BIOGRAPHICAL SKETCH

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NAME: Tulimieri, Duncan Thibodeau

eRA COMMONS USER NAME (credential, e.g., agency login): NA

POSITION TITLE: Quantitative Developer

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

INSTITUTION AND LOCATION	DEGREE (*if applicable*)	Completion Date MM/YYYY	FIELD OF STUDY
Denison University	B.A.	05/2019	Kinesiology and Biology
University of Delaware	Ph.D.	05/2024	Neuromechanics

A. Personal Statement

My long term research interests involve the development of a comprehensive understanding of how stroke effects movement and how to retrain movement post stroke. My academic training and research experience to date have provided me with an excellent background in movement science and neuroscience. While in high school I was a member of the National Honor Society, Science National Honor Society, French National Honor Society, and Math Honor Society. As an undergraduate at Denison University, I conducted research with Dr. Brian Hortz on the mechanisms of dry needling as well as Athletic Trainers competencies of dry needling. This resulted in a co-authorship publication, as well as an invitation to present a poster at the Undergraduate Research Symposium[8,9]. As a graduate student at the University of Delaware, I conducted research with Dr. Jennifer Semrau on developing assessments and training for proprioception for individuals post with chronic stoke. This resulted in multiple publications[1,2,3,4,5,6,7].

1. **Tulimieri, D. T.**, Decarie, A., Singh, T., & Semrau, J. A. (2025). *Impairments in proprioceptively-referenced limb and eye movements in chronic stroke.* Neurorehabilitation and Neural Repair, 39(1), 47-57.

2. Austin, D. S., Dixon, M. J., Hoh, J. E., **Tulimieri, D. T.**, Cashaback, J. G., & Semrau, J. A. (2024). *Using a tablet to understand the spatial and temporal characteristics of complex upper limb movements in chronic stroke.* PloS one, 19(11), e0311773.

3. **Tulimieri, D. T.**, Kim, G., Hoh, J. E., Sergi, F., & Semrau, J. A. (2024). *A pilot study for self-guided, active robotic training of proprioception of the upper limb in chronic stroke.*

4. **Tulimieri, D. T.**, & Semrau, J. A. (2024). *Impaired proprioception and magnified scaling of proprioceptive error responses in chronic stroke.* Journal of NeuroEngineering and Rehabilitation, 21(1), 51.

5. **Tulimieri, D. T.** (2024). *Assessing and Training of Proprioception for Individuals with Chronic Stroke.* University of Delaware.

6. **Tulimieri, D. T.**, & Semrau, J. A. (2023). *Aging increases proprioceptive error for a broad range of movement speed and distance estimates in the upper limb.* Frontiers in Human Neuroscience, 17, 1217105.

7. Austin, D. S., Dixon, M. J., **Tulimieri, D. T.**, Cashaback, J. G., & Semrau, J. A. (2023). *Validating the measurement of upper limb sensorimotor behavior utilizing a tablet in neurologically intact controls and individuals with chronic stroke.* Journal of NeuroEngineering and Rehabilitation, 20(1), 114.

8. Hortz, B. V., Falsone, S., & **Tulimieri, D.** (2019). Current athletic training educational preparation for dry needling. *Journal of Sports Medicine and Allied Health Sciences: Official Journal of the Ohio Athletic Trainers Association, 4*(3), 5.

9. **Tulimieri, D. T.**, Hortz, B. V. (2018, September). A Review of Dry Needling's Effects and Athletic Trainers Education Relative to Dry Needling Tasks [Poster session]. Denison University Summer Scholars.

B. Positions and Honors

Positions and Employment

2024– Research Assistant, Sensorimotor Control and Robotic Rehabilitation Laboratory, University of Delaware, Newark, DE	Quantitative Developer, New Age Alpha 2020–2024
2022–	Teaching Assistant, ReproRehab
2020–2022	Teaching Assistant, KINARM Camp
2019	Teaching Assistant, Motor Control and Learning, University of Delaware, Newark, DE
2018–2019	Undergraduate Researcher, Health, Exercise, and Sports Studies, Denison University, Granville, OH
2018	Summer Scholar Researcher, Denison University, Granville, OH
2018	Research Assistant, Denison University, Granville, OH

Other Experience and Professional Memberships

2022–2024	Member, American Society of Neurorehabilitation
2020–2024	Member, Society for Neuroscience
2020-2024	Programming Tutor, Pandemic Professors
2020–2021	Member, Society for the Neural Control of Movement
2018–2019	Department Fellow, Denison University
2018–2019	Student Faculty Learning Partnership Pilot Program, Denison University
2017–2019	Teaching Assistant, Denison University
2017–2019	Tutor, Denison University

Honors

2020	Graduate College Travel Award, University of Delaware
2019	Order of Omega, Denison University
2019	Men's Ice Hockey "55" Award, Denison University
2019	Natalie Shepard Physical Education Award, Denison University
2018	Livingston Memorial Scholarship, Denison University
2018–2019	Alpha Epsilon Delta, Denison University

C. Contributions to Science

1. **Undergraduate Research**: I was part of a project in collaboration with my main advisor, Dr. Brian Hortz at Denison University. Dr. Hortz was asked to investigate Athletic Trainers competencies for dry needling as a potential new therapeutic modality. During my time working with Dr. Hortz, I conducted a survey of Athletic Trainers as well as investigating various proposed mechanisms for why dry needling had the effects seen clinically[1,2]. This work was very exciting as it was my first encounter with approaching the edges of current human knowledge as well as understanding the process of how new treatment techniques are introduced

into a clinicians practice. Soon after, Dr. Hortz took a position as a private consultant for a dry needling based company and has since been training clinicians how to dry needle as well as consulting for many professional sports team.

2. **Graduate Research**: My doctoral research was focused on proprioception, or the bodies awareness of its location and movement in space. The first part of my work focuses on assessment of proprioception[a,c,d,e] and the second part of my work focuses on refining these assessments as well as a proprioceptive training paradigm[b]. The results from my research will assist researchers in broadening their understanding of proprioception, as well as assist clinicians in understanding stroke's effect on proprioception and potential assessments and treatments they can administer to maximize recovery. I completed all of my projects. I have presented this work as it has been ongoing [a,b,c,d].

    a. **Tulimieri, D. T.** and Semrau, J. A. (2022, February 10). Measuring proprioceptive accuracy using limb and oculumotor output. [KINARM User Knowledge Exchange].
    b. **Tulimieri, D. T.** (2022, May 18). Integrating a peripheral with KINARM Exoskeleton [KINARM Camp].
    c. **Tulimieri, D. T.**, Semrau, J. A. (2021, April 15). Determining the influence of movement speed and distance on the accuracy of upper limb proprioceptive estimates. [Poster session]. University of Delaware College of Health Science Research Day.
    d. **Tulimieri, D. T.**, Faunce, A., Semrau, J. A. (2021, April 15). Proprioceptive accuracy to trial-by-trial changes in speed, direction, and length of movement. [Poster session]. Society for the Neural Control of Movement.
    e. Gray, J. **Tulimieri, D. T.**, Eskander, J., Semrau, J. A. (2021, August). Impact of Block Order on Execution of Proprioceptive Matching Task. [Poster session]. University of Delaware Summer Scholars.

D. Additional Information: Research Support and/or Scholastic Performance

YEAR	COURSE TITLE	GRADE
University of Delaware		
2022	Mathematical Techniques in Data Science	A
2021	Biomedical Experimental Design and Analysis	A
2021	Machine Learning	A-
2020	Body and Space	A
2020	Introduction to Programming MATLAB	A
2020	Biomechanical Methods	A
2020	Neuromechanics of Human Motion	A-
2019	Applied Multivariate Data Analysis	A
2019	Sensorimotor Learning	A

Table 1: Graduate Scholastic Performance

YEAR	COURSE TITLE	OFFERED
2022	Statistical Rehthinking (partial)	Book
2022	Advanced Python: Working with Databases	LinkedinLearning
2021	Statistics for Data Science with Python	Cousera
2021	Neuromatch Academy - Computational Neuroscience	Neuromatch Academy
2021	Mastering Programming with MATLAB	Coursera
2020	Mathematical Tools for Neural and Cognitive Science	New York University
2020	Regression Models	Coursera
2019	Introduction to Programming with MATLAB	Coursera

Table 2: Audited courses.