Lihua Lou

PERSONAL DATA

Assistant Professor
Department of Mechanical Engineering
School of Mechanical and Automotive Engineering
College of Engineering, Computing and Applied Sciences
Clemson University
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EDUCATION

- Ph.D., Texas Tech University, 2019, Environmental Toxicology
- M.S., Donghua University, 2016, Textile Materials and Textile Design
- B.S., Henan Institute of Engineering, 2013, Textile Materials and Textile Design

PROFESSIONAL EXPERIENCE

- Clemson University, 2024 – present, Assistant Professor of Mechanical Engineering
- Florida International University, 2023 – 2024, Research Assistant Professor
- Florida International University, 2020 – 2023, Postdoctoral Associate
- Virginia Commonwealth University, 2020, Postdoctoral Researcher

MEMBERSHIPS

- Associate Editor, Engineering Science (2025 – 2028)
- Editorial Board, Journal of Biomaterials (2023 – 2025)
- Member, American Heart Association (2022 – 2025)
- Member, Society of Biomaterials (2022 – 2025)
- Member, Golden Key International Honor Society, TAPPI, Association of American Physicians and Surgeons (AAPS), Biomedical Engineering Society, SAMPE, PHI KAPPA PHI (2016 – 2022)
- Member, Llano Estacado Student Chapter of the National Society of Environmental Toxicology and Chemistry (2016 – 2019)

HONORS AND AWARDS

- ASED Young Investigator Award Finalist (2024)
- CELL-MET Industry Days Perfect Pitch Competition Winner (2023)
- Florida Heart Research Foundation Stop Heart Disease “Early Career Research of the Year” Award (2023)
- CELL-MET Industry Days Perfect Pitch Competition 1st Price (2022)
- Florida International University Postdoctoral Scholar Travel Awards (2022)
- Graduate Student Research Award, Texas Tech University (2019)
- Love of Learning Award, Phi Kappa Phi (2019)
- Summer Thesis Scholarship, Texas Tech University (2019)
- Graduate School Travel Award, Texas Tech University (2019)
- Study Abroad Scholarship, Texas Tech University (2019)
- Terracon Funding, Terracon (2018)
- AATCC Research Scholarship (2017)
- Outstanding Graduate Students in Donghua University (2016)
- Ninth International Innovation Forum of Textile & Clothing Excellent Paper (2015)
- Donghua University Scientific Award (EG2015005) (2015)
- Graduate National Scholarship, China (2015)
- Shanghai International Textile Graduate Summer School Certificate of Honor (2015)
- 3rd Prize 11th National Graduate Student Mathematical Modeling Competition (2015)
- Donghua University Outstanding Student (2015)

- Uster Prize, Donghua University (2014)

PUBLICATIONS

U.S. Patents and Disclosures

1. A. Agarwal, D. Darryl, L. Lihua, and R. Mukesh. "Systems and methods for multi-directional imaging during indentation." U.S. Patent 11,683,597, issued June 20, 2023.
2. A. Agarwal, N. Ambreen, L. Lihua, and P.B. Benjamin. "Method for fabricating a hybrid carbon nanofiber product." U.S. Patent 11,643,756, issued May 9, 2023.
3. A. Agarwal, B.C. Omar, and L. Lou. "Devices and Methods for Nanofiber-based Membrane Fabrication." U.S. Patent 12,234,575B1; issued Feb 2, 2025.
4. A. Agarwal, N. Ambreen, L. Lihua, and P.B. Benjamin. " Hybrid Carbon Nanofibers Products and Methods of Fabrication the Same." U.S. Patent 18,181,338, issued May 12, 2025.
5. A. Agarwal, L. Lou, M. Pulugurtha, and G. A.Duhni. Polymer Nanocomposite Flexible Films for Electromagnetic Interference Shielding. Serial No. 19/048,359; filed February 07, 2025.

Peer-reviewed Publications

1. Zhou, S., Li, P., Yin, S., Lu, Y., Wang, J., Hu, X., Zhang, X., Deng, L., Liu, Y., Luo, X. and Wang, J., Improved adhesion between glass fiber and PAAm/SA hydrogel via a synergy strategy. *Polymer Composites*.
2. Shen, H., Guo, W., Wang, J., An, Y. and Lou, L. Investigating heat generation and transfer in hygroscopic and exothermic textiles by 3D numerical model. *International Communications in Heat and Mass Transfer*, *165*, p.109053 (2025).
3. Ewoldt, J.K., DePalma, S.J., Jewett, M.E., Karakan, M.Ç., Lin, Y.M., Mir Hashemian, P., Gao, X., Lou, L., McLellan, M.A., Tabares, J. and Ma, M. Induced pluripotent stem cell-derived cardiomyocyte in vitro models: benchmarking progress and ongoing challenges. *Nature Methods*, pp.1-17 (2024).
4. Mirza, A., Hsu, C.P.D., Rodriguez, A., Alvarez, P., Lou, L., Sey, M., Agarwal, A., Ramaswamy, S. and Hutcheson, J. Computational Model for Early-Stage Aortic Valve Calcification Shows Hemodynamic Biomarkers. *Bioengineering*, **11**, p.955 (2024).
5. Somu, D.R., Fuentes, M., Lou, L., Agarwal, A., Porter, M. and Merk, V. Revealing chemistry-structure-function relationships in shark vertebrae across length scales. *Acta Biomaterialia*, **189**, pp.377-387 (2024).
6. Lou, L., Al-Duhni, G.S.G., Cruz, O.B., Volakis, J.L., Pulugurtha, M. and Agarwal, A. Iron Oxide Quantum Dots and Graphene Nanoplatelets Integrated in a Dual-Polymer Conductive Fiber for Electromagnetic Interference-Shielding Thin Films. *ACS Applied Nano Materials* (2025).
7. Lou, L., Lopez, K.O., Nair, A.B., Desueza, W. and Agarwal, A. Micro-Mechanosensory insights from Nature's Mimosa leaves to shape memory adaptive robotics. *Materials & Design*, **249**, p.113567 (2025).
8. Lou, L., Rubfiaro, A.S., Deng, V., He, J., Thomas, T., Roy, M., Dickerson, D. and Agarwal, A. "Harnessing 3D Printing and Electrospinning for Multiscale Hybrid Patches Mimicking the Native Myocardium," *ACS Applied Materials & Interfaces*, **16**, 37596-37612 (2024).
9. Paul, T., Dolmetsch, T., Lou, L. and Agarwal, A. "Frictional resistance and delamination mechanisms in 2D tungsten diselenide revealed by multi-scale scratch and in-situ observations," *Nanotechnology*, ***35***, 395703 (2024).
10. Lou, L., Dolmetsch, T., Aguiar, B.A., Mohammed, S.M.A.K. and Agarwal, A. "Quantum Dots on a String: In Situ Observation of Branching and Reinforcement Mechanism of Electrospun Fibers," *Small*, 2311073, (2024).
11. Lou, L., Bacca, N., Ma, M.S., Nautiyal, P., Bifano, T.G. and Agarwal, A. "Multiscale mechanics of polydimethylsiloxane: A comparison of meso-and micro-cyclic deformation behavior," *Journal of Applied Polymer Science*, **141**, e55546, (2024).
12. Agarwal, V., Nisar, A., Sukumaran, A.K., Lou, L. and Mohammed, S.M. "Synergistic Effect of Spark Plasma Sintering Driven Solid-Solution Phases on Scratch Resistance in Two-Dimensional Materials," *Lubricants*, **12**, 31, (2024).

13. Sesena-Rubfiaro, A., Prajapati, N.J., Lou, L., Ghimire, G., Agarwal, A. and He, J. "Improving the development of human engineered cardiac tissue by gold nanorods embedded extracellular matrix for long-term viability," *Nanoscale*, **16**, 2983-2992, (2024).
14. Orikasa, K., Dolmetsch, T., Lou, L., Thomas, T., Boesl, B. and Agarwal, A. "Orientation-Dependent Thermal and Mechanical Properties of 2D Boron Nitride Nanoplatelet Foams via Freeze-Drying," *ACS Applied Nano Materials*, **6**, 19048-19060, (2023).
15. Lou, L., Rubfiaro, A.S., He, J. and Agarwal, A. "Understanding spatiotemporal mechanical behavior, viscoelasticity, and functions of stem cell-derived cardiomyocytes," *Nanoscale*, **15**, 10360-10370 (2023).
16. Lou, L., Paolino, L. and Agarwal, A. "Bridging the gap in Ashby's map for soft material properties for tissue engineering," *ACS Applied Materials & Interfaces*, **15**, 24197-24208, (2023).
17. Ma, M.S., Sundaram, S., Lou, L., Agarwal, A., Chen, C.S. and Bifano, T.G. "High throughput screening system for engineered cardiac tissues," *Frontiers in Bioengineering and Biotechnology*, **11**, 1177688, (2023).
18. Nisar, A., Lou, L., Boesl, B. and Agarwal, A. "Enhanced flexibility and thermal conductivity of HfC decorated carbon nanofiber mats," *Carbon*, **205**, 573-582, (2023).
19. Sesena-Rubfiaro, A., Prajapati, N.J., Paolino, L., Lou, L., Cotayo, D., Pandey, P., Shaver, M., Hutcheson, J.D., Agarwal, A. and He, J. "Membrane remodeling of human-engineered cardiac tissue by chronic electric stimulation," *ACS Biomaterials Science & Engineering*, **9**,1644-1655, (2023).
20. Lou, L., Rodrigues de Oliveira, N., Sahani, R., Sukumaran, A.K., John, D. and Agarwal, A. "Localized Nanoindentation Paradigm for Revealing Sutured Tissue Interface Mechanics and Integrity," *ACS Applied Bio Materials*, **6**, 908-918, (2023).
21. Li, H., Sundaram, S., Hu, R., Lou, L., Sanchez, F., McDonald, W., Agarwal, A., Chen, C.S. and Bifano, T.G. "Dynamic control of contractile force in engineered heart tissue." *IEEE Transactions on Biomedical Engineering*, **70**, 2237-2245, (2023).
22. Dong, D., Lou, L., Lopez, K.O., Agarwal, A. and Bhansali, S. "Revealing nanomechanical deformation at the interface and degradation in all-thin-film inorganic electrochromic devices," *Nanoscale*, **15**, 3438-3448, (2023).
23. Lou, L., Paul, T., Aguiar, B.A., Dolmetsch, T., Zhang, C. and Agarwal, A. "Direct Observation of Adhesion and Mechanical Behavior of a Single Poly (lactic-co-glycolic acid)(PLGA) Fiber Using an In Situ Technique for Tissue Engineering." *ACS Applied Materials & Interfaces*, **14**, 42876-42886, (2022).
24. Lin, Y.M., Paolino, L., Lou, L., Herrera, A., Pierre, E., Agarwal, A. and Ramaswamy, S. "Directional dependence on concomitant pressure and volume increases during left ventricular filling." *Journal of Biomechanics*, **138**, 111129, (2022).
25. Lou, L., Lopez, K.O., Nautiyal, P. and Agarwal, A. "Integrated perspective of scaffold designing and multiscale mechanics in cardiac bioengineering," *Advanced NanoBiomed Research*, **1**, 2100075, (2021).
26. Lou, L., Rubfiaro, A.S., He, J. and Agarwal, A. "Effect of Electrical Stimulation on Spontaneously Beating Dynamics of Cardiac Tissues: An Analysis Using Digital Image Correlation," *Advanced Materials Technologies*, **6**, 2100669, (2021).
27. Lou, L., Yu, W., Kendall, R.J., Smith, E. and Ramkumar, S.S. "Tensile testing and fracture mechanism analysis of polyvinyl alcohol nanofibrous webs," *Journal of Applied Polymer Science*, **137**, 49213, (2020).
28. Lou, L., Osemwegie, O. and Ramkumar, S.S. "Functional nanofibers and their applications," *Industrial & Engineering Chemistry Research*, **59**, 5439-5455, (2020).
29. Lou, L., Kendall, R.J. and Ramkumar, S. "Comparison of hydrophilic PVA/TiO2 and hydrophobic PVDF/TiO2 microfiber webs on the dye pollutant photo-catalyzation," *Journal of Environmental Chemical Engineering*, **8**, 103914, (2020).
30. Chai, G., Hassan, A., Meng, T., Lou, L., Ma, J., Simmers, R., Zhou, L., Rubin, B.K., Zhou, Q.T., Longest, P.W. and Hindle, M. "Dry powder aerosol containing muco-inert particles for excipient enhanced growth pulmonary drug delivery," *Nanomedicine: Nanotechnology, Biology and Medicine*, **29**, 102262, (2020).
31. Lou, L., Kendall, R.J., Smith, E. and Ramkumar, S.S. "Functional PVDF/rGO/TiO2 nanofiber webs for the removal of oil from water," *Polymer*, **186**, 122028, (2020).
32. Lou, L., Subbiah, S., Smith, E., Kendall, R.J. and Ramkumar, S.S. "Functional PVA/VB2/TiO2 nanofiber webs for controlled drug delivery," *ACS Applied Bio Materials*, ***2***, 5916-5929, (2019).

33. Lou, L., Wang, J., Lee, Y.J. and Ramkumar, S.S. "Visible light photocatalytic functional TiO2/PVDF nanofibers for dye pollutant degradation," *Particle & Particle Systems Characterization*, **36**, 1900091, (2019).
34. Wang, J., Lou, L. and Qiu, J. "Super-tough hydrogels using ionically crosslinked networks," *Journal of Applied Polymer Science*, **136**, 48182, (2019).
35. Lou, L., Wang, J. and Ramkumar, S. "Optimization of testing parameters for tensile property evaluation of poly (vinyl alcohol) nanofibers webs," *Journal of Applied Polymer Science*, **136**, 47159.
36. Lou, L.H., Qin, X.H. and Zhang, H. "Preparation and study of low-resistance polyacrylonitrile nano membranes for gas filtration," *Textile Research Journal*, **87**, 208-215, (2017).

Conference Proceedings (Reviewed)

1. Dong, D., Lou, L., Agarwal, A. and Bhansali, S. "Direct Observation of Reversible Surface Potential in Pseudocapacitive Electrochromic Films by Kelvin Probe Force Microscopy," In *Electrochemical Society Meeting*, Online, (Aug. 2024).
2. DeForest, T.E., Bhansali, S., Urban III, F.K., Dong, D., Lou, L., Agarwal, A., Pinzon, S., Derby, B., Valdez, J., Uberuaga, B. and Kreller, C.R. "Exploring the Dielectric Properties of Lanthanide Oxide Thin Films," In *Electrochemical Society Meeting Abstracts 244*, Online, (May. 2023).
3. Dolmetsch, T., Paul, T., Lou, L., Boesl, B. and Agarwal, A. "Deformation mechanisms of hierarchically structured 2D single-crystal materials revealed by real-time high-resolution in-situ nanomechanical testing," In *Engineering Conferences International (ECI)*, Online, (Oct. 2022).
4. Paolino, L., Lou, L., Rubfiaro, A.S., He, J. and Agarwal, A. "Nanomechanical Properties of Engineered Cardiomyocytes Under Electrical Stimulation," In *FIU MME Undergraduate Research Symposium*, Online, (Oct. 2021).
5. Bifano, T.G., Chen, C.S., Li, H., Sundaram, S., Hu, R., Lou, L., Sanchez, F., McDonald, W., Agarwal, A. "Dynamic Control of Contractile Force in Engineered Heart Tissue," In *TechRxiv*, Online, (Jul. 2021)
6. Lou, L. and Ramkumar, S. "Functional nanoparticle/nanofiber composite webs in environmental protection and human health applications," In *TAPPICon Virtual 2021*, Online. (May. 2021)

Book Chapters

1. Lou, L., Yu, W. and Ramkumar, S. "Wearable and smart responsive textiles," *High Performance Technical Textiles*, pp.439-473, (2019).

PRESENTATIONS

1. Sumit Kolte, Vinayak Vijayan *, Lihua Lou *. Assessment of Auxetic and Nanocomposite Designs for Mimicking Natural Intervertebral Disc Behavior. (Presentation) The 6th International Electronic Conference on Applied Sciences; Session: Nanosciences, Chemistry and Materials Science (December 9 – 11, 2025).
2. Ashfaqul Hoque Khadem, Lihua Lou *. A Predictive Framework for Investigating Nanoscale Elastic Modulus in PVDF/Fe3O4 Nanocomposite Fibers. (Presentation) The 6th International Electronic Conference on Applied Sciences; Session: Nanosciences, Chemistry and Materials Science (December 9 – 11, 2025).
3. Sumit Kolte, Vinayak Vijayan, Lihua Lou *. Application of Polymer Nanocomposites in the Design of Prosthetic Sockets that Feature Auxetic Meta-Structures. (Presentation) The 6th International Electronic Conference on Applied Sciences; Session: Nanosciences, Chemistry and Materials Science (December 9 – 11, 2025).
4. Aditya Chauhan *, Ashfaqul Hoque Khadem, Lihua Lou *. Cerium Oxide Enhanced Electrospun PVDF Nanofibers: Nanoscale Surface Mapping Towards Biomedical Scaffold Development. (Poster) The 6th International Electronic Conference on Applied Sciences; Session: Nanosciences, Chemistry and Materials Science (December 9 – 11, 2025).
5. *Isaac, L., *Charlette, A., *Basik, K., *Conte, M., *Lemmon, S., *Johnson, A., *Davis, W., Vijayan, V., Lou, L. (2025, April). Integrating Biomechanical Mimicry in 3D-Printed Scaffolds for Anterior Cruciate

Ligament Reconstruction. Poster presentation at Clemson University 20th Annual Focus on Creative Inquiry Forum, Clemson, SC.

6. Murickan, R. T. “High cycle shape memory performance evaluation of GNP-reinforced polyurethane electrospun membranes based on a novel constrained shape recovery approach,” 2025 TMS Annual Meeting & Exhibition (March 2025).
7. Lou, L., “Mechanistic Insights into the Structural and Mechanical Properties of Quantum Dot-Doped Nanofibers,” The 5th International Electronic Conference on Applied Sciences (December 2024) **Invited Speaker.**
8. Lou, L., “Advanced EMI Shielding with Quantum Dots and 2D Nanomaterial Enhanced Dual Polymer Fiber Films,” AVS70 conference (November 2024) **ASED Young Investigator Award Finalist**
9. Lou, L., “Shining a Light on Quantum Dots Incorporated Electrospun Nanofibers: Branching and Reinforcement Mechanisms,” 2024 TMS Annual Meeting & Exhibition (March 2024).
10. Lou, L., “Advancing Towards Single HiPSC-CM Mechanics and Functions,” 2023 CELL-MET Industry and Community Days (October 2023).
11. Lou, L., “Exploring Single Electrospun PLGA Fiber Mechanics and Fiber Mat Applications in Cardiac Bioengineering,” MS&T22: Materials Science & Technology, Society for Biomaterials: Biomaterial Applications (October 2022).
12. Lou, L., “Biomanufacturing ultrastructure cardiac tissue with capillary-scale vasculature,” 2022 CELL-MET Industry and Community Days (November 2022).
13. Lou, L., “The Function of Electrical Stimulation on Cardiomyocyte Tissue's Mechanics”, FIU MME Graduate Seminar (November 2021).
14. Lou, L., “Modular cyclic electrical and mechanical stimulation setup,” 2021 CELL-MET Industry and Community Days (November 2021).
15. Lou, L., “The Function of Electrical Stimulation on Cardiomyocyte Tissue's Beating Mechanics Measured by Image Analysis,” 2021 BMES Annual Meeting (October 2021).
16. Lou, L., “Functional Nanoparticle/nanofiber Composite Webs in Environmental Protection and Human Health Applications,” TAPPICon Virtual Event 2021 (May 2021).
17. Lou, L., “Functional Nanofiber Substrates,” TAPPI PaperCon May 2019 meeting (May 2019).
18. Lou, L., “Functional Nonwoven in Crude Oil Removal,” West Texas Agricultural Employer Forum (February 2019). **Invited Speaker.**
19. Lou, L., “Visible Light Photocatalytic,”17th TTU Annual Graduate School Meeting (April 2018).
20. Lou, L., “Nanofibers for Dye Pollutant Degradation,” 2018 regional SETAC meeting (April 2018).
21. Lou, L., “Nanofibers for Human Health Applications,” 2018 Texas Tech Annual Biological Sciences Symposium (TTABSS) (March 2018).
22. Lou, L., “Air pollutions Around the World,” 2017 regional SETAC meeting (April 2017)
23. Lou, L., “Nanofibers for Air Filtration. 2017 Texas Tech Annual Biological Sciences Symposium (TTABSS) (March 2017).
24. Lou, L., “Study of tensile strength of electrospinning PAN nanofiber membranes,” 2015 Annual Shanghai Graduate Student Academic Innovation Forum of Fashion and Textile & The ninth International Innovation Forum of Textile & Clothing” (2015)
25. Lou, L., “Electrospun PAN nanofibrous membranes for gas filtration.” DHU-KIT Symposium for Material and Research in Textile & Fashion (July 2015)

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