Software Engineer for Brain-Computer Interface R&D
Brown University / Providence VA Medical Center

Our research team (BrainGate) is developing intracortical brain-computer interface (BCI) technology to improve communication and independence for people with severe motor disabilities. We are an internationally recognized, multidisciplinary team of engineers, computer scientists, neuroscientists and clinicians leading innovation in the field of assistive BCI. We seek an enthusiastic, highly motivated Software Engineer to become a key contributor to the ongoing development of this technology.

Major responsibilities of the Software Engineer include the creation of novel software and integration of commercial hardware for the BrainGate system. Software will be developed to provide individuals with neural control of computer-based communication, home automation, prosthetic limbs, and other assistive technologies. The Software Engineer will develop in several languages and work with engineering staff and academic investigators to advance the BCI platform. The Software Engineer will develop both offline data analyses and real-time neural signal processing algorithms that deliver new functionality for persons in the BrainGate pilot clinical trial. S/he will have the opportunity to present scientific and engineering advancements at conferences and to publish in academic journals.

Specific responsibilities of the Software Engineer will include:

- Develop, test and integrate clean, well-architected software for data acquisition, real-time neural signal processing and decoding, inter-computer communication and control of assistive devices including computers and state-of-the-art robotic arms
- Develop software testing and validation tools such as simulators that emulate the signal and noise properties of neural signals acquired from motor cortex
- Refactor existing code to help automate, modularize, and standardize the BrainGate software suite
- Conceive and implement tools for research data analysis to evaluate performance of the platform and of novel neural decoding approaches
- Work closely with all team members, and contribute experience with digital signal processing, machine learning, dynamical systems, and applied math to improve platform capability, flexibility, reliability and performance
- Verify and deploy system software, support and ensure successful system operation in the homes of clinical trial participants
- Help to educate new team members including engineers, students, postdocs, and research faculty on procedures, methods and best practices pertaining to system development and data analysis

Relevant skills:

This position requires a master's degree or equivalent experience in computer science, neuroscience, or engineering, and expertise in MATLAB, Simulink and Simulink Real-Time (xPC Target). In addition to demonstrated programming skills, the successful candidate will have

previous experience with team development of complex software, and a deep understanding of two or more of the following areas: Kalman filters, Bayesian statistics, dimensionality reduction, multivariate classification and other machine learning techniques, digital signal processing, and adaptive filtering. Additional experience in the following would confer an advantage:

- Neurophysiological recording, preferably applied to brain-computer interfaces
- Objective-C/Swift and/or Java
- Wireless data streaming using common protocols (e.g. 802.11 networks)
- Analysis and presentation of complex data sets
- Research and publication in academic settings

Exceptional interpersonal skills are critical: the successful candidate will independently lead projects and provide remote technical support across clinical sites based in Boston, Providence, Cleveland, and Palo Alto.

This position will be based at Brown University in Providence, RI. Occasional day travel of up to four hours from Providence may be required to attend clinical research sessions.

To Apply:

Interested applicants should forward their CV or resume to Drs. Leigh Hochberg and John Simeral, c/o Ms. Beth Travers (beth_travers@brown.edu).

BrainGate2.org