Postdoctoral Associate Positions to Conduct Research on Neural Control Engineering and Neuronal Population Dynamics

The Neuromodulation Research Center (NMRC) at the University of Minnesota seeks three postdoctoral researchers to join its interdisciplinary team. Interested candidates will join dedicated, collaborative researchers working to advance neuromodulation therapies for those living with neurological disorders. In the heart of Minnesota's Medical Alley, our translational research brings together experts from neurology, neurosurgery, neuroscience, engineering, radiology, and beyond. For more information, visit nmrc.umn.edu.

Successful candidates for these positions will apply control and systems engineering techniques to the analysis of neuronal population dynamics in Parkinson's disease and the development of feedback control techniques for patient-specific deep brain stimulation (DBS) therapies. Candidates should apply for one of three positions described as follows.

Clinical Research on Closed-Loop DBS (Job Code 328604)

This placement will focus on the design, implementation, and testing of feedback control techniques aimed to optimize DBS therapies in Parkinson's disease patients. The postdoctoral researcher working in this position will have the opportunity to be involved in clinical research with patients receiving DBS implants.

Required Qualifications:
- PhD in control engineering or related science/engineering field with a background in:
  - Feedback control systems
  - Signal processing and data analysis
  - System identification and mathematical modeling of dynamical systems

Desired Qualifications:
- Systems neuroscience
- Kinematics and robotics
- Development of software tools using MATLAB/Simulink
- Real-time systems
Pre-clinical Research on Neuronal Population Dynamics (Job Code 328718)

The postdoctoral researcher working in this placement will study the collective dynamics of neuronal populations in Parkinson’s disease and the effect of DBS therapy on these dynamics. The postdoctoral researcher will have the opportunity to access and analyze large sets of neural data available in the NMRC.

**Required Qualifications:**
- PhD in engineering, applied mathematics, neuroscience or a related field with a background in:
  - Signal processing and data analysis
  - System identification and mathematical modeling of dynamical systems
  - Graduate-level linear algebra and differential equations

**Desired Qualifications:**
- Systems neuroscience
- Brain machine interfaces
- Kinematic analysis
- Development of software tools using MATLAB/Simulink

Pre-clinical Research in Brain Connectivity and Feedback Control to Optimize DBS (Job Code 328718)

The postdoctoral researcher working in this placement will focus on studying how Parkinson’s disease alters effective connectivity in brain circuits responsible for movement control and investigating feedback control techniques aimed to restore function in these circuits. The postdoctoral researcher will have the opportunity to apply engineering methods to the development and testing of next generation DBS therapies.

**Required Qualifications:**
- PhD in control engineering or related science/engineering field with a background in:
  - Feedback control systems
  - Signal processing and data analysis
  - System identification and mathematical modeling of dynamical systems
  - Real-time systems

**Desired Qualifications:**
- Systems neuroscience
- Kinematics and robotics
- Development of software tools using MATLAB/Simulink

If you are interested in one of the aforementioned positions or would like to know more about them, please contact Dr. David Escobar at descobar@umn.edu. Please include your CV and indicate in which area you are most interested. All formal applications must be made through the University of Minnesota job portal at https://humanresources.umn.edu/content/find-job using the job codes indicated above.