Curriculum Vitae

Zhijian Ren

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RESEARCH INTERESTS

- **Soft Robotics, Micro Robotics, Control**

EDUCATION

- **B.S. Shanghai Jiao Tong University (SJTU)**, Shanghai, China

  Department of Automation (September 2013 – August 2018)

- **M.S. Carnegie Mellon University (CMU)**, Pittsburgh, PA, USA

  Department of Mechanical Engineering (August 2018 – May 2020)

- **Ph.D. Massachusetts Institute of Technology (MIT)**, Cambridge, MA, USA

  Department of Electrical Engineering and Computer Science (June 2020 – Present)

PUBLICATIONS

Journal articles

- **Z. Ren,** S. Kim, X. Ji, W. Zhu, F. Niroui, J. Kong, and Y. Chen, "High Lift Micro-Aerial-Robot Powered by Low Voltage and Long Endurance Dielectric Elastomer Actuators," *Advanced Materials*, p. 2106757, 2022. **(Cover Article)**

- Y. Chen, C. Arase, **Z. Ren**, and P. Chirarattananon, "Design, Characterization, and Liftoff of an Insect-Scale Soft Robotic Dragonfly Powered by Dielectric Elastomer Actuators," *Micromachines*, 13(7), 1136, 2022

- X. Huang, Z.J. Patterson, A.P. Sabelhaus, W. Huang, K. Chin, **Z. Ren**, M.K. Jawed, and C. Majidi, "Design and Closed-Loop Motion Planning of an Untethered Swimming Soft Robot Using 2D Discrete Elastic Rods Simulations," *Advanced Intelligent Systems*, 2200163.

- Y. Chen, S. Xu, **Z. Ren,** P. Chirarattananon, "Collision resilient insect-scale soft-actuated aerial robots with high agility," *IEEE Transactions on Robotics*, vol. 37, no. 5, pp. 1752–1764, 2021. **(Best Paper)**

- **Z. Ren,** M. Zarepoor, X. Huang, A. P. Sabelhaus, C. Majidi, "Shape Memory Alloy (SMA) Actuator with Embedded Liquid Metal Curvature Sensor for Closed-Loop Control," *Frontiers in Robotics and AI,* vol.8, pp. 9, 2021.

Conference papers

- X. Huang, W. Huang, Z. Patterson, **Z. Ren**, M. K. Jawed and C. Majidi, "Numerical Simulation of an Untethered Omni-Directional Star-Shaped Swimming Robot," in 2021 IEEE International Conference on Robotics and Automation (ICRA), pp. 11884-11890. IEEE, 2021.

- Z. Masoud, **Z. Ren**, and C. Majidi, "Fabrication and Testing of a Soft Shape Memory Alloy Actuator With an Integrated Liquid Metal Sensor," in Smart Materials, Adaptive Structures and Intelligent Systems, vol. 84027, p. V001T04A028. American Society of Mechanical Engineers, 2020.

- X. Huang, **Z. Ren**, and C. Majidi, "Soft thermal actuators with embedded liquid metal microdroplets for improved heat management," in 2020 3rd IEEE International Conference on Soft

Robotics (RoboSoft), pp. 367-372. IEEE, 2020.

- **Z. Ren**, H. Wang, and W. Chen, "Frog-inspired hind limb for jumping robots," in 2017 IEEE International Conference on Robotics and Biomimetics (ROBIO), pp. 605-610. IEEE, 2017.

HONORS

- IEEE Transactions on Robotics King-Sun Fu Memorial Best Paper Award 04/2022
- MathWorks Engineering Fellowship 06/2021 and 06/2022
- Grass Instrument Company Fellowship 02/2020
- Outstanding Project Innovation Award 06/2017

SELECTED PRESS COVERAGE

- Adam Zewe. **"Giving bug-like bots a boost"**, MIT News, December 16, 2021.
- Daniel Ackerman. **"Researchers introduce a new generation of tiny, agile drones"**, MIT News, March 2, 2021.

RESEARCH EXPERIENCE

- **Research Assistant, Soft and Micro Robotics Lab (SMRL), MIT**
  Design, fabrication, and control of insect-scale flapping wing flying robot powered by dielectric elastomer actuators (DEAs),
  Professor YuFeng (Kevin) Chen, June 2020 - Present
- **Research Assistant, Soft Machines Lab (SML), CMU**
  Liquid metal curvature sensor for enabling closed-loop control on soft robots,
  Professor Carmel Majidi, September 2018 – May 2020
- **Undergraduate Research, Autonomous Robot Lab, SJTU**
  Shape memory actuator for bio-inspired jumping robots,
  Professor Hesheng Wang and Professor Weidong Chen, February 2014 – June 2018

INTERNSHIP EXPERIENCE

- **Undergraduate Intern, Apple R&D (Beijing) Limited Shanghai Branch**
  Maintenance and improvement on an automation test system for Apple's products, including UR and Mitsubishi robotic arms and PLC stock system, February 2018 – August 2018

OUTREACH AND LEADERSHIP EXPERIENCE

- **Vice President of SJTU Racing Team,** September 2014 – June 2015
- **Volunteer for the Shanghai International Marathon,** March 2014

SERVICE

- Reviewer of *IEEE Robotics and Automation Letter (RAL)* – 2020, 2021, 2022, 2023
- Reviewer of *Frontiers in Robotics and AI* – 2022
- Reviewer of *IEEE International Conference on Robotics and Automation (ICRA)* – 2021, 2022
- Reviewer of *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)* – 2021
- Reviewer of *IEEE International Conference on Soft Robotics (RoboSoft)* – 2021