Postdoctoral research fellowship in intracortical brain computer interfaces

As part of our ongoing clinical trials of an intracortically implanted neural interface system (BrainGate), we seek enthusiastic individuals with expertise in computational and systems neuroscience, intracortical neurophysiology, machine learning, or neuroengineering to join our internationally recognized research team. Our work focuses on developing brain-computer interfaces to restore communication and functional independence for people with paralysis. We also conduct fundamental human neuroscience research in movement 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. Fellows will join the rich research community at the Center for Neurotechnology and Neurorecovery at Massachusetts General Hospital and Harvard Medical School, working in close collaboration with colleagues at Brown University, Stanford University, and the Providence VA Medical Center. Opportunities are available for each team member to interact directly with clinical trial participants. Multiple available research projects, shaped to the researcher's skills and interests, include (but are not limited to):

* Harnessing intracortical signals for the development of communication interfaces for persons who are locked-in by studying the human cortical representation of speech and language in an effort to develop speech-BCI.

* Analyzing neuronal ensemble activity (including how kinematics and dynamics of intended movement are encoded in single units, multi-unit activity, and local field potentials recorded from motor cortex) toward the improvement of decoding intended movement.

* Developing new real-time decoding strategies, signal processing, and post-processing algorithms that will improve the decoding of intended multidimensional movement in the face of changes in neural signals over time and across different contexts.

Candidates should have strong neuroscientific, mathematical, and computational skills, including proficiency in Matlab, C, C++, and/or Simulink, as well as strong writing skills.

Preferred educational background is a PhD in neuroscience, biomedical engineering, electrical engineering, computer science, applied mathematics, or other closely related fields. Depending upon research interests, candidates should have previous experience with single or multi-unit recordings (e.g., intracortical recordings in awake non-human primates), neuronal ensemble analysis, adaptive filter design, signal processing, and statistical analysis or modeling of neuronal action potential and local field potential data.

If interested, please email Daniel Rubin, M.D., Ph.D. (drubin4@mgh.harvard.edu) to learn more.