Leonardo Tchen Hao Hang Wei, Ph.D.

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Visa Status: F1

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ACADEMIC POSITIONS

Jan 2022 – Present	**Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, Lubbock, TX, USA
Aug 2021 – Present	**Graduate Research Assistant**, Human Performance and Neuro Engineering Lab (PI: Dr. Suman Kanti Chowdhury), Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, Lubbock, TX, USA
Jan 2021 – July 2021	**M.S.** (incomplete)**,** Department of Mechanical Engineering (Supervisor: Angela Ourivio Nieckele), Pontifical Catholic University of Rio de Janeiro, RJ, Brazil
Jul 2019- Dec2020	**Undergraduate Research Assistant**, Combustion Lab, Pontifical Catholic University of Rio de Janeiro, RJ, Brazil
Jul 2017- Jul 2018	**Undergraduate Research Assistant**, Department of Mechanical Engineering, Pontifical Catholic University of Rio de Janeiro, RJ, Brazil

EDUCATION

July 2025	**Ph.D. in Industrial Engineering (Graduating in December)**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, Lubbock, TX, USA / GPA: 3.97

- *Dissertation Title:* Biomechanical Feasibility of Passive Shoulder Exoskeleton in Construction Work
- *Internal Committee:* Dr. Suman Chowdhury (chair), Dr. Jennifer Cross, Dr. Timothy Matis, and Dr. Nade Liang.
- *External Committee:* Dr. HeeSun Choi, and Dr. Tanushree Roy

December 2020	**B.S. in Mechanical Engineering**, Department of mechanical Engineering, Pontifical Catholic University of Rio de Janeiro, Rio de Janeiro, Brazil / GPA: 3.2

- *Dissertation Title*: Numerical Study of Flashback in Laminar Flows in Circular Tubes
- *Committee Members*: Dr. Luis Fernando Figueira da Silva (chair), Dr. Angela Ourivio Nieckele

December 2015	**Associate Degree in Mechanical Engineering**, Department of mechanical Engineering, Federal Technology Center Celso Suckow da Fonseca (CEFET-RJ), RJ, Brazil

TEACHING EXPERIENCE

Jan 2025 – May 2025 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5320/4320 – Systems Theory (class size: 70 students)

Jan 2025 – May 2025 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5325/4325 – Productivity and Performance Improvement in Organizations: Lean Methods (class size: 60 students)

- Assisted students in understanding many concepts, including theory of constraints, six sigma, and organizational structure.

Aug 2024 – Dec 2024 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5342 – Design of Experiment (class size: 20 students)

- Assisted students to code in R to perform statistical analysis. Graded projects, homeworks, quizzes, and exams.

Aug 2024 – Dec 2024 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5301 / IE 4301 – Engineering Design for People/ Advanced Industrial Ergonomics (class size: 75 students)

- Created class projects and assignments, graded projects, quizzes, homework, and exams.

Jan 2023 – Jun 2023 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5304 –Biomechanics and Workphysiology (class size: 20 students)

- Created projects, graded assignments, quizzes, and exams.

Aug 2022 – Dec 2023 **Graduate Teaching Assistant**, Department of Industrial, Manufacturing & Systems Engineering, Texas Tech University, TX, USA

Class: IE 5301/ IE4301 – Ergonomics and Engineering Design (class size: 70 students)

- Prepared and lectured a few classes and graded assignments, quizzes, and exams.

Feb 2021 – July 2021 **Teaching Assistant**, Department of Mechanical Engineering, Pontifical Catholic University of Rio de Janeiro, RJ, Brazil

Class: MEC 2335– Computational Fluid Dynamics (class size: 10 students)

- Assisted students in understanding key concepts of fluid dynamics and applied coding skills to bridge the gap between theory and practical applications.

PEER-REVIEWED JOURNAL PUBLICATIONS

2025	1.	Wei, L., Paulon, G., Sarker, P., Chowdhury, S. (2025). Sustained-Till-Exhaustion Effects of Firefighter Helmets on Neck Muscle Fatigue Mechanism. *Ergonomics.* Available at https://doi.org/10.1080/00140139.2025.2548004
2025	2.	Wei, L., & Chowdhury, S. (2025). An electromyography-based multi-muscle fatigue model to investigate operational task performance. *Computer Methods in Biomechanics and Biomedical Engineering*, 1–17. Available at https://doi.org/10.1080/10255842.2025.2510369
2025	3.	Wei, L. H., Sudeesh, S., Chakroborty, S., & Chowdhury, S. K. (2025). A comprehensive methodological framework for 3D head anthropometric shape modeling of a small dataset. *Ergonomics*, 1-16. Available at https://doi.org/10.1080/00140139.2025.2518306
2024	4.	Zheng, L., Pan, C., **Wei, L**., Bahreinizad, H., Chowdhury, S., Ning, X., & Santos, F. (2024). Shoulder-assist exoskeleton effects on balance and muscle activity during a block-laying task on a simulated mast climber. International journal of industrial ergonomics, 104, 103652. https://doi.org/10.1016/j.ergon.2024.103652
2018	5.	Paulon, G., M., Sudeesh, S., **Wei, L**., & Chowdhury, S. K. (2024). Firefighter helmets and cervical intervertebral Kinematics: An OpenSim-Based biomechanical study. Journal of Biomechanics, 112364. https://doi.org/10.1016/j.jbiomech.2024.112364

Under-Review

2025	1.	Bahreinizad, H., Chowdhury, S. K., Paulon, G., Wei, L. (2023). Development and Validation of an MRI-Derived Head-Neck Finite Element Model. Biomechanics and Modeling in Mechanobiology (Accepted)

CONFERENCE PRESENTATIONS

2025	1.	Wei, L., Paulon, G., Sarker, P., Chowdhury, S. (2025). Influence of Firefighter Helmet Inertial Properties on Neck Muscle Fatigue. Submitted to *ASPIRE Human Factors and Ergonomics Society 2025 Annual Meeting. Lecture.*
2024	2.	Wei, L., & Chowdhury, S. (2024). A comprehensive methodological framework for Anthropometric Head Shape Modeling Using Small Dataset. Submitted to *ASPIRE Human Factors and Ergonomics Society 2024 Annual Meeting.*
2021	3.	Wei, L., & Chowdhury, S. (2021). An electromyography based multi-muscle fatigue index formulation and validation. Submitted to *North American Congress on Biomechanics 2021 Annual Meeting*

PROPOSAL WRITING EXPERIENCE

2022	1.	National Science Foundation: "Unifying Neuroscience and Biomechanics Paradigms for Modeling Brain and Muscle Responses to Mechanical Impacts," P.I.: Dr. Suman Chowdhury. The project was successfully funded.
		My Role: Conceptualization, figure generation, and writing.

2023	2. Defense Advanced Research Projects Agency: "BrainCrossNet: A Multiscale, Multiphysics Modeling Framework to Decode Cellular Interaction in Traumatic Brain Injury", P.I.: Dr. Suman Chowdhury.
	<u>My Role</u>: Conceptualization, writing, and figure generation.

CURRENT AND RECENT RESEARCH PROJECTS

Feb 2022 – Present	<u>Project Title</u>: *Effects of Passive Exoskeleton Applied in Masonry Tasks on a Mast Climbing Work Platform (NIOSH)*
	<u>Institutions</u>: Texas Tech University and National Institute for Occupational Safety
	<u>Role</u>: PhD. research assistant with Dr. Suman Chowdhury and Dr. Christopher Pan
	<u>Brief Description</u>: Investigated the efficacy of using passive shoulder exoskeletons in reducing musculoskeletal disorders for tasks performed on elevated platforms while lifting heavy cinder blocks. Motion capture, muscle activity, and ground reaction forces were collected to assess the biomechanical feasibility of exoskeleton assistance in such scenarios.
Aug 2021 – Dec 2023	<u>Project Title</u>: *Next Generation Firefighter Helmet (DHS)*
	<u>Institutions</u>: Texas Tech University and Department of Homeland Security
	<u>Role</u>: PhD. research assistant with Dr. Suman Chowdhury and Dr. Gregory McKenna
	<u>Brief Description</u>: Studied the effects of prolonged use of existing firefighter helmets on neck and shoulder muscles by integrating in vivo biomechanical measurements (motion capture and electromyography) and 3D modeling (3D scanning) of the helmet-head-neck system. Additionally, subjective perspectives were gathered from firefighters through a questionnaire designed to assess key aspects of helmet performance and the level of protection these helmets provide in field conditions.
Oct 2022 – May 2024	<u>Project Title</u>: *Mission-Adaptive, Modular Law Enforcement Helmet Design (DHS)*
	<u>Institutions</u>: Texas Tech University and Department of Homeland Security
	<u>Role</u>: PhD. research assistant with Dr. Suman Chowdhury
	<u>Brief Description</u>: Developed a modular, mission-adaptive new generation helmet for law enforcement officers and first responders that could provide both concussive and ballistic protection while being lightweight, ergonomically adaptable, and comfortable when worn for long periods.

PROFESSIONAL AFFILIATIONS

2024	• Member of the Human Factors and Ergonomics Society
2022 – 2023	• Member of the American Society of Biomechanics (ASB)

INDUSTRIAL EXPERIENCE

Jan 2020 – Jan 2021	**Project Engineer, DORIS Group, Rio de Janeiro, Brazil**

- Assessed mechanical fatigue to predict failures, enhance safety, and extend platform lifespan by 3 years.
- Developed mechanical solutions that reduced platform maintenance time and improved operational efficiency by 30%
- Performed finite element simulations to identify critical oil platform components impacted by sea corrosion.

Jan 2016 – Jul 2016	**Engineering Intern, CarriLee, Rio de Janeiro, Brazil**

- Led a team of 10 to diagnose and resolve air conditioning equipment failures in industrial buildings, optimizing efficiency and procedure effectiveness.
- Achieved a 22% reduction in energy costs by implementing advanced temperature monitoring systems.

Oct 2016 – Dec 2018	**Manufacturing Manager, Pontifical Catholic University Robotic Team Rio Botz, Rio de Janeiro, Brazil**

- Led end-to-end manufacturing operations, including 3D-printed prototype design, production planning, supplier management, quality assurance, and maintenance optimization.
- The team conquered 1 gold and 2 silver medals in the Robogames 2018 edition competition in San Francisco, CA.

AWARDS

2023	• Third place in presentation award for BioMed Journal Club (Texas Tech internal)
2018	• Gold medal in Robogames competition, San Francisco, California
2017	• 2017 Student Scholarship award from National Center for Science and Development (CNPQ – Brazil)

SKILLS

Instrumentation	• Motion capture system (Motion Analysis), electromyography (Delsys), force platforms (Bertec and Kinvent), 3D scanner (Shinning 3D), Dynamometer (Biodex)
Modeling	• SolidWorks, Finite Element Analysis (ANSYS, ANSA), LS-Dyna, SolidWorks, Image Segmentation (Mimics), GEOMAGIC, 3-Matic, and AutoCAD, Rhino
Coding Languages	• MATLAB/Simulink, Python, Visual Basics, C++, R
Languages	• English (fluent), Portuguese (native)

SELECTED GRADUATE COURSES

Industrial, Manufacturing, & Systems

- Ergonomics and Design
- Biomechanics and Work physiology
- Biomedical Design and Manufacturing
- Systems Safety Engineering
- Design of Experiment
- Advanced Manufacturing Process
- Principles of Operations Research

Other departments

- Numerical Methods in Engineering
- Applied Statistics II
- Machine Learning
- Computational Fluid Dynamics
- Applied Linear Algebra
- Advanced Fluid Mechanics I

TEACHING INTERESTS

- Human Factors and Design
- Biomechanics and Occupational Safety
- Design of experiment
- Statistics and advanced data analysis
- Advanced manufacturing
- Fluid mechanics

RESEARCH INTERESTS

- Exoskeleton and musculoskeletal supportive systems
- Muscle mechanics and motor control
- Human movement analysis
- Anthropometry and design
- Musculoskeletal rehabilitation