

Ruitao Su

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Work

Yongjiang Lab

Leader of AFAM Group	Research Scientist	2022 – 2024
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Zhengzhou University

School of Mech. and Power Eng.	Associate Professor	2022 – 2024
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Massachusetts Institute of Technology

CSAIL	Postdoctoral Associate	2021 – 2022
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University of Minnesota

Department of Mechanical Engineering	Postdoctoral Associate	2020 – 2021
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Education

University of Minnesota	Ph.D. in Mechanical Engineering	Oct. 2020
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Minneapolis, MN, US

➤ Best Dissertation Award: 3D Printing Multifunctional Optoelectronic and Microfluidic Devices

University of Cincinnati	M.S. in Mechanical Engineering	July 2015
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Cincinnati, OH, US

Huazhong University of Sci. and Tech.	B.S. in Mechanical Engineering	July 2013
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Wuhan, Hubei, China

Grants

- The Mechanism of 3D Printing Thixotropic Fluids for Thin-Shell Structures, National Science Foundation of China Youth Program, Host, 2024-2026
- 3D Printing Thin-Shell Structures for the Encapsulation of Electronic Devices, China Postdoctoral Science Foundation, Host, 2024-2025
- 3D Printing Multifunctional Microscale Thin Structures, Henan “Zhongyuan Talents” Program, Host, 2023-2025
- CAD Cloud Architecture Technology for Product Co-Design in a Ubiquitous Computing Environment, National Program on Key Research Project Youth Program, Ministry of Science and Technology, Joint, 2023-2025

Publications

Peer-Reviewed Articles

- **R. Su**, F. Wang, M. C. McAlpine, 3D Printed Microfluidics: Advances in Strategies, Integration, and Applications, *Lab on a Chip* **23**, 1279-1299 (2023)
- **R. Su**, S. H. Park, X. Ouyang, S. I. Ahn, M. C. McAlpine, 3D Printed Flexible Organic Light-Emitting Diode Displays, *Science Advances* **8**, eabl8798 (2022)
 - Highlighted: *Nature* (2022). DOI: 10.1038/d41586-022-00043-4
- X. Ouyang, **R. Su**, G. Han, D. W. H. Ng, D. R. Pearson, M. C. McAlpine, 3D Printed Skin-Interfaced UV-Visible Photodetectors, *Advanced Science* **9**, 2201275 (2022)
- **R. Su**, J. Wen, Q. Su, M. S. Wiederoder, S. J. Koester, J. R. Uzarski, M. C. McAlpine, 3D Printed Self-Supporting Elastomeric Structures for Multifunctional Microfluidics, *Science Advances* **6**, eabc9846 (2020)

- S. H. Park* (co-first), **R. Su*** (co-first), J. Jeong, S.-Z. Guo, K. Qiu, D. Joung, F. Meng, M. C. McAlpine, 3D Printed Polymer Photodetectors. *Advanced Materials* **30**, 1803980 (2018)
 - Highlighted: *Nature* (2018). DOI: 10.1038/d41586-018-06193-8
- K. Qiu, Z. Zhao, G. Haghighashtiani, S.-Z. Guo, M. He, **R. Su**, Z. Zhu, D. Bhuiyan, P. Murugan, F. Meng, S. H. Park, C.-C. Chu, B. M. Ogle, D. A. Saltzman, B. R. Konety, R. M. Sweet, M. C. McAlpine, 3D Printed Organ Models with Physical Properties of Tissue and Integrated Sensors. *Advanced Materials Technologies* **3**, 1700235 (2017)
- G. Hou, D. Chauhan, V. Ng, C. Xu, Z. Yin, M. Paine, **R. Su**, V. Shanov, D. Mast, M. Schulz, Y. Liu, Gas Phase Pyrolysis Synthesis of Carbon Nanotubes at High Temperature. *Materials and Design* **132**, 112-118 (2017)
- G. Hou, **R. Su**, A. Wang, V. Ng, W. Li, Y. Song, L. Zhang, M. Sundaram, V. Shanov, D. Mast, D. Lashmore, M. Mark, Y. Liu, The effect of a convection vortex on sock formation in the floating catalyst method for carbon nanotube synthesis. *Carbon* **102**, 513–519, (2016)

Book Chapter

- **R. Su**, S. H. Park, Z. Li, M. C. McAlpine, “3D Printed Electronic Materials and Devices,” in *Robotic Systems and Autonomous Platforms: Advances in Materials and Manufacturing*. Eds: S. M. Walsh, M. S. Strano. CH 13 (Woodhead, Cambridge, 2019)

Conference Proceeding

- J. R. Uzarski, M. S. Wiederoder, C. Luckhardt, R. Paffenroth, **R. Su**, M. C. McAlpine, Novel data science driven chemical and biological agent sensors: towards better discrimination in complex environments, *18th International Meeting on Chemical Sensors*, Montreal, Canada (2020)

Patents

- M. C. McAlpine, X. Ouyang, D. Pearson, **R. Su**, “Photodetectors for Measuring Real-Time Optical Irradiance,” US Patent Application 18/874,948. International Patent Application WO2023/244975A2.
- M. C. McAlpine, **R. Su**, S. H. Park, “Organic Light-Emitting Diode (OLED) Display and Methods of Fabrication Using a Multimodal Three-Dimensional (3D) Printing Technique,” US Provisional Patent Application 63/247,358. International Patent Application PCT/US22/44322.
- M. C. McAlpine, **R. Su**, S. J. Koester, J. R. Uzarski, “Additively Manufactured Self-Supporting Microfluidics,” U.S. Patent US 11,820,061 B2. International Patent Application PCT/US2020/061072.
- E. Crist, D. K. Wood, **R. Su**, M. C. McAlpine, “Three-Dimensional Microfluidic Metastasis Array,” U.S. Patent Application 18/556,529. International Patent Application PCT/US22/71843.

Presentations

Talks

- “3D Printing Optoelectronic Materials and Devices” Mar. 2022
Invited talk on the KLA Instruments Display Materials Technology Asia Symposium
- “3D Printed Microfluidics with Applications in Drug Screening and Oncology Research” Sep. 2021
Invited talk on the “6th Annual 3D Tissue Models Summit” (Boston, MA)
- “3D Printed Self-Supporting Elastomeric Microfluidics with Yield-Stress Polymers” May 2021
Invited seminar presentation at Korea Institute of Industrial Technology (Online)
- “3D Printed Flexible Organic Light Emitting Diode Displays” Dec. 2021
Presentation in Materials Research Society (Boston, MA)
- “3D Printed Self-Supporting Elastomeric Structures for Multifunctional Microfluidics” Nov. 2020
Presentation in Materials Research Society (Online)
- “3D Printed Polymer Photodetector” Nov. 2018

Posters

- “3D Printed LED and Photodetectors” July 2019
Poster on Purdue Mi-Bio Summit on Flexible and Stretchable Bioelectronics (West Lafayette, IN)
- “3D Printed Silicon Nanocrystal LED” Mar. 2017
Poster on NSF MnDRIVE Symposium (Minneapolis, MN)

Awards

- Pui Best Dissertation Award** Sep. 2022
University of Minnesota
- Best Dissertation Award** Apr. 2021
Department of Mechanical Engineering of UMN
- MRS Best Presentation Award** Dec. 2020
Material Research Society, Additive Manufacturing Symposium
- MRS Graduate Student Silver Award** Nov. 2018
Material Research Society (<https://www.mrs.org/gsa-past>)
- Outstanding Research Award** July 2015
Nanoworld Lab at the University of Cincinnati
- National Encouragement Scholarship** Oct. 2010
Ministry of Education of the People's Republic of China
- Excellent Freshman Study Scholarship** Apr. 2010
Mechanical School of HUST

Academic Services

- **Journal topic editor:** *Micromachines* (since 2021)
- **Journal Youth Editorial Committee:** *Additive Manufacturing Frontiers* (since 2023)
- **Journal reviewer:** *Nature Communications*, *Communications Engineering*, *MRS Advances*, *Journal of Materials Chemistry C*, *ACS Applied Materials & Interfaces*, *npj Flexible Electronics*, *PLOS ONE*

Teaching & Leadership

- **Mentorship:** 2017 Summer NSF MRSEC undergrad researcher: Nicholas Fuhr
- **Guest lecturer:** Introduction to Nanoscience (2021 Fall, Virginia Commonwealth University), Biofabrication (2021 Spring, University of Nebraska-Lincoln), Introduction to Nanotechnology (2019 Fall, University of Minnesota)
- **Teaching assistant:** Vibration Engineering (University of Minnesota), Kinematics and Kinetics of Machines, Structural Mechanics, Engineering Economics (University of Cincinnati)
- **Lab safety officer** of the McAlpine Research Lab at University of Minnesota (2017 – 2020)
- **Secretary** of ME Grad Student Council, University of Minnesota (2017 – 2019)
- **Volunteer supervisor** of environmental protection nonprofit – Great River Greening (2017)

Press Report

- “Print job completed: a bendable image display,” *Nature Research Highlight*, Jan. 2022
- “How microfluidics can automate drug discovery and development,” *Drug Target Review*, May 2021
- “3D printing microfluidic channels for medical testing,” *National Academy of Engineering Frontier of Engineering*, Jan. 2021
- “Eyes, wasps and asteroid dust — August’s best science images,” *Nature News*, Sep. 2018

- “12 innovations that will revolutionize the future of medicine,” *National Geographic*, Dec. 2018