Han Xu

Assistant Professor

Department of Industrial, Manufacturing and Systems Engineering

Texas Tech University

Education

08/2018 - 05/2023 **Ph.D. in Industrial and Systems Engineering, University of Southern California**
Field of Research: Additive Manufacturing
Dissertation: Motion-Assisted Vat Photopolymerization: An Approach to High-Resolution Additive Manufacturing

08/2016 - 05/2018 **M.S. in Aerospace and Mechanical Engineering, University of Southern California**
Field of Research: Computer Vision, Collaborative Robot, Additive Manufacturing

08/2012 - 06/2016 **B.E. in School of Mechanical Science & Engineering, Huazhong University of Science and Technology**
Thesis: Design of a Large Diameter Hydraulic Steel Cable Cutter Based on Remote Operated Vehicle

Professional Experience

08/2025 - Present Assistant Professor, Department of Industrial, Manufacturing, and Systems Engineering, Texas Tech University

06/2023 - 06/2025 Postdoctoral Research Associate, Department of Aerospace & Mechanical Engineering, University of Southern California

08/2019 - 05/2023 Doctoral Research Assistant, Department of Industrial & Systems Engineering, University of Southern California

08/2021 - 12/2022 Doctoral Teaching Assistant, Department of Aerospace & Mechanical Engineering, University of Southern California

03/2014 - 05/2016 Undergraduate Research Assistant, Huazhong University of Science and Technology University, China

Awards and Honors

06/2021 **Best Paper Award**, ASME 2021 Manufacturing Science and Engineering Conference (MSEC2021), Virtual Conference, Hosted by the University of Cincinnati

08/2018 **Viterbi Graduate School Ph.D. Fellowship**, University of Southern California

Biography

Han Xu is an Assistant Professor in the Department of Industrial, Manufacturing, and Systems Engineering at Texas Tech University. His research focuses on microscale additive manufacturing. His research aims to advance additive manufacturing for smart device applications, including optical components, microsensors, and soft actuators. He earned his Ph.D. in Industrial and Systems Engineering from the University of Southern California in 2023. Before he joined TTU, he was a Postdoc researcher at the University of Southern California. He has published nine journal papers in high-impact journals, including Small and IJEM. He has also published five conference papers and was awarded the ASME 2021 Manufacturing Science and Engineering Conference Best Paper Award.

Research Interests

My primary area of interest is microscale additive manufacturing technologies and their applications. I focus on advancing high-resolution processes and material systems through interdisciplinary approaches combining robotics, soft lithography, and materials science. My work involves the development of advanced manufacturing processes for functional materials, including liquid metals and thermoset polymers, enabling applications in flexible electronics and wearable devices. I also explore volumetric printing methods using spatial light modulation to enhance microscale resolution, as well as scaffold fabrication for biomedical applications such as bone regeneration. In a word, my goal is to expand the capabilities of additive manufacturing for next-generation smart devices and engineered systems.

Publications

Journal Articles:

1. **Han Xu**, Qizhou Li, Shangxiong Zhang, Changyuan Pu, Yizhu Chen and Yong Chen, "Feature-oriented Vibrations in LCD-based Vat Photopolymerization." ***Journal of Manufacturing Processes,*** *volume 148 30 August 2025, Pages 224-236 DOI:10.1016/j.jmapro.2025.05.034* (IF:6.1)
2. **Han Xu**, Renzhi Hu, Shuai Chen, Junhong Zhu, Chi Zhou and Yong Chen. “Vibration-assisted Vat Photopolymerization for Pixelated-aliasing-free Surface Fabrication.” **International Journal of Extreme Manufacturing,** 2024 (DOI 10.1088/2631-7990/ad2e14) (IF:14.7)
3. **Han Xu**, Shuai Chen, Renzhi Hu, Muqun Hu, Yang Xu, Yeowon Yoon, and Yong Chen. “Continuous Vat Photopolymerization for Optical Lens Fabrication.” **Small**, 2023. (Selected frontispiece) (IF:13.3) (https://doi.org/10.1002/smll.202300517)
4. **Han Xu**, Shuai Chen, Huachao Mao, Fuyan Luo, and Yong Chen “A Numerically Controlled Shape Memory Alloy Wire Bending Process Using Vat Photopolymerization.” ***Journal of Manufacturing Processes***, 2020 (IF: 6.8) (https://doi.org/10.1016/j.jmapro.2020.04.027)

5. Chi Zhou, **Han Xu,** Yong Chen "Spatiotemporal Projection-Based Additive Manufacturing: A Data-driven Image Planning Method for Subpixel Shifting in a Split Second." ***Advanced Intelligent Systems, 2100079, 2021*** (IF: 7.1) (https://doi.org/10.1002/aisy.202100079)

6. Wenxuan Jia, Yuen-shan Leung, Huachao Mao, **Han Xu,** Chi Zhou, Yong Chen, "Hybrid-light-source Stereolithography for Fabricating Macro-objects with Micro-textures." ***ASME Journal of Manufacturing Science and Engineering***, 144(3), 031003, 2022. (IF:4.0) (https://doi.org/10.1115/1.4051831)

7. Ye Yang, Songwei Li, **Han Xu,** Yang Xu, and Yong Chen, "Fabrication of flexible microheater with tunable heating capabilities by direct laser writing and selective electrodeposition." ***Journal of Manufacturing Processes***, 74, 88-99, 2022. (IF:6.8) (https://doi.org/10.1016/j.jmapro.2021.11.045)

8. Chengqian Zhang, Xiangjia Li, Laiming Jiang, Daofan Tang, **Han Xu,** Peng Zhao, Jianzhong Fu, Qifa Zhou, and Yong Chen, "3D Printing of Functional Magnetic Materials: From Design to Applications." **Advanced Functional Materials**, 2102777, 2021. (IF:19.0) (https://doi.org/10.1002/adfm.20210277)

9. Xiangjia Li, Weitong Shan, Yang Yang, Dylan Joralmon, Yizhen Zhu, Yiyu Chen, Yuan Yuan, **Han Xu**, Jiahui Rong, Rui Dai, Qiong Nian, Yang Chai, and Yong Chen, "Limpet Teeth Inspired Painless Microneedles Fabricated by Magnetic Field Assisted 3D Printing." ***Advanced Functional Materials***, 31(5), 2003725, 2021. (IF:19.0) (https://doi.org/10.1002/adfm.202003725)

Conference papers:

1. **Han Xu,** Shuai Chen, Huachao Mao, Fuyan Luo, Yong Chen, "A Numerically Controlled Shape Memory Alloy Wire Bending Process Using Vat Photopolymerization." Proceeding of 48th SME North American Manufacturing Research Conference, NAMRC48, Cincinnati, Ohio, June 22-26, 2020. (forward to Journal of Manufacturing Process)

2. **Han Xu**, Yingkai Xia, Guohua Xu, Gang Liu, Guanxue Wang, "Dynamic Attitude Measurement of Underwater Parallel Robot Based on Integrated Measurement System." The Twenty-fifth International Ocean and Polar Engineering Conference, Kona, Hawaii, USA, June 2015. Paper Number: ISOPE-I-15-293

3. Wenxuan Jia, Yuen-shan Leung, Huachao Mao, **Han Xu,** Chi Zhou, Yong Chen, "Hybrid-light-source Stereolithography for Fabricating Macro-objects with Micro-textures." Proceeding of the 2021 International Manufacturing Science and Engineering Conference, MSEC2021-63717, Cincinnati, Ohio, June 21-25, 2021 (Best Paper Award). (forward to Journal of Manufacturing Process)

4. Guohua Xu, Yingkai Xia, Kan Xu, Zhilin Zeng, **Han Xu**, "Leveling Control of Underwater Platform Based on Sliding Mode Controller." The Twenty-fourth International Ocean and Polar Engineering Conference, Busan, Korea, June 2014. Paper Number: ISOPE-I-14-212

5. Guohua Xu, Yin Zhao, Kan Xu, **Han Xu,** Zhouji Cheng " A Speed Measurement Method for Underwater Vehicle Based on Pulse Speedometer and Accelerometer." The Twenty-third International Offshore and Polar Engineering Conference, Anchorage, Alaska, June 2013. Paper Number: ISOPE-I-13-262

Patents

1. Guohua Xu, Shiyang Zhu, Kui Jing, **Han Xu**, and Minghui Huang. An emergency system for an underwater operation platform, granted by State intellectual Property Office of the P.R.C. 2014
   Patent number: ZL 2014 2 0508109.1

2. Guohua Xu, Kui Jing, Ying Chen, Gang Liu, **Han Xu** and Shiyang Zhu. A ballast water tank intake and drainage control system and control method for an underwater operation platform, granted by State intellectual Property Office of the P.R.C. 2014
   Patent number: ZL 2014 2 0508335.X

3. Guohua Xu, Yinkai Xia, Chuncheng Zhao, Zensheng Ji, Ze He, and **Han Xu**. The simulation system of the underwater platform based on semi-physical simulator, granted by State intellectual Property Office of the P.R.C. 2014
   Patent number: ZL 2014 2 0533048.4

4. Guohua Xu, Chuncheng Zhao, Jian Bi, **Han Xu**, Ying Chen, and Ze He. A tension leg platform submergence control system for underwater use, granted by State intellectual Property Office of the P.R.C. 2014
   Patent number: CN 20140522219.8

Presentations and Talks

1. Onsite Job talk – Feb 2025, Department of Industrial, Manufacturing and System Engineering, Texas Tech University.
2. Onsite Job talk – Feb 2025, Oklahoma State University.
3. Guest Lecture - April 2024, AME-504 Mechatronic Systems Engineering, University of Southern California, Los Angeles, CA.
4. Seminar Talk - January 2024, Huazhong Agricultural University, China.
5. Seminar Talk - December 2023, South China University of Technology, China.
6. Seminar Talk - December 2023, Hongkong University of Science and Technology (Guangzhou), China.
7. Guest Lecture - November 2023, AME-504 Mechatronic Systems Engineering, University of Southern California, Los Angeles, CA.
8. Ph.D. Dissertation Defense - April 2023, University of Southern California, Los Angeles, CA.
9. Guest Lecture - November 2022, ISE-511 Mechatronic Systems Engineering, University of Southern California, Los Angeles, CA.

10. Selected Doctoral Symposium Speaker - June 2022, ASME 2022 Manufacturing Science and Engineering Conference (MSEC2022), West Lafayette, Indiana, Hosted by Purdue University.
11. Guest Lecture - October 2021, ISE-511 Mechatronic Systems Engineering, University of Southern California, Los Angeles, CA.
12. Conference Presentation - June 2021, 49th SME-North American Manufacturing Research Conference (NAMRC49), Virtual (hosted by the University of Cincinnati).
13. Poster Presentation - April 2019, 2019-Epstein Institute Research Festival, University of Southern California, Los Angeles, CA.
14. Conference Presentation - June 2014, The Twenty-fourth International Ocean and Polar Engineering Conference, Busan, Korea, June 2014

Teaching Experience

Fall 2022	Teaching Assistance of Mechatronic Systems Engineering (ISE511)
Spring 2022	Teaching Assistance of Mechatronic Systems Engineering (ISE511)
Fall 2021	Teaching Assistance of Mechatronic Systems Engineering (ISE511)

Services

Conference Volunteer: ASME/MESC 2018

Skills and Competencies

Language:	English, Mandarin
Programming:	C/C++, Matlab, Python, R, Java, GCode, PLC