Shanaathanan Modchalingam

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EDUCATION

PhD, York University (Sensorimotor Neuroscience – Kinesiology and Health Science) **expected: 2023**
Focus: Factors affecting attention-free error reduction during 3D motor interactions in virtual environments.

MSc, York University (Sensorimotor Neuroscience – Kinesiology and Health Science) **2018**
Focus: Changes in sensed limb position following adaptation to misaligned visual feedback.

WORK EXPERIENCE

Reality Labs Research, Meta **Toronto, ON, Canada**
Research Scientist Intern – Human Computer Interaction **Aug 2022 – Feb 2023**

- Conducted extensive literature reviews to establish research direction, iteratively refined input-interaction and multimodal-feedback designs, executed a 40-person user study, and disseminated data and findings within organization.
- Increased start-up times of multiple projects within the organization by developing rapid prototyping tools for demo and study development integrating *surface-EMG inputs, machine-learning models, XR devices,* and *wearable haptic feedback devices* (*Unity, C#, Python, PyTorch*).
- Active participant in planning and execution of several input and interaction research projects in addition to own projects.

Theoretical Cognitive Science Group, The Philipp University of Marburg **Marburg, Germany**
Visiting Researcher – Computational Neuroscience **Jun 2021 – Aug 2022**

- Optimized time-series machine learning models, emphasizing Bayesian approaches for contextual inference (*PyTorch*).

Sensorimotor Control Lab, York University **Toronto, ON, Canada**
Workstream Lead – Learning in Immersive Virtual Environments **Sept 2018 – Present**

- Started, maintained, and grew the workstream by securing funding, and setting and achieving research goals.
- Grew team from a single researcher to 10+ members including developers, researchers, and research assistants while fostering a collaborative and innovative environment. In charge of procurement, hiring, and task assignments.
- Accelerated demo and study development timelines by >400% through collaborative hardware (accessories and robotics) and software (*Unity, C#*) design and development with developers and researchers.
- Designed and developed data-cleaning and visualization tools – now used by >10 researchers in the wider research group.

LEADERSHIP ACTIVITIES

Vision Science to Action – Leadership Committee **Jun 2020 – Aug 2022**

- Elected member on committee overseeing a $120M+ research fund representing student and postdoc interests.
- Impacted the strategic direction and funding decisions that led to innovation, enhanced research output, outreach, and the securing of an additional $300M+ in funding by the same group of researchers.

Brain in Action: International Research Training Group – Directorate **Sep 2021 – Aug 2022**

- Represented Canadian researchers in an international multi-university collaborative research group.

Centre for Vision Research – Steering Committee **May 2020 – Dec 2021**

- Elected member on committee overseeing strategic and funding allocation for the Centre for Vision Research, encompassing >40 tenured human- and computer-vision scientists at York University, and their staff and trainees.

Additional: Neuromatch Academy (Volunteer Organizer), Virtual Vision Futures (International Conference – Organizing Committee Member and Session Chair), CVR Director Hiring Committee (Student Rep), Cerebral Palsy Association (President)

SELECT PUBLICATIONS

- **Modchalingam S**, Ciccone M, D'Amario S, 't Hart BM, Henriques DYP. 2023. Adapting to visuomotor rotations in stepped increments increases implicit motor learning. Scientific Reports 2023;13.
- **Modchalingam S,** 't Hart BM, and Henriques DYP. The effects of immersive visual cues on adaptation to internal and external errors. Society for the Neural Control of Movement Meeting, 2022, Dublin, Ireland

ADDITIONAL INFORMATION

Awards: NSERC PGSD (23,000/year), VISTA Graduate Scholarship (10,000/year), Brain in Action Training Grant (15,000/year)
Skills: Software Development (**Unity, C#, Python, R**), Machine Learning (**PyTorch, scikit-learn, Tensorflow**), Data Science (**Python, R**), Project Management (**Agile, Kanban**), Source Control (**Git, Github**), Databases (**SQL Server, MySQL, OSF**)
Training and Certifications: Deep Learning, Computational Neuroscience, EEG Measurement & Analysis, XR for Research