SHANAATHANAN MODCHALINGAM

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EDUCATION

In Progress - **PhD** - Sensorimotor Neuroscience - Kinesiology and Health Science - York University

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

2018 - **Graduate Diploma** – Neuroscience - York University

2014 - **Bachelor of Science with Honours** - Biology (Biomedical Science) - York University

2009 - Enriched Math, Science and Computers - W.L. Mackenzie C.I.

EXPERIENCE

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

• Specialized in input interactions, wearables, haptics, neural input, XR interactions, gestural input, pressure-based input, and optimal feedback for skill development
• Developed a technical framework for prototyping, demonstrating, and executing research studies, benefiting multiple projects within the organization
• Investigated novel interactions through the design and execution of research studies using next-generation technologies
• Influenced research direction for several projects beyond the primary scope of the internship

The Philipps University of Marburg | *Jun 2021 – Aug 2022*
Visiting Researcher (Remote) – Group for Theoretical Neuroscience, Dr. Dominik Endres

• Concentrated on time series analysis, contextual inference, non-parametric Bayesian modelling, and machine learning
• Enhanced and compared machine learning models for contextual inference during human motor learning

Centre for Vision Research at York University | *Sep 2016 – Present*
Researcher and XR Workstream Lead – Sensorimotor Control Lab, Dr. Denise Henriques

Researcher

• Explored implicit and explicit processes of motor learning, visual feedback, learning in XR environments, and learning protocols

Workstream Lead: Motor Learning in Immersive Virtual Environments

• Obtained funding and launched a successful research program
• Shaped research direction for AR/VR projects within the lab
• Supervised a team of developers in creating custom software and hardware solutions for motor learning research in AR/VR

Leadership and Committees

• Advocated for trainee-level researchers in multiple institutional and international leadership groups managing >$120 million in funding

York University | *Jul – Aug 2016*
Brain and Motor Learning Instructor – Science Exploration Summer Camp

• Facilitated a workshop for children and adolescents
• Orchestrated a motor learning experiment as part of the workshop

Centre for Vision Research at York University | *2015 – 2016*
Research Assistant – Sensorimotor Control Lab

• Executed motor learning experiments independently with undergraduate participants
• Assisted in testing and troubleshooting experiments
• Mentored volunteers in performing quality control on robot-generated data

Cerebral Palsy Association at York University | *2012 – 2013*
President

• Coordinated biweekly events and various activities to fundraise and raise awareness about cerebral palsy
• Collaborated with executive members to delegate tasks and ensure efficiency

E-sports at York University | *2012 – 2013*
Vice President

• Arranged and presided over weekly executive meetings
• Ensured smooth execution of multiple events and tournaments

Grace Health Centre under Dr. T. Y. Wong | *2010 – 2012*
Clinical Assistant

• Maintained records of various tests including MRIs, X-rays, EEGs, and ECGs
• Administered vaccines under doctor supervision
• Shadowed doctors to observe procedures and consultations

Cerebral Palsy Association at York University | *2011- 2012*
Events and Promotions Director

• Planned and managed various biweekly events
• Designed promotional materials such as pamphlets, posters, booklets, and brochures

TEACHING EXPERIENCE

Fall 2019 - **Course Director** - Principles of Neuro-motor Learning

Winter 2021-2022 - **Teaching Assistant** - Analysis of Data in Kinesiology

Winter 2017-2021 - **Teaching Assistant** - Human Physiology II

Fall 2016-2021 - **Teaching Assistant** - Human Physiology I

Winter 2018 - **Teaching Assistant** - Principles of Neuro-motor Learning

PUBLICATIONS AND PRESENTATIONS

Research Articles:

Modchalingam S, Ciccone M, D'Amario S, 't Hart BM, Henriques DYP. Adaptation to visuomotor rotations in stepped increments increases implicit motor learning. Scientific Reports. 2023;13. https://doi.org/10.1038/s41598-023-32068-8

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

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

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

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). https://doi.org/10.1371/journal.pone.0220884

Preprint: 't Hart BM, Taqvi U, Gastrock RQ, Ruttle JE, **Modchalingam S,** Henriques DYP. Measures of implicit and explicit adaptation do not linearly add. bioRxiv. Jun 2022. https://doi.org/10.1101/2022.06.07.495044

Conference Abstracts and Presentations:

Modchalingam S, 't Hart, BM, and Henriques DYP. The effects of immersive visual cues on adaptation to internal and external errors. Society for Neural Control of Movement Meeting, 2022, Dublin, Ireland

Modchalingam S, 't Hart, BM, and Henriques DYP. Effects of visual cues in an immersive environment on adaptation to internal and external errors. Brain in Action Annual Retreat, 2022, Grünberg, Germany, Talk

Modchalingam S, 't Hart, BM, and Henriques DYP. The effects of visual cues in an immersive virtual reality environment on adaptation to internal and external errors. Vision Sciences Society, 2022, St. Pete's Beach, FL

Modchalingam S, and Henriques DYP. Factors affecting implicit motor learning. Virtual Vision Futures, 2021, Online Conference, Talk

Albert ST, Jang J, **Modchalingam S**, 't Hart BM, Henriques D, Lerner G, Della-Maggiore V, Haith AM, Krakauer JW, Shadmehr R. 2021. Adaptation as a competition between two distinct sensorimotor learning systems. Society for Neural Control of Movement Meeting, 2021, Online Conference

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

Modchalingam S, Ciccone M, 't Hart, BM, and Henriques DYP. Unbounded implicit motor adaptation. VISTA Annual Research Retreat, 2020, Toronto, ON

Modchalingam S, Ciccone M, ’t Hart BM, and Henriques DYP. Unbounded implicit motor learning. Society for Neuroscience Annual Meeting, 2019, Chicago IL

Modchalingam, S, and Henriques, DYP. Attribution of error: adapting in virtual reality. International Conference on Predictive Vision. 2019, Toronto, ON

Modchalingam, S, and Henriques, DYP. Attribution of error: adapting in virtual reality. Brain in Action Annual Retreat, 2019, Grand Bend, ON, Talk

Modchalingam S, Ciccone M, ’t Hart BM, Henriques DYP. Implicit motor learning. Canadian Action and Perception Network Satellite – Canadian Association for Neuroscience, 2019, Toronto, ON

Gastrock, RQ, **Modchalingam, S,** Vachon, C, 't Hart, BM, & Henriques, DYP. Proprioceptive recalibration and updating predicted sensory consequences are neither exclusively implicit nor explicit. Journal of Exercise, Movement, and Sport (SCAPPS refereed abstracts repository), 2018, 50(1)

Modchalingam S, Vachon C, ’t Hart BM, Henriques DYP. Explicit awareness of a perturbation during training does not affect predicted and perceived sensory consequences of hand motion. Society for Neuroscience Annual Meeting, 2017, Washington DC

Vachon C, **Modchalingam S**, ’t Hart BM, Henriques DYP. Older adults benefit less from explicit instruction but show a larger change in perceived but not predicted estimate of hand position following visuomotor training. Society for Neuroscience Annual Meeting, 2017, Washington DC

Modchalingam S, Vachon C, ’t Hart BM, Henriques DYP. Explicit instruction and a large perturbation have equivalent effects on rate of motor learning. Centre for Vision Research-VISTA Conference, 2017, Toronto, ON

Vachon C, **Modchalingam S**, ’t Hart BM, Henriques DYP. The Roles of Sensory Prediction and Explicit Strategies for Motor Learning in Older Adults. Centre for Vision Research-VISTA Conference, 2017, Toronto, ON

Modchalingam S, Vachon C, ’t Hart BM, Henriques DYP. Explicit instruction and a large perturbation have equivalent effects on rate of motor learning. Canadian Association for Neuroscience, 2017, Montreal, QC

Vachon C, **Modchalingam S**, ’t Hart BM, Henriques DYP. The Roles of Sensory Prediction and Explicit Strategies for Motor Learning in Older Adults. Canadian Association for Neuroscience, 2017, Montreal, QC

Henriques DYP, Vachon C, **Modchalingam S**, ’t Hart BM. Proprioceptive Recalibration and Updating Predicted Sensory Consequences are not Affected by Explicit Instruction. Society for Neural Control of Movement Meeting, 2017, Dublin, Ireland

’t Hart BM, **Modchalingam S**, Echlin H, Vachon C, Henriques DYP. 2016. Proprioceptive Recalibration is a Purely Implicit Process. Journal of Exercise, Movement, and Sport (SCAPPS refereed abstracts repository), 2015, 50(1)

COMMITTEES AND SERVICE

‘Brain in Action’ International Research Training Group Directorate – Canada Representative	Sep 2021 – Aug 2022
Organizing Committee – Participant Repository for Virtual Reality Research	Sep 2020 – Dec 2021
Vision, Science to Application Leadership Committee: Trainee Representative	Jun 2020 – Aug 2022
Centre for Vision Research (CVR) Steering Committee: Trainee Representative	May 2020 – Dec 2021

CVR Communications Committee	May 2020 – April 2021
Neuromatch Academy – Volunteer Organizer – Support	Jul 2021
Virtual Vision Futures (VVF) Conference Organization Committee	Sep 2020 – Jun 2021
Chair of talk session for VVF conference	June2020
CVR Director Hiring committee – Graduate student representative	Mar 2020
Moderator for the CVR summer school	Jun 2020
Chair of talk session for IRTG 2019 retreat	Jun 2019
Neuroscience at York – Events Coordinator	Sep 2018 – Aug 2019

AWARDS AND SCHOLARSHIPS

2020–2022 - NSERC PGS D	$23000/year
2018–2022 - VISTA Graduate Scholarship	$10000/year
2018-2021 - NSERC CREATE IRTG 'Brain in Action' Program	$15000/year
2020 - Ontario Graduate Scholarship	declined
2018, 2019 - Ontario Graduate Scholarship	$15000/year
2018 - NSERC CREATE IRTG 'Brain in Action' Program	$5000
2018 - Professional Development Fund	$420
2017 - Health Graduate Student Conference Travel Fund	$1000
2010, 2011, 2014 - Member of Dean’s Honour Roll	

TRAINING AND WORKSHOPS

2022 - Productivity, Project, and Time Management - Fit4Trust Consulting

2020 - Implicit Bias + EDI training - York University

2020 - Computational Neuroscience - Neuromatch Academy

2018 - EEG Workshop - University of Marburg

2018, 2019 - Virtual Reality workshop - York University

2016 - Brain and Mind Institute EEG Workshop - University of Western Ontario

OTHER ACTIVITIES

2014-2016 - Postal Clerk - Canada Post

2015 - Toured Hospitals in Rural Sri Lanka - Northern Province

2012-2014 - Team Member - York University Dragon Boat Club

2013-2014 - Math, Science and English Tutor - Brilliant Tutor

2012-2013 - Team Coordinator - Team York University in the Collegiate Star League

2011-2013 - Peer Mentor for First Year Students - Bethune College, York University

2011 - Visited Healthcare Centers in Urban and Rural China - Beijing, Shanghai, Xi'an

2010-2011 - Undergraduate Biology Tutor - Bethune College, York University