

# Turner Jennings

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## Education

- 2022-Present **PhD in Mechanical Engineering** **Northeastern University, Boston, MA, USA**  
*Frequency-Domain Head Impact Mechanics and Evaluation of a Granular Energy Absorber for Helmets*  
Advisors: Dr. Sinan Müftü and Dr. Rouzbeh Amini
- 2017-2022 **B.S./M.S. in Mechanical Engineering** **Northeastern University, Boston, MA, USA**  
Concentration in Mechanics and Design, minor in Mathematics

## Skills

- **Finite Element Analysis:** LS-DYNA, Altair Hypermesh, Paraview, ANSYS, ABAQUS
- **Programming Languages:** MATLAB, R, Python, C++, HTML/CSS, Julia
- **Software:** SolidWorks (CSWP – Mechanical Design), Simulink, Confluence, Jira
- **Tools:** Split-hopkinson pressure bar, optical and scanning electron microscopy, high-speed imaging, universal mechanical tester, planar and cylindrical biaxial tensile testing

## Research Experience

- 2022-Present **Graduate Research Assistant** **Northeastern University, Boston, MA, USA**
- Developed a computational workflow for procedural generation of subject-specific finite element brain models using LS-DYNA, MATLAB, Python, and Julia.
  - Designed and built a custom modified Split-Hopkinson Pressure Bar technique to test the high-strain-rate response of particulate media for energy absorption in a helmet environment.
  - Experimentally measured helmet/head interface forces and developed multiple computational models of helmet fitting and impact processes in LS-DYNA.

## Industry Experience

- 2020 **Manufacturing Quality Intern** **Bosch Automotive Technologies, Amata City, Thailand**  
Supervised the “Firewall” team, a cross functional group of 12-15 specialists from engineering, production, supply chain, and quality. Coordinated proactive and reactive quality control efforts to ensure more quality issues closed than opened every month.
- 2019 **R&D Engineering Co-op** **DOTS Technology Corp., Natick, MA, USA**  
Developed an improved protein extraction system from concept to production, coordinating with contract manufacturers and consultants to create a functional and manufacturable design. The optimized system developed performed comparably to laboratory-grade benchtop equipment while costing less than \$1 to manufacture.

## Publications

8. **Jennings, T.**, Acosta, D., Karamzadeh, M., Amini, R., and Müftü, S. “Experimental Validation of Composite Helmet Donning Boundary Conditions and Computational Analysis of Fit Differences” *Manuscript in Preparation*
7. **Jennings, T.**, Acosta, D., Karamzadeh, M., Amini, R., and Müftü, S. “A Computational Model of Subject-specific Differences in Brain Vibrational Resonance” *Manuscript in Preparation*
6. **Jennings, T.**, Tillman, A., Mukasa, D., Marchev, M., Müftü, S., and Amini, R. “Measurement and Assessment of Head-to-Helmet Contact Forces.” *Manuscript in Review*
5. **Jennings, T.**, Amini, R., and Müftü, S. “Toward a Consistent Framework for Describing the Free Vibration Modes of the Brain.” *ASME J Biomech Eng. Manuscript accepted December 2024*
4. Pakzadmanesh, M., Salinas, S., Thomas, V., **Jennings, T.**, DelCiello, H., Vargas, A., Clarin, J., and Amini, R. “Mechanically Induced Deformation of Nuclei in the Tricuspid Valve Interstitial Cells: Experimental Measurements and Multi-scale Computational Simulation.” *ASME Open J Eng.* August 2024; 3:031023

3. Vargas, A. I., Tarraf, S. A., **Jennings, T.**, Bellini, C., and Amini, R. (March 19, 2024). "Vascular Remodeling During Late-Gestation Pregnancy: An In-Vitro Assessment of the Murine Ascending Thoracic Aorta." ASME. J Biomech Eng. July 2024; 146(7):071004.
2. Clarin, J., Vargas, A., **Jennings, T.**, Salinas, S., Amini, R., Tjiptowidjojo, Y., Yelle, B., Jacobsen, M., Eide, T., Udberg-Helle, C., Olsen, T., Crossen, J., Prot, V., Skallerud, B., and Amini, R. (March 7, 2024). "An Experiential Learning Opportunity in Norway: Computation for Bioengineering and Mechanical Engineering Students." ASME. J Biomech Eng. May 2024; 146(5):051004.
1. **Jennings, T.**, Amini, R., and Müftü, S. "In-Silico Model Validation of Impact on a Composite Helmet Shell." ASME Open J. Eng. May 2024; 3:031012

## Mentorship and Volunteering

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### *Undergraduates directly mentored:*

2024	<i>Mahika S.:</i> Development of rigid body dynamics simulations in Python
2024	<i>Supratim S.:</i> High-strain-rate testing of granular materials
2024	<i>Ian K.:</i> High-strain-rate testing of granular materials
2023-2024	<i>Diego A.:</i> Development of subject-specific finite element head models in MATLAB and Python
2023-2024	<i>Lily B.:</i> Material sample preparation process development
2023-2024	<i>Aidan T.:</i> Statistical modelling of helmet ergonomics data in MATLAB and R

### *Volunteering:*

2023-2024	<b>Letters to Pre-Scientists</b> Paired with a middle school student pen pal sending regular letters to help them learn more about careers in STEM.
2023	<b>Northeastern University Young Scholars Program</b> Mentored two high school students during a six-week program mentoring them about the research process and critical skills for higher education.
2018-2021	<b>FIRST LEGO League team coach</b> Coached a team of 8-12 middle school students participating in robotics and design competition.

## Awards

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2022-2023	Sami Alsaif Doctoral Fellowship
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## Conference Presentations

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2024	Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)	<b>Lake Geneva, WI</b>
2024	ARL Physics of Soldier Protection Program Annual Meeting	<b>Boston, MA</b>
2024	Winter Conference for Brain Research	<b>Breckenridge, CO</b>
2023	Summer Biomechanics, Bioengineering, and Biotransport Conference (SB3C)	<b>Vail, CO</b>
2023	ARL Physics of Soldier Protection Program Annual Meeting	<b>Pittsburgh, PA</b>
2023	Winter Conference for Brain Research	<b>Snowbird, UT</b>

## Affiliations/Memberships

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American Society of Mechanical Engineers (ASME)