

# Duncan T. Tulimieri, PhD

QUANTITATIVE DEVELOPER & DATA SCIENTIST

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## Education

### University of Delaware

Newark, DE

PHD IN NEUROMECHANICS [BIOMECHANICS AND MOVEMENT SCIENCE]

June 2019 - May 2024

- Sensorimotor Control and Robotic Rehabilitation Laboratory

### Denison University

Granville, OH

HEALTH, EXERCISE, AND SPORTS STUDIES AND BIOLOGY

August 2015 - May 2019

- Department Fellow
- Undergraduate Researcher
- Tutor and Teaching Assistant

## Experience

### New Age Alpha

New York | Remote

QUANTITATIVE DEVELOPER

February 2023 - Present

- Optimized run time of 9 MATLAB scripts (~14,516 lines) by an average of 60.22% using class based unit testing to ensure proper refactorization
- Review potential candidate materials (5+) and interview potential candidates (2)
- Lead rewrite of 9 MATLAB files to Python with custom conda environment, git for version control, and Azure DevOps

## Research Experience

### University of Delaware

Newark, DE

GRADUATE STUDENT

August 2019 - May 2024

- Developed scientific ideas and methodologies for 5 experiments
- Programmed 4 robotic tasks with KINARM Exoskeleton (using MATLAB and Simulink), 3 of which are used in continuing research
- Wrote custom analyses, abiding by Google's MATLAB Style Guide, using object oriented programming and git for each experiment to ensure accuracy, efficiency, reproducibility, transparency, and ease to build upon
- Mentored 3 graduate students and 3 undergraduate students

### Denison University

Granville, OH

UNDERGRADUATE STUDENT

August 2015 - May 2019

- Designed, deployed, and analyzed survey using Qualtrics

## Publications & Presentations

### PUBLICATIONS

- |      |   |   |
|------|---|---|
| 2024 | <b>Impaired proprioception and magnified scaling of proprioceptive error responses in chronic stroke,</b> <i>Tulimieri, D. T. and Semrau, J. A.</i>   | <i>Journal of NeuroEngineering and Rehabilitation</i>         |
| 2023 | <b>Understanding the relationship between limb position sense and oculomotor proprioceptive estimations in individuals with stroke.,</b> <i>Tulimieri, D. T., Singh, T., Semrau, J. A.</i>  | <i>In preparation</i>   |
| 2023 | <b>Aging increases proprioceptive error for a broad range of movement speed and distance estimates in the upper limb,</b> <i>Tulimieri, D. T. and Semrau, J. A.</i>   | <i>Frontiers In Human Neuroscience - Sensory Neuroscience</i> |
| 2023 | <b>Validating the measurement of upper limb sensorimotor behavior utilizing a tablet in neurologically intact controls and individuals with chronic stroke,</b> <i>Austin, D. S., Dixon, M. J., Tulimieri, D. T., Cashaback, J. G., and Semrau, J. A.</i> | <i>Journal of NeuroEngineering and Rehabilitation</i>         |
| 2019 | <b>Current Athletic Training Educations Preparation for Dry Needling,</b> <i>Hortz, B., Falsone S., Tulimieri, D. T.</i>  | <i>Journal of Sports Medicine and Allied Health Sciences</i>  |

### PRESENTATIONS

2023	<b>Targeted training of proprioception using an integrated robotic-joystick approach improves sensorimotor function in chronic stroke.</b> , Tulimieri, D. T., Kim, G., Semrau, J. A., Society for Neuroscience	Poster
2023	<b>Proprioceptive signaling of the upper limb influences oculomotor function and may suggest impaired multisensory integration after stroke.</b> , Decarie A., Tulimieri, D. T., Singh T., Semrau, J. A., Society for Neuroscience	Poster
2023	<b>How to Use AI to be a Better Programmer</b> , Tulimieri, D. T., Reproducible Rehabilitation Research Summit	Panelist
2023	<b>Virtual environments to improve reproducibility.</b> , Tulimieri, D. T., Reproducible Rehabilitation Research Summit	Presentation
2023	<b>Oculomotor estimates of limb proprioception scale with magnitude of proprioceptive limb error in chronic stroke.</b> , Tulimieri, D. T., Singh T., Semrau, J. A., Progression in Clinical Motor Control II	Poster
2023	<b>Understanding the relationship between limb position sense and oculomotor proprioceptive estimations in individuals with stroke.</b> , Tulimieri, D. T., Austin, D. A., Eskander, J., Singh, T., Semrau, J. A., College of Health Science Research Day	Podium
2023	<b>Understanding the relationship between limb position sense and oculomotor proprioceptive estimations in individuals with stroke.</b> , Tulimieri, D. T., Austin, D. A., Eskander, J., Singh, T., Semrau, J. A., College of Health Science Research Day	Poster
2022	<b>Measuring proprioceptive accuracy using limb and oculomotor output.</b> , Tulimieri, D. T. and Semrau, J. A., KINARM User Knowledge Exchange	Presentation
2022	<b>Integrating a peripheral with KINARM Exoskeleton.</b> , Tulimieri, D. T., KINARM Camp	Presentation
2022	<b>Using a computerized tablet device to understand spatial precision and movement time of the upper limbs in individuals who have had a stroke.</b> , Austin, D. S., Dixon, M., Hoh, J. E., Tulimieri, D. T., Cashaback, J. G., Semrau, J. A., College of Health Science Research Day	Poster
2022	<b>Understanding the relationship between limb position sense and oculomotor proprioceptive estimations in individuals with stroke.</b> , Tulimieri, D. T., Austin, D. A., Eskander, J., Singh, T., Semrau, J. A., Society for Neuroscience	Poster
2022	<b>Using a computerized tablet device to understand spatial precision and movement time of the upper limbs in individuals who have had a stroke.</b> , Austin, D. S., Dixon, M., Hoh, J. E., Tulimieri, D. T., Cashaback, J. G., Semrau, J. A., Society for Neuroscience	Poster
2021	<b>Determining the influence of movement speed and distance on the accuracy of upper limb proprioceptive estimates.</b> , Tulimieri, D. T. and Semrau, J. A., College of Health Science Research Day	Poster
2021	<b>Determining the influence of movement speed and distance on the accuracy of upper limb proprioceptive estimates.</b> , Tulimieri, D. T. and Semrau, J. A., Society for Neuroscience	Poster
2021	<b>Proprioceptive accuracy to trial-by-trial changes in speed, direction, and length of movement.</b> , Tulimieri, D. T., Faunce, A., Semrau, J. A., Society for the Neural Control of Movement	Poster
2021	<b>Proprioceptive accuracy to trial-by-trial changes in speed, direction, and length of movement.</b> , Gray, J., Tulimieri, D. T., Eskander, J., Semrau, J. A., University of Delaware Summer Scholars Symposium	Poster
2018	<b>A Review of Dry Needling's Effects and Athletic Trainers Education Relative to Dry Needling Tasks</b> , Tulimieri, D. T., Hartz, B. V., Denison University Summer Scholars Symposium	Poster

## Academic Experience

### ReproRehab

University of Southern California |

Remote

TEACHING ASSISTANT

October 2022 - Present

- Teach data science skills to neurorehabilitation researchers
- Host weekly office hours for troubleshooting MATLAB and Python code
- Host mini-boot camp for local research community

### University of Delaware

University of Delaware

RESEARCH ASSISTANT

February 2020 - May 2024

- Perform research duties in laboratory

### KAAP428: Motor Control and Learning

University of Delaware

TEACHING ASSISTANT

September 2019 - January 2020

- Lead two lab sections of 20+ students in successful completion of weekly experiments

### Student Faculty Learning Partnership Pilot Program

Denison University

STUDENT MEMBER

November 2018 - May 2019

- Collaborate with faculty partners to deepen culture of engaged teaching and learning

## Health, Exercise, and Sports Studies Program

DEPARTMENTAL FELLOW

- Represent 95+ departmental students to department faculty and staff
- Host weekly study tables to help department students

*Denison University*

*September 2018 - May 2019*

## Health, Exercise, and Sports Studies Program

TUTOR

- Tutored students 4-6 hours per week in one or more of the following topics: Applied Anatomy, Orthopedic Injury and Illness Assessment, Therapeutic Exercise in Athletic Training, Fundamental of Health and Exercise, Kinesiology, Molecular Biology and Unicellular Life, and Therapeutic Modalities

*Denison University*

*September 2017 - May 2019*

## Health, Exercise, and Sports Studies Program

TEACHING ASSISTANT

- Demonstrate proper dissection technique to 20+ students per semester

*Denison University*

*September 2017 - May 2019*

# Involvement & Leadership

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## Pandemic Professors

TUTOR

- 1 hr/week of 1:1 Python tutoring for a 4<sup>th</sup> grade student

*Remote*

*January 2021 - Present*

## Kinesiology Graduate Student Organization

COMMUNICATIONS CHAIR

- Create monthly newsletter

*University of Delaware*

*August 2019 - August 2020*

## Senior Gift Committee

STUDENT MEMBER

- Encourage classmates to make donations to the senior gift
- Meet with Board of Trustees, President, and important donors

*Denison University*

*September 2018 - May 2019*

## Denison Coalition for Sexual Respect

CERTIFIED PEER EDUCATOR

- Continue education for first year students on sexual respect and available resources

*Denison University*

*July 2018 - May 2019*

## Campus Affairs Council

STUDENT MEMBER

- Design solutions for campus issues like social spaces and blue light program

*Denison University*

*September 2017 - May 2019*

## Student Government

SENATOR

- Discuss and help create legislation around current issues

*Denison University*

*September 2018 - March 2019*

## Policy Committee

MEMBER

- Amend policy when necessary

*Denison University*

*September 2018 - March 2019*

## Denison Ice Hockey

ALTERNATIVE CAPTAIN

- Developed program from local club to finalists in ACHA Men's D2
- Secured funding ~\$7,500 from alumni and donors for new locker room, equipment, and team transportation

*Denison University*

*September 2020 - May 2019*

## Denison Ice Hockey

VICE PRESIDENT

- Initialize alumni hockey network
- Implement yearly volunteer event for community outreach (Try Hockey For Free)

*Denison University*

*September 2020 - May 2019*

## CheckIt

FOUNDER

- Developed business model to solve multiple campus problems and help surrounding community

*Denison University*

*June 2018 - December 2018*

## Health, Exercise, and Sports Studies Faculty Search Committee

STUDENT MEMBER

- Interview potential candidates

*Denison University*

*June 2018*

## Chief of Campus Safety Search Committee

STUDENT MEMBER

- Interview potential candidates

*Denison University*

*June 2018*

## **Becoming and Active, Empowered Patient**

STUDENT TEACHER

- Co-designed and co-taught course on how patients can take healthcare into their own hands to 8 undergraduate students

*Denison University*

*January 2018 - May 2018*

## **Committee for Intercollegiate Athletics**

STUDENT MEMBER

- Represented student athletes to administrators and organized events

*Denison University*

*September 2017 - May 2018*

## **Intramural Sports**

FIRST-AID RESPONDER

- Supervised students and provided on-site care when needed
- American Red Cross Certification: Lifeguarding, AED, CPR, and First-Aid

*Denison University*

*September 2016 - May 2018*

## **Boy Scouts of America**

EAGLE SCOUT

*Portland, CT*

*July 2015*

## **Internships**

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### **Prentiss Hockey Performance**

STRENGTH AND CONDITIONING COACH INTERN

- Assisted and observed summer training of clients ranging from NHL players to geriatrics.

*Stamford, CT*

*May 2017 - August 2017*

## **Honors & Awards**

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### **Kinesiology and Applied Physiology**

SCHOLARSHIP

*University of Delaware*

*March 2023*

### **Graduate College**

TRAVEL AWARD

*University of Delaware*

*February 2020*

### **Health, Exercise, and Sports Studies**

NATALIE SHEPARD PHYSICAL EDUCATION AWARD

*Denison University*

*May 2019*

### **Denison Men's Ice Hockey**

55 AWARD

*Denison University*

*April 2019*

### **Health, Exercise, and Sports Studies**

LIVINGSTON MEMORIAL SCHOLARSHIP

*Denison University*

*August 2018*

### **Alpha Epsilon Delta - United States Health Preprofessional Honor Society**

MENTOR

*Denison University*

*January 2018 - May 2019*

### **University Conduct Board**

BOARD MEMBER

*Denison University*

*February 2018 - May 2019*

### **Men's Ice Hockey**

ACADEMIC ALL-AMERICAN

*Denison University*

*January 2016 - May 2019*

### **Denison Founders Scholarship**

RECIPIENT

*Denison University*

*August 2015 - May 2019*