Shanaathanan Modchalingam

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Education

PhD - Sensorimotor Neuroscience - Kinesiology and Health Science, *York University* present

MSc - Sensorimotor Neuroscience - Kinesiology and Health Science, *York University* 2018

Skills

Programming
- Statistical programming in R, Python, and MATLAB
- Experiment and scientific tool development experience in Python, Unity, C#, and R
- Machine learning in Python, PyTorch, and MATLAB

Program management
- Led a small team of developers in creating software tools for VR-based experimentation
- Transformed project structure to a work-from-home model, with rapid redeployment in mind
- Rapidly and successfully deployed new and existing experiments in a lab setting

Leadership and communication
- Voting member on the Steering Committee for the Centre for Vision Research; a world-leading vision research group
- Voting member on the Leadership Committee for Vision, Science to Application; a multidisciplinary research program overseeing over $120,000,000 in funding
- Organization Committee for Virtual Vision Futures; an international scientific conference

Human-Computer Interactions
- Developed intuitive human-participant based experiments with varying research goals
- Developed software tools with multiple user roles; participant, experimenter, and developer
- Performed ex situ and in situ studies to increase student engagement in psychophysics experiments

Program development
- Submitted proposals and secured grants to develop a virtual reality-centred lab space
- Designed and assembled lab space with goals of minimizing measurement errors
- Created flexible frameworks for building and executing rigorous scientific experiments
- Successfully deployed multiple undergraduate, graduate, and post-doctoral level projects

Databases
- Maintained database for scientific data analysis using SQL Server and MySQL
- Published cleaned and anonymized datasets for open science use on Open Science Framework

Professional Experience

PhD Candidate | Sensation, Perception, and Motor Learning, *Sensorimotor Control Lab – Dr. Denise Henriques | Centre for Vision Research at York University* 09/2016 – present
- Dissertation focus: the interplay between conscious and unconscious motor learning, and maximizing, implicit, intuitive human motor learning; includes experiment design, development, data analysis, and computational modelling work
- Lead the AR/VR research program at the Sensorimotor Control Lab
- Published findings in peer reviewed scientific journals

Visiting Researcher | Computational Neuroscience, 08/2021 – present
Group for Theoretical Neuroscience | The Philipp University of Marburg
- Develop and compare neuroscience-informed machine learning models of contextual inference when moving in new environments

Course Director, Lecturer, and Teaching Assistant | Motor Learning and Physiology, 09/2016 – present
School of Kinesiology and Health Science, York University
- Designed and delivered course material for a 4th year university level course
- Mentored undergraduate students through designing, executing, and communicating neuro-motor learning research
- Instructed applied fundamentals of collecting electrophysiological and biological data

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

Additional Training

Implicit Bias and EDI Training | York University

EEG Workshop | University of Marburg

Brain and Mind Institute EEG Workshop | University of Western Ontario

Computational Neuroscience Summer School | Neuromatch Academy

XR for Research Workshop | York University

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*

Committees and Service

Participant Repository for VR Research Organizing Committee, *Founding Member* 02/2021 – present

Vision Science to Application Leadership Commitee, *Voting Member* 05/2020 – present

Successful Grants and Scholarships Writing Workshop, *Panelist* 10/2021

Centre for Vision Research Steering Committee, *Voting Member, Trainee Representative* 09/2020 – 10/2021

Centre for Vision Research Communications Committee, *Member* 05/2020 – 04/2021

Neuromatch Academy, *Volunteer Organizer, Support* 07/2020

Vision Futures International Conference, *Organizing Member, Talk Session Chair* 06/2020

CVR Director Hiring Committee, *Voting Member, Graduate Student Representative* 03/2020