Shanaathanan Modchalingam

PhD Candidate and VR Research Lead

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Toronto, Canada

EXPERIENCE

Visiting Researcher (Remote) | Computational Neuroscience,
Group for Theoretical Neuroscience, The Philipps University of Marburg
08/2021 – present

- Developed, optimized, and compared neuroscience-informed machine learning models of context assignment and context switching during motor learning -- used Python, PyTorch, Numpy
- Focus: Non-parametric Bayesian models and time-series analysis of motor performance and perceptual input

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

Project Lead: Motor Learning in Immersive Virtual Environments

- Pitched, secured > $10,000 in funding for, and established a prolific research program aligned with the research goals of the laboratory
- Led a team of 3 developers creating software and hardware to best employ immersive VR for motor learning research
- Prioritized researcher users during development, reducing experiment deployment times from months to weeks
- Facilitated multiple research projects at all academic levels -- completing 5 research projects over the past 3 years
- Designed, developed, and refined intuitive measures for research and product feedback (e.g. gaze-based localization of limbs in space, custom hardware, surveying tools)

Researcher

- Dissertation focus: Conscious vs unconscious contributions to changing motor behaviour in dynamic virtual environments
- Secured collaborations, published findings in scientific journals, and presented at multiple international conferences

Leadership and Committees

- Represented trainee-level researchers in multiple institutional and international leadership groups overseeing > $120 million in funding
- Secured funding for innovation, industry and academic collaboration, and travel for graduate researchers

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

Lecturer and Course Director: Human Motor Learning

- Designed and delivered a research-based undergraduate course
- Mentored undergraduate students through designing, executing, and communicating neuro-motor learning experiments

SELECT PUBLICATIONS

Competition between parallel sensorimotor learning systems, *eLife*
Albert ST, Jang J, Modchalingam S, 't Hart BM, Henriques DYP, Lerner G, Della-Maggiore V, Haith AM, Krakauer JW, Shadmehr R. 2022;11.
https://doi.org/10.7554/eLife.65361

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

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

EDUCATION

PhD Candidate - Sensorimotor Neuroscience - Health,
York University
present

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

SKILLS

Machine Learning and Data Science
- Python (PyTorch, TensorFlow, Pandas, Numpy, SciPy)
- R (Stan, Tidyverse, Shiny)

Software Development
- Unity 3D (C#)
- Python (PsychoPy)
- R (Shiny)

Project Management
- Agile, Kanban, Trello
- Git, Github

Human-Computer Interaction
- Hardware and software design and prototyping
- Remote and in-person usability testing and quality control

Research
- Human-focused motor learning
- Immersive virtual reality
- Qualitative and quantitative methods: surveys, psychophysical, and physiological measures

Databases
- SQL Server, MySQL
- Open Science Framework

SELECT AWARDS

NSERC Postgraduate Scholarship - Doctoral **2020 – 2022**
$23,000/year

VISTA Graduate Scholarship - Doctoral **2018 – 2022**
$10,000/year

NSERC CREATE "Brain in Action" International Training **2018 - 2021**
$15,000/year

ADDITIONAL TRAINING

Implicit Bias and EDI Training
York University

Computational Neuroscience
Neuromatch Academy

EEG Measurement and Analysis
The Philipp University of Marburg

XR for Research
York University