SELECTION OF SPONSOR AND INSTITUTION

The research and training plan I have proposed reflects my desire to move towards a deeper understanding of the interplay between visual and motor neuroscience within the visuo-locomotor system. This proposal combines my foundation in complex systems and perception and action research with the resources available to me at Northeastern University. I chose to begin this new stage in my career with Dr. Jonathan Matthis. I had gotten to know Dr. Matthis by seeing him present his work at VSS throughout my graduate career, and when I had found out that he was starting a lab at Northeastern University, I was thrilled by the chance to work with him. I believe that Dr. Matthis's research is in many ways the future of vision science; his expertise in measuring natural visuo-locomotor behavior is unparalleled and his training will be critical for me in the pursuit of my goals. By using cutting edge technologies to measure visual behavior in natural environments, we can start to test hypotheses and theories that go beyond the typical grasp of the field of vision science, and begin to understand how well researched visual processes – like visual search – might be reshaped when exposed to the task constraints of the natural world.

Dr. Matthis has over a decade of experience measuring the visual control of foot placement, and has a strong history of communicating his findings in high-quality research journals such as *Current Biology, PloS One, Proceedings of the National Academy of Sciences*, and many more. Dr. Matthis's lab space is critical for the proposed research, combining a 14x3m Augmented Reality tracking space with Qualisys motion capture, binocular eye tracking, and kinetic force plates built into the floor. The paradigm that myself and my co-sponsors have developed has benefited greatly from the state of the art technology within the lab, and Dr. Matthis's unique expertise in using it all correctly. Despite Dr. Matthis's lack of experience in training post-doctoral fellows, I believe that I am to be the first of many successful scientists to pass through Dr. Matthis's lab – his support and guidance in the generation of this proposal has been invaluable. To supplement his guidance, I have selected two co-sponsors both within the Northeastern University system to support my development with respect to both visual and motor neuroscience: Drs. Peter Bex and Dagmar Sternad.

Dr. Bex has 23 years of experience studying binocular vision disorders and has established an extensive collaborative network among local clinicians in the Boston area. Dr. Bex has mentored 17 post-doctoral associates in his academic career – all of whom have research positions – and will bring critical insight into helping me plan my own career in vision science. Dr. Bex will be able to aide in my communication to the vision science community, as his graduate students and postdoctoral researchers have published widely, both in basic vision research journals and ophthalmology journals, including *Proceedings of the National Academy of Sciences, Current Biology, Journal of Neuroscience, Scientific Reports, Journal of Vision, Investigative Ophthalmology & Visual Science*, and many others. Furthermore, members of his lab have gone on to secure faculty positions at research universities, having gained the professional and research skills they needed as faculty during their time in the lab.

Dr. Dagmar Sternad has 25 years of experience studying movement neuroscience and motor control, and has been instrumental in making Northeastern University a high-quality research institution in the past decade. Dr. Sternad has mentored 17 post-doctoral associates and 13 graduate students in her academic career, many of whom have gone on to be professors in kinesiology and movement science. Dr. Sternad is an accomplished grant writer, having received continuous research funding over the past 23 years from the NIH, NSF, and many more. Her background in the motor control of standing, walking, and complex behaviors in varying task demands will provide critical support to our analysis of the visuo-locomotor system in the experiments within this proposal. Additionally, Dr. Sternad is an expert in scientific networking, as she hosts the most prolific action-oriented talk series in all of Boston, Boston Action Club. Her network of perception and action scientists stretches across the world and having her as a co-sponsor will be beneficial in helping me find promising venues for communicating my scientific findings as well as providing career opportunities.

Northeastern University provides an outstanding research and academic environment for interdisciplinary training in visual and motor neuroscience. Dr. Matthis's lab at Northeastern University is a part of an extensive network of researchers in the Boston area studying visual and motor neuroscience. In my visits to Northeastern in preparation for this proposal, I have already benefited from interactions with faculty, postdocs, and students working in these areas. I am excited to engage in journal clubs, talk series, audited courses, and lab meetings which will all provide me with the particular expertise required to achieve my goals of becoming an excellent researcher within perception and action.