Shanaathanan Modchalingam
PhD Candidate and VR Research Lead

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EXPERIENCE

PhD Candidate | Sensation, Perception, and Motor Learning,
Sensorimotor Control Lab | Centre for Vision Research at York University
09/2016 – present

Project Lead: Experimental Framework in Immersive VR
- Led a team of 3 developers creating hardware and software tools to best employ immersive VR for motor learning research
- Worked with Principal Investigators to design and establish a research program aligned with global research goals of the laboratory
- Successfully completed multiple research projects at all academic levels (Undergraduate, Masters, PhD, Postdoctoral)
- **HCI:** Designed, developed, and refined intuitive and engaging measures and aides for research (e.g. gaze-based localization of limbs in space, and custom hardware)
- Successfully navigated CoViD-19 guidelines to conduct safe human-focused tool development and research

Graduate Researcher
- Dissertation focus: limb movement in VR environments and maximizing movement-based learning in all environments
- Published findings in peer-reviewed scientific journals and presented findings at multiple international conferences

Visiting Researcher | Computational Neuroscience, *Group for Theoretical Neuroscience | The Philipp University of Marburg*
08/2021 – present
- Developed and compared machine learning models of inferring environmental context during movements

Teaching | Motor Learning, Statistics and Physiology,
School of Kinesiology and Health Science, York University
09/2016 – present

Lecturer and Course Director: Human Motor Learning
- Designed and delivered an applied-research focused 4th-year university-level course
- Mentored undergraduate students through designing, executing, and communicating neuro-motor learning experiments

Teaching Assistant
- Human Physiology: Instructed applied fundamentals of collecting electrophysiological and biological data
- Statistics: Instructed fundamentals of data analysis and statistics

PUBLICATIONS

External error attribution dampens efferent-based predictions but not proprioceptive changes in hand localization.
Gastrock RQ, Modchalingam S, 't Hart BM, Henriques DYP. Scientific Reports. 2020;10. https://doi.org/10.1038/s41598-020-76940-3

The effect of age on visuomotor learning processes.
Vachon CM, Modchalingam S, 't Hart BM, Henriques DYP. PLOS ONE. 2020;15(9). https://doi.org/10.1371/journal.pone.0239032

The effects of awareness of the perturbation during motor adaptation on hand localization.
Modchalingam S, Vachon CM, 't Hart BM, Henriques DYP. 2019. PLOS ONE. 2019;14(8). https://doi.org/10.1371/journal.pone.0220884

Unbounded implicit motor adaptation.
Modchalingam S, Ciccone M, 't Hart, BM, and Henriques DYP. 2020. Neuromatch 2, Online Conference, Talk

EDUCATION

PhD Candidate – Sensorimotor Neuroscience – Health, *York University*
present

MSc – Sensorimotor Neuroscience – Health, *York University*
2018

SKILLS

Programming
- Statistical programming, machine learning and data visualization: Python (PyTorch, Numpy), R (Stan, Tidyverse), and MATLAB
- Software development: Unity 3D (C#), Python (PsychoPy), and R (Shiny)

Human-Computer Interaction
- Design and development of graphical user interfaces for experimenters
- Design and development of movement-based interfaces for research participants
- Prototyping and refinement of hardware tools and tracked wearables integral to motor learning research

Research and Scientific Measurements
- Participant-focused experiment design
- Human-focused qualitative and quantitative measures: surveys, behavioural, psychophysical, and physiological measures

Leadership and Program Management
- Lead research program involving large team of programmers and researchers
- Elected to multiple leadership committees representing 300+ trainees
- Elected to leadership committee for research unit focused on innovation, science-to-application and commercialization

Databases
- SQL Server and MySQL
- Published cleaned and anonymized datasets on Open Science Framework

AWARDS

2020 – 2022 | NSERC Postgraduate Scholarship - Doctoral, *$23000/year*

2018 – 2022 | VISTA Graduate Scholarship, *$10000/year*

2018 - 2021 | NSERC CREATE IRTG 'Brain in Action' Program, *$15000/year*

ADDITIONAL TRAINING

Implicit Bias and EDI Training
York University

Computational Neuroscience
Neuromatch Academy

EEG Measurement and Analysis
University of Western Ontario Brain and Mind Institute, The Philipp University of Marburg

XR for Research
York University