FACILITIES & OTHER RESOURCES

Laboratory:
All experimental studies with healthy human subjects will take place in the BIG lab shared by Dr Jonathan Matthis and Josh Stefanik located in Richards Hall at Northeastern University. Housed in Richards Hall on Northeastern's main campus, the Action Lab has an approximate space of over 3,100 sqft dedicated to the study of full-body human movement. This lab has state-of-the-art 31-camera Qualisys motion capture system providing over 140m^2 of usable full-body capture volume within a 7.6m x 18.5m area, 5 AMTI 400600 force plates, and a FLOAT multi-directional active bodyweight support system, a Bertec instrumented spilt treadmill, several Pupil Labs mobile eye trackers and a Delsys wireless EMG system. The labspace also includes a lockable exam room that be used for confidential converstations and secure storage of sensitive documents.

Technical Support:
Northeastern's computer network and servers are administrated by a central help desk that is freely available to faculty and student. Site-licensed software includes MATLAB for mathematical analysis, LabView for real-time data acquisition and control plus numerous other software packages. Due to on the co-sponsor's (Dr. Sternad) joint appointment in Electrical and Computer Engineering and in Physics, she has access to the workshops in these departments. A machine shop with specialization in electronics is available for support in designing customized experimental set-ups.

All experimental activities within the laboratories are monitored for Human Subjects and Biosafety requirements by Northeastern's Office of Regulatory Compliance.

Scientific Environment:
The Action Lab at Northeastern is a state-of-the-art facility provided by Northeastern University in 2008 when the university made a significant commitment to research in motor neuroscience. This commitment is reinforced by additional programs and initiatives at the university, most prominently the PhD program in the newly founded Department of Bioengineering, with Neural Control and Neuroengineering. Further, Dr. Matthis assists with the organization of an inter-institutional seminar series, the Boston Action Club, supported by the College of Science and founded by Dr Sternad, which regularly brings together researchers from the Boston area setting a platform for collaborative exchange.

Dr. Matthis works closely with Dr. Sternad, whose lab houses the virtual environment with a large backprojection screen and the robot arm. The lab is also equipped with a 12-camera system for 3D motion capture (Qualisys), 2 AMTI force plates, and wireless EMG system with 16 sensors (Myon), and many other smaller pieces of equipment like accelerometers, goniometers, etc. In addition, there is equipment for brain measurement and stimulation such as Transcranial Magnetic Stimulation (TMS) with a brain navigation system, a 128-channel EEG system (Biosemi), and a Transcranial Direct Current System (tDCS). Dr. Sternad's lab group currently comprises 4 postdocs with a background in Robotics, Neuroscience, and Biomedical Engineering, 3 graduate students pursuing PhDs in Bioengineering and Electrical and Mechanical Engineering, and 4 undergraduate students from Behavioral Neuroscience and Bioengineering. Shared lab meetings between the Matthis and Sternad labs will provide the applicant with an opportunity to gain experience working in a large, established lab as a counterpoint to working on developing a new lab with his primary advisor, Dr Matthis.

In addition, the applicant will attached weekly meetings of the Northeastern Vision Club with Dr. Peter Bex (co-sponsor) and other Notheastern Faculty, including Dr. Ennio Mingola and Dr Rhea Eskew. These meetings will help the applicant gain experience with classical vision science, and help to situation him within the larger intellectual community of Boston.