between electronic/optical and mechanical approach by using the electronics and optical probe design. This will allow a complete multimodal (neural and hemodynamic) mapping of the cortical activation in neonates as well as adults. The PhD student will work under the conditions of a CIFRE contract (Industrial Training Conventions by the Research) with our business partner (Seenel Imaging) for a period of 3 years. The candidate will split his/her time between our laboratory and the company, both situated in the Amiens city. A future collaboration within the Seenel Imaging company could be a great opportunity further to the Ph.D project.

Job description

We seek a Ph.D. student to work in a team of senior researchers, postdocs, and other Ph.D. students with complementary skills and tasks. After being trained in neuroimaging and functional optical imaging using state-of-the-art equipment in a hospital environment, the Ph.D. student will actively participate in the research and development of innovative electro-optical technologies and integration schemes. **The work is mainly biomechanical design with a focus on helmet fabrication and evaluation at the device level, but also involves integration with electronics and optics experiments**. In addition, some amount of efforts on design and modeling is expected. Much of the work will be conducted in close collaboration with external partners (Seenel Imaging®). You are expected to develop your own scientific concepts and communicate the results of your research verbally and in writing. The position is intended as a full-time appointment in the INSERM U 1105/GRAMFC for the duration of three years. After successful completion of the Ph.D. research, a Ph.D. degree will be granted.

Qualifications

By the starting date, the applicant should have a Master of Science degree in Biomechanical Engineering, Mechanical engineering, Applied Physics, or equivalent. Solid knowledge in the areas of mechatronics is a plus. Any experience from device design (i.e. CAD design), device fabrication in a biomedical field, and/or device characterization is a merit. A good command of English is required.

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