Postdoctoral Research Associate in Neuroprosthetics and Neurorobotics

Brown University and Massachusetts General Hospital

As part of our ongoing clinical trials of an intracortical neural interface system (BrainGate), we seek enthusiastic individuals with substantial experience in high-resolution neurophysiology and state-of-the-art approaches in machine learning / neuroengineering to develop models and neural interfaces for the restoration of arm and hand function through soft robotics, wearable neurorobotics and other high-dimensional prosthetics. Our internationally recognized research team focuses on developing brain- computer interfaces that will restore communication and upper limb function for people with severe speech and motor impairments, including people with spinal cord injury, stroke, or ALS. Throughout our clinical research, we also conduct fundamental human neuroscience research inmovement control, cognition, and attention.

As a highly multidisciplinary endeavor, our team includes a tight-knit collaborative group of neuroscientists, engineers, computer scientists, mathematicians, and clinicians. Opportunities are available for each team member to interact directly with clinical trial participants. This postdoctoral position will contribute to a variety of neural interface research projects with a particular focus on the high-dimensional neural control of devices to assist with reaching and grasping by individuals with tetraplegia. Activities will include

- Analyzing neuronal ensemble activity, including how kinematics and dynamics of intended movement are encoded in cortical single units, multi-unit activity, and local field potentials toward the robust decoding of intended movement.
- Harnessing the rich information embedded in intracortical signals for the development of robotic / prosthetic interfaces.
- Developing innovative real-time signal processing and decoding strategies to improve the control of multidimensional effectors across different contexts.
- Creating leading approaches to decoding intended speech from cortical signals.

Candidates must have strong neuroscientific, mathematical, and computational skills, including proficiency in MATLAB, Simulink, and/or Python, as well as demonstrated skills in peer-reviewed manuscript preparation. Preferred educational background is a PhD in neuroscience, BME/neural engineering, EE, CS, applied mathematics, or other closely related fields. Depending upon research interests, candidates should have previous experience with single or multi-unit recordings, neuronal ensemble analysis, current dimensionality reduction and machine learning techniques, signal processing, and/or statistical analysis.

Inquiries should be directed to the laboratory of Leigh R. Hochberg, MD, PhD, c/o Beth Travers (Beth_Travers@brown.edu).

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