

LEAH T. GAETA

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SUMMARY

Over the last several years, I've designed and tested soft robotic systems that interact with humans and adapt to their surroundings. As a doctoral researcher, I developed and validated soft robotic prototypes, led cross-functional research efforts, and published peer-reviewed work in leading scientific journals on tunable soft materials. While collaborating with engineers, clinicians, and users, I've moved ideas from concept to tested systems, under the same constraints, rigor, and pace one would find in industry. I strive to advance scientific understanding while developing technology to be smarter, more intuitive, and built for the people who rely on it.

EDUCATION

Boston University September 2021 – May 2025
Ph.D. Mechanical Engineering Boston, MA

M.S. Mechanical Engineering

- Doctoral researcher in the Morphable Biorobotics Lab
- Dissertation: *Stiffness Localization in Soft and Wearable Robotics*
- Advisor: Professor Tommaso Ranzani

Boston University Summer 2019 – Spring 2021
Late-Entry Accelerated Program in Mechanical Engineering Boston, MA

- College of Engineering Scholarship (maximum award) for being in top 1% of class

University of Southern California Fall 2008 – Spring 2013
B.S. Human Biology (emphasis in Applied Physiology) Los Angeles, CA

- Undergraduate researcher in the USC Biomechanics Lab
- NCAA DI Cross Country and Track & Field Student-Athlete, 2008 – 2012

PEER-REVIEWED JOURNAL PUBLICATIONS

4. **L.T. Gaeta**, V.T. Vo, S.-Y. Lee, S. Raste, M. Venkatesam, J. Rogatinsky, M.D. Albayrak, T. Ranzani. "Jamming Metal Sheets Using Electropermanent Magnets for Stiffness Modulation," *IEEE Robotics & Automation Letters*, Vol. 10, No. 8, pp. 7739-7746, 2025, doi: 10.1109/LRA.2025.3579246.
3. L. Kinnicutt, **L.T. Gaeta**, J. Rogatinsky, J. Lee, A. Cameron, A.J. Naik, D.T. Hess, and T. Ranzani. "A soft robotic, modular laparoscopic grasper for atraumatic retraction of the small intestine," *Device*, Vol. 2, Issue 10, 100560, 2024, doi: 10.1016/j.device.2024.100560.
2. **L.T. Gaeta**, M.D. Albayrak, L. Kinnicutt, S. Aufrichtig, P. Sultania, H. Schlegel, T.D. Ellis, and T. Ranzani. "A magnetically controlled soft robotic glove for hand rehabilitation," *Device*, Vol. 2, Issue 9, 100512, 2024, doi: 10.1016/j.device.2024.100512.
1. **L.T. Gaeta**, K.J. McDonald, L. Kinnicutt, M. Le, S. Wilkinson-Flicker, Y. Jiang, T. Atakuru, E. Samur, and T. Ranzani. "Magnetically induced stiffening for soft robotics," *Soft Matter*, vol. 19, no. 14, pp. 2623–2636, 2023, doi: 10.1039/D2SM01390H.

CONFERENCE PROCEEDINGS & PRESENTATIONS

3. **L.T. Gaeta**, V.T. Vo, S.-Y. Lee, S. Raste, M. Venkatesam, J. Rogatinsky, M.D. Albayrak, T. Ranzani. “Jamming Metal Sheets Using Electropermanent Magnets for Stiffness Modulation,” *IEEE International Conference on Robotics & Automation*, 2026 (to appear), Vienna, Austria.
2. **L.T. Gaeta** and T. Ranzani. “Magnetically Induced Stiffening for Soft Robotics,” *Material Research Society (MRS) Fall meeting*, 2023, Boston, MA, USA.
1. L. Kinnicutt, J. Lee, J. Oden, **L.T. Gaeta**, S.K. Carroll, A. Rathi, Z.H. Lim, M. Lee, C. Orakwue, K.J. McDonald, D.T. Hess, T. Ranzani. “A Soft Laparoscopic Grasper for Retraction of the Small Intestine,” *The Hamlyn Symposium on Medical Robotics*, 2023, London, UK.

RESEARCH POSITIONS

Boston University, Morphable Biorobotics Lab <i>Doctoral Researcher</i> Advisor: Prof. Tommaso Ranzani	September 2021 – May 2025 <i>Boston, MA</i>
Automatic Data Processing, Inc., User Experience <i>UX Research Coordinator</i> Supervisor: Margot Dear	January 2019 – May 2019 <i>Pasadena, CA</i>
University of Southern California, Biomechanics Lab <i>Undergraduate Researcher</i> Advisor: Prof. Jill McNitt-Gray	August 2012 – May 2013 <i>Los Angeles, CA</i>
Gilead Sciences, Inc., Medicinal Chemistry <i>Medicinal Chemistry Intern</i> Supervisor: Dr. Paul Roethle	Summer 2010 & Summer 2011 <i>Foster City, CA</i>

TEACHING POSITIONS

Co-Instructor, Boston University EK 125	FA2022
EK 125: Introduction to Programming for Engineers. Students learn to program in MATLAB and C, applying coding concepts to solve engineering problems. As Co-Instructor, I taught seven lecture sessions weekly, supervised lab and discussion sections, and proctored exams. I also held office hours, wrote homework assignments, and helped construct and grade exams. Received mean teaching evaluation score of 4.9/5.0 from 600+ surveyed students.	
Teaching Assistant, Boston University EK 125	SP2020 – SU2021
EK 125: Introduction to Programming for Engineers. Students learn to program in MATLAB and C, applying coding concepts to solve engineering problems. My duties consisted of assisting with learning during lecture and lab sections, leading two weekly discussion sections, holding weekly office hours, writing homework assignments, and grading. I TA'd for five semesters.	

EXPERIENCE

Boston University, Morphable Biorobotics Lab

September 2021 – May 2025

*Doctoral Researcher**Boston, MA*

- Developed electropermanent magnet-based systems that achieved 68% stiffness change with microsecond response time and minimal power consumption, enabling portable, long-duration wearable use through magnetic actuation.
- Advanced electropermanent magnet-based force transmission via stiffness modulation in soft wearable robotics, including development of a wearable haptic communication device to provide directional navigation cues.
- Engineered proof-of-concept rehabilitative glove that leveraged electropermanent magnet-based soft robotics, pioneering the first portable clinic-to-home strength training solution for patients with hand impairments.
- Led experimental testing that validated significant stiffness modulation improvements, utilizing Instron, universal robot arms, and force/torque sensors across multiple test conditions.
- Analyzed mechanical characterization data to inform design refinements and performance optimization, using MATLAB and Python on datasets from EMG, force sensors, and robotic platforms.
- Directed cross-functional research efforts with 5–8 engineers, roboticists, and clinicians, leading design collaboration and co-authoring peer-reviewed publications.
- Mentored 15+ student researchers, resulting in 7 advancing to competitive PhD programs and 4 co-authored papers published in top-tier journals (including *IEEE Robotics and Automation – Letters*).
- Presented research at international conferences (e.g., *MRS*), elevating visibility and peer recognition for advancements in magnetic stiffening mechanisms in soft robotics.
- Authored 4 peer-reviewed journal articles and reviewed submissions for leading robotics publications, advancing academic and industry scholarship in soft robotics and wearable technologies.
- Received *NIH fellowship* from successfully funded grant application to support individual PhD research.

Boston University, EK 125

September 2022 – December 2022

*Co-Instructor**Boston, MA*

- Promoted from Teaching Assistant to Co-Instructor for EK 125: Introduction to Programming for Engineers, to fulfill doctoral teaching fellowship.
- Taught seven 50-minute lectures weekly and frequently supervised learning during the labs & discussion sections.
- Held four office hours weekly.
- Wrote homework assignments, and proctored and graded exams.
- Supervised graduate-level and undergraduate-level teaching assistants.
- Received mean teaching evaluation score of 4.9/5.0 from 600+ surveyed students.

Boston University, EK 125

January 2020 – August 2021

*Teaching Assistant**Boston, MA*

- Taught five semesters for Professor Stormy Attaway's EK 125: Introduction to Programming for Engineers.
- Assisted with learning during the lectures and lab sections.

- Led two discussion sections weekly and held two 2-hour “open hours” blocks weekly for students to drop by for help and questions.
- Wrote homework assignments, including introducing students to MATLAB Mobile data collection, Live Editor, debugging, using C with Unix command line, and statistics in Data Science & Machine Learning.
- Graded quizzes, exams, and assignments.

Automatic Data Processing, Inc.

January 2019 – May 2019

*User Experience Research Coordinator**Pasadena, CA*

- Cleaned large-scale user datasets (hundreds of thousands of records) to develop a structured database that enabled the UX research team to efficiently recruit study participants and analyze trends.
- Delivered weekly research summaries for executive stakeholders, distilling qualitative and quantitative insights from early-stage user data to support proof-of-concept evaluations.
- Coordinated cross-functional collaboration between engineers, designers, and researchers, ensuring smooth alignment between data preparation and early product research efforts.
- Supported the development of scalable research workflows by transforming fragmented datasets into actionable resources for ongoing UX design initiatives.

Studio Metamorphosis

February 2015 – May 2019

*Senior Trainer**Pasadena, CA*

- Led over 5,000 high-performance training sessions across strength, cycling, and running formats, developing precise communication, instructional clarity, and real-time performance assessment.
- Designed customized training protocols for clients with complex physical needs, sharpening skills in human systems analysis, adaptation, and user-centered problem-solving.
- Served elite clients, including professional athletes from the Los Angeles Dodgers (2017 and 2018 off-seasons), refining ability to support a variety of high-performance scenarios.
- Co-developed fitness programs at new studio locations and trained junior instructors.
- Work featured in national media outlets including *The New York Times*, *CNN*, *Women's Health*, and *People*, reflecting a reputation for excellence and innovation in the fitness space.

Pilates Platinum & Pilates Plus

June 2013 – March 2016

*Freelance Fitness Instructor**Greater Los Angeles Area*

- Led Lagree Fitness, indoor cycling, and private training sessions for various studios across Los Angeles.

Varsity Tutors, LLC

April 2013 – May 2014

*Academic Tutor**Greater Los Angeles Area*

- Provided in-home tutoring for high school and undergraduate students in math and science.
- All five clients went from failing grades to A's and B's at the completion of their courses.

Gilead Sciences, Inc.

Summer 2010 & Summer 2011

*Medicinal Chemistry Intern**Foster City, CA*

- Synthesized, isolated, and identified compounds designed to inhibit a novel HIV target.
- Used mass-spectrometers, NMRs, and other instruments to isolate and identify products.

TECHNICAL SKILLS

Languages	MATLAB, Python (Jupyter Notebook, Numpy, Pandas, TensorFlow, Scikit-Learn), C, L ^A T _E X
Software	Creo, Onshape, SolidWorks, Arduino, Inspire, nTopology, Cura, Excel, Ansys, Abaqus, Adobe Creative Cloud Suite, Salesforce, Eloqua, Qualtrics
Tools	Instron, FDM & SLA 3D Printing, CO ₂ Laser Cutter, UV Laser Cutter, ATI Force/Torque Sensors, Soft Materials Processing Equipment, Universal Robot Arm (mechanical testing), Heat Press, Soldering

AWARDS & HONORS

National Institutes of Health (NIH) Fellowship: Health-Related Research through the National Institute of Biomedical Imaging and Bioengineering	2022 – 2024
Distinguished Mechanical Engineering Fellowship, Boston University	2021 – 2022
College of Engineering Scholarship (Max. Award), Boston University	2020 – 2021
All-Academic Track & Field Team, PAC-10 Conference	2009 – 2011
Heritage Association Coaches' Award, University of Southern California	2010
Dean's List College of Arts & Sciences, University of Southern California	2010
All-Academic Cross Country Team, PAC-10 Conference	2008 – 2010
Alpha Lambda Delta Honor Society, University of Southern California	2008
Dean's List College of Arts & Sciences, University of Southern California	2008

ACADEMIC ACTIVITIES

Peer Reviewer For:

- Soft Robotics
- Science Advances
- IEEE International Conference on Intelligent Robots and Systems (IROS)
- IEEE-RAS International Conference on Soft Robotics (RoboSoft)
- IEEE Transactions on Robotics (T-RO)
- International Journal of Robotics Research (IJRR)
- npj Flexible Electronics

Leadership Positions:

- Mentoring Chair, Graduate Women in Science and Engineering (GWISE), 2022 – 2024
- Board Member, GWISE, 2022 – 2024
- Mentoring Representative, GWISE, 2021 – 2022
- Late-Entry Accelerated Program (LEAP) Ambassador 2020 – 2021

RESEARCH MENTORSHIP

Undergraduate Mentorship:

1. Mark Lucas – Current student, Biomedical Engineering, Expected Graduation May 2026
2. Howell Xia – BS, Computer Engineering, 2025
 - Post-graduation: Engineering Development Group at Mathworks
3. Hanna Schlegel – BS, Mechanical Engineering, 2024
 - Publications: Gaeta et al. (2024)
 - Post-graduation: PhD Student at UC Berkeley
4. Megan Le – BS, Biomedical & Mechanical Engineering, 2023
 - Publications: Gaeta et al. (2023)
 - Post-graduation: Graduate Student, Imperial College London
5. Anushka Rathie – BS, Mechanical Engineering (2023)
 - Post-graduation: PhD Student at University of Michigan
6. Bryson Garriques – BS, Mechanical Engineering, 2023

Graduate Mentorship:

1. Megha Venkatesam – Current student
 - Publications: Gaeta et al. (2025)
2. Srushti Raste – MS, Robotics & Autonomous Systems, 2025
 - Publications: Gaeta et al. (2025)
 - Post-graduation: Research Associate at Wesleyan University
3. M. Deniz Albayrak – MS, Mechanical Engineering, 2024
 - Publications: Gaeta et al. (2024), Gaeta et al. (2025)
 - Post-graduation: PhD Student at ETH Zurich
4. Yuyuan Zhang – MS, Mechanical Engineering (2024)
 - Post-graduation: PhD Student at UMass Amherst
5. Yixiao Jiang – MS, Mechanical Engineering, 2022
 - Publications: Gaeta et al. (2023)
 - Post-graduation: PhD Student at Columbia University
6. Piyaporn (View) Chivatanaporn – MS, Mechanical Engineering

Other Mentorship:

1. Susanna Aufrichtig
 - BU RISE High School Intern, Summer 2023
 - Publications: Gaeta et al. (2024)
 - Currently: Undergraduate Student at Cornell University
2. Sidney Wilkinson-Flicker
 - NSF RET Fellow, Summer 2022

- Publications: Gaeta et al. (2023)
- Currently: A.C. Whelan Elementary School Teacher

VOLUNTEER EXPERIENCE

Advance, Recruit, Retain, and Organize Women in STEM Mentoring Circles Program

2019 – 2025

- Ran the Mentoring Circles Program as the GWISE Mentoring Chair for two academic years (2022 – 2024).
- Developed monthly mentoring curriculum for mentoring groups to follow, which would focus on various themes (e.g. professional networking, managing academic stress, graduate school and internship application workshops, and more).
- Organized semester social and networking events for all mentors and mentees, often securing outside guest speakers from industry STEM roles.
- Provided monthly mentoring to 3–5 undergraduate women in STEM each academic year.

Kids Enjoy Exercise Now

2017 – 2019

- Worked with children with physical and mental disabilities in Los Angeles.
- Encouraged athletes to play and emphasized the importance of physical activity.

Joint Educational Project

2012 – 2013

- Planned coursework and taught basic human biology to 4th graders at St. Raphael's school in South Central Los Angeles.
- Formulated a weekly curriculum with varied lesson plans, often adapting based on student and teacher feedback.

INTERESTS

Running (6x Marathoner, 6x Boston Marathon Qualifier) · Strength Training · Baseball · Saber-metric Books, Blogs, & Newsletters

REFERENCES

Tommaso Ranzani, Ph.D.

Boston University

- Professor Tommaso Ranzani was my doctoral research advisor in the Morphable Biorobotics lab at Boston University. Before that, he was also my Fluid Mechanics and Soft Robotics professor.
- Contact: tranzani@bu.edu

Sheila Russo, Ph.D.

Boston University

- Professor Sheila Russo served on my doctoral research committee, was my Medical Robotics professor, and was a mentor to me while at Boston University.
- Contact: russos@bu.edu

Terry D. Ellis, Ph.D.*Boston University*

- Professor & Chair Terry D. Ellis served on my doctoral research committee and we co-authored a peer-reviewed journal paper while at Boston University.
- Contact: tellis@bu.edu

Doug Holmes, Ph.D.*Boston University*

- Professor Doug Holmes served on my doctoral research committee and was my Advanced Mathematics in Mechanics professor while at Boston University.
- Contact: dpholmes@bu.edu

Stormy Attaway, Ph.D.*Boston University*

- Professor Stormy Attaway was the Introduction to Programming for Engineers professor when I was a Teaching Assistant (five semesters) and later a Co-Instructor (one semester).
- Contact: sa@bu.edu