

Curriculum Vitae (CV)

Dr. Grace X. Gu
Assistant Professor
Department of Mechanical Engineering
University of California, Berkeley
E-mail: ggu@berkeley.edu

(a) Professional appointments

2018 - Present: Assistant Professor, Mechanical Engineering, University of California, Berkeley

(b) Education

University of Michigan, Ann Arbor, MI; Mechanical Engineering; B.S., 2012
Massachusetts Institute of Technology, Cambridge, MA; Mechanical Engineering; M.S., 2014
Massachusetts Institute of Technology, Cambridge, MA; Mechanical Engineering; Ph.D., 2018

(c) Selected publications

40. Z Zhang, JH Lee, and GX Gu. Rational design of piezoelectric metamaterials with tailored electro-momentum coupling, *Extreme Mechanics Letters*, 2022
39. V Shah, S Zadourian, C Yang, Z Zhang, and GX Gu. Data-driven approach for the prediction of mechanical properties of carbon fiber reinforced composites, *Materials Advances*, 2022
38. Z Zhang, Z Jin, and GX Gu. Efficient pneumatic actuation modeling using hybrid physics-based and data-driven framework, *Cell Reports Physical Science*, 2022
37. S Lee, Z Zhang, and GX Gu. Generative machine learning algorithm for lattice structures with superior mechanical properties, *Materials Horizons*, 2022
36. Z Zhang, Z Zhang, F Di Caprio, and GX Gu. Machine learning for accelerating the design process of double-double composite structures, *Composite Structures*, 2022
35. K Brown and GX Gu. Dimensions of smart additive manufacturing, *Advanced Intelligent Systems*, 2021
34. B Zheng, Z Zheng, and GX Gu. Uncertainty quantification and prediction for mechanical properties of graphene aerogels via Gaussian process metamodelling, *Nano Futures*, 2021
33. YT Kim, YS Kim, C Yang, GX Gu, and S Ryu. Deep learning framework for material design space exploration using active transfer learning and data augmentation, *npj Computational Materials*, 2021
32. F Sui, R Guo, Z Zhang, GX Gu, and L Lin. Deep reinforcement learning for digital materials design, *ACS Materials Letters*, 2021
31. CT Chen and GX Gu. Learning hidden elasticity with deep neural networks, *Proceedings of the National Academy of Sciences*, 2021
30. AY Chen, A Chen, J Wright, A Fitzhugh, A Hartman, J Zeng, and GX Gu. Effect of build parameters on the mechanical behavior of polymeric materials produced by multi-jet fusion, *Advanced Engineering Materials*, 2021
29. K Demir, Z Zhang, A Ben-Artzy, P Hosemann, and GX Gu. Laser scan strategy descriptor for defect prognosis in metal additive manufacturing using neural networks. *Journal of Manufacturing Processes*, 2021

28. B Zheng and GX Gu. Prediction of graphene oxide functionalization using gradient boosting: Implications for material chemical composition identification, *ACS Applied Nano Materials*, 2021
27. Z Zhang and GX Gu. Physics-informed deep learning for digital materials, *Theoretical & Applied Mechanics Letters*, 2021
26. Z Jin, Z Zhang, X Shao, and GX Gu. Monitoring anomalies in 3D bioprinting with deep neural networks. *ACS Biomaterials Science & Engineering*, 2021
25. AY Chen, S Baehr, A Turner, Z Zhang, and GX Gu. Carbon-fiber reinforced polymer composites: A comparison of manufacturing methods on mechanical properties. *International Journal of Lightweight Materials and Manufacture*, 2021
24. Z Jin, Z Zhang, J Ott, and GX Gu. Precise localization and semantic segmentation detection of printing conditions in fused filament fabrication technologies using machine learning, *Additive Manufacturing*, 2021
23. E Jacobs, C Yang, K Demir, and GX Gu. Vibrational detection of delamination in composites using a combined finite element analysis and machine learning approach, *Journal of Applied Physics*, 2020
22. Z Zhang and GX Gu. Finite element based deep learning model for deformation behavior of digital materials, *Advanced Theory and Simulations*, 2020
21. Z Jin, Z Zhang, K Demir, and GX Gu. Machine learning for advanced additive manufacturing, *Matter*, 2020
20. B Zheng and GX Gu. Machine learning-based detection of graphene defects with atomic precision, *Nano-Micro Letters*, 2020
19. YT Kim, C Yang, YS Kim, GX Gu, and S Ryu. Designing adhesive pillar shape with deep learning-based optimization, *ACS Applied Materials & Interfaces*, 2020
18. CT Chen, D Chrzan, and GX Gu. Nano-topology optimization for materials design with atom-by-atom control, *Nature Communications*, 2020
17. Z Jin, Z Zhang, and GX Gu. Automated real-time detection and prediction of inter-layer imperfections in additive manufacturing processes using artificial intelligence, *Advanced Intelligent Systems*, 2020
16. C Yang, Y Kim, S Ryu, and GX Gu. Prediction of composite microstructure stress-strain curves using convolutional neural networks, *Materials & Design*, 2020
15. JK Wilt, C Yang, and GX Gu. Accelerating auxetic metamaterial design with deep learning, *Advanced Engineering Materials*, 2020
14. B Zheng and GX Gu. Stress field characteristics and collective mechanical properties of defective graphene. *The Journal of Physical Chemistry C*, 2020.
13. JD Ott, MT Lazalde, and GX Gu. Algorithmic-driven design of shark denticle bioinspired structures for superior aerodynamic properties, *Bioinspiration & Biomimetics*, 2020
12. YS Kim, H Jeong, GX Gu, and S Ryu. A three-dimensional fracture pattern diagram of staggered platelet structures, *Composite Structures*, 2019
11. B Zheng and GX Gu. Recovery from mechanical degradation of graphene by defect enlargement, *Nanotechnology*, 2019
10. Z Jin, Z Zhang, and GX Gu. Autonomous in-situ correction of fused deposition modeling printers using computer vision and deep learning. *Manufacturing Letters*, 2019

9. Z Vangelatos, Z Zhang, GX Gu, and CP Grigoropoulos. Architected metamaterials with tailored 3D buckling mechanisms at the microscale, *Extreme Mechanics Letters*, 2019
8. B Zheng and GX Gu. Tuning graphene mechanical anisotropy via defect engineering, *Carbon*, 2019
7. Z Zhang, K Demir, and GX Gu. Developments in 4D-printing: A review on current smart materials, technologies, and applications, *International Journal of Smart and Nano Materials*, 2019
6. GX Gu, CT Chen, DJ Richmond, and MJ Buehler. Bioinspired hierarchical composite design using machine learning: Simulation, additive manufacturing, and experiment, *Materials Horizons*, 2018
5. GX Gu, F Libonati, S Wettermark, and MJ Buehler. Printing nature: Unraveling the role of nacre's mineral bridges, *Journal of the Mechanical Behavior of Biomedical Materials*, 2017
4. GX Gu, M Takaffoli, and MJ Buehler. Hierarchically enhanced bioinspired impact resistant composites, *Advanced Materials*, 2017
3. GX Gu, S Wettermark, and MJ Buehler. Algorithm-driven design of tough composite materials realized through additive manufacturing, *Additive Manufacturing*, 2017
2. GX Gu, M Takaffoli, AJ Hsieh, and MJ Buehler. Biomimetic additive manufactured polymer composites for improved impact resistance, *Extreme Mechanics Letters*, 2016
1. GX Gu, I Su, S Sharma, J Voros, Z Qin, and MJ Buehler. Three-dimensional-printing of bio-inspired composites, *Journal of Biomechanical Engineering*, 2016

(d) Selected awards and honors

Sloan Research Fellowship	2022
Amazon Research Award	2022
Bakar Fellows Spark Award	2022
ACS PMSE Young Investigator Award	2022
ONR Young Investigator Award	2021
Prytanean Faculty Award	2021
Lam Research Unlock Ideas Award	2021
DARPA Young Faculty Award	2021
Amazon Research Award	2021
SME Outstanding Young Manufacturing Engineer Award	2020
MRS Communications Lecture Award	2020
Hellman Fellowship	2020
ASME Applied Mechanics Division Haythornthwaite Research Award	2019
35 Innovators Under 35 MIT Technology Review (Category: Pioneer)	2019
Royal Society of Chemistry Materials Horizons Outstanding Paper Prize	2019
3M Non-Tenured Faculty Award	2019
Johnson and Johnson WiSTEM2D Scholars Award	2019
Amazon Research Award	2019
MIT Meredith Kamm Graduate Women of Excellence Institute Award	2018
American Ceramic Society Excellence in Materials Science Diamond Award	2017
Materials Research Society Graduate Student Award	2017
National Defense Science and Engineering Graduate (NDSEG) Fellowship	2015

(e) Selected invited lectures

Gordon Conference on Additive Manufacturing of Soft Materials, Speaker, Ventura, CA, August 2022

ACS PMSE Young Investigator Symposium, Speaker, Chicago, IL, August 2022
International Solid Freeform Fabrication Symposium, Plenary Speaker, Austin, TX, 2022
Lam Research, Technical Seminar Series, 2022 (Virtual)
TEDxBerkeley, Speaker, Berkeley, CA, 2022
MRS workshop on Advances in Materials and Manufacturing, Keynote Speaker, 2022 (Virtual)
Brown University, Crunch Seminar, 2021 (Virtual)
Amazon Robotics Symposium, Talk, 2021 (Virtual)
3M Technical Forum, Seminar, 2021 (Virtual)
Air Force Research Laboratory, Seminar, 2021 (Virtual)
Neural Information Processing Systems (NIPS) Conference, Talk, 2020 (Virtual)
Cornell University, MAE Department Seminar, 2020 (Virtual)
International Conference on Intelligent Robots and Systems (IROS) Conference, Talk, 2020 (Virtual)
Stanford University, MSE Department Seminar, Palo Alto, CA, 2020
HP Labs, Seminar, Palo Alto, CA, 2020
NASA, Advanced Supercomputing Division Seminar, Mountain View, CA, 2018
Citrine Informatics, Lunch Seminar, Redwood City, CA, 2018
Lawrence Livermore National Laboratory, Engineering Colloquium, Livermore, CA, 2018

(f) Synergistic Activities

Community outreach, Society of Women Engineers (SWE); Girls in Engineering (GiE) Summer Camp; Pi Tau Sigma Guest; Berkeley Engineers and Mentors (BEAM); NextProf Nexus Workshop Speaker and Panelist; ME Rising Stars Program Panelist; Green STEM Summit; Berkeley ME Scholars Program; Haas Scholar Program

Committee member, Master of Engineering (MEng); Aerospace Minor program; Department Web and Communication; ME Rising Stars program committee

Guest Editor, Advanced Intelligent Systems special issue on machine learning, 2021

Guest Editor, Mechanics of Materials special issue on data science driven mechanics, 2022

Advisory Board member, journal Materials Horizons, 2021; journal Advanced Intelligent Systems, 2021

Conference co-organizer, Symposium at the Materials Research Society, 2022; Symposium at the Society of Engineering Science, 2022

Session Chair, The Minerals, Metals & Materials conference (TMS), 2020; Pan-American Congress of Applied Mechanics conference, 2019; Solid Freeform Fabrication (SFF) conference, 2022

Panelist for proposal review, NSF - 2020, 2021, 2022; DOE – 2020; NIH - 2021

Panelist, DOE Basic Energy Sciences workshop on manufacturing, 2020

Program committee, Grace Hopper Celebration of Women in Computing conference, 2021

Member, The Minerals, Metals & Materials (TMS), Materials Research Society (MRS), Society of Manufacturing Engineers (SME), American Society of Mechanical Engineers (ASME)

Peer Reviewer, Advanced Materials, npj Computational Materials, Additive Manufacturing, Science Advances, Nature Communications, Composite Structures, PNAS, Extreme Mechanics Letters, among others

Teaching, Introduction to Composite Materials (undergrad/grad); Introduction to Solid Mechanics (undergrad)