Shanaathanan Modchalingam

Motor Learning, Human Computer Interaction, XR Research

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Toronto, Canada

EXPERIENCE

Research Scientist Intern - Human Computer Interaction,
Reality Labs Research, Meta
08/2022 – 02/2023 | Toronto, Canada
- Focus: Input interactions, neural input, wearables, haptic feedback, XR interactions, gestural input, optimal feedback for skill learning
- Integrated state-of-the-art technologies to build a technical framework for prototyping, demoing, and building research studies: currently used by multiple projects within the organization
- Designed and conducted research studies exploring novel interactions unlocked by next-generation technologies
- Aided in setting research direction for several research projects beyond the primary scope of the internship project

Visiting Researcher (Remote) | Computational Neuroscience,
Group for Theoretical Neuroscience, The Philipps University of Marburg
08/2021 – 08/2022
- Focus: Time series analysis, contextual inference, non-parametric Bayesian modelling, machine learning
- Developed, optimized, and compared machine learning models of contextual inference during human motor learning

PhD Candidate | Sensation, Perception, and Motor Learning,
Sensorimotor Control Lab, Centre for Vision Research, York University
09/2018 – present (expected: 2023)

Researcher
- Focus: Sensorimotor neuroscience, human motor learning, visual feedback, learning in XR environments, learning protocols

Workstream Lead: Motor Learning in Immersive Virtual Environments
- Secured funding for and established a prolific research program
- Determined the research direction of AR/VR projects within the lab
- Led a team of developers creating and maintaining custom software and hardware solutions for motor learning research in AR/VR

Leadership and Committees
- Represented trainee-level researchers in multiple institutional and international leadership groups overseeing > $120 million in funding

Teaching | Motor Learning, Statistics and Physiology,
Department of Health, York University
09/2016 – 04/2022

Lecturer and Course Director: Human Motor Learning
- Designed and delivered a research-based undergraduate course
- Instructed measurement and analysis of human physiological data

Teaching Assistant
- Courses: Statistics, Human Physiology, Motor Learning

SELECT PUBLICATIONS

Adapting to visuomotor rotations in stepped increments increases implicit motor learning, *Scientific Reports*
Modchalingam S, Ciccone M, D'Amario S, 't Hart BM, Henriques DYP. 2023;13.

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.

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).

EDUCATION

PhD Candidate - Sensorimotor Neuroscience - Health,
York University
present (expected: 2023)

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

SKILLS

Research
- Sensation, perception, and motor learning in XR environments
- Human-computer interaction
- Qualitative and quantitative methods: surveys, psychophysical, and physiological measures
- Remote and in-person user studies
- XR interaction design, iteration, and demo building
- Wearables
- Neural input
- Hardware and software design and prototyping

Machine Learning and Data Science
- Python (Scikit-learn, Numpy, Pandas, PyTorch, TensorFlow, Keras, Jupyter Notebooks)
- R (Stan, Tidyverse)

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

Project Management
- Agile, Kanban, Trello
- Source control (Git, Github)

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

Computational Neuroscience
Neuromatch Academy

EEG Measurement and Analysis
The Philipp University of Marburg

XR for Research
York University