



Tahereh Kamali

Instructor, Adult Neurology

Bio

BIO

My research focuses on the clinical translation of artificial intelligence and machine learning methods to improve therapeutic response evaluation in neuromuscular disorders. I am Head of AI for Clinical Development in the Division of Neuromuscular Medicine, where we design and deploy AI-driven models that integrate multimodal data, including neuroimaging, electrophysiology, molecular and neurocognitive measures, and patient-reported outcomes, to quantify treatment effects and support individualized care.

In alignment with emerging genetic and disease-modifying therapies, our work emphasizes scalable and interpretable modeling approaches that learn from heterogeneous, multisite datasets. These models are designed to capture both shared and disease-specific patterns across neuromuscular conditions, enabling cross-disorder insights and practical deployment in clinical trials and real-world settings, with the goal of bringing advanced analytics closer to routine clinical and research workflows.

ACADEMIC APPOINTMENTS

- Instructor, Adult Neurology
- Member, Wu Tsai Human Performance Alliance
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Provost Doctoral Student Award, University of Waterloo, Canada (2014-2015)
- Graduate Research Scholarship, University of Waterloo, Canada (2014-2018)
- Faculty of Engineering Graduate Scholarship, University of Waterloo, Canada (2016-2017)
- Doctoral Thesis Completion Award, University of Waterloo, Canada (2018)
- MDF Early Career Researcher, Myotonic Dystrophy Foundation (2024-2025)

PROFESSIONAL EDUCATION

- PhD, University of Waterloo , Systems Design Engineering (2019)
- M.Sc, Shiraz University , Computer Science (2013)
- B.Sc, Shiraz University , Computer Science (2006)

LINKS

- Twitter: https://twitter.com/Tahereh_Kamali

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

AI for Healthcare, Neuroimaging, Biomarkers Development

Publications

PUBLICATIONS

- **Cerebrospinal fluid proteomic profiling reveals potential biomarkers and altered pathways in myotonic dystrophy type 1** *FRONTIERS IN NEUROSCIENCE*
Zafarullah, M., Kamali, T., Hagerman, K. A., Ghiglieri, L., Duong, T., Wang, E., Sampson, J. B., Day, J. W.
2025; 19: 1709678
- **Cerebrospinal Fluid Proteomic Changes after Nusinersen in Patients with Spinal Muscular Atrophy.** *Journal of clinical medicine*
Beaudin, M., Kamali, T., Tang, W., Hagerman, K. A., Dunaway Young, S., Ghiglieri, L., Parker, D. M., Lehallier, B., Tesi-Rocha, C., Sampson, J. B., Duong, T., Day, J. W.
2023; 12 (20)
- **Learning Spectral Fractional Anisotropy and Mean Diffusivity Features as Neuroimaging Biomarkers for Tracking White Matter Integrity Changes in Myotonic Dystrophy Type 1 Patients using Deep Convolutional Neural Networks.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*
Kamali, T., Day, J. W., Deutsch, G. K., Sampson, J. B., Murad, A., Chauffy, J., Parker, D., Wozniak, J. R.
2023; 2023: 1-4
- **A Multimodal Neuroimaging Feature Extraction Framework for Biomarker Discovery in Myotonic Dystrophies**
Kamali, T., Day, J., Sampson, J., Murad, A., Chauffy, J.
LIPPINCOTT WILLIAMS & WILKINS.2023
- **Multimodal fusion of neuroimaging and neuropsych data: A machine learning approach to study brain alterations linked with cognitive domains in DM1**
Kamali, T., Parker, D., Deutsch, G., Sampson, J., Day, J., Wozniak, J.
PERGAMON-ELSEVIER SCIENCE LTD.2022: S132
- **Cognitive Impairment Analysis of Myotonic Dystrophy via Weakly Supervised Classification of Neuropsychological Features.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*
Kamali, T., Deutsch, G. K., Hagerman, K. A., Parker, D., Day, J. W., Sampson, J. B., Wozniak, J. R.
2022; 2022: 4377-4382
- **Exploring Protein Changes in Cerebrospinal Fluid of Spinal Muscular Atrophy Patients Pre-Nusinersen vs. Post-Nusinersen Treatment using Bayesian Machine Learning Algorithms**
Kamali, T., Hagerman, K., Duong, T., Parker, D., Young, S., Tang, W., Sampson, J., Day, J.
LIPPINCOTT WILLIAMS & WILKINS.2022
- **Toward Developing Robust Myotonic Dystrophy Brain Biomarkers using White Matter Tract Profiles Sub-Band Energy and A Framework of Ensemble Predictive Learning.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*
Kamali, T., Parker, D., Day, J. W., Sampson, J., Deutsch, G. K., Wozniak, J. R.
2021; 2021: 3838-3841
- **Discovering Density-Based Clustering Structures Using Neighborhood Distance Entropy Consistency** *IEEE TRANSACTIONS ON COMPUTATIONAL SOCIAL SYSTEMS*
Kamali, T., Stashuk, D. W.
2020; 7 (4): 1069–80
- **Diagnosis of Myotonic Dystrophy Based on Resting State fMRI Using Convolutional Neural Networks.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*
Kamali, T., Hagerman, K. A., Day, J. W., Sampson, J., Lim, K. O., Mueller, B. A., Wozniak, J.

2020; 2020: 1714–17

- **Transparent Electrophysiological Muscle Classification From EMG Signals Using Fuzzy-Based Multiple Instance Learning** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Kamali, T., Stashuk, D. W.
2020; 28 (4): 842–49
- **Electrophysiological Muscle Classification Using Multiple Instance Learning and Unsupervised Time and Spectral Domain Analysis** *IEEE TRANSACTIONS ON BIOMEDICAL ENGINEERING*
Kamali, T., Stashuk, D. W.
2018; 65 (11): 2494–2502
- **A Multiple Instance Learning Approach to Electrophysiological Muscle Classification for Diagnosing Neuromuscular Disorders Using Quantitative EMG**
Kamali, T.
University of Waterloo.2018
- **A Density-Based Clustering Approach to Motor Unit Potential Characterizations to Support Diagnosis of Neuromuscular Disorders** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Kamali, T., Stashuk, D. W.
2017; 25 (7): 956–66
- **Automated segmentation of white matter fiber bundles using diffusion tensor imaging data and a new density based clustering algorithm** *ARTIFICIAL INTELLIGENCE IN MEDICINE*
Kamali, T., Stashuk, D.
2016; 73: 14–22
- **A Multi-Classifer Approach to MUAP Classification for Diagnosis of Neuromuscular Disorders** *IEEE TRANSACTIONS ON NEURAL SYSTEMS AND REHABILITATION ENGINEERING*
Kamali, T., Boostani, R., Parsaei, H.
2014; 22 (1): 191–200
- **A Hybrid Classifier for Characterizing Motor Unit Action Potentials in Diagnosing Neuromuscular Disorders** *Journal of Biomedical Physics & Engineering*
Kamali, T., Boostani, R., Parsaei, H.
2013

PRESENTATIONS

- Myotonic Dystrophy and the Brain: Causes, Effects, and Treatment - Myotonic Dystrophy Foundation (2020)
- Developing Novel Robust Myotonic Dystrophy Brain Biomarkers: A Machine Learning Approach using Diffusion Tensor Imaging Data - Myotonic Dystrophy Foundation (2021)
- Drug Response Prediction for SMA Patients Under Treatment with Nusinersen : An Exploratory Approach using Graph-based Supervised Machine Learning Algorithms - CureSMA (2022)