Qinglei Ji (PhD)

SUMMARY

- Expertise in AI and Control systems, with a proven history of concepting, leading, and performing R&D projects in multiple organizations.
- Experience with industrial product development approaches like Agile and Model-based Systems Engineering.

INTERESTS

I have a profound interest and insatiable curiosity in all facets of AI and Robotic Systems, keeping up-to-date with the latest academic and industrial advancements. My areas of focus include:

- Artificial Intelligence: Reinforcement learning, AI safety, and their applications in automated driving systems.
- Mechatronics: Intelligent control, simulation, robotics, sensors, and actuators.
- Systems Engineering: Requirement engineering, Model-based systems engineering.

EXPERIENCE

Solution Engineer (AI and Control Systems)
Volvo Cars Cooperation, Gothenburg   Nov 2022 - Present

Visiting Researcher (Mechatronics)
Peking University, Beijing   Apr 2017 - Feb 2018

Visiting Student Researcher (Mechanics)
King Abdullah University of Science and Technology, Thuwal   Jun 2016 - Oct 2016

EDUCATION

Doctor of Philosophy (Learning-based Robotics)
Kungliga Tekniska Högskolan, Stockholm   2022

Engineer's Degree and Master of Science (Aerospace Engineering)
École Nationale Supérieure de Mécanique et d'Aérotechnique, Poitiers   2018

Bachelor of Engineering (Aerospace Engineering)
Nanjing University of Aeronautics and Astronautics, Nanjing   2015

AWARDS

[5] Government Award for Outstanding Self-financed Students Abroad   2022
[4] Travel grant from the Karl Engvers foundation   2022
[3] PEGASUS Award for participating in Aerospace Educations, Europe   2018
[2] Regional Scholarship of Vienne, France   2017
[1] National Scholarship, China   2015

PUBLICATIONS

* Corresponding Author   † Equal Contribution

[18] **Ji, Q.***, Zhao C., & Feng, L. (2024). AI-based Control in 4D Printing *in* 4D printing roadmap. **Smart Materials and Structures**, 10.1088/1361-665X.

[17] Tan, K., Niu, X., **Ji, Q.**, Feng, L.*, & Törngren, M. (2024). Optimal Gait Design for a Soft Quadruped Robot via Multi-fidelity Bayesian Optimization. **arXiv**:2406.07065.

[16] Wang, L., Wang, X., **Ji, Q.**, Wang, L., & Jin, R.* (2023). Mutual Active Learning for Engineering Regulated Statistical Digital Twin Models. **IEEE Transactions on Industrial Informatics**.

[15] **Ji, Q.**, Jansson, J., Sjöberg, M., Wang, X. V., Wang, L., & Feng, L.* (2023). Design and calibration of 3D printed soft deformation sensors for soft actuator control. **Mechatronics**, 92, 102980.

[14] Tan, K., **Ji, Q.**, Feng, L.*, & Törngren, M. (2023). Edge-enabled Adaptive Shape Estimation of 3D Printed Soft Actuators with Gaussian Processes and Unscented Kalman Filters. **IEEE Transactions on Industrial Electronics**.

[13] **Ji, Q.**, Wang, X. V., Wang, L., & Feng, L.* (2022). Online reinforcement learning for the shape morphing adaptive control of 4D printed shape memory polymer. **Control Engineering Practice**, 126, 105257.

[12] Tan, K., **Ji, Q.**, Feng, L.*, & Törngren, M. (2022). Shape estimation of a 3D printed soft sensor using multi-hypothesis extended kalman filter. **IEEE Robotics and Automation Letters**, 7(3), 8383-8390.

[11] **Ji, Q.**, Chen, M., Wang, X. V., Wang, L., & Feng, L.* (2022). Optimal shape morphing control of 4D printed shape memory polymer based on reinforcement learning. **Robotics and Computer-Integrated Manufacturing**, 73, 102209.

[10] **Ji, Q.**, Fu, S., Tan, K., Muralidharan, S. T., Lagrelius, K., Danelia, D., ... & Feng, L.* (2022). Synthesizing the optimal gait of a quadruped robot with soft actuators using deep reinforcement learning. **Robotics and Computer-Integrated Manufacturing**, 78, 102382.

[9] **Ji, Q.**, Wang, X. V., Wang, L., & Feng, L.* (2022). Customized protective visors enabled by closed loop controlled 4D printing. **Scientific reports**, 12(1), 7566.

[8] **Ji, Q.***, Fu, S., Feng, L., Andrikopoulos, G., Wang, X. V., & Wang, L. (2022, October). Omnidirectional walking of a quadruped robot enabled by compressible tendon-driven soft actuators. In 2022 **IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)** (pp. 11015-11022). IEEE.

[7] Muralidharan, S. T., Zhu, R., **Ji, Q.***, Feng, L., Wang, X. V., & Wang, L. (2021, August). A soft quadruped robot enabled by continuum actuators. In 2021 IEEE 17th **International Conference on Automation Science and Engineering (CASE)** (pp. 834-840). IEEE.

[6] **Ji, Q.**, Chen, M., Zhao, C., Zhang, X., Wang, X. V., Wang, L., & Feng, L.* (2020). Feedback control for the precise shape morphing of 4D-printed shape memory polymer. **IEEE Transactions on Industrial Electronics**, 68(12), 12698-12707.

[5] **Ji, Q.**, Zhang, X., Chen, M., Wang, X. V., Wang, L., & Feng, L.* (2020). Design and closed loop control of a 3D printed soft actuator. In 2020 16th **IEEE International Conference on Automation Science and Engineering (CASE)** (pp. 842-848). IEEE.

[4] **Ji, Q.**, Zhao, C., Chen, M., Wang, X. V., Feng, L., & Wang, L.* (2020). A flexible 4D printing service platform for smart manufacturing. In **Swedish Production Symposium** 2020 7-8 October 2020, Jönköping, Sweden.

[3] **Ji, Q.**, Zhang, J. M., Liu, Y., Li, X., Lv, P., Jin, D., & Duan, H.* (2018). A modular microfluidic device via multimaterial 3D printing for emulsion generation. **Scientific reports**, 8(1), 4791.

[2] Zhang, J. M., **Ji, Q.**, & Duan, H.* (2019). Three-dimensional printed devices in droplet microfluidics. **Micromachines**, 10(11), 754.

[1] Zhang, J. M.[+], **Ji, Q.**[+], Liu, Y., Huang, J., & Duan, H.* (2018). An integrated micro-millifluidic processing system. **Lab on a Chip**, 18(22), 3393-3404.

PATENTS

[4] **Ji, Q.**, Liu, Y., Duan, H., Zhang, J. M. (2024). An adjustable flow pump. **CN patent**, CN 108252901B.

[3] Zhang, J. M., Duan, H., **Ji, Q.**, Li, X. (2020). Modular microfluidic chip fixture. **CN patent**, CN107321403B.

[2] Zhang, J. M., Duan, H., **Ji, Q.** (2019). Microfluidic chip and the device for generating microdroplets that utilizes it. **CN patent**, CN106807463A.

[1] **Ji, Q.**, Duan, H., Zhang, J. M., Liu, Y. (2017). A stop valve. **CN patent**, CN108150672A.

TEACHING

Lectures

[3] Dynamics and Motion Control

[2] Mechatronics Basics

[1] Advanced Master Project in Mechatronics

Supervisions

[1] Supervised more than 20 master's theses in different organizations.

SERVICES

Conference Reviewers

[3] IEEE International Conference on Automation Science and Engineering (CASE)

[2] IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

[1] International Conference on Energy Engineering and Environmental Protection

Journal Reviewers

[8] Engineering Research Express

[7] Measurement Science and Technology

[6] Robotics and Autonomous Systems

[5] Journal of Bionic Engineering

[4] Robotics and Computer-Integrated Manufacturing

[3] IEEE Robotics and Automation Letters

[2] Chemical Engineering Journal

[1] Advances in Manufacturing

Event Attendance

[2] Invited participation in MathWorks Advisory Board Europe meeting, 2024

[1] Co-chair for Robotics and Automation Session of IEEE International Conference on Automation Science and Engineering, 2021