Emma Lejeune

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Current Position

Assistant Professor 1/2020 - Present
David R. Dalton Career Development Assistant Professorship
Department of Mechanical Engineering
Boston University

Prior Research Experience

Research Assistant Professor 9/2019 - 12/2019
Department of Mechanical Engineering
Boston University

Peter O'Donnell, Jr. Postdoctoral Fellow 9/2018 - 8/2019
The Oden Institute for Computational Engineering and Sciences
The University of Texas at Austin
Advisor: Michael Sacks

Graduate Research Fellow 9/2013 - 8/2018
The Department of Civil and Environmental Engineering
Stanford University
Advisor: Christian Linder

Education

Stanford University 3/2015 - 9/2018
Ph.D. in Civil & Environmental Engineering,
Thesis: Numerical modeling of mechanically driven emergent behavior in biological systems
Advisor: Christian Linder
Additional Committee Members: Ronaldo Borja, Ellen Kuhl

Stanford University 9/2013 - 3/2015
M.S. in Civil & Environmental Engineering, Structural Engineering and Geomechanics
Advisor: Christian Linder

Cornell University 8/2009 - 5/2013
B.S. in Civil Engineering, *magna cum laude*

Journal Publications

Google Scholar: `https://scholar.google.com/citations?user=Yqj_HWkAAAAJ&hl=en`

* *Lejeune Lab students*

J47. Prachaseree, P.,* & **Lejeune, E.** (2026). Information Propagation and Encoding in Solids: A Quantitative Approach Towards Mechanical Intelligence. arXiv preprint arXiv:2602.00140.

J46. Mohammadzadeh, S.,* Hamdi, E.,* Shor, J., & **Lejeune, E.** (2025). FEM-Bench: A Structured Scientific Reasoning Benchmark for Evaluating Code-Generating LLMs. arXiv preprint arXiv:2512.20732.

J45. Mohammadzadeh, S.,* Tsan, Y. C., Renberg, A., Kobeissi, H.,* Helms, A., & **Lejeune, E.** (2025). SarcGraph for High-Throughput Regional Analysis of Sarcomere Organization and Contractile Function in 2D Cardiac Muscle Bundles. microPublication Biology, 2025, 10-17912.

J44. Hamdi, E.,* & **Lejeune, E.** (2025). Towards robust surrogate models: Benchmarking machine learning approaches to expediting phase field simulations of brittle fracture. Computer Methods in Applied Mechanics and Engineering, 449, 118526.

J43. Mohammadzadeh, S.,* & **Lejeune, E.** (2025). Quantifying HiPSC-CM structural organization at scale with deep learning-enhanced SarcGraph. PLOS Computational Biology, 21(10), e1013436.

J42. Prachaseree, P.,* & **Lejeune, E.** (2025). Towards understanding structure-function relationships in random fiber networks. Journal of the Mechanics and Physics of Solids, 106221.

J41. Granhold, S. L., Madariaga, A., Lohr, M. J., Jones, S., Robinson, A. J., Cosgriff-Hernandez, E., **Lejeune, E.**, Dortdivanlioglu, B. & Rausch, M. K. (2025). The Nonlinear Visco-Hyperelastic Damage Mechanics of Individual Electrospun Polycaprolactone Fibers: Experiments and Modeling. Advanced Engineering Materials, 2500253.

J40. Yuan, L.,* **Lejeune, E.**, & Park, H. S. (2025). Machine learning-guided design of non-reciprocal and asymmetric elastic chiral metamaterials. International Journal of Solids and Structures, 113412.

J39. Ewoldt, J. K., DePalma, S. J., Jewett, M. E., Karakan, M. C., Lin, Y. M., Mir Hashemian, P., Gao, X., Lou, L., McLellan, M.A., Tabares, J., Ma, M., Salazar Coariti, A. C., He, J., Toussaint Jr., K. C., Bifano, T. G., Ramaswamy, S., White, A. E., Agarwal, A., **Lejeune, E.**, Baker, B. M., & Chen, C. S. (2024). Induced pluripotent stem cell-derived cardiomyocyte in vitro models: benchmarking progress and ongoing challenges. Nature Methods, 1-17.

J38. Kobeissi, H.,*, Gao, X., DePalma, S. J., Ewoldt, J. K., Wang, M. C., Das, S. L., Jilberto, J., Nordsletten, D., Baker, B.M., Chen, C.S. & **Lejeune, E.** (2024). MicroBundlePillarTrack: A Python package for automated segmentation, tracking, and analysis of pillar deflection in cardiac microbundles. Micropublication Biology, 2024.

J37. DePalma, S. J., Jillberto, J., Stis, A. E., Huang, D. D., Lo, J., Davidson, C. D., Chowdhury, A., Jewett, M.E., Kobeissi, H.,* Chen, C.S., **Lejeune, E.**, Helms, A.S., Nordsletten, D.A., & Baker, B.M. (2024). Matrix Architecture and Mechanics Regulate Myofibril Organization, Costamere Assembly, and Contractility in Engineered Myocardial Microtissues. Advanced Science, 2309740.

J36. Kobeissi, H.,* Jilberto, J., Karakan, M. C., Gao, X., DePalma, S. J., Das, S. L., Quach, L, Urquia, J.,* Baker, B.M., Chen, C.S., Nordsletten, D. & **Lejeune, E.** (2024). MicroBundleCompute: Automated segmentation, tracking, and analysis of subdomain deformation in cardiac microbundles. Plos one, 19(3), e0298863.

J35. Prachaseree, P.*, Mohammadzadeh, S.,*, Dortdivanlioglu, B., & **Lejeune, E.** (2024). FEniCS-arclength: A numerical continuation package in FEniCS for nonlinear problems in solid mechanics. Journal of Open Source Software, 9(94), 5727.

J34. Nguyen, Q.,* & **Lejeune, E.** (2024). Segmenting mechanically heterogeneous domains via unsupervised learning. Biomechanics and Modeling in Mechanobiology, 23(1), 349-372.

J33. Jilberto, J., DePalma, S. J., Lo, J., Kobeissi, H.,* Quach, L., **Lejeune, E.**, Baker, B. M., & Nordsletten, D. (2023). A data-driven computational model for engineered cardiac microtissues. Acta biomaterialia, 172, 123-134.

J32. Rios, B., Bu, A., Sheehan, T., Kobeissi, H.,* Kohli, S., Shah, K., **Lejeune, E.**, & Raman, R. (2023). Mechanically programming anisotropy in engineered muscle with actuating extracellular matrices. Device, 1(4).

J31. Kakaletsis, S., **Lejeune, E.**, & Rausch, M. (2023). The mechanics of embedded fiber networks. Journal of the Mechanics and Physics of Solids, 181, 105456.

J30. **Lejeune, E.**, & Prachaseree, P.* (2023). Locality sensitive hashing via mechanical behavior. Extreme Mechanics Letters, 102042.

J29. Mohammadzadeh, S.,* Prachaseree, P.,* & **Lejeune, E.** (2023). Investigating deep learning model calibration for classification problems in mechanics. Mechanics of Materials, 104749.

J28. Mohammadzadeh, S.,* & **Lejeune, E.** (2023). SarcGraph: A Python package for analyzing the contractile behavior of pluripotent stem cell-derived cardiomyocytes. Journal of Open Source Software, 8(85), 5322.

J27. Kakaletsis, S., **Lejeune, E.**, & Rausch, M. K. (2023). Can machine learning accelerate soft material parameter identification from complex mechanical test data?. Biomechanics and Modeling in Mechanobiology, 1-14.

J26. Yuan, L.,* Park, H. S., & **Lejeune, E.** (2022). Towards out of distribution generalization for problems in mechanics. Computer Methods in Applied Mechanics and Engineering, 400, 115569.

J25. Das, S. L., Sutherland, B. P., **Lejeune, E.**, Eyckmans, J., & Chen, C. S. (2022). Mechanical response of cardiac microtissues to acute localized injury. American Journal of Physiology-Heart and Circulatory Physiology, 323(4), H738-H748.

J24. Kobeissi, H.,* Mohammadzadeh, S.,* & **Lejeune, E.** (2022). Enhancing Mechanical Metamodels with a Generative Model-Based Augmented Training Dataset. Journal of Biomechanical Engineering.

J23. Prachaseree, P.,* & **Lejeune, E.** (2022). Learning Mechanically Driven Emergent Behavior with Message Passing Neural Networks. Computers & Structures, 270, 106825.

J22. Lohr, M.J., Sugerman, G.P., Kakaletsis, S., **Lejeune, E.**, & Rausch, M.K. (2022). An Introduction to the Ogden Model in Biomechanics – Benefits, Implementation Tools, and Limitations. Philosophical Transactions of the Royal Society A.

J21. Mohammadzadeh, S.,* & **Lejeune, E.** (2022). Predicting mechanically driven full-field quantities of interest with deep learning-based metamodels. Extreme Mechanics Letters, 50, 101566.

J20. Zhao, B.,* Zhang, K., Chen, C. S., & **Lejeune, E.** (2021). Sarc-Graph: Automated segmentation, tracking, and analysis of sarcomeres in hiPSC-derived cardiomyocytes. PLOS Computational Biology, 7(10), e1009443.

J19. Khang, A., **Lejeune, E.**, Abbaspour, A., Howsmon, D. P., & Sacks, M. S. (2021). On the Three-Dimensional Correlation Between Myofibroblast Shape and Contraction. Journal of Biomechanical Engineering, 143(9), 094503.

J18. Das, S. L., Bose, P., **Lejeune, E.**, Reich, D. H., Chen, C., & Eyckmans, J. (2021). Extracellular Matrix Alignment Directs Provisional Matrix Assembly and Three Dimensional Fibrous Tissue Closure. Tissue Engineering Part A, 27(23-24), 1447-1457.

J17. Kakaletsis, S., Meador, W., Mathur, M., Sugerman, G. P., Jazwiec, T., Malinowski, M., **Lejeune, E.**, Timek, T.A. & Rausch, M. K. (2021). Right Ventricular Myocardial Mechanics: Multi-Modal Deformation, Microstructure, and Modeling. Acta Biomateriala, 123, 154-166.

J16. **Lejeune, E.**, & Zhao, B.* (2021). Exploring the potential of transfer learning for metamodels of heterogeneous material deformation. Journal of the Mechanical Behavior of Biomedical Materials, 104276.

J15. **Lejeune, E.** (2021). Geometric Stability Classification: Datasets, Metamodels, and Adversarial Attacks. Computer-Aided Design, 131, 102948.

J14. **Lejeune, E.** (2020). Mechanical MNIST: A benchmark dataset for mechanical metamodels. Extreme Mechanics Letters, 100659.

J13. **Lejeune, E.**, Khang, A., Sansom, J., & Sacks, M. S. (2020). FM-Track: A fiducial marker tracking software for studying cell mechanics in a three-dimensional environment. SoftwareX, 11, 100417.

J12. **Lejeune, E.**, & Linder, C. (2020). Interpreting stochastic agent-based models of cell death. Computer Methods in Applied Mechanics and Engineering, 360, 112700.

J11. Khang, A., Rodriguez, A. G., Schroeder, M. E., Sansom, J., **Lejeune, E.**, Anseth, K. S., & Sacks, M. S. (2019). Quantifying heart valve interstitial cell contractile state using highly tunable poly (ethylene glycol) hydrogels. Acta biomaterialia, 96, 354-367.

J10. **Lejeune, E.**, & Sacks, M. S. (2019). Analyzing valve interstitial cell mechanics and geometry with spatial statistics. Journal of biomechanics, 93, 159-166.

J9. **Lejeune, E.**, Dortdivanlioglu, B., Kuhl, E., & Linder, C. (2019). Understanding the mechanical link between oriented cell division and cerebellar morphogenesis. Soft matter, 15(10), 2204-2215.

J8. **Lejeune, E.**, & Linder, C. (2018). Understanding the relationship between cell death and tissue shrinkage via a stochastic agent-based model. Journal of biomechanics, 73, 9-17.

J7. **Lejeune, E.**, & Linder, C. (2018). Modeling mechanical inhomogeneities in small populations of proliferating monolayers and spheroids. Biomechanics and modeling in mechanobiology, 17(3), 727-743.

J6. **Lejeune, E.**, & Linder, C. (2017) Quantifying the relationship between cell division angle and morphogenesis through computational modeling. Journal of Theoretical Biology, 418, 1-7.

J5. **Lejeune, E.**, & Linder, C. (2017) Modeling tumor growth with peridynamics. Biomechanics and Modeling in Mechanobiology, 16(4), 1141-1157.

J4. **Lejeune, E.**, Javili, A., Weickenmeier, J., Kuhl, E., & Linder, C. (2016). Tri-layer wrinkling as a mechanism for anchoring center initiation in the developing cerebellum. Soft Matter, 12(25), 5613-5620.

J3. **Lejeune, E.**, Javili, A., & Linder, C. (2016). An algorithmic approach to multi-layer wrinkling. Extreme Mechanics Letters, 7, 10-17.

J2. **Lejeune, E.**, Javili, A., & Linder, C. (2016). Understanding geometric instabilities in thin films via a multi-layer model. Soft Matter, 12(3), 806-816.

J1. Rivera, J. P., Josipovic, G., **Lejeune, E.**, Luna, B. N., & Whittaker, A. S. (2015). Automated detection and measurement of cracks in reinforced concrete components. ACI Structural Journal, 112(3), 397.

Software

S8. FEM-bench, a comprehensive benchmarking system for evaluating Large Language Models (LLMs) on finite element method (FEM) tasks (2025) `https://github.com/elejeune11/FEM-bench`

S7. MicroBundlePillarTrack (2024) `https://github.com/HibaKob/MicroBundlePillarTrack`

S6. FEniCS-Arclength (2024) `https://github.com/pprachas/fenics_arclength`

S5. MicroBundleCompute: analyzing in vitro cardiac microbundles (2023) `https://github.com/HibaKob/MicroBundleCompute`

S4. WoundCompute: analyzing wound healing in three-dimensional tissue culture (2023) `https://github.com/elejeune11/woundcompute`

S3. Autotwin: Automated workflow for the Human Digital Twin: Image → Segmentation → Mesh → Simulation → Injury Risk (2022) `https://github.com/autotwin`

S2. Sarc-Graph: Segmentation, Tracking, and Analysis of hiPSC-CMs (2021 first version, 2023 updated version) `https://github.com/Sarc-Graph/sarcgraph`

S1. FM-Track: Fiducial Marker Tracking Software (2020) `https://github.com/elejeune11/FM-Track`

Datasets

D5. Nonlinear Mecahnics Benchmark, Phase Field Fracture (2025) `https://dataverse.harvard.edu/dataverse/PFM-Fracture`

D4. Asymmetric Buckling Columns Datasets (2022) `https://open.bu.edu/handle/2144/43730`

D3. Right Ventricular Myocardial Mechanics Dataset · Collaboration with M.K. Rausch (2020) `https://dataverse.tdl.org/dataverse/RVMechanics`

D2. Buckling Instability Classification Datasets (2020) `https://open.bu.edu/handle/2144/40085`

D1. Mechanical MNIST Datasets (2020-2023) `https://open.bu.edu/handle/2144/39371`

Book Chapters and Educational Materials

E4. Flamm, L. & **Lejeune, E.**. (under review, Association of College and Research Libraries). Advancing Institutional Data Practices through Disciplinary Grounding, Discourse, and Framing.

E3. **Lejeune, E.** (2025). A scaffolded approach to learning FEA implementation: code as textbook, LLMs as tutor. OpenBU Institutional Repository.

E2. **Lejeune, E.**, & Linder, C. (2021). Modeling biological materials with peridynamics. In Peridynamic Modeling, Numerical Techniques, and Applications (pp. 249-273). Elsevier.

E1. Khang, A., Howsmon, D. P., **Lejeune, E.**, & Sacks, M. S. (2020). Multi-scale modeling of the heart valve interstitial cell. In Multi-scale Extracellular Matrix Mechanics and Mechanobiology (pp. 21-53). Springer, Cham.

Invited Talks

T36. **Lejeune, E.**, From Mechanical MNIST to FEM-Bench: A Suite of Computational Mechanics Tools for Scientific ML, Amazon Research. December 2025.

T35. **Lejeune, E.**, Working with large datasets in computational mechanics and mechanobiology: benchmarks, metrics, and validation studies. Iowa State Mechanical Engineering Seminar. November 2025.

T34. **Lejeune, E.**, Working with large datasets in computational mechanics and mechanobiology: benchmarks, metrics, and validation studies. MIT AI for Design & Manufacturing Seminar. October 2025.

T33. **Lejeune, E.**, Working with large datasets in computational mechanics and mechanobiology: benchmarks, metrics, and validation studies. Johns Hopkins University SMaRT Seminar Series (Virtual). October 2025.

T32. **Lejeune, E.**, Working with large datasets in computational mechanics and mechanobiology: benchmarks, metrics, and validation studies. Princeton University PMI Seminar. October 2025.

T31. **Lejeune, E.**, Developing benchmark datasets for engineering mechanics. Duke University Emerging Ideas in AI for Materials and Mechanical Design. May 2025.

T30. **Lejeune, E.**, Benchmark datasets for solid mechanics. UT Austin Harrington Scientific ML Workshop. May 2025.

T29. **Lejeune, E.**, Analyzing large datasets of time-lapse microscopy images to quantify and understand the behavior of mechanobiological systems. Tufts University Department of Physics and Astronomy's Condensed Matter Seminar Series. April 2025.

T28. **Lejeune, E.**, Data driven modeling of mechanical and biomechanical systems. Solid Mechanics Seminar at Brown University. November 2024.

T27. **Lejeune, E.**, Data driven modeling of mechanical systems. Duke NRT Seminar. September 2024.

T26. **Lejeune, E.**, Building open science tools for quantifying the mechanical behavior of biomaterials. New England Complex Fluids (NECF) keynote talk. September 2024.

T25. **Lejeune, E.**, Open science approaches to data-driven modeling of mechanobiological systems. UCSB Data Driven Biology Workshop keynote talk. July 2024.

T24. **Lejeune, E.**, Data driven modeling of mechanical systems. USACM Novel Methods TTA Seminar. April 2024.

T23. **Lejeune, E.**, Open science approaches to data-driven modeling of mechanobiological systems. Quarter Century of Peridynamics invited keynote talk. April 2024.

T22. **Lejeune, E.**, Data driven modeling of mechanical systems. MME Graduate Seminar. Worcester Polytechnic Institute. April 2024.

T21. **Lejeune, E.** Data driven modeling of mechanical systems. CEE Graduate Colloquium, Duke University. November 2023.

T20. **Lejeune, E.** Building Open Science Tools for Quantifying Mechanical Behavior in Engineered Cardiac Tissue. BU Materials Day. October 2023.

T19. **Lejeune, E.** An Open Science Approach to Data-Driven Modeling of Mechanobiological Systems. BU CMTM Symposium. October 2023.

T18. **Lejeune, E.** Data driven modeling of mechanical systems. Extreme Mechanics Letters Webinar. October 2023.

T17. **Lejeune, E.** Data driven modeling of mechanical systems. Mechanics Seminar, University of Wisconsin Madison. September 2023.

T16. **Lejeune, E.** Establishing an Open Science Foundation for Data-Driven Modeling of Mechanobiological Systems. Isaac Newton Institute for Mathematical Sciences, University of Cambridge. August 2023.

T15. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Problems in Mechanics. ME Department Seminar, University of Connecticut. April 2023.

T14. **Lejeune, E.** Open access benchmark datasets for assessing deep learning model accuracy and calibration in mechanics. USACM Workshop on Establishing Benchmarks for Data-Driven Modeling of Physical Systems. April 2023.

T13. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Problems in Mechanics. Engineering and Applied Science Forum (EASF) Webinar. December 2022.

T12. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Problems in Mechanics. Distinguished Seminar Series in Computational Science and Engineering, MIT. October 2022.

T11. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Problems in Mechanics. MEAM Department Seminar, University of Pennsylvania. September 2022.

T10. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Problems in Mechanics. Machine Learning + X Seminar, Brown University. September 2022.

T9. **Lejeune, E.** Open Access Benchmark Datasets and Metamodels for Predicting the Mechanical Behavior of Heterogeneous Materials. NEW.Mech, Massachusetts Institute of Technology. May 2022.

T8. **Lejeune, E.** Metamodeling Strategies for Predicting Single and Full Field Quantities of Interest in Heterogeneous Materials. Computing in Engineering Forum University of Wisconsin-Madison. September 2021.

T7. **Lejeune, E.** Benchmark Datasets and Metamodeling Strategies for Predicting the Behavior of Heterogeneous Materials. Northern Arizona University. September 2021.

T6. **Lejeune, E.** Methods for computational modeling and computation based discovery of spatially heterogeneous biological materials. Pontificia Universidad Católica de Chile. June 2021.

T5. **Lejeune, E.** Modeling heterogeneous materials: benchmark datasets, metamodels, and experimental characterization. Michigan Institute for Computational Discovery & Engineering. University of Michigan. February 2021.

T4. **Lejeune, E.** Benchmark datasets for mechanical metamodels. Machine Learning in Science and Engineering (MLSE), Mechanical Engineering, Engineering Mechanics, and Civil Engineering Track. Columbia University Data Science Institute. December 2020.

T3. **Lejeune, E.**, Khang, A., & Sacks, M.S. Multiscale mechanical modeling of biological systems. Biophysical Society Meeting, Bioengineering Subgroup Saturday. February 2020.

T2. **Lejeune, E.** Multi-scale mechanical modeling of biological systems. Joint Solid Mechanics and Materials Seminar Series at Brown University. November 2019.

T1. **Lejeune, E.**, Khang, A., West, N., Sansom, J., & Sacks, M.S.. Keynote: Multiscale modeling of valve interstitial cells in a three-dimensional hydrogel environment. The Society of Engineering Sciences. St. Louis, MO. October 2019.

Honors and Awards

Selected for the NAE Grainger Foundation Frontiers of Engineering Symposium	2024
Extreme Mechanics Letters Young Investigator Award (EML YIA)	2022
BU Mechanical Engineering "Professor of the Year" Award for Teaching Excellence	2022
American Heart Association Career Development Award	2021
David R. Dalton Career Development Professorship	2020-2023
Haythornthwaite Foundation Research Initiation Grant ASME Applied Mechanics Division	2020
Junior Faculty Fellow BU Rafik B. Hariri Institute for Computing and Computational Science & Engineering	2020
Biophysical Society Bioengineering Subgroup Early Career Research Award	2020
The Oden Institute Peter O'Donnell, Jr. Postdoctoral Fellowship	2018-2019
NSF Graduate Research Fellowship	2014-2017
Stanford School of Engineering Graduate Fellowship	2013-2014
Cornell Merrill Presidential Scholar, Top 1% of Graduating Seniors	2013

Teaching Experience

Instructor of Record Spring 2025
ENG ME 700: Computational Mechanics: Nonlinear Analysis and Software Development

Course Description: Simulating materials and structures is fundamental to engineering design and analysis. To this end, the field of computational mechanics is concerned with discretizing mathematical models so that they can be solved by a computer. In this course, we taught both matrix structural analysis and finite element analysis as techniques to solve problems in mechanics with an emphasis on problems with material and geometric nonlinearity. For example, we covered introductory examples of simulating plasticity and fracture (material nonlinearity), and large deformation and buckling instabilities (geometric nonlinearity). In addition to mastering core concepts in mechanics, students gained hands-on experience with essential tools and workflows for modern software development. Topics covered included the use of the command line, Python programming, Markdown for documentation, GitHub for version control and code dissemination, and software management with Anaconda. The course also focused on best practices such as Test Driven Development (TDD), Code Coverage, and Code Review. Programming assignments reinforced theoretical learning and developing practical skills, while an open-ended final project allowed students to apply their knowledge creatively and interact with the open source software ecosystem.
Teaching Evaluations: 4.49/5.0 Total Score.$^{+}$

Instructor of Record Spring 2020-Present
EK 301: Engineering Mechanics I *Boston University*

Course Description: Fundamental statics of particles, rigid bodies, trusses, frames, virtual work, distributed forces, uni-axial stress and strain, shear and bending moment diagrams, application of vector analysis, and introduction to engineering design.

Semester	Number of Students	Teaching Evaluations
Spring 2026	90	TBD
Fall 2024	74	$4.51/5.0^{+}$
Spring 2024	66	$4.57/5.0^{*+}$
Spring 2024	60	$4.56/5.0^{*+}$
Spring 2023	67	4.76/5.0
Fall 2022	66	4.69/5.0
Spring 2022	66	4.85/5.0
Fall 2021	64	4.85/5.0
Fall 2020	25	4.75/5.0
Spring 2020	53	4.65/5.0

*In Spring 2024, I taught two sections of EK301.
+In 2024 the course evaluation changed format. Prior to 2024, the question reported here is "Overall, I rate the Instructor." From 2024 onward this question was removed and the value reported is the Total Score averaged across five questions: (1) "How organized did the course seem to you?", (2) "How well were the course learning objectives communicated?", (3) "How well did the course fulfill its stated learning objectives?", (4) "How much did you learn from

this course?", and (5) "How well did the course foster a sense of belonging and an inclusive climate that was supportive of learning for all students?"

Instructor of Record Fall 2020, Fall 2023
EK 100: Freshman Advising Seminar *Boston University*

This first-year experience course introduces students to Boston University, the College of Engineering, and the field of engineering. Students meet with faculty and student advisors and attend lectures to broaden their knowledge of the inner workings of the College and to gain a better understanding of engineering as a discipline and the ethical responsibilities of an engineer. Includes academic policies and special programs along with support services. Faculty advisors follow each cohort of 10-12 students for all four years of their undergraduate degree, meeting with them once or more each semester to discuss course selection and provide general advice about making the most of the BU undergraduate experience.

Semester⋆	Number of Students	Advisor Evaluations
Fall 2024	15	5.0/5.0
Fall 2022	14	4.79/5.0
Fall 2021	15	4.53/5.0
Spring 2021	13	4.83/5.0
Fall 2020	11	4.91/5.0

⋆ Evaluations are not available every semester, the value reported is the response to the statement "I would recommend my advisor."

Research Mentorship

PhD Students Directly Mentored Spring 2020-Present
Lejeune Lab PhD Students *Boston University*

Name	Year(s)	Publications
Lingxiao Yuan (co-advised with Harold Park)	2021 - 2024	J26, J40
Saeed Mohammadzadeh	2021 - 2025	J21, J24, J28, J29, J35, J43, J45, J46
Hiba Kobeissi	2020 - 2025	J24, J32, J33, J36, J37, J38, J45
Peerasait Prachaseree	2020 - 2026	J23, J29, J30, J35, J42, J47
Quan Nguyen	2021 - Present	J34
Erfan Hamdi	2023- Present	J44, J46
Sara Jahedazad	2023- Present	-
Evangelos Apostolakis	2025- Present	-

MS Students Directly Mentored Spring 2020-Present
Lejeune Lab MS Students *Boston University*

Name	Year(s)	Publications
Bill Zhao	2020-2021	J16, J20

BS Students Directly Mentored Spring 2020-Present

Lejeune Lab BS Students *Boston University*

Name	Year	Funding Source	Project Title(s)
Shirley Rodriguez	2025	BU UROP	Wound healing tissue engineering image analysis and device fabrication
Anthony Aparicio	2025	CELL-MET	Cardiac tissue engineering image analysis – microtissue scale
Rickerson Geneus	2024	Pathways to STEM REU	Cardiac tissue engineering image analysis – microtissue scale
Aidan Donovan	2023	BU UROP	Calibrating digital image correlation software for out-of-plane motion
Jonathan Urquia	2022	CELL-MET REU	Cardiac tissue engineering image analysis – microtissue scale
Nicholas Marchuk	2020–2022	BU UROP	Generating synthetic labeled datasets of hard-to-access structures; creating a synthetic dataset of deformed elastica in space
Eunhye Kwon	2020–2021	BU UROP	Detecting structural damage with machine learning
Anjana Srivastava	2020–2021	BU UROP	Synthetic datasets of endoscopic surgery for testing machine-learning-based optical flow algorithms
Chia Jen Cheng	2021	BU UROP	Crack detection via convolutional neural network trained on synthetic data
Tao Zhang	2021	BU UROP	Investigating machine-learning-based optical flow algorithms on an in silico beating heart
Destiny Nunez-Parra	2021	CELL-MET REU	Cardiac tissue engineering image analysis – cellular scale

Thesis Readerships Completed Spring 2020-Present

Name	Title	Degree	Date	Role
Hiba Kobeissi	Computational Methods and Open-Source Tools for Spatial and Temporal Characterization of Heterogeneous Soft Tissue	PhD	2025	First Reader
Javiera Jilberto	A Multiscale Computational Study of Cardiac Mechanics in Desmoplakin Cardiomyopathy	PhD	2025	Fifth Reader
Saeed Mohammadzadeh	Advances in Data-Driven Modeling for Computational Mechanics and Biomechanics	PhD	2025	First Reader

Name	Title	Degree	Date	Role
Grace Matthews	Nitinol Stabilization Device for Beating Heart Procedures	MS	2024	Third Reader
Eric Abercrombie	Transient Analyses of Viscoelastic Materials with Applications to Numerical Models	PhD	2024	Second Reader
Kelsey Lawrence Snapp	Discovering Tough and Impact-Resistant Structures Using a Self-Driving Lab	PhD	2024	Third Reader
Javier Morales Ferrer	Multiscale Heterogeneous Polymer Composites and Soft Synthetic Fascia for 4D Printed Electrically Controllable Multifunctional Structures with High Stiffness and Toughness	PhD	2024	Third Reader
Lingxiao Yuan	Machine Learning Powered Insights into Metamaterial Prediction and Design	PhD	2024	Second Reader
Sotirios Kakaletsis	Histomechanical Characterization and Microstructure-Based Modeling of Right Ventricular Myocardium	PhD	2023	Second Reader
Anastasia Gkousioudi	Biomechanical and Structural Vascular Remodeling in Aging and Diseases Using an Animal Model	PhD	2023	Fourth Reader
Metehan Calis	Mechanical Characterization of the Two-Dimensional Heterostructures by Strain Engineering	PhD	2023	Third Reader
Marshall Ma	High Throughput Screening System for Engineered Cardiac Tissue	PhD	2023	Fourth Reader
Arman Guerra	Elastogranular Structures: Deformable Objects in Contact	PhD	2023	Second Reader
Yuchen Kang	Soft Bracing Mechanism for Minimally Invasive Cardiac Interventions Surgery	MS	2022	Third Reader
Daniel Gendin	Uncertainty in Inverse Elasticity Problems	PhD	2021	Third Reader
Jeong Ho Lee	Stimuli-Responsive Shell Theory	PhD	2021	Fourth Reader
Quang Ha	Generalized Moving Least Squares Interpolation for Solution of Partial Differential Equations	PhD	2021	Third Reader
Perry Thomson	Soft Expanding Anchor Mechanism for Minimally Invasive Beating Heart Surgery	MS	2021	Third Reader

Academic Service, Boston University Internal

Strategic Planning Committee on AI in undergraduate engineering education 2025-2026
Member of a ten person committee reporting to the Dean of the College of Engineering.

Committee to create an AI/ML master's specialization in the College of Engineering 2025
Member of a six person committee reporting to the Dean of the College of Engineering.

NSF Engineering Research Center for Cellular Metamaterials (CELL-MET) 2024-Present
Lead for Integrated Engineering Goal 3: Measurement Technology and Benchmarking

BU College of Engineering Generative AI in Education Oversight Committee 2024
Member of a 3 person committee reporting to the Dean of the College of Engineering, organizing a workshop at the BU ME Department Annual Retreat.

Mechanical Data Curation Workshop Organizer Fall 2024
Organized a 2 hour workshop with ≈ 25 attendees in partnership with BU Libraries.

Month of Mechanics Organizing Committee Fall 2024
Member of a 4 person committee organizing a month of planned programming for the Department of Mechanical Engineering.

BU ME MS Committee 2024-2025
Member of a 9 person committee re-organizing the MS program.

Center for Multiscale and Translational Mechanobiology (CMTM) 2024-Present
Executive Committee, Open Science Lead

BU Mechanical Engineering Department 2023-Present
EK301 Course Coordinator

BU Mechanical Engineering Department 2023-2024
Strategic Planning Task Force, Undergraduate Experience

Center for Multiscale and Translational Mechanobiology (CMTM) 2022-2023
Strategic Planning Task Force

BU Mechanical Engineering Department 2021-2022
Faculty Search Committee, Emerging Areas Search

BU Mechanical Engineering Department 2020-Present
Graduate Admissions Committee

BU College of Engineering 2020
Dean's Catalyst Award Reviewer

Academic Service, External

PLOS Computational Biology Academic Editor 2025-Present
Academic Editors oversee the peer-review process by selecting reviewers, evaluating manuscripts, and making publication recommendations to ensure scientific rigor and quality.

NEW.Mech 2024 Organizer May 2024
Organized a 1 day conference at BU for the New England mechanics community with 3 invited speakers, 29 student lightning talks, and 100+ attendees.

USACM Executive Committee Member at Large 2024-Present
This is an elected position – the United States Association for Computational Mechanics (USACM) is an ≈ 800 member organization.

WCCM-ECCOMAS 2026 Next Generation Committee 2024-Present
One of four members representing "The Americas" for the World Congress of Computational Mechanics.

USNCCM18 Scientific Committee 2024-Present
Biomechanics/ computational biology/ biosystems topical area

Extreme Mechanics Letters Special Issue Editor 2023-2024
Machine Learning and Mechanics

Early Career Advisory Board 2023-Present
Extreme Mechanics Letters Journal (EML-ECAB)

Open Access Mechanics Datasets Website 2021-Present
Website with links to open access datasets designed as a community resource
`https://elejeune11.github.io/`

iMechanica Journal Club Leader May 2022
Machine Learning in Mechanics: Curating datasets and defining challenge problems
`https://imechanica.org/node/25935`

Lead Organizer 2021-2022
A Closer Look: Open Journal Club in Biomechanics, 39 speakers to date

Minisymposium Organizer 2021
U.S. National Congress on Computational Mechanics

NSF Panel Reviewer 2020-2025

Abstract Reviewer and Student Presentation Competition Judge 2020-2024
Summer Biomechanics, Bioengineering, and Biotransport Conference

Minisymposium Organizer 2019, 2022, 2023, 2025
Society of Engineering Sciences

Manuscript Reviewer: Acta Biomaterialia, Biophysical Reviews, Computational Materials Science, Computer-Aided Design, Computer Methods in Applied Mechanics and Engineering, Computer Methods in Biomechanics and Biomedical Engineering, Engineering with Computers, International Journal for Numerical Methods in Biomedical Engineering, International Journal of Solids and Structures, Journal of Biomechanical Engineering, Journal of Engineering Mechanics, Journal of the Mechanical Behavior of Biomedical Materials, Journal of the Mechanics and Physics of Solids, Journal of the Royal Society Interface, Materials Horizons, Nature Communications, Nature Computational Science, Nature Scientific Reports, Proceedings of the National Academy of Sciences, Proceedings of the National Academy of Sciences Nexus, Soft Matter, Numerical Methods in Biomedical Engineering, Theoretical and Applied Fracture Mechanics.

Outreach

Undergraduate Student Mentor Summer 2021, 2022, 2024
CELL-MET NSF Engineering Research Center REU Program *Boston University*

Provided research guidance and mentorship to a community college student participating in the CELL-MET REU, a program for exposing students from diverse backgrounds to research.

High School Student Mentor Summer 2016
Raising Interest in Science and Engineering (RISE) program *Stanford University*

Provided research guidance and mentorship for a high school student participating in RISE, a program designed for bright low income students who will be the first in their family to attend college.

High School Teacher Mentor Summer 2016
Research Experience for Teachers (RET) program *Stanford University*

Provided research guidance and collaborated with a high school teacher participating in RET, a program designed to give teachers a research experience that they can transfer to their high school classroom.

Mechanics Simulation Tutorial Spring 2015
Eastside College Preparatory School *East Palo Alto, CA*

Taught an interactive lesson on simulating structural materials at a high school focused on providing opportunities to students traditionally underrepresented in higher education.

Grants

Total amount of funding at BU:

- **$3,922,654 *Total* ($3,329,654 to the Lejeune Lab)**
- **$3,715,214 *External* ($3,172,214 to the Lejeune Lab)**
- **$207,440 *Internal* ($157,440 to the Lejeune Lab)**

Academic Innovation Fund 2025
BU Shipley Center, PI $7,440

Generative AI Demonstrations in Engineering Mechanics Education

Multidisciplinary University Research Initiatives (MURI) Program 2025
AFOSR, BU PI $657,235 *Y1-3* + $475,979 *Y4-5*

MURI: Cellular Mechanics and Process Principles of 3D Secretion for Ultralight Multifunctional Materials in Butterfly Wing Scales
Note: our team was awarded the MURI, but the money has not reached BU yet so it is not included in the total count.

Course Improvement Grant 2025
BU Department of Mechanical Engineering, PI $7,440

Generative AI Demonstrations in Engineering Mechanics Education

Amazon Research Award 2025
Amazon Research, PI $70,000 + $12,000 *AWS Credits*

Formidable yet Solvable: Scientific Computing Tasks for Agentic AI

DOE 2024-2028
External, BU PI, Project PI Paris Perdikaris @ UPenn $500,000 *to BU,* $3,800,000 *total*

Overall Project: Resolution-invariant deep learning for accelerated propagation of epistemic and aleatory uncertainty in multi-scale energy storage systems, and beyond
BU Project: Open source benchmarks for uncertainty quantification in machine learning

Dean's Catalyst Award 2023-2025
BU Internal, PI, co-PI Jeroen Eyckmans (50% share) $100,000

Proof of concept for data driven computational modeling of wound healing

NSF BMMB 2311640 2024-2027
External, PI, co-PI Jeroen Eyckmans (50% share) $635,000

Understanding the role of mechanical boundary conditions on tissue assembly and repair in 3D fibrous microtissues

NSF CSSI Elements 2310771 2024-2027
External, PI, co-PI Harold Park (50% share) $451,000

Elements: Curating and Disseminating Solid Mechanics Based Benchmark Datasets

ONR Research Award N00014-23-1-2450 2023-2026
External, PI $300,000

Enabling High Throughput Mechanical Analysis of the Human Brain

ONR Research Award N00014-22-1-2066 2022-2023
External, PI $77,000

Speeding Up Soft Tissue Simulation with Machine Learning Based Metamodels

NSF MoMS 2127864 2021-2024
External, PI $286,000

Collaborative Research: Leveraging Limited Imaging Data to Infer The Mechanics of Embedded Fiber Networks

American Heart Association Career Development Award 2021-2024
External, PI $231,000

Towards computational discovery: advancing high-throughput quantitative analysis of hiPSC-CMs with open source software

Haythorthwaite Foundation Research Initiation Grant 2020
External, PI $20,000

Predicting and controlling symmetry breaking in soft heterogeneous structures

David R. Dalton Career Development Assistant Professorship 2020-2023
BU Internal, PI $90,000

Award to support broad research endeavors at BU.

Hariri Institute Junior Faculty Fellowship 2020-2023
BU Internal, PI $10,000

Award to support broad research endeavors at BU.

Other funding support at BU:

CELL-MET Engineering Research Center 2020-Present
Faculty member *1 PhD student supported*

Funding to define metrics and develop open source software to analyze the structural and mechanical behavior of cardiac cells and tissue. This project is in direct response to feedback from the NSF Site Visit Team, and involves collaboration with multiple groups across the center.