Bujingda Zheng

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Education

University of Missouri | Columbia MO, US
- **Doctor of Philosophy**, **Mechanical and Aerospace Engineering** | 01/2020 – 05/2024
- **Minor in Statistics** | 01/2020 – 02/2023
  School of Engineering

The University of Melbourne | Melbourne, Australia
- **Master of Engineering** (*with Distinction*), **Mechanical Engineering** | 07/2016 – 07/2018
  School of Engineering

Northwestern Polytechnical University | Xi'an, China
- **Bachelor of Engineering, Aircraft Manufacturing Engineering** | 09/2012 – 07/2016
  School of Mechanical Engineering

Research interests

3D Electronics, Robotics, Computer vision, Embedded System, Additive Manufacturing

Research Outcomes

Submitted:

- **Zheng, B.**, Xie, Y., Xu, S., Meng, A.C., Wang, S., Wu, Y., Yang, S., Wan, C., Huang G., Tour, J.M., and Lin, J. (2024) Programmed Multimaterial Assembly by Synergized 3D Printing and Freeform Laser Induction. ***Nature Communications*** (under review) IF-16.6

  Impacts: pioneering use of FDM, DIW 3D printing, and freeform laser induction for programmable multimaterial assembly in robotics and electronics applications, with significant impact in both academic and industrial domains.

  My contributions: project leader, hybrid manufacturing platform mechanical & control system development, sensor fabrication, material synthesis & characterization.

- Yang, S., **Zheng, B.**, Qian H., Zhang H., Yan Q., Huang G., Lin, J., Wan, C. (2023) Low-defect Laser-induced Graphene from Lignin for Smart Triboelectric Touch Sensors. ***Small*** (under review) IF-13.3

  My contributions: wireless sensors fabrication and data analysis.

Published:

- Wu, Y., Su, C., Wang, S., **Zheng, B.**, Mahjoubnia, A., Sattari, K., Zhang, H., Meister, J., Huang, G. and Lin, J., (2023). A photocured Bio-based shape memory thermoplastics for reversible wet adhesion. ***Chemical Engineering Journal***. IF-16.7

  My contributions: wireless sensors fabrication and data analysis.

- **Zheng, B.**, Zhao, G., Yan, Z., Xie, Y., & Lin, J. (2022). Direct Freeform Laser Fabrication of 3D Conformable Electronics. ***Advanced Functional Materials***. IF-19.4

  Impacts: since its invention in 2014, this research has enhanced the LIG fabrication process, enabling

conformal fabrication and unlocking potential applications across diverse fields.

My contributions: project leader, 5-DOF laser manipulator mechanical & control system development, sensor fabrication, statistical analysis, and AI model implementation.

- **Zheng, B.**, Su, J. W., Xie, Y., Miles, J., Gao, W., Xin, M., & Lin, J. (2022). An Autonomous Robot for Shell and Tube Heat Exchanger Inspection. ***Journal of Field Robotics***. IF-8.3

  Impacts: innovative application of autonomous robots and deep learning models for heat exchanger inspection.

  My contributions: project leader, 7-DOF autonomous robot mechanical & control system development, data collection and statistical analysis, real-time AI model implementation.

- Xie, Y., Zhang, C., Deng, H., **Zheng, B.**, Su, J. W., Shutt, K., & Lin, J. (2021). Accelerate Synthesis of Metal–Organic Frameworks by a Robotic Platform and Bayesian Optimization. ***ACS Applied Materials & Interfaces***. IF-9.5

  My contributions: paper co-author, 3-DOF robotic system development, control algorithm development

- Qiu, F., Bu, K., **Zheng, B.**, & Tian, G. (2020). Control of edge plate stray grain of single-crystal turbine blade by using process bar method. ***International Journal of Metalcasting***. IF-2.6

  My contributions: paper co-author, casting mold design, statistical analysis.

Under preparation:

- **Zheng, B.**, Xie, Y., & Lin, J. Assembly-free robots Fabricated by 3D Printing and Spatial Laser Induction. (2024).
- Xie, Y., Xu, S., Meng, A., **Zheng, B.**, Chen, Z., Tour, J.M., & Lin, J. Laser-Induced High-Entropy Alloys as Long-Duration Bifunctional Electrocatalysts for Seawater Splitting. (2024).
- Wu, Y., **Zheng, B.**, Chen, Z., Tour, J.M., & Lin, J. Sustainable shape memory polymer for metamaterial and 3D printing. (2024).
- Yang, S., **Zheng, B.**, Wan, C., & Lin, J. LIG. Full-LIG wireless sensor for bio-data collection (2024).

Presentation:

- **Zheng, B.**, & Lin, J. *ASME IDETC-CIE 2023.* Fabrication of 3D conformable electronics on arbitrary curvilinear surfaces by direct freeform laser technique. (2023)
- **Zheng, B.** *Annual SME Student Night presentation.* Freeform Multimaterial Assembly via 3D printing and spatial laser induction. (2023)

Patent

Programmed Multimaterial Assembly via 3D Printing and Freeform Laser Induction: apparatus and methods of use thereof — Status: **Ongoing**

Teaching experience

Teaching assistant (TA) of (MAE 3800) Instrumentation and measurement Lab | 08/2020 – 05/2021
Teaching assistant (TA) of (MAE 4825) Materials and Manufacturing Lab | 08/2021 – 05/2023

Grant writing

Co-author of a proposal funded by the National Science Foundation (NSF).

Honors & Awards

ASME IDETC-CIE Conference travel award	8/2023
SME student's night best presentation award	5/2023
Mizzou Graduate Fellowship	1/2020
Awarded with the degree of Master of Engineering with Distinction	7/2018
2nd Class Scholarship of School of Engineering in NPU	9/2015
2nd place in Navigation Cup Competition	8/2015
2nd Class Scholarship of School of Engineering in NPU	9/2014

Professional skills

Embedded system	Arduino, ESP32, ESP8266, Raspberry Pie
System integration	5-yr experience in designing and manufacturing robotic system, computer vision system and hybrid manufacturing platform.
Coding	9-yr experience with MATLAB, Python, R, C++
Artificial Intelligence	Machine learning, deep learning, and reinforcement learning
Manufacturing	FDM, SLA, DLP, LCD 3D printing MeshCAM, PowerMill, GD&T, CNC machining
Computer Aided Design	10-yr experience with SolidWorks, NX and AutoCAD
Numerical Analysis	ODE/PDE systems with numerical methods
FEM Analysis	Abaqus, COMSOL Multi physics

Reference list

Dr. Jian Lin (Ph.D. advisor)
Email: linjian@umsystem.edu

Dr. Zheng Yan (project collaborator)
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Dr. Ming Xin (project collaborator)
Email: xin@umsystem.edu