Yijie (Steven) Jiang

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Employment History

Assistant Professor 08/2019 – Present
Mechanical and Energy Engineering, University of North Texas

Postdoc researcher 03/2017 – 07/2019
Mechanical Engineering and Applied Mechanics, University of Pennsylvania

Academic Background

Doctor of Philosophy 08/2012 – 12/2016 (05/2017 degree awarded)
Mechanical Engineering and Applied Mechanics, University of Pennsylvania

Master of Science 08/2011 – 05/2013
Mechanical Engineering and Applied Mechanics, University of Pennsylvania

Bachelor of Science 09/2007 – 07/2011
Theoretical and Applied Mechanics, Fudan University, China

Research Awards

[1] 3D printed multifunctional structure in advanced vehicle for in-situ vehicle health monitoring, Co-PI, sponsored by DOE-ORNL, $1.5 million total and $121,500 share, 11/2020 – 09/2023

[2] Advanced Ballistics Technology: A mechanisms-based approach to designing materials systems for enhanced dynamic performance, Co- PI, sponsored by US Army Research Laboratory, $8.75 million total and $710,000 share, 08/2020 – 07/2022

[3] Ralph E. Powe Junior Faculty Enhancement Award, Oak Ridge Associated Universities, $10,000, 10/2020-9/2021

[4] NFL Helmet Challenge Symposium travel grant, $1,000, 11/2019

[5] Junior Faculty Summer Research Support Award, $5,000, 7/2021

Publications

[1] N.R. Khatri, M.N. Islam, P.-F. Cao, R.C. Advincula, W. Choi, and Y. Jiang, Integrating helicoid channels for passive control of fiber alignment in direct-write 3D printing, ***Additive Manufacturing***, 48, 102419 (2021).

DOI: doi.org/10.1016/j.addma.2021.102419

[2] N.R. Khatri, X. Ji, H.K. Minsky, and Y. Jiang, Understanding Nanoscale Topology – Adhesion Relationships Via Support Vector Regression, ***Advanced Materials Interfaces***, 2100175 (2021)

Doi: doi.org/10.1002/admi.202100175

[3] S. Ferdousi, Q. Chen, M. Soltani, J. Zhu, P. Cao, W. Choi, R. Advincula, and Y. Jiang, Characterize traction–separation relation and interfacial imperfections by data–driven machine learning models, ***Scientific Reports***, 11, 14330 (2021)

DOI: doi.org/10.1038/s41598-021-93852-y

[4] B. Chem, Y. Jiang, C. Liu, J.R. Raney, and C. Reina, Dynamic behavior of soft, resonant metamaterials: Experiments and simulations, ***Journal of Applied Physics***, 129, 135104 (2021).

DOI: doi.org/10.1063/5.0042456

[5] C. Mo, Y. Jiang, and J.R. Raney, Microstructural evolution and failure in short fiber soft composites: Experiments and modeling, ***Journal of the Mechanics and Physics of Solids***, 141, 103973 (2020).

DOI: doi.org/10.1016/j.jmps.2020.103973

[6] X.A. Zhang, Y. Jiang, R.B. Venkatesh, J.R. Raney, K.J. Stebe, S. Yang and D. Lee, Scalable manufacturing of bending-induced surface wrinkles, ***ACS Applied Materials & Interfaces***, 12 (6), 7658-7664 (2020).

DOI: doi.org/10.1021/acsami.9b23093

[7] Y. Jiang, L.M. Korpas and J.R. Raney, Bifurcation-based embodied logic and autonomous actuation, ***Nature Communications***, 10, 128 (2019).

DOI: 10.1038/s41467-018-08055-3

[8] Y. Jiang and J.R. Raney, 3D printing of amylopectin-based natural fiber composites, ***Advanced Materials Technologies***, 1900521 (2019).

DOI: 10.1002/admt.201900521

[9] S. Kim, Y. Jiang, K. Towell, M.S.H. Boutilier, N. Nayakanti, C. Chen, C. Jacob, H. Zhao, K.T. Turner and A.J. Hart, Soft nanocomposite electroadhesives for digital micro- and nanotranfer printing, ***Science Advances***, 5, eaax4790 (2019).

DOI: 10.1126/sciadv.aax4790

[10] Y. Jiang, J.L. Hor, D. Lee and K.T. Turner, Toughening Nanoparticle Films via Polymer Infiltration and Confinement, ***ACS Applied Materials & Interfaces***, 10 (50), 44011-44017 (2018).

DOI: 10.1021/acsami.8b15027

[11] W. Chen, W. Liu, Y. Jiang, M. Zhang, N. Song, N.J. Greybush, J. Guo, A. Estep, K.T. Turner, R. Agarwal and C.R. Kagan, Ultra-sensitive, mechanically-responsive optical metasurfaces via strain amplification, ***ACS Nano***, 12 (11), 10683-10692 (2018).

DOI: 10.1021/acsnano.8b04889

[12] Y. Cho, H.K. Minsky, Y. Jiang, K. Yin, K.T. Turner and S. Yang, Shear adhesion of tapered nanopillar arrays, ***ACS Applied Materials & Interfaces***, 10 (13), 11391-11397 (2018).

DOI: 10.1021/acsami.8b02303

[13] J. Liu[#], Y. Jiang[#], D.S. Grierson, K. Sridharan, Y. Shao, T.D.B. Jacobs, M.L. Falk, R.W. Carpick and K.T. Turner, Tribochemical wear of diamond-like carbon-coated atomic force microscope tips, ***ACS Applied Materials & Interfaces***, 9 (40), 35341–35348 (2017) [#]*Equal contribution.*

DOI: 10.1021/acsami.7b08026

[14] E.D. Cubuk, R.J.S. Ivancic, S.S. Schoenholz, D.J. Strickland, A. Basu, Z.S. Davidson, J. Fontaine, J.L. Hor, Y.-R. Huang, Y. Jiang, N.C. Keim, K.D. Koshigan, J.A. Lefever, T. Liu, X.-G. Ma, D.J. Magagnosc, E. Morrow, C.P. Ortiz, J.M. Rieser, A. Shavit, T. Still, Y. Xu, Y. Zhang, K.N. Nordstrom, P.E. Arratia, R.W. Carpick, D.J. Durian, Z. Fakhraai, D.J. Jerolmack, D. Lee, J. Li, R. Riggleman, K.T. Turner, A.G. Yodh, D.S. Gianola and A.J. Liu, Structure-property relationships from universal signatures of plasticity in disordered solids, ***Science,*** 358 (6366), 1033-1037 (2017).

DOI: 10.1126/science.aai8830

[15] Y. Jiang, J.A. Harrison, J.D. Schall, K.E. Ryan, R.W. Carpick and K.T. Turner, Correcting for tip geometry effects in molecular simulations of single-asperity contact, ***Tribology Letters***, 65:78 (2017).

DOI: 10.1007/s11249-017-0857-1

[16] J.L. Hor, Y. Jiang, D.J. Ring, R.A. Riggleman, K.T. Turner and D. Lee, Nanoporous polymer-infiltrated nanoparticle films with uniform or graded porosity via undersaturated capillary rise infiltration, ***ACS Nano***, 11, 3229-3236 (2017).

DOI: 10.1021/acsnano.7b00298

[17] Y. Shao, T.D.B. Jacobs, Y. Jiang, K.T. Turner, R.W. Carpick and M.L. Falk, A multi-bond model of single-asperity tribochemical wear at the nano-scale, ***ACS Applied Materials & Interfaces***, 9 (40), 35333–35340 (2017).

DOI: 10.1021/acsami.7b08023

[18] C. Lin, K. Davami, Y. Jiang, J. Cortes, M. Munther, M. Shaygan, H. Ghassemi, J.T. Robinson, K.T. Turner and I. Bargatin, Enhancing the stiffness of vertical graphene sheets through ion beam irradiation and fluorination, ***Nanotechnology***, 28, 295701 (2017).

DOI: 10.1088/1361-6528/aa75ac

[19] X. Liang, J. Shin, D. Magagnosc, Y. Jiang, S.J. Park, A.J. Hart, K.T. Turner, D.S. Gianola, P.K. Purohit, Compression and recovery of carbon nanotube foams described as a phase transition, ***International Journal of Solids and Structures***, 122-123, 196-209 (2017).

DOI: 10.1016/j.ijsolstr.2017.06.025

[20] J. Zhang, Z. Zhao, J. Li, H. Jin, F. Rehman, P. Chen, Y. Jiang, C. Chen, M. Cao and Y. Zhao, Evolution of structural and electrical properties of Oxygen-deficient VO_2 under low temperature heating process, ***ACS Applied Materials & Interfaces***, 9, 27135-27141 (2017).

DOI: 10.1021/acsami.7b05792

[21] Y. Jiang and K.T. Turner, Measurement of the strength and range of adhesion using atomic force microscopy, ***Extreme Mechanics Letters***, 9, 119-126 (2016).

DOI: 10.1016/j.eml.2016.05.013

[22] K. Davami, Y. Jiang, J. Cortes, C. Lin, M. Shaygan, K.T. Turner and I. Bargatin, Tuning the mechanical properties of vertical graphene sheets through atomic layer deposition, ***Nanotechnology***, 27, 155701 (2016).

DOI: 10.1088/0957-4484/27/15/155701

[23] J. Zhang, J. Li, P. Chen, F. Rehman, Y. Jiang, M. Cao, Y. Zhao and H. Jin, Hydrothermal growth of VO_2 nanoplate thermochromic films on glass with high visible transmittance, ***Scientific Reports***, 6, 27898 (2016).

DOI: 10.1038/srep27898

[24] K. Davami, Y. Jiang, C. Lin, J. Cortes, J.T. Robinson, K.T. Turner and I. Bargatin, Modification of mechanical properties of vertical graphene sheets via fluorination, ***RSC Advances***, 6, 11161-11166 (2016).

DOI: 10.1039/C5RA25068D

[25] Y.-R. Huang, Y. Jiang, J.L. Hor, R. Gupta, L. Zhang, K.J. Stebe, G. Feng, K.T. Turner and D. Lee, Polymer nanocomposite films with extremely high nanoparticle loadings via capillary rise infiltration (CaRI), ***Nanoscale***, 7, 798-805 (2015).

DOI: 10.1039/C4NR05464D

[26] Y. Jiang, D.S. Grierson and K.T. Turner, Flat punch adhesion: transition from fracture-based to strength-limited pull-off, ***Journal of Physics D: Applied Physics***, 47, 325301 (2014).

DOI: 10.1088/0022-3727/47/32/325301

[27] V. Vahdat, K.E. Ryan, P.L. Keating, Y. Jiang, S.P. Adiga, J.D. Schall, K.T. Turner, J.A. Harrison and R.W. Carpick, Atomic-scale wear of amorphous hydrogenated carbon during intermittent contact: A combined study using experiment, simulation, and theory, ***ACS Nano***, 8, 7027-7040 (2014).

DOI: 10.1021/nn501896e

[28] X. Gong, Y. Jiang, S. Ding, Y. Huo, C. Wang and L. Yang, Simulation of the in-pile behaviors evolution in nuclear fuel rods with the irradiation damage effects, ***Acta Mechanica Solida Sinica***, 27, 551-567 (2014)

[29] Y. Jiang, Y. Cui, Y. Huo and S. Ding, Three-dimensional FE analysis of the thermal-mechanical behaviors in the nuclear fuel rods, ***Annals of Nuclear Energy***, 38, 2581-2593 (2011)

[30] Y. Jiang, Q. Wang, Y. Cui, Y. Huo and S. Ding, Simulation of irradiation hardening of Zircaloy within plate-type dispersion nuclear fuel elements, ***Journal of Nuclear Materials***, 413, 76-89 (2011)

[31] Y. Jiang, Q. Wang, Y. Cui, Y. Huo, S. Ding, L. Zhang and Y. Li, Prediction of the

micro-thermo-mechanical behaviors in dispersion nuclear fuel plates with heterogeneous particle distributions, ***Journal of Nuclear Materials***, 418, 69-79 (2011)

[32] Y. Jiang, Y. Cui, Y. Huo and S. Ding, A method for 3D simulation of internal gas effects on thermal-mechanical behaviors in nuclear fuel elements, ***Nuclear Science and Techniques***, 22, 185-192 (2011)

[33] Y. Jiang and K.T. Turner, Characterization and prediction of nanoscale wear of polymer films. (In preparation)

[34] Y. Jiang and K.T. Turner, Characterization of PMMA wear at microscale by nanoindenter. (In preparation)

Patents

[1] Yijie Jiang and Nava Raj Khatri, Devices and methods for passive fiber control, Provisional Application No. 63/170,861, April 5, 2021

[2] Cherie R. Kagan, Kevin T. Turner, Wenxiang Chen, and Yijie Jiang, Ultra-sensitive, mechanically-responsive optical metasurfaces via strain amplification, Application No. 17/026,468, September 21, 2020 (Pending)

[3] Sanha Kim, A. John Hart, Kevin T. Turner, and Yijie Jiang, Nanocomposite surfaces with electrically switchable adhesion, US20200254718A1, August 13, 2020

[4] Jordan R. Raney, Lucia Korpas, and Yijie Jiang, Embodied Logic and Actuation in Soft, Stimuli-Responsive Structures Poised Near Bifurcation Points, U.S. Application No. PCT/US2019/025356, April 2, 2019 (Pending)

Teaching Experience

[1] Advanced Solid Mechanics — Spring 2020, 2021

[2] Mechanics I – Statics — Fall 2019, 2021

[3] Continuum Mechanics — Fall 2020, 2021

[4] Mechanics of Solids (teaching assistant) — Spring 2014

[5] Statics and Strength of Materials (teaching assistant) — Fall 2013, 2014

Mentoring Experience

Graduate 2 Masters in total

[1] Directed Master thesis (co-advisor) — 08/2020 – 12/2021

3D Printing of Zinc Anode Structures, Stephen Adot Oyo Amoko, Mechanical Engineering, UNT

[2] Directed Master thesis — 09/2019 – 08/2020

Passive Control of Fiber Orientation in Direct Ink Writing 3D printing, Nava Raj Khatri, Mechanical and Energy Engineering, UNT

[3] Advisor for Undergraduate Research Fellowship (URF), UNT — 2020-2022

Designs for 3D printed energy absorbing structures, Sophia Zoch

[4] Advisor for Undergraduate Research Fellowship (URF), UNT 2021-2022

3D Printed Self Cleaning Surfaces through Capillary Forces, Gary Tejeda-Godinez

[5] Mentoring for the Caltech Summer Undergraduate Research Fellowship (SURF) program Summer 2017

Co-mentoring an undergraduate, Cindy Huang, the California Institute of Technology

[6] Mentoring for NSF funded Penn Research Experience for Undergraduates (REU) program Summer 2014

Co-mentoring an undergraduate, Nicholas Stoltzfus, the University of Delaware

Conferences

[1] MRS Fall 2021 Meeting and Exhibit, Boston, MA (12/2021)

Presentation 1: 3D Printing of Corn-Based Natural Fiber Composites via Direct Ink Writing

Presentation 2: Topology Optimization of a Bi-Material Composite Using Genetic Algorithm-Augmented Finite Element Method (GA-AFEM)

[2] MRS Fall 2020 Meeting and Exhibit, Boston, MA (12/2020)

Presentation 1: Understanding nanoscale adhesion via machine learning on topology-adhesion correlated data

Presentation 2: 3D printable sustainable biocomposites from corn starch and husks

[3] ASME 2018 International Mechanical Engineering Congress & Exposition (IMECE), Pittsburgh, PA (11/2018)

Presentation: Autonomous actuation of 3D printed bistable beam-based structures

[4] MRS Fall 2018 Meeting and Exhibit, Boston, MA (11/2018)

Presentation: Multi-Stimuli Responsive Actuation of 3D Printed Bistable Beam-Based Structures

[5] 2017 SES Conference, Boston, MA (07/2017)

Presentation: Characterization and prediction of nanoscale wear of polymer films

[6] MRS Fall 2016 Meeting and Exhibit, Boston, MA (11/2016)

Presentation: Tuning the Fracture Properties of Polymer Nanocomposite with Extremely High Filler Fractions

[7] Gordon Research Conference and Seminar (Adhesion), South Hadley, MA (07/2015)

Presentation: A novel approach for characterizing the strength and range of

adhesion at the nanoscale using atomic force microscopy

[8] AVS 61st International Symposium & Exhibition, Baltimore, MD (11/2014)
Presentation: Nanoscale wear of patterned PMMA structures

Services

Graduate Programs Committee
Department of Mechanical Engineering, UNT (Fall 2021-Present)

Research Roadmap Adhoc Committee
Department of Mechanical Engineering, UNT (Fall 2021-Present)

Guest editor:

Micromachines

Editorial board:

Frontiers in Mechanical Engineering

Engineering Press

Peer reviewer:

Science Advances

Composites Part B: Engineering

Acta Biomaterialia.

Extreme Mechanics Letters

Chemical Engineering Journal

ACS Applied Materials & Interfaces

International Journal of Solids and Structures

Experimental Mechanics

International Journal of Advanced Manufacturing Technology

K-12 outreach

Research project advisor for high school students from Rick Reedy High School and Centennial High School, Frisco, TX, and Red Oak High School, Red Oak, TX.