

## SHANAATHANAN MODCHALINGAM

408-5 San Romanoway | North York, ON | M3N 2Y4

email: s.modcha@gmail.com | phone: (647) 878 1890

### EDUCATION

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

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

2018 | Neuroscience Graduate Diploma Program | York University

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

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

### AWARDS AND SCHOLARSHIPS

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

2009, 2010 | York University Renewable Entrance Scholarship

### 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

### Articles:

**Preprint: Modchalingam S**, Ciccone M, D’Amario S, ’t Hart BM, Henriques DYP. Adaptation to visuomotor rotations in stepped increments increases implicit motor learning. bioRxiv. Jul 2022. <https://doi.org/10.1101/2022.07.04.498746>

**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>

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>

### 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	June 2020
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

## 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*

## EXPERIENCE

Upcoming: **Aug 2022 – Feb 2023** | Research Scientist Intern

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

- Developed, optimized, and compared neuroscience-informed machine learning models of contextual inference during human motor learning
- Focus: Non-parametric Bayesian models and time-series analysis of motor performance and perceptual input

**Sep 2016 – Present** | Graduate Student Researcher | *Sensorimotor Control Lab. Centre for Vision Research at York University – Dr. Denise Henriques*

Conducted motor learning experiments with elderly and undergraduate participants

- Led a research program overseeing multiple projects and employees
- Conducted statistical analysis using Python and R

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

- Led a workshop with children and adolescents
- Conducted a motor learning experiment as part of the workshop

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

- Conducted motor learning experiments independently with undergraduate participants
- Helped test and troubleshoot experiments
- Trained volunteers to perform quality control on robot generated data

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

- Oversaw the smooth execution of biweekly events as well as various other activities with the goal of fundraising for and raising awareness about cerebral palsy
- Worked closely with executive members and delegated tasks to maximize efficiency

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

- Organized and lead weekly executive meetings
- Responsible for the smooth execution of multiple events and tournaments

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

- Kept records of various tests including MRIs, X-rays, EEGs and ECGS
- Administered vaccines under supervision of doctors
- Shadowed doctors and observed various procedures and consultations

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

- Organized and oversaw the execution of various biweekly events
- Created various promotional items such as pamphlets, posters, booklets and brochures

## **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*