Tianyang Zhou

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Education

2022	**PhD in Materials Science and Engineering** Co-advisors: Drs. Dimitris Lagoudas and James Boyd " Micromechanics Modeling of Structural Energy Storage Devices"	**Texas A&M University**
2016	**MS in Engineering Mechanics** Advisor: Dr. Jinsong Leng "Shape Memory Foams based on Solid State Foaming for Biomedical Applications"	**Harbin Institute of Technology, China**
2014	**BEng, Honors School** **Composite Materials and Engineering Major** Graduated with First Honor	**Harbin Institute of Technology, China**

Research Interests

- Multifunctional energy storage devices (structural supercapacitors/ batteries, morphing & conformable batteries)
- Micromechanics and multiphysics modeling (traditional and multifunctional materials)
- Advanced manufacturing (additive manufacturing combined with traditional techniques)

Selected Awards & Honors

2022	Outstanding Engineering Ph.D. Graduate Student Award	Texas A&M University
2022	Outstanding Graduate Teaching Fellowship	Texas A&M University
2021	MRS Spring Presentation Award	Materials Research Society
2015	2nd Best Student Paper Award	Center for Smart Materials and Structures
2015	First Tier Scholarship for Graduate Students	Harbin Institute of Technology
2014	Graduate with Honors	Harbin Institute of Technology
2011–13	National Encouragement Scholarship (3%)	Department of Education of HL Province
2024	Gordon Research Conference Travel Grant	Gordon Research Conference
2023	Travel Award for Postdocs	Texas A&M University
2019	Graduate Student Travel Award	OGPAS, Texas A&M University

Publications (Google Scholar citations: 678)

Peer reviewed

01. Guo Y, **Zhou T**, Vasoya M, Lagoudas D. C, Micromechanics Modeling of the Elastic Modulus of Cement Concrete, *Constr. Build. Mater.*, 2024, 438, 137193 (IF: 7.4)
02. Lianos, A. K, **Zhou, T**, Peterson, S. R, Kolluru, P. V, Lagoudas, D. C, & Bukkapatnam, S. T Towards Spatial Property Control of the Glass Transition Temperature and Microstructure of 3D Printed Shape Memory Polymers via Set-point Tuning of the Extrusion Temperature and Extraction of the Underlying Physical Model with Gaussian Process Regression. *J. Manuf. Processes*, 2024, 119, 1022-1032. (IF: 6.1)
03. Loufakis D, **Zhou T**, Boyd J, Powel Z, Martinez A, Lutkenhaus J, Lagoudas D In-situ Electrochemo-Mechanical Coupling of Reduced Graphene Oxide Supercapacitor Film Electrodes, *Matter.* 2023 6(11):3975-92. (IF: 17.3)
04. **Zhou T**, Dickinson E, Boyd JG, Lutkenhaus J, Lagoudas DC. Multifunctional Efficiency Metric for Structural Supercapacitors. *Multifunctional Materials.* 2020, 3: 044002.
05. **Zhou T**, Boyd J, Loufakis D, Lutkenhaus J, Lagoudas D. Fabrication, Characterization and Micromechanics Modeling of the Electrical Conductivity of Reduced Graphene Oxide/Aramid Nanofiber Nanocomposites. *Smart Mater. Struct.* 2019, 28: 094001. (IF: 3.7)
06. **Zhou T**, Boyd J, Lutkenhaus J, Lagoudas D. Micromechanics modeling of the elastic moduli of ANF/rGO composites. *Acta Mechanica.* 2019, 230: 265. (IF: 2.3)
07. Yao Y, **Zhou T**, Xu Y, Liu Y and Leng J. Preparation and characterization of shape memory composite foams based on solid foaming method. *J. Appl. Polym. Sci.* 2018, 135: 46767. (IF: 3.0)

08. Kwon S R, Harris J, **Zhou T**, Loufakis D, Boyd J G, Lutkenhaus J L. Mechanically strong graphene/aramid nanofiber composite electrodes for structural energy and power. *ACS nano.* 2017, 11: 6682. (IF: 15.8)
09. Liu T, **Zhou T**, Yao Y, Zhang F, Liu L, Liu Y, Leng J. Stimulus methods of multi-functional shape memory polymer nanocomposites: A review. *Compos. Part A.* 2017, 100: 20. (IF: 8.1)
10. Yao, Y, Hou, G, Li, N., **Zhou, T**., Liu, L., Liu, Y., & Leng, J. Influence of the processing parameters on the electrocaloric effect of poly (vinylidene fluoride–trifluoroethylene) copolymers. *J. Appl. Polym. Sci.* 2017 134: 5. (IF: 3.0)
11. Yao Y, **Zhou T**, Qin C, Liu Y and Leng J. Styrene-based shape memory foam: fabrication and mathematical modeling. *Smart Mater. Struct.* 2016, 25:105031. (IF: 3.7)
12. Yao, Y, **Zhou, T**, Wang, J, Li, Z, Lu, H, Liu, Y, & Leng, J, 'Two way'shape memory composites based on electroactive polymer and thermoplastic membrane. *Compos. Part A.*, 2016, 90. (IF: 8.1)
13. Yao Y, **Zhou T**, Yang C, Liu Y, Leng J, Preparation and characterization of shape memory composite foams with interpenetrating polymer networks. *Smart Mater. Struct*. 2016, 25: 035002. (IF: 3.7)
14. Zhang F, Zhang Z, **Zhou T**, Liu Y, & Leng J, Shape memory polymer nanofibers and their composites: electrospinning, structure, performance, and applications. *Frontiers in Materials*. 2015, *2*: 62. (IF: 2.6)
15. Zhang F, **Zhou T**, Liu Y, Leng J, Microwave synthesis and actuation of shape memory polycaprolactone foams with high speed. *Sci. Rep*. 2015, 5. (IF: 3.8)

Conference proceeding

16. **Zhou T**, Metlich C, Pranada J A & Lagoudas D C. (2024). Modeling the Microstructure-Dependent Elastic Modulus and Ionic Conductivity of Structural Battery Electrolyte for Low-Temperature Applications, *In Proceedings of the American Society for Composites Thirty-nineth Technical Conference on Composite Materials*. 2024 (accepted)
17. **Zhou T**, Boyd J. G., Lagoudas D. C. Energy-based Multifunctional Efficiency Metric for Multifunctional Composite Anodes in Structural Batteries. *In Proceedings of the American Society for Composites Thirty-Sixth Technical Conference on Composite Materials*. 2021

Projects & Proposals

1. U.S. Air Force Office of Scientific Research, "Morphological and Interfacial Effects in Aramid-Graphene Composites for Structural Energy and Power" PI: Jodie Lutkenhaus, Co-PIs: James Boyd, Dimitris Lagoudas, Micah Green, $1,070,088, 04/2016-03/2020. Extended to 22. Role: Writing and conducting preliminary research
2. U.S. Air Force Office of Scientific Research, "Structural Batteries for Extreme Environments," PI: Jodie Lutkenhaus, Co-PIs: James Boyd, Dimitris Lagoudas, Micah Green, $767,186, 08/2022-03/2025. Role: Writing and conducting preliminary research.
3. NSF, "REU Site: 3D Printing of NextGen Multifunctional Batteries at TAMU and UTEP," PI: Dimitris Lagoudas, Co-PI: Alexis Maurel, $372,000, 05/2025, pending. Role: Conceptualizing, writing, and conducting preliminary research.
4. NSF, "LEAP-HI: Multi-functional Organic Morphing Batteries," PI: Tse Nga Ng, Co-PIs: Jodie Lutkenhaus, Dimitris Lagoudas, and Hyunsun Kim, $987,500, 09/2025, pending. Role: Conceptualizing, writing, and conducting preliminary research.

Presentations & Talks

2024

American Society for Composites (ASC) 39th Technical Conference on Composite Materials, San Diego, CA
" Modeling the Microstructure-Dependent Elastic Modulus and Ionic Conductivity of Structural Battery Electrolyte for Low Temperature Applications"

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2024	(Poster) Gordon Research Conference (GRC) on Multifunctional Materials, Ventura "Coupling in Structural Energy Storage Materials and Multifunctionality Metric"
2023	Society of Engineering Science (SES) Annual Technical Meeting, Minneapolis "Micromechanics Modeling on Electrochemical and Mechanical Response in Energy Storage Devices"
2022	Society of Engineering Science (SES) Annual Technical Meeting, College Station "In-situ Electrochemo-mechanical Coupling of Reduced Graphene Oxide Supercapacitor Electrodes"
2022	Society of Engineering Science (SES) Annual Technical Meeting, College Station "Micromechanics Modeling of Electrochemo-mechanical Coupling in Reduced Graphene Oxide Supercapacitor Electrodes"
2022	(Invited talk) Micromechanics AERO 617 "Application of Micromechanics in Structural Energy Storage Materials"
2022	(Guest lectures) Materials Science and Engineering AERO 413 "Fickian Diffusion, Phase Diagram and Corrosion"
2021	American Society for Composites (ASC) 36 Technical Conference on Composite Materials, Virtual "Energy-based Multifunctional Efficiency Metric for Multifunctional Composite Anodes in Structural Batteries"
2021	Materials Research Society (MRS) Spring meeting & exhibits, Virtual "Interphase Influence on the Elastic Moduli of frGO and ANF Supercapacitor Electrodes"
2020	(Guest lecture) Kinetics MSEN 205, TAMU "Fick's 2nd Law and the Influence of Boundary Condition and Initial Condition"
2019	SMASIS Conference on Smart Materials, Adaptive Structures and Intelligent Systems "Effects of Waviness and Discontinuous Interphase on the Conductivity of Multifunctional Aramid Nanofiber-Functionalized Reduced Graphene Oxide"
2019	(Invited talk) Center for Intelligent Multifunctional Materials and Structures (CiMMS) Seminar, TAMU "Micromechanics Modeling of the Elastic Moduli and Electrical Conductivity of Aramid Nanofiber-Functionalized Graphene Nanocomposites"
2018	SMASIS Conference on Smart Materials, Adaptive Structures and Intelligent Systems "Micromechanics Modeling of Aramid Nanofiber-Functionalized Graphene Nanocomposites"
2017	Society of Engineering Science (SES) 54th Annual Technical Meeting, Boston "Micromechanics Modeling of Aramid Nanofiber-Reduced Graphene Nanocomposites"
2015	23rd Annual International Conference on Composites or Nano Engineering (ICCE), China "Shape Memory PCL/CNT Composite Foams and Their Microwave Activated Behavior"
2015	4th Annual Symposium on Smart and Multi-Functional Materials, China "Interface Conductance Properties of Epoxy Based CNF Composite"

Teaching & Mentoring

2022	**Primary Instructor of Record**, graduate course Micromechanics (AERO 617), TAMU Student projects resulted in at least one publication (Guo. Y et al. *Constr. Build. Mater.* 2024)
2022-23	**Instructor**, International Summer School on Advanced Material Systems (AMS) Manufacturing – Characterization – Modeling, Greece, Virtual
2022	**Teaching assistant**, undergraduate Materials Science and Engineering (AERO 413), TAMU
2020	**Teaching assistant**, undergraduate Kinetics (MSEN 305), TAMU
2024	**Postdoctoral mentor**, undergraduate student Landon Riley, TAMU Fused deposition modeling 3D printing of morphing battery scaffold Mentee is contributing to two papers under preparation
2020	**Graduate mentor**, Online Research Experiences for Undergraduates (OREU), TAMU Multifunctional efficiency for structural supercapacitors under different loading conditions Mentee contributed to a publication (Zhou. T et al. *Multifunctional Materials.* 2020)

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Professional Society & Service

2017 – present	**Professional Memberships** Society of Engineering Science (SES) American Society for Composites (ASC) National Association of Corrosion Engineers (NACE) Electrochemical Society (ECS)
2023	**Symposium organizer** - Symposium on Structural Energy Storage Systems Symposium, SES, Oct. 8-11, 2023, Minneapolis, MN, (co-organizers Drs. Lagoudas, and Lutkenhaus)
2018	**Symposium organizer,** CMR symposium to bridge industry leaders and faculty members at TAMU with NACE student chapter
2024	**Reviewer,** TAMU Undergraduate Research Scholars program
2023	**Student representative,** Hagler Institute for Advanced Study Gala 2023, TAMU
2017 – 18	**Outreach director,** ESC Student Chapter at TAMU

Additional Professional Trainings

2024	Scientific Leadership	Texas A&M University
2024	Graduate Mentoring Academy – Postdoctoral	Texas A&M University
2022	Professional Development for Future Faculty	Texas A&M University
2014	Undergraduate Intern "Interface conductance measurement based on experiments and modeling"	Texas A&M University

Community Services

2016 – present **Lecturer**, traditional Chinese martial arts

- Help students develop more body and environment awareness, resilience, flexibility, mobility, endurance, strength, and posture alignment
- Promote wellness among students through group practice, meditation and outings in nature

2024 – present **Volunteer**, Aggieland Humane Society

2017 – 18 **Volunteer**, The Big Event at Texas A&M University

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