Yuhao Jiang

EPFL STI IGM RRL, MED 12313, Station 9 – CH-1015 Lausanne
+41 79 350 52 66 • yuhao.jiang@epfl.ch • yuhaoj.com
Last updated: Mar. 1, 2024

Research Statement

I seek to explore novel mechanisms and control strategies aimed at enhancing the accessibility, functionality, and reliability of soft reconfigurable modular robotic systems across a spectrum of challenging and unfamiliar environments. My research centers on using dynamic modeling methods, complemented by simulations and machine learning techniques, to study and develop novel mechanisms and advanced controls for soft robotic systems. Moreover, I actively engage in mentoring students, guiding them through the process of designing, modeling, prototyping, and testing cutting-edge robotic systems tailored for both locomotion and manipulation tasks.

Education

Arizona State University

Ph.D. in Mechanical Engineering *Jan. 2019 - Aug 2023*

Dissertation: Y. Jiang, "Design and Modeling of Soft Curved Reconfigurable Anisotropic Mechanisms," 2023

Advisor: Prof. Daniel Aukes

Committee: Prof. Spring Berman, Prof. Hyunglae Lee, Prof. Hamidreza Marvi, Prof. Siddharth Srivastava

University of Florida

Master of Science in Mechanical Engineering *Sep. 2015 - May. 2017*

Donghua University

Bachelor of Engineering in Mechanical Engineering *Sep. 2011 - Jun. 2015*

Professional Experience

Post-doctoral Researcher

Reconfigurable Robotics Lab, EPFL *Sep. 2023 - Present*

Student Mentoring and Teaching

Course Instructor

Course Name	Affiliation	Period
ME410: Mechanical Engineering Product Design and Development	STI, EPFL	Fall 2023

Master's Semester Project Advisor

Name	Topic	Program	Period
Louis Flahault	Kinematic study and design for spatial reconfigurable modular robotic platform	MS in Robotics	Spring 2024
Serge Asmar	Locomotion design and control using surface wave change generated by ori-pixel platform	MS in Robotics	Spring 2024
Aurora Ruggeri	Study on soft metamaterials for object sensing and geometry generation	MS in Mechanical Engineering	Spring 2024

Master's Thesis Advisor

Name	Topic	Program	Period
Nicolas Nouel	Programmable surface using bistable structure	MS in Robotics	Spring 2024

Publications

Google Scholar: Yuhao Jiang

- **Y. Jiang**, F. Chen and D. M. Aukes, "Tunable Dynamic Walking via Soft Twisted Beam Vibration," in IEEE Robotics and Automation Letters, vol. 8, no. 4, pp. 1967-1974, April 2023, https://doi.org/10.1109/LRA.2023.3244716.
- **Y. Jiang**, M. Sharifzadeh, and D. M. Aukes, "Reconfigurable Soft Flexure Hinges via Pinched Tubes," 2020 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2020, pp. 8843-8850, https://doi.org/10.1109/IROS45743.2020.9341109.

- **Y. Jiang**, M. Sharifzadeh, and D. M. Aukes, "Shape Change Propagation Through Soft Curved Materials for Dynamically-Tuned Paddling Robots," 2021 IEEE 4th International Conference on Soft Robotics (RoboSoft), 2021, pp. 230-237, https://doi.org/10.1109/RoboSoft51838.2021.9479208.
- M. Sharifzadeh, **Y. Jiang**, A. Lafmejani, D. M. Aukes, "Compensating for Material Deformation in Foldable Robots via Deep Learning – A Case Study," 2022 IEEE International Conference on Robotics and Automation (ICRA), 2022, https://doi.org/10.1109/ICRA46639.2022.9811752.
- M. Sharifzadeh, **Y. Jiang**, A. Lafmejani, K. Nichols, and D. M. Aukes, "Maneuverable gait selection for a novel fish-inspired robot using a CMA-ES-assisted workflow," in Bioinspiration & Biomimetics, vol. 16, no. 5, pp. 056017, August 2021, https://doi.org/10.1088/1748-3190/ac165d.
- M. Sharifzadeh, **Y. Jiang**, and D. M. Aukes, "Reconfigurable Curved Beams for Selectable Swimming Gaits in an Underwater Robot," in IEEE Robotics and Automation Letters, vol. 6, no. 2, pp. 3437-3444, April 2021, https://doi.org/10.1109/LRA.2021.3063961.
- Sharifzadeh, M, **Jiang, Y**, Khodambashi, R, & Aukes, D. "Increasing the Life Span of Foldable Manipulators With Fabric." Proceedings of the ASME 2020 International Design Engineering Technical Conferences and Computers and Information in Engineering Conference. Volume 10: 44th Mechanisms and Robotics Conference (MR). Virtual, Online. August 17–19, 2020. V010T10A087. ASME, https://doi.org/10.1115/DETC2020-22757.

Conference Talks

RoboSoft 2023:

- **Conference proceedings talk:**"Tunable Dynamic Walking via Soft Twisted Beam Vibration"
- **Workshop presentation:**"Model Order Reduction for Vibrational Soft Twisted Beams Using Pseudo-rigid-body Modeling – A Case Study", https://youtu.be/7g6SEwEBvhU.

ICRA 2022:

- **Conference proceedings talk:**"Compensating for Material Deformation in Foldable Robots Via Deep Learning – a Case Study", https://youtu.be/AwS4vabv-JQ.
- **Workshop presentation:**"Modular Robots Using Soft Curved Reconfigurable Anisotropic Mechanisms".

ICRA 2021:

- **Conference proceedings talk:**"Reconfigurable Curved Beams for Selectable Swimming Gaits in an Underwater Robot", https://youtu.be/EszTDc9slyw.

Robosoft 2021:

- **Conference proceedings talk:**"Shape Change Propagation Through Soft Curved Materials for Dynamically-Tuned Paddling Robots".

IROS 2020:

- **Conference proceedings talk:**"Reconfigurable Soft Flexure Hinges via Pinched Tubes", https://youtu.be/J5heXXD6mVo.

Patents

- "Pinched tubes for reconfigurable robots", Daniel Aukes, Mohammad SHARIFZADEH, **Yuhao JIANG**, Nicholas Gravish, Mingsong Jiang - US Patent App. 17/971,062, 2023;
- "Buckling beams for underwater and terrestrial autonomous vehicles", D Aukes, M Sharifzadeh, **Y Jiang** - US Patent App. 17/966,550, 2023;
- "Mechanisms for steering robotic fish", D Aukes, M Sharifzadeh, K Nichols, **Y Jiang** - US Patent 11,124,281, 2021;

Academic Services

Reviewer

- **Journal Reviewer:** Soft Robotics (SoRo), Journal of Field Robotics (JFR), IEEE Transactions on Robotics (T-RO), IEEE Robotics and Automation Letters (RA-L), ASME Journal of Mechanisms and Robotics (JMR).
- **Conference Reviewer:** IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), International Conference on Robotics and Automation (ICRA), International Conference on Soft Robotics (Robosoft), ACM Symposium on Computational Fabrication (SCF).

Organizing Workshops

- **Robosoft 2021 Workshop:** "Breaking the Mold: Challenging Current Paradigms in Soft Robotics", https://www.scrambots.com/robosoft-2021-workshop.