

Abhishesh Homagain

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Skills and Qualifications

- Data driven mixed-methods researcher with an ability to lead complex research studies
- 4+ years of experience with Python (NumPy, Pandas, Matplotlib, scikit-learn), R, and Tableau for hypothesis testing, data analysis, and visualization
- Experienced with large, structured and unstructured datasets (ex. MIMIC-III, The Violence Project, geospatial data)
- Self-motivated, focused on collaborative means to make life better for all Canadians

Work Experience

Doctoral Candidate | University of Waterloo | Waterloo, ON **Sep 2022 – Current**

- Developing a mixed-methods approach using semi-structured interviews and natural language processing to qualitatively assess how Parkinson's Disease affects patients' views and experiences of their homes
- Currently developing RNN based machine learning models to detect freezing of gait using a combination of accelerometers and biophysical sensors

Graduate Peer Tutor | UW Writing and Communication Center | Waterloo, ON **Jan 2023 – Current**

- Advised graduate students in their writing and communication projects, from brainstorming to proofreading of thesis work, course assignments, and manuscripts
- Guided undergraduate students with their course assignments, asking probing questions and providing feedback to improve their work

Council Speaker | UW Graduate Student Association | Waterloo, ON **May 2024 – Current**

- Chair of the graduate student council, responsible for advising and collaborating with the Board and President of the GSA on matters of concern, advocacy, and direction of the GSA
- Advised and facilitated discussion within leadership committees of the University of Waterloo on matters pertaining to graduate student experience (funding, academic policies etc.)

Projects

- **Deadline in mass shootings:** What factors determine deadliness of a mass shooting incident in the United States? (R)
 - Used data from the Violence Project to determine whether factors such as gun law strictness, gun ownership, political party affiliation, link to hate groups etc. affected the deadliness of a mass shooting incident
- **Emergency room readmission:** Prediction of high-frequency users of emergency departments using MIMICIII dataset & various machine learning models (PostgreSQL & Python)
 - Compared and optimized various ML models (XGBoost, Ensemble, SVM etc.) to identify the best performing model that predicted high frequency users of emergency departments
- **Three parties of Ontario:** Insights into 2018 and 2022 provincial elections (Tableau & Python)
 - Compared Ontario provincial election results and highlighted insights from the 2018 and 2022 results across the three major parties, creating interactive geospatial maps of riding outcomes
- **Wrangling Chess:** Analyzing first move advantage and most common first move in chess (R)
 - Used R and Lichess.com to extract and wrangle unstructured text into usable tabular data and performed linear regressions to calculate first move ELO advantage and most common move

Education

PhD Candidate, Kinesiology – Neuroscience, University of Waterloo **2022 - Current**

PhD Thesis: Emotions, environments, and freezing of gait in Parkinson's Disease

MSc, Kinesiology – Neuroscience, University of Waterloo **2020 - 2022**

MSc Thesis: How do emotions affect gait?

BSc, Honors Kinesiology (Co-op), University of Waterloo **2015 - 2020**

Graduate Research

Publications

Emotions affect steady-state walking performance, PLOS ONE, **Accepted September 14, 2023**

Presentations

- Conference Poster Presentations
 - Title: Postural instability relates to autonomic dysfunction in Parkinson's Disease, International Congress of Parkinson's Disease and Movement Disorders, Philadelphia, USA, September 2024
 - Title: Emotions affect walking performance, International Brain Research Organization (IBRO), Granada, Spain, September 2023
 - Title: Gait differences in virtual and real-life laboratory environments, International Society for Posture and Gait Research (ISPGR), Montreal, Canada, July 2022
- Research Talks
 - Semi-finalist, Three-minute thesis (3MT) ISPGR 2021 (COVID postponed)
 - Winner, Departmental 3MT competition, Faculty of Health, University of Waterloo
 - Thesis Talk, Research Day, Center for Theoretical Neuroscience (CTN), University of Waterloo

Teaching Experience

- Graduate Teaching Assistant – 1st Year Human Anatomy Lab (cadaver lab)
- Guest Lecture – Cognition, Cognitive Dysfunction, and Movement (KIN359)

Extra-Curriculars

Hacker | Hack the North **September 2023**

- Created a working prototype of a single camera-based gait analysis tool, using OpenCV in Python

Member | Senate Graduate Research Committee | University of Waterloo **May 2024 – Current**

- Represented the Faculty of Health as a voting member of the SGRC, providing input and recommendations to senate regarding changes in academic programs, finance, graduate courses etc.