

Eugenio ("Henny") Frias-Miranda

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Education

Purdue University – West Lafayette, Indiana

- Doctor of Philosophy in Mechanical Engineering Aug 2022 – May 2027 | GPA: 3.90/4.00
Advisor – Laura H. Blumenschein
Dissertation – Leveraging Compliant Human Robot Interaction for Emerging Behaviors
- Bachelor of Science in Mechanical Engineering Aug 2018 – May 2022 | GPA: 3.50/4.00

Technical Skills

- **Software:** MATLAB, Python, C++, C#, C, Arduino, ROS, LabView, Motion Capture, EMGs, Unity
- **CAD:** SolidWorks, Siemens NX, CATIA, Creo Parametric, Abaqus, ANSYS

Research Experience

Wearable Resistance Device's Motor Learning Effects in Exercise

Mar 2023 – Jan 2024

RAAD Lab, Purdue University

- Showed reduction in squat form asymmetry by 15% using passive resistance in overhead squats.
- Led a motor learning 64 subject 3-day study comparing haptic and visual feedback, using motion capture.
- Developed and calibrated a stretch sensor for a wearable device, achieving force-displacement accuracy of $R^2 = 0.88$.

Inflatable Rotational Joint for Soft Robots | RAAD Lab, Purdue University

Jul 2024 – Sep 2024

- Led experimental validation of tendon-driven actuation, achieving a 10.45 N average buckling force.
- Developed an inflatable rotational joint, reducing actuation energy by 46% compared to isotropic designs.
- Designed and tested a multi-unit soft robot system, creating reconfigurable motion sequences with modular joints.

Vine Robot Localization | RAAD Lab, Purdue University

Jun 2022 – Mar 2023

- Developed a localization algorithm for a Vine Robot with less than 5% error in tip position over multi-obstacle paths.
- Designed and implemented a sensorized end cap, improving collision detection accuracy by 100%.
- Led experiments with a 2.4m Vine Robot with a sensorized endcap.

Professional Experience

Mechatronics Fellow Intern | GE Aerospace Research, Niskayuna, NY

Jun 2025 – Aug 2025

- Led concept design of a soft everting robot for jet engine inspection, contributing to a filed patent.
- Deployed a soft everting robot in 50+ on-engine trials in Ohio, achieving a 75% deployment success rate.
- Developed modular Rigidizable Guide Tube prototypes via thermal modeling and material testing, cutting iteration time.

Software Engineer Intern | M365 Core, Microsoft, Redmond, WA

May 2021 – Aug 2021

- Analyzed data gathered from a TDS machine and logged data analysis results in kusto using C#.
- Created a processor which ingests a signal to obtain workplace data analytics.

Program Manager Intern | Project Agora, Microsoft Graph, Microsoft, Redmond, WA

May 2020 – Aug 2020

- Defined current problems, customers, and potential solutions within Microsoft Graph's API Review process.

Leadership & Service

President | Mechanical Engineering Graduate Student Association

Aug 2022 – Present

- Organized major events for ME as direct link between ME students, faculty, and staff.
- Fostered communication skills by leading prospective student/new student orientation events.

Graduate Student Representative | Society of Hispanic Professional Engineers

Aug 2019 – Present

- Build professional communication practices through networking and creating events with over 100 attendees.

Volunteer | 2025 IEEE International Conference on Robotics and Automation (ICRA 2025)

May 2025

Volunteer | 2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS 2023)

Oct 2023

Research Interests

- Eugenio ("Henny") is a PhD candidate in Mechanical Engineering at Purdue University from San Juan, Puerto Rico. He works in Laura Blumenschein's Robust and Adaptive Design Lab. He is supported by the William E. and Florence E. Perry Teaching Fellowship, where he lectures a section of 109 students in Dynamics. His broader work centers on integrating soft robots into everyday life by leveraging compliant human-robot interaction, where human perception and decision-making are combined with soft robotic models to enable new capabilities and emergent behaviors. At present, he studies how wearable kinesthetic force feedback devices influence human motor adaptation, with an emphasis on how force magnitude and feedback design shape learning in full-body tasks. Previously, he has contributed to the development of a self-sensing obstacle-interacting vine robot and folded pneumatic artificial muscles. In his free time, Eugenio enjoys playing tennis, hiking, and learning about technology.

Publications

1. **E. Frias-Miranda***, A. de la Torre*, D. Yu, and L. H. Blumenschein, "Effects of Control Gain on a Soft Continuum Robot Target-Reaching Task", In preparation.
2. **E. Frias-Miranda**, M. M. Matthews, M. R. Misterka, D. Chan, and L. H. Blumenschein, "Role of Kinesthetic Force Magnitude in Motor Learning After-Effects", In review.
3. S. Wang, **E. Frias-Miranda**, A. Alvarez Valdivia, and L. H. Blumenschein, "Anisotropic Stiffness and Programmable Actuation for Soft Robots Enabled by an Inflated Rotational Joint," in IEEE International Conference on Robotics and Automation (ICRA), 2025.
4. **E. Frias-Miranda**, H. A. Nguyen, J. Hampton, T. Jones, B. Spotts, M. Cochran, D. Chan, and L. H. Blumenschein, "Adaptation and Training Effects from a Passive, Wearable Resistance Device During Exercise," in IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2024.
5. **E. Frias-Miranda**, A. Srivastava, S. Wang, and L. H. Blumenschein, "Vine Robot Localization Via Collision", in IEEE International Conference on Intelligent Robots and Systems (IROS), 2023.
6. S. Wang, **E. Frias-Miranda**, and L. H. Blumenschein, "The Folded Pneumatic Artificial Muscle (foldPAM): Towards Programmability and Control via End Geometry," in IEEE Robotics and Automation Letters (RA-L), 2023.

Presentations

- **E. Frias-Miranda**, M. M. Matthews, M. R. Misterka, D. Chan, and L. H. Blumenschein, "Role of Kinesthetic Force Magnitude in Motor Learning After-Effects," in IEEE ICRA 2025. Workshop Poster Presentation.
- **E. Frias-Miranda**, H. A. Nguyen, J. Hampton, T. Jones, B. Spotts, M. Cochran, D. Chan, and L. H. Blumenschein, "Adaptation and Training Effects from a Passive, Wearable Resistance Device During Exercise," in IEEE International Conference on Biomedical Robotics and Biomechatronics (BioRob), 2024. Poster Presentation.
- **E. Frias-Miranda**, H. A. Nguyen, J. Hampton, T. Jones, B. Spotts, M. Cochran, D. Chan, and L. H. Blumenschein, "A Wearable Resistance Device's Motor Learning Effects in Exercise" in Dynamic Walking Conference 2024. Poster Presentation.
- **E. Frias-Miranda**, A. Srivastava, S. Wang, and L. H. Blumenschein, "Vine Robot Localization Via Collision", in IEEE International Conference on Intelligent Robots and Systems (IROS), 2023. Oral and Poster Presentation.

Teaching

Lecturer | Basic Mechanics II – Dynamics (ME 274)

Jan 2025 – May 2026

Graduate Teaching Assistant | Basic Mechanics I – Statics (ME 270)

Aug 2025 – Dec 2025

Undergraduate Teaching Assistant | Systems, Measurements, and Controls II (ME 375)

Jan - May 2023

Honors and Awards

- William E. and Florence E. Perry Teaching Fellowship Jan 2026
- Purdue Engineering Student Council EXPO Gold Scholarship Jan 2025
- Purdue University Dr. Anil Bajaj Outstanding Service Scholarship Dec 2024
- Society of Hispanic Professional Engineers Scholarship May 2023
- Eagle Scout, Scouts of America May 2018