Shanaathanan Modchalingam

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EDUCATION

PhD, York University (Sensorimotor Neuroscience – Kinesiology and Health Science) **expected: Summer 2023**
Focus: Conscious and unconscious processes of learning free-hand and tool-based interactions in 2D and 3D environments

MSc, York University (Sensorimotor Neuroscience – Kinesiology and Health Science) **2018**
Focus: Changes in sensed hand position following learning 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 effectively disseminated data and findings within the organization.
- Improved start-up times of multiple projects within the organization by developing rapid prototyping software for demo and study development integrating surface-EMG inputs, XR devices, and wearable haptic feedback devices.
- Actively participated in the planning and execution of several input and interaction research 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 – Aug 2022**

- Started, maintained, and grew the workstream by securing funding, and setting and achieving research goals.
- Grew the team from a single researcher to 10+ including software developers, researchers, and research assistants while fostering a collaborative and innovative environment.
- Accelerated demo and study development timelines by >75% through collaborative hardware (accessories and robotics) and software (Unity, C#) design with developers and researchers.

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 allocation 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.
- Started multiple graduate-student-led initiatives including establishment of a participant repository for remote XR experimentation during pandemic lockdowns ensuring continuity of research.

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**, Vachon CM, 't Hart BM, Henriques DYP. 2019.The effects of awareness of the perturbation during motor adaptation on hand localization. PLoS ONE 2019;14(8).

ADDITIONAL INFORMATION

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