

Xueju “Sophie” Wang

Assistant Professor

Materials Science and Engineering and Institute of Materials Science,

Affiliated with Biomedical Engineering,

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Career Highlights/Qualifications

- Current research focuses on the mechanics of soft materials and multifunctional structures for applications from soft robotics to flexible electronic devices.
- Published 47 journal papers in total: 25 papers after joining UConn, and 13 papers as the corresponding author (*Matter*, *JMPS*, *Materials Horizons*, *Adv. Funct. Mater.*, *ACS sensors*, etc.).
- Received >10 major awards from NSF/NIH/DoD and professional societies including the NSF CAREER Award, NIH Trailblazer Award, and ONR Young Investigator Award.
- Received 8 grants from NSF/NIH/DoD/Foundation as PI after joining UConn (4.39 million in total, with 3.0 million to Wang Group).
- Delivered >30 talks including >10 invited talks at international conferences and universities.
- Passionate about teaching and education in STEM (remodeled an undergraduate core course on mechanical behaviors of materials and developed a new course on soft materials; SET>4.1/5.0).
- Dedicated to cultivating student success (6 awards received from graduate and undergraduate students under the supervision of Dr. Wang at UConn).

Research Interests

- Mechanics, materials, and structures of soft, stimuli-responsive materials
- Multistability of reconfigurable, magnetically responsive structures
- Flexible/pressure-tolerant/bio-integrated electronics
- Soft robotics and intelligent systems

Employment

Aug. 2020-present	Assistant Professor, Materials Science and Engineering and Institute of Materials Science, affiliated with Biomedical Engineering, University of Connecticut
Aug. 2018-Aug. 2020	Assistant Professor, Mechanical and Aerospace Engineering, University of Missouri, Columbia
Sept. 2016-Aug. 2018	Postdoctoral Fellow, Professor John A. Rogers Group, Materials Science and Engineering, Northwestern University

Education

Aug. 2016	Georgia Institute of Technology , Atlanta, Georgia Ph.D. Mechanical Engineering Advisor: Dr. Shuman Xia
Aug. 2016	Georgia Institute of Technology , Atlanta, Georgia M.S. , Mechanical Engineering

June 2011 **Dalian University of Technology**, Dalian, China
B.E. Chemical Engineering; B.A., English

Honors & Awards

- **Office of Naval Research (ONR) Young Investigator Award** 2023
- Soft Matter Emerging Investigator 2023
- Journal of Materials Chemistry B Emerging Investigator 2023
- Extreme Mechanics Letters (EML) Young Investigator Award 2022
- **National Institute of Health (NIH) Trailblazer Award** 2022
- **National Science Foundation (NSF) CAREER Award** 2022
- ACS Polymeric Materials: Science and Engineering (PMSE) Young Investigator Award 2022
- **ASME ORR Early Career Award** 2021
- Defense University Research Instrumentation Program (DURIP) Award 2021
- ASME Haythornthwaite Foundation Research Initiation Award 2019
- 1907 Women in Engineering Faculty Award, University of Missouri 2019
- Richard Wallace Faculty Incentive Grant Award, University of Missouri 2019
- Coulter Program Award, Coulter Biomedical Accelerator, University of Missouri 2019
- Gary L. Cloud Scholarship Award, Society for Experimental Mechanics 2019
- Society of Experimental Mechanics International Student Paper Competition Finalist 2014

Publications († denotes co-first author; _denotes graduate/undergraduate students in Wang Group at UConn; * denotes the corresponding author)

Google Scholar Profile: <https://scholar.google.com/citations?user=fjXceLIAAAAAJ&hl=en>

47. G.C. Wan†, S. J. Avis†, Z.Z. Wang, **X.J. Wang***, H. Kusumaatmajac*, T. Zhang*, “Finding Transition State and Minimum Energy Path of Bistable Elastic Continua”, *Journal of the Mechanics and Physics of Solids (JMPS)*, accepted.
46. B.B. Wu†, H. Ouro-Koura†, S.H. Lu, H.D. Li, **X.J. Wang**, J. Xiao*, Z. D. Deng*, “Implementing Functional Materials in Next-Generation Miniature Sensors”, *Materials Today*, DOI:10.1016/j.mattod.2023.09.001 (Invited Review Paper). [\[Link\]](#)
45. Y. Li†, A. Villada†, S.H. Lu, H. Sun, J.L. Xiao*, **X.J. Wang***, “Soft, Flexible Pressure Sensors for Pressure Monitoring Under Large Hydrostatic Pressure and Harsh Ocean Environments”, *Soft Matter*, <https://doi.org/10.1039/D3SM00563A>. (Invited paper for the **Soft Matter Emerging Investigators Series; selected as the inside front cover**) [\[Link\]](#)
44. S.H. Lu, Y. Li, **X.J. Wang***, Soft, flexible conductivity sensors for monitoring ocean salinity, *Journal of Materials Chemistry B*, <https://doi.org/10.1039/D3TB01167D>. (Invited paper for the **2023 Emerging Investigators Themed Issue**) [\[Link\]](#)
43. **X.J. Wang**, M. Lu, M. Zhou, S.M. Xia*, “Fracture Resistance of Chemo-mechanically Coupled Solid Solutions”, *Journal of Applied Mechanics*, p1-33 (2023). (Invited paper for a special issue in honor of Prof. Kyung-Suk Kim's 70th birthday and his contribution to micro- & nano-mechanics) [\[Link\]](#)
42. L. Muok, C. Liu, X.C. Chen, C. Esmonde, P. Arthur, **X.J. Wang**, M. Singh, T. Driscoll, and Y. Li*, “Inflammatory Response and Exosome Biogenesis of Choroid Plexus Organoids Derived from Human Pluripotent Stem Cells”, *International Journal of Molecular Sciences*, 24(8), 7660 (2023). [\[Link\]](#)
41. Y. Cao, X.C. Chen, A. Matarasso, Z.Z. Wang, Y. Song, G.F. Wu, X.C. Zhang, H. Sun, **X.J. Wang**, M. R. Bruchas, Y. Li*, and Y. Zhang*, “Covalently Attached Slippery Surface Coatings to Reduce

- Protein Adsorptions on Poly(dimethylsiloxane) Planar Surfaces and 3D Microfluidic Channels”, *ACS Applied Materials and Interfaces*, 15, 7, 9987–9995(2023). [\[Link\]](#)
40. Y. Li, G. Parlato, F.K. Masese, R.M. Kasi, T. Zhang*, **X.J. Wang***, “Morphing of Stiffness-Heterogeneous Liquid Crystal Elastomer Structures Via Mechanical Training and Locally Controlled Photopolymerization”, *Matter*, 5(12), 4332-4346 (2022). [\[Link\]](#)
 39. Y. Li, Y. Teixeira, G. Parlato, J. Grace, F. Wang, B. D. Huey, **X.J. Wang***, “Three-Dimensional Thermochromic LCE Structures with Reversible Shape-Morphing and Color-Changing Capabilities for Soft Robotics”, *Soft Matter*, 18(36), 6857-6867 (2022) (**Invited paper for the Soft Matter collection on soft robotics**). [\[Link\]](#)
 38. Y. Li†, G.F. Wu†, G. Song, S.H. Lu, Z.Z. Wang, H. Sun, Y. Zhang, **X.J. Wang***, “Soft, Pressure-Tolerant, Flexible Electronic Sensors for Sensing Under Harsh Environments”, *ACS Sensors*, 7(8), 2400-2409 (2022). [\[Link\]](#)
 37. Ian. Heck†, W. Lu†, Z. Wang, X. Zhang, T. Adak, C. Crumley, Y. Zhang, **Xueju Wang***, “Soft, Wireless Pressure-Sensor-Integrated Smart Bandage for the Management of Diabetic Foot Ulcers”, *Advanced Materials Technologies*, 2200821 (2022). [\[Link\]](#)
 36. A Yau, Z Wang, N Ponthempilly, Y Zhang*, **X Wang***, Y Chen*, “Biosensor integrated tissue chips and their applications on Earth and in space”, *Biosensors and Bioelectronics*, 114820 (2022). [\[Link\]](#)
 35. Marzano, M., Chen, X., Russell, T.A., Medina, A., Wang, Z.Z., Hua, T., Zeng, C., **Wang, X.**, Sang, Q.X., Tang, H. and Yun, Y., 2022. “Studying the Inflammatory Responses to Amyloid Beta Oligomers in Brain-Specific Pericyte and Endothelial Co-Culture From Human Stem Cells”. *Frontiers in Chemical Engineering*, 4. (2022). [\[Link\]](#)
 34. Z.Z. Wang, G.F. Wu, Y. Li, Y. Zhang, **X.J. Wang***. “Shape-Programmable Three-Dimensional Microfluidic Structures”. *ACS Applied Materials & Interfaces*, 14, 13, 15599–15607 (2022). [\[Link\]](#)
 33. S.H. Lu†, M. Samandari†, C.H. Li, H.J. Li, D.J. Song*, Y. Zhang*, A. Tamayol*, **X.J. Wang***. “Multimodal Sensing and Therapeutic Systems for Wound Healing and Management: A Review”. *Sensors and Actuators Reports*, 100075 (2022). [\[Link\]](#)
 32. Wu, G., Zhang, N., Matarasso, A., Heck, I., Li, H., Lu, W., Phaup, J.G., Schneider, M.J., Wu, Y., Weng, Z. and Sun, H., Gao, Z., Zhang, X.C., Sandberg, S., Parvin, D., Seaholm, E., Islam, S.K., **Wang, X.J.**, Phillips, P., Castro, D.C., Ding, S.H., Li, D.P., Bruchas, M.R., Zhang, Y.*. “Implantable Aptamer-Graphene Microtransistors for Real-Time Monitoring of Neurochemical Release in Vivo”. *Nano Letters*, 22(9), pp.3668-3677. (2022). [\[Link\]](#)
 31. Y. Li†, S. Avis†, J. Chen, G.F. Wu, T. Zhang*, H. Kusumaatmajab*, **X.J. Wang***. “Tailoring the Multistability of Origami-Inspired, Buckled Magnetic Structures via Compression and Creasing”, *Materials Horizons*, 8, 3324-3333 (2021). Reported by UConn MSE news. 2021 Materials Horizons most popular articles). [\[Link\]](#)
 30. Y. Li†, S. Avis†, J. Chen, G.F. Wu, T. Zhang*, H. Kusumaatmajab*, **X.J. Wang***. “Reconfiguration of multistable 3D ferromagnetic mesostructures guided by energy landscape surveys”, *Extreme Mechanics Letters*, 48, 101428 (2021). (**Selected for the EML Young Investigator Award**). [\[Link\]](#)
 29. Y. Li, H.B. Yu, K. Yu, X. Guo*, **X.J. Wang***. “Reconfigurable 3D Mesotstructures of Spatially Programmed Liquid Crystal Elastomers and their Ferromagnetic Composites”, *Advanced Functional Materials*, 2100338 (2021). [\[Link\]](#)
 28. Y. Li, C.Q. Luo, K. Yu, **X.J. Wang***. “Remotely Controlled, Reversible, On-Demand Assembly and Reconfiguration of 3D Mesostructures via Liquid Crystal Elastomer Platforms”, *ACS Applied Materials & Interfaces*, 13, 7, 8929–8939 (2021). [\[Link\]](#)
 27. H. Luan, Q. Zhang, T. Liu, **X.J. Wang**, S. Zhao, H. Wang, S. Yao, Y. Xue, JW. Kwak, W.B. Bai, Y.M. Xu, M. Han, K. Li, Z. Li, X. Ni, J.L. Ye, DW. Choi, Q. Yang, J. Kim, S. Li, S.L. Chen, C. Wu, D. Lu, J.K. Chang, ZQ. Xie, Y.G. Huang*, J.A. Rogers*, “Complex 3D microfluidic architectures

- formed by mechanically guided compressive buckling” *Science Advances*, 7(43), eabj3686 (2021). [\[Link\]](#)
26. H.R. Wang*, S.H. Lu, **X.J. Wang**, S.M. Xia, H.B. Chew*. A Review of the Multiscale Mechanics of Silicon Electrodes in High-Capacity Lithium-ion Batteries. *Journal of Physics D: Applied Physics*, 55 063001 (2021). [\[Link\]](#)
 25. H. Sun, R. Li, H.J. Li, Z.Y. Weng, G.F. Wu, P. Kerns, S.L. Suib, **X.J. Wang**, Y. Zhang*, “Bioinspired oil-infused slippery surfaces with water and ion barrier properties.” *ACS Applied Materials and Interfaces*, 13, 28, 33464–33476 (2021). [\[Link\]](#)
 24. B.H. Kim†, K. Li†, J.T. Kim†, Y.S. Park†, H.K. Jang, **X.J. Wang**, Z. Xie, S. Won, W. Jang, K.H. Lee, T. S. Chung, Y.H. Jung, S.Y. Heo, Y. Lee, J. Kim, T. Cai, Y. Kim, P. Prasopsukh, Y. Yu, X.G. Yu, H.W. Luan, H. Song, F. Zhu, Y. Zhao, L. Chen, S. Han, J. Kim, S. Ju, O. Lee, C.H. Lee, Y.G. Huang*, L.P. Chamorro*, YH. Zhang*, J.A. Rogers*. “Three-Dimensional Electronic Microfliers With Designs Inspired by Wind-Dispersed Seeds.” *Nature*. 597, 503–510 (2021). [\[Link\]](#)

Before joining UConn

23. Bashandeh, K., Lee, J., Wu, Q., Li, Y., **Wang, X.**, Shi, Y., Guo, X., Huang, Y., Rogers, J.A. and Polycarpou*. “Mechanics and deformation of shape memory polymer kirigami microstructures.” *Extreme Mechanics Letters*, p.100831 (2020). [\[Link\]](#)
22. **XJ. Wang**†, R. Feiner†, H.W. Luan†, Q. Zhang, S. Zhao, Y. Zhang, M. Han, Y. Li, R. Sun, H. Wang, T.L. Liu, X.G. Guo, H. Oved, N. Noor, A. Shapira, Y.H. Zhang, Y.G. Huang, T. Dvir, and J. A. Rogers. “Three-Dimensional Electronic Scaffolds for Monitoring and Regulation of Multifunctional Hybrid Tissues”, *Extreme Mechanics Letters*, p.100634 (2020). [\[Link\]](#)
21. Y. Liu†, **X.J. Wang**†, Y.M. Xu, Z.G. Xu, Y. Zhang, X. Ning, X. Cheng, Y.G. Xue, D. Lu, Q.H. Zhang, F. Zhang, J.X. Liu, X.G. Guo, K.C. Hwang, Y.G. Huang, J.A. Rogers, Y.H. Zhang. “Harnessing the interface mechanics of hard films and soft substrates for 3D assembly by controlled buckling”, *Proceedings of National Academy Science (PNAS)*, 116 (31), 15368-15377 (2019). [\[Link\]](#)
20. H.B. Zhao†, K. Li†, M.D. Han, F. Zhu, A. Vazquez-Guardado, P.J. Guo, Z.Q. Xie, Y. Park, L. Chen, **X.J. Wang**, H.W. Luan, Y.Y. Yang, H.L. Wang, C.M. Liang, Y.G. Xue, R. Schaller, D. Chanda, Y.G. Huang, Y.H. Zhang, J.A. Rogers, “Buckling and twisting of advanced materials into morphable 3D mesostructures”, *Proceedings of National Academy Science (PNAS)*, 201901193 (2019). [\[Link\]](#)
19. SM Won, H. Wang, B.H. Kim, K.H. Lee, H. Jang, K.H. Kwon, M.D. Han, K.E. Crawford, H.B. Li, D.H. Kim, Y.C. Lee, X. Yuan, S.B. Kim, Y.S. Oh, W.J. Jang, J.Y. Lee, S.Y. Han, J. Kim, X.J. Wang, Z. Xie, Y.H. Zhang, Y.G. Huang, J.A. Rogers. “Multimodal sensing with a three-dimensional piezoresistive structure” *ACS Nano*, 13 (10), 10972-10979 (2019). [\[Link\]](#)
18. **X.J. Wang**†, X.G. Guo†, J.L. Ye†, N. Zheng, P. Kohli, Y. Zhang, Z.Q. Xie, H.W. Luan, D. Choi, K.W. Nan, Q.H. Zhang, Y.M. Xu, X.W. Shan, W.B. Bai, Z.Z. Wang, B.H. Kim, H. Jang, F. Zhang, Y.J. Ma, Z. Xu, X. Feng, T. Xie, Y.G. Huang, Y.H. Zhang, J.A. Rogers. “Freestanding 3D Mesostructures, Functional Devices and Shape-Programmable Systems based on Mechanically Induced Assembly with Shape Memory Polymers,” *Advanced Materials*, 1805615 (2019) . [\[Link\]](#)
17. Y Zhang, H Guo, SB Kim, Y Wu, D Ostojich, SH Park, X Wang, Z Weng, R. Li, A. Bandodkar, Y. Sekine, J. Choi, S. Xu, S. Quaggin, R. Ghaffari, J.A. Rogers. “Passive sweat collection and colorimetric analysis of biomarkers relevant to kidney disorders using a soft microfluidic system”, *Lab on a Chip*, 19 (9), 1545-1555 (2019). [\[Link\]](#)
16. Y. Zhang†, A. D. Mickle†, P. Guttruff†, L. A. McIlvried, H. Guo, Y. Wu, J.P. Golden, Y.G. Xue, J.G. Grajales-Reyes, **X.J. Wang**, S. Krishnan, Y. Xie, D. Peng, C.J. Su, F. Zhang, J.T. Reeder, S.K. Vogt, Y.G. Huang, J.A. Rogers, R.W. Gereau, “Battery-free, Fully Implantable Optofluidic Cuff

- System for Wireless Optogenetic and Pharmacological Neuromodulation of Peripheral Nerves”, *Science advances*, 5(7), eaaw5296 (2019). [\[Link\]](#)
15. Y. Zhang†, D. C. Castro†, Y. Han, Y. Wu, H. Guo, Z. Weng, Y. Xue, J. Ausra, **X.J. Wang**, R. Li, G.F. Wu, A. Vázquez-Guardado, Y. Xie, Z.Q. Xie, D. Ostojich, D.S. Peng, R.J. Sun, B. Wang, Y. Yu, J. P. Leshock, S. Qu, C.J. Su, W. Shen, T. Hang, A. Banks, Y.G. Huang, J. Radulovic, P. Gutruf, M.R. Bruchas, J.A. Rogers, “Battery-free, Lightweight, Injectable Microsystem for in vivo Wireless Pharmacology and Optogenetics”, *Proceedings of National Academy Science (PNAS)*, 201909850 (2019). [\[Link\]](#)
 14. B.H. Kim, F. Liu, Y. Yu, H. Jang, Z.Q. Xie, K. Li, J. Lee, J.Y. Jeong, A. Ryu, Y. Lee, D.H. Kim, **X.J. Wang**, K.H. Lee, J.Y. Lee, S.M. Won, N. Oh, J. Kim, J.Y. Kim, S. Jeong, K.I. Jang, S. Lee, Y.G. Huang, Y.H. Zhang, J.A. Rogers, “Mechanically Guided Post-Assembly of 3D Electronic Systems”, *Advanced Functional Materials*, 28 (48), 1803149 (2018). [\[Link\]](#)
 13. X.G. Guo†, **X.J. Wang**†, D.P. Qu†, J.L. Ye, W.B. Pang, Y.G. Huang, J.A. Rogers, Y.H. Zhang. “Controlled Mechanical Assembly of Complex 3D Mesostructures and Strain Sensors,” *npj Flexible Electronics*, 2 (1), 14 (2018). [\[Link\]](#)
 12. X.G. Guo†, Z. Xu†, F. Zhang, **X.J. Wang**, Y.Y. Zi, J.A. Rogers, Y.G. Huang, Y.H. Zhang. “Reprogrammable 3D Mesostructures Through Compressive Buckling of Thin Films with Prestrained Shape Memory Polymer,” *Acta Mechanica Solida Sinica*, 1-10 (2018). [\[Link\]](#)
 11. B.H. Kim, J. Lee, S.M. Won, Z. Xie, J.K. Chang, Y. Yu, Y.K. Cho, H. Jang, J.Y. Jeong, Y. Lee, A. Ryu, D.H. Kim, K.H. Lee, J.Y. Lee, F. Liu, **X.J. Wang**, Q. Huo, S. Min, D. Wu, B. Ji, A. Banks, J. Kim, N. Oh, H.M. Jin, S. Han, D. Kang, C.H. Lee, Y. Song, Y.H. Zhang, Y.G. Huang, K. Jang, J.A. Rogers. “Three-Dimensional Silicon Electronic Systems Fabricated by Compressive Buckling Process” *ACS Nano*, 12 (5), 4164-4171 (2018). [\[Link\]](#)
 10. X. Ning†, **X.J. Wang**†, Y. Zhang, X.G. Yu, D.W. Choi, N. Zheng, D.S. Kim, Y.G. Huang, Y.H. Zhang, J.A. Rogers. “Assembly of Advanced Materials into Three-Dimensional Functional Structures by Methods Inspired by Origami and Kirigami: A Review,” *Advanced Materials Interfaces*, 1800284 (2018). [\[Link\]](#)
 9. M. Papakyriakou, **X.J. Wang**, S.M. Xia. “Characterization of Stress-Diffusion Coupling in Lithiated Germanium by Nanoindentation,” *Experimental Mechanics*, 58(4): 613-625 (2018). [\[Link\]](#)
 8. Y. Shi†, F. Zhang†, K.W. Nan, **X.J. Wang**, J.T. Wang, Y.J. Zhang, Y.T. Zhang, H.W. Luan, K.C. Hwang, Y.G. Huang, J.A. Rogers, Y.H. Zhang. “Plasticity-Induced Origami for Assembly of Three-Dimensional Metallic Structures Guided by Compressive Buckling,” *Extreme Mechanics Letters*, 11: 105-110 (2017). [\[Link\]](#)
 7. **X.J. Wang**, A. Yang, S.M. Xia. “Fracture Toughness Characterization of Lithiated Germanium as an Anode Material for Lithium-Ion Batteries,” *Journal of the Electrochemical Society*, 163(2): A90-A95 (2016). [\[Link\]](#)
 6. **X.J. Wang**, F.F. Fan, J.W. Wang, H.R. Wang, S.Y. Tao, A. Yang, Y. Liu, H.B. Chew, S.X. Mao, T. Zhu, S.M. Xia. “High Damage Tolerance of Electrochemically Lithiated Silicon,” *Nature Communications*, 6: 8417 (2015). Reported by ScienceDaily, Science360, Phys.org, R&D Magazine, Nanotechnology Now, and Georgia Tech News. [\[Link\]](#)
 5. **X.J. Wang**, Z.P. Pan, F.F. Fan, J.W. Wang, Y. Liu, S.X. Mao, T. Zhu, S.M. Xia. “Nanoscale Deformation Measurement with High-Resolution Transmission Electron Microscopy and Digital Image Correlation”, *Journal of Applied Mechanics*, 82 (12), 121001 (2015). [\[Link\]](#)
 4. H.R. Wang, **X.J. Wang**, S.M. Xia, H.B. Chew, “Brittle-to-Ductile Transition of Lithiated Silicon Electrodes: Craze to Stable Nanopore Growth,” *Journal of Chemical Physics*, 143: 104703 (2015). [\[Link\]](#)

3. H.R. Wang, B.Y. Hou, **X.J. Wang**, S.M. Xia, H.B. Chew. “Atomic-Scale Mechanisms of Sliding Along an Interdiffused Li–Si–Cu Interface,” *Nano Letters*, 15(3), 1716-1721 (2015). [\[Link\]](#)
2. H.B. Chew, B.Y. Hou, **X.J. Wang**, S.M. Xia. “Cracking Mechanisms in Lithiated Silicon Thin Film Electrodes,” *International Journal of Solids and Structures*, 51: 4176-4187 (2014). [\[Link\]](#)
1. H.S. Chen, B.L. Dou, Y.C. Song, Y.J. Xu, **X.J. Wang**, Y. Zhang, X. Du, C. Wang, X.H. Zhang, C.Q. Tan. “Studies on Absorption and Regeneration for CO₂ Capture by Aqueous Ammonia,” *International Journal of Greenhouse Gas Control*, 6:171-178 (2012). [\[Link\]](#)

Patents

3. **X.J. Wang**, C. Crumley. “Wearable, Wireless Pressure-Sensor-Integrated Smart Bandage.” Application No: 17/687,163, March 2022.
2. N. Dennis, **X.J. Wang**, S.M. Xia. “An Additive Manufacturing Method for 3D Printing of Tough Ceramic Parts.” Invention disclosure (filed with the Office of Industry Engagement, Georgia Tech), 2013.
1. **X.J. Wang**, M.J. Li, S.X. Zhang, “A Multi-Functional Covering Layer Attached to Liquid Surface.” Invention Patent, Invention Patent No.201010248223, December 2010.

Awarded Grants/Projects

4.39 million in total, with 3.0 million to Wang lab at UConn

1. **Title: A Soft Intelligent Robot for Self-Digging, Multi-Modal Sensing, and in situ Marine Sediment Analysis**
 Role: PI
 Source: Office of Naval Research Young Investigator Program (ONR YIP)
 Total amount: \$749,997 (100% to Wang lab) 10/2023-09/2026
2. **Title: CAREER: Mechanics of Active Polymers and Morphing Structures: Determine the Role of Molecular Interactions and Stiffness Heterogeneity in Reversible Shape Morphing**
 Role: PI
 Source: NSF/Faculty Early Career Development Program
 Total amount: \$546,813 (100% to Wang lab) 02/2022-01/2027
3. **Title: Multifunctional 3D Bioelectronic/Microfluidic Hybrid System for Online Monitoring, Regulation, and Vascularization of Organoids**
 Role: PI
 Source: NIH NIBIB (Trailblazer)
 Total amount: \$643,591 (\$406,619 to Wang lab) 08/2022-07/2025
4. **Title: Development of Lightweight, Power-Efficient, Soft Electronic Sensor Systems for Next-Generation Oceanographic Measurements**
 Role: PI
 Source: Office of Naval Research
 Total amount: \$500,000 (\$262,271 to Wang lab) 04/2021-04/2024
5. **Title: High-Performance Laser Etching System for Multi-Layer Soft Electronics**
 Role: PI
 Source: ONR (DURIP)
 Total amount: \$374,280 (\$299,424 to Wang lab) 02/2021-01/2022

6. **Title: Collaborative Research: Tailoring Energy Landscapes to Harness the Multistability for Reconfigurable 3D Buckled Structures**
 Role: PI
 Source: NSF
 Total amount: \$301,240 (100% to Wang lab) 10/2020-01/2024
7. **Title: Development of Lightweight, Power-Efficient, Soft Electronic Sensor Systems for Next-Generation Oceanographic Measurements**
 Role: PI
 Source: Office of Naval Research
 Total amount: \$950,000 (\$379,625 to Wang lab) 10/2020-08/2023
8. **Title: In Situ Investigation of the Mechanics of 3D Flexible Architectures and Electronics**
 Role: PI
 Source: ASME foundation
 Total amount: \$20,000 (100% to Wang lab) 10/2019-09/2023

Conference Presentations and Seminars

33. **X.J. Wang**, “Stimuli-responsive, morphing liquid crystal elastomer structures for intelligent systems”, 2023 ACS Fall Meeting, Hybrid (**Invited**).
32. **X.J. Wang**, “Wearable Electronics for Real-Time Sensing: From Smart Bandage for Diabetic Foot Ulcers to Health Monitoring in the Ocean”, 243rd Electrochemical Society (ECS) Meeting, Boston, MA, 2023 (**Invited**).
31. Y. Li, **X.J. Wang**, “Tailoring the Multistability of Reconfigurable 3D Magnetic Mesostructures”, MRS Spring Meeting, San Francisco, CA, 2023.
30. **X.J. Wang**, Y. Li, “Stimuli-Responsive, Morphing Liquid Crystal Elastomer Structures and Electronics for Intelligent Systems”, MRS Spring Meeting, San Francisco, CA, 2023 (**Invited**).
29. **X.J. Wang**, “Pressure-Sensor-Integrated Smart Bandage for the Management of Diabetic Foot Ulcers”, MRS Spring Meeting, San Francisco, CA, 2023.
28. Y. Li, **X.J. Wang**, “Tailoring the multistability of origami-inspired, buckled magnetic structures via compression and creasing” MRS Fall Meeting, Boston, MA, 2022.
27. **X.J. Wang**, Y. Li, S.H. Lu, “Soft, Pressure-Tolerant, Flexible Electronic Sensors for Sensing Under Harsh Environments”, MRS Fall Meeting, Boston, MA, 2022.
26. **X.J. Wang**, Y. Li, “Morphing and color-changing liquid crystal elastomer structures for soft robotics” MRS Fall Meeting, Boston, MA, 2022.
25. **X.J. Wang**, “Smart Bandage and Electronic Tissue Scaffold for Biomedical Applications”, Center to Stream Healthcare in Place, October 2022 (**Invited**).
24. **X.J. Wang**, Y. Li, “Spatially Programmed Liquid Crystal Elastomers for Reconfigurable Structures”, 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, TX, June 2022.
23. Y. Li, S. J. Avis, T. Zhang, H. Kusumaatmaja, **X.J. Wang**, “Reconfiguration of Multistable 3D Ferromagnetic Composite Mesostructures Guided by Energy Landscape Surveys”, 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, TX, June 2022.
22. **X.J. Wang**, Y. Li, “3D Magnetic Liquid Crystal Elastomer Composite Structures for Untethered Soft Robotics”, MRS Spring Meeting, May 2022 (virtual).
21. Z.Z. Wang, **X.J. Wang**, “Shape-Programmable Three-Dimensional Microfluidics”, MRS Spring Meeting, May 2022 (virtual).
20. **X.J. Wang**, “Morphing Materials and Multifunctional Structures: From Mechanics to Applications”, California Institute of Technology, 2022 (**Invited**).

19. **X.J. Wang**, Y. Li, “Reconfigurable 3D Structures of Spatially Programmed Liquid Crystal Elastomers and Their Ferromagnetic Composites”, MRS Fall Meeting, December 2021(virtual).
18. Y. Li, **X.J. Wang**, “Bioinspired color-changing and morphing structures with stiffness heterogeneity”, MRS Fall Meeting, December 2021 (virtual).
17. Y. Li, **X.J. Wang**, “Reconfiguration of multistable 3D ferromagnetic mesostructures guided by energy landscape surveys”, ASME International Mechanical Engineering Congress & Exposition (IMECE), 2021.
16. Y. Li, **X.J. Wang**, “Reconfigurable 3D Structures of Spatially Programmed Liquid Crystal Elastomers for soft robotics”, ASME International Mechanical Engineering Congress & Exposition (IMECE), 2021.
15. Y. Li, **X.J. Wang**, “Mechanics of Reconfigurable 3D Mesostructures in Active Materials”, SEM 2021 Annual Conference & Exposition on Experimental and Applied Mechanics (IMECE), Virtual meeting, 2021.
14. **X.J. Wang**, “Mechanics of Reconfigurable 3D Mesostructures in Active Materials”, SEM 2020 Annual Conference & Exposition on Experimental and Applied Mechanics, 2021 (virtual).
13. **X.J. Wang**, “Mechanics, Materials, and Functional Structures: From Energy Storage to Flexible Electronics”, Mechanical and Aerospace Engineering, Kennesaw State University, December 2020 (**Invited**).
12. X.J. Wang, “Mechanics, Materials, and Functional Structures: From Energy Storage to Flexible Electronics”, Mechanical and Aerospace Engineering, St. Louis University, September 2020 (**Invited**).
11. **X.J. Wang**, “Mechanics, Materials, and Functional Structures: From Energy Storage to Flexible Electronics”, Mechanical and Aerospace Engineering, Syracuse University, Syracuse, New York, September 2020 (**Invited**).
10. **X.J. Wang**, Y.G. Huang, T. Dvir, J.A. Rogers. “Development of Three-Dimensional Electronic Scaffolds for Monitoring and Regulation of Multifunctional Hybrid Tissues”, 2019 Society of Engineering Science (SES), St. Louis, Missouri, October 2019.
9. **X.J. Wang**, Y.G. Huang, Y.H. Zhang, J.A. Rogers. “Freestanding 3D Mesostructures, Functional Devices, and Shape-Programmable Systems Based on Mechanically Induced Assembly of Shape Memory Polymers,” SEM 2019 Annual Conference & Exposition on Experimental and Applied Mechanics, Reno, Nevada, June 2019.
8. **X.J. Wang**, “Materials, Mechanics, and Structures: From Energy Storage to Human Health”, Southern Illinois University, Carbondale, IL, April 2019 (**Invited**).
7. **X.J. Wang**, M. Zhou, S.M. Xia. “Mechanics of Fracture in Lithium-ion batteries,” ASME 2018 International Mechanical Engineering Congress & Exposition (IMECE), Pittsburgh, Pennsylvania, November 2018.
6. **X.J. Wang**, X.G. Guo, Y.G. Huang, Y.H. Zhang, J.A. Rogers. “Freestanding 3D Mesostructures, Functional Devices and Shape-Programmable Systems based on Mechanically Induced Assembly with Shape Memory Polymers,” ASME 2018 International Mechanical Engineering Congress & Exposition (IMECE), Pittsburgh, Pennsylvania, November 2018.
5. **X.J. Wang**, M. Zhou, S.M. Xia. “Integrated Experimental and Computational Framework for Explicit Analyses of Fracture in Lithium-Ion Storage Materials,” ASME 2017 International Mechanical Engineering Congress & Exposition (IMECE), Tampa, Florida, November 2017.
4. **X.J. Wang**, S.M. Xia. “Nanomechanical Characterizations of Deformation and Fracture in Lithium-Ion Battery Electrodes,” SEM 2016 Annual Conference & Exposition on Experimental and Applied Mechanics, Orlando, Florida, June 2016.
3. **X.J. Wang**, S.M. Xia. “Fracture Mechanics of High-Capacity Lithium-Ion Battery Electrodes,” ASME 2015 International Mechanical Engineering Congress & Exposition (IMECE), Houston, Texas, November 2015.

2. **X.J. Wang**, A. Yang, S.M. Xia. “Fracture Characteristics of Lithiated Silicon and Germanium for Lithium-ion Batteries,” SEM 2015 Annual Conference & Exposition on Experimental and Applied Mechanics, Costa Mesa, California, June 2015.
1. **X.J. Wang**, S.M. Xia. “Fracture Toughness Characterization of Lithiated Silicon for Lithium-Ion Batteries,” International Student Paper Presentation Competition, SEM 2014 Annual Conference & Exposition on Experimental and Applied Mechanics, Greenville, South Carolina, June 2014.

Teaching (After joining UConn)

Term	Title	Level	Enrollment	SET score
Spring 2021	MSE 3056 Mechanical Behaviors Laboratory	Undergraduate	27	Instructor: 4.6 Course: 4.2
Fall 2021	MSE 4095/5095 Soft Functional Materials and Structures: Fundamentals and Applications	UG/Graduate crosslinked	6	Instructor: 4.2 Course: 4.3
Spring 2022	MSE 3056 Mechanical Behaviors Laboratory	Undergraduate	25	Instructor: 4.1 Course: 3.9
Fall 2022	MSE 4095/5095 Soft Functional Materials and Structures: Fundamentals and Applications	UG/Graduate crosslinked	13	Instructor: 4.3 Course: 4.2
Spring 2023	MSE 3056 Mechanical Behaviors Laboratory	Undergraduate	17	Instructor: 4.3 Course: 4.3

Outstanding Student Achievements under my Supervision

- Summer Doctoral Dissertation Fellowship (Yi Li, Ph.D. student) 2023
- Doctoral Dissertation Research Award (Yi Li, Ph.D. student) 2022
- First Place Winner of the 2022 Graduate Elevator Pitch Competition (Zizheng Wang, Ph.D. student) 2022
- Undergraduate Outstanding Research Award (Gina Parlato, undergraduate) 2022
- 1st Place of Senior Design (Team: Camille Martinez, Robert Williams, Liam Gerety, and Cole Accardi; Project: Optimization of the Poly(methyl methacrylate) Annealing Cycle; Sponsor: Norgren) 2022
- 2nd Place of Senior Design (Team: Seth Utter and Elliott Trester; project: Hybrid Composite Metal Case Design; Sponsor: Pratt & Whitney) 2023

Mentorship/Supervision

Name	Type	Period
• Yi Li	Ph. D.	Sept. 2019-Aug. 2023
• Zizheng Wang	Ph. D.	Aug. 2020-present
• Shao-Hao Lu	Ph. D.	Aug. 2021-present
• Yongyu Lu	Postdoc	Aug. 2022-present
• Manikandan Muthu	Postdoc	Oct. 2022-present
• Gyuho Song	Postdoc	Sept. 2020-Aug. 2021
• Thong Cu	M.S.	Aug. 2022-May 2023
• Ian Heck	M.S.	Oct. 2020-Oct. 2021
• Gina Parlato	Undergraduate	May 2021-Aug. 2021
• Pablo Zarama	Undergraduate	June 2021-Dec. 2021
• Martin Birnbach	Undergraduate	June 2021-Dec. 2021

• Camille Martinez

Undergraduate

Aug. 2021-Dec. 2021

Service and Activities

Technical Committee Officer

- Vice chair (2022-present), Composites and Heterogeneous Materials Technical Committee, Materials Division (MD), ASME
- Vice chair (2023-present), Electronic Materials Technical Committee, Materials Division (MD), ASME
- Vice chair (2021-2023), Experimental Mechanics Technical Committee, Applied Mechanics Division (AMD), ASME

Symposia Organizer

- “Material Processing of Flexible Electronics, Sensors, and Devices”, ASME International Technical Conference and Exhibition (IMECE), 2019-2023
- “Soft Matter Mechanics, Physics, and Devices”, 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, TX, June 2022
- “Mechanics of Liquid Crystal Elastomers”, 19th U.S. National Congress on Theoretical and Applied Mechanics, Austin, TX, June 2022
- “Design, Material Processing, and Applications of Composites”, ASME International Technical Conference and Exhibition (IMECE), 2022
- “Advances in Mechanics of Deformation, Plasticity, and Failure”, Society of Experimental Mechanics Annual Conference, Virtual meeting, 2021
- “3D/4D printed functional materials and structures: 3D/4D printing of active structures”, Society of Engineering Science (SES), St. Louis, MO, 2019
- “Fracture in Soft and Time-dependent Materials 3: Adhesive Failure” session, Society for Experimental Mechanics (SEM), Reno, Nevada, 2019
- “Mechanics of Deformation and Failure of Energy Materials”, ASME 2017 International Technical Conference and Exhibition (IMECE), Tampa, Florida
- “Fracture of Brittle and Ductile Materials”, Society for Experimental Mechanics (SEM) 2017 Annual Conference, Indianapolis, Indiana, 2017
- “Damage Detection in Fracture & Fatigue”, Society for Experimental Mechanics (SEM) 2016 Annual Conference, Orlando, Florida, 2016
- “Fracture in Composite Materials”, the Society for Experimental Mechanics (SEM) 2015 Annual Conference, Costa Mesa, California, 2015

Editorial Board, Journal and Proposal Reviewers

- Editorial Board Member of Scientific Reports
- Extreme Mechanics Letters (EML)-Early Career Advisory Board (EML-ECAB)
- Guest editor for the Journal of Micromechanics and Molecular Physics (JMMP) and Journal of Polymers; Review editor for the Journal of Frontiers in Sensors
- Journal reviewers for Science Advances, Advanced Science, ACS Applied Materials and Interfaces, Journal of Experimental Mechanics, and Extreme Mechanics Letters
- Led the iMechanica Journal Club for July 2022: Liquid crystal elastomers: programming, multifunctionality, and opportunities
- NSF panelist (CMMI, ECCS), NIH, Swiss NSF/Innosuisse BRIDGE

Service to Local Community and Campus

- Hosted workshop for high school teachers, University of Connecticut, 2021
- University of Connecticut: Graduate student committee, 2020-present

- Hosted High School Summer Camp, University of Missouri, 2019
- Invited speaker for Flat Rock Middle School STEM Symposium, ASME Atlanta, 2015
- Judge for 9th Annual Undergraduate Research Symposium, Georgia Tech, 2014
- Volunteer for Graduate Recruitment, Georgia Tech, 2012
- University of Missouri: Materials Area Committee, 2018-2020

Associations and Memberships

- American Society of Mechanical Engineers (ASME)
- Society of Engineering Science (SES)
- Society of Experimental Mechanics (SEM)
- Material Research Society (MRS)
- Society of Women Engineers (SWE)