KAIGE TAN

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EDUCATION

Ph.D candidate | *Division: Mechatronics* Dec. 2020 – Present
Royal Institute of Technology Stockholm, Sweden

Master of Science | *Track: Mechatronics* Sept. 2017 – Sept. 2019
Royal Institute of Technology Stockholm, Sweden

Bachelor of Science | *Major: Mechatronics* Sept. 2014- June. 2017
Harbin Institute of Technology Harbin, P. R. China

RESEARCH INTERESTS

- Connected and Automated Vehicles   • Soft Robotics and Soft Sensors
- Optimal Control and Reinforcement Learning   • Edge Computing Systems and Applications

JOURNAL PUBLICATIONS

1. **K. Tan**, X. Niu, Q. Ji, L. Feng, and M. Törngren, "Optimal gait design for a soft quadruped robot via multi-fidelity Bayesian optimization," *Journal of Applied Soft Computing*, p. 112568, 2025

2. **K. Tan**, Q. Ji, L. Feng, and M. Törngren, "Edge-enabled adaptive shape estimation of 3-D printed soft actuators with Gaussian processes and unscented Kalman filters," *IEEE Transactions on Industrial Electronics*, vol. 71, no. 3, pp. 3044–3054, 2023

3. **K. Tan**, L. Feng, G. Dán, and M. Törngren, "Decentralized convex optimization for joint task offloading and resource allocation of vehicular edge computing systems," *IEEE Transactions on Vehicular Technology*, vol. 71, no. 12, pp. 13226–13241, 2022

4. **K. Tan**, Q. Ji, L. Feng, and M. Törngren, "Shape estimation of a 3D printed soft sensor using multi-hypothesis extended kalman filter," *IEEE Robotics and Automation Letters*, vol. 7, no. 3, pp. 8383–8390, 2022

5. T. Liu, **K. Tan**, W. Zhu, and L. Feng, "Computationally efficient energy management for a parallel hybrid electric vehicle using adaptive dynamic programming," *IEEE Transactions on Intelligent Vehicles*, vol. 9, no. 2, pp. 4085–4099, 2023

6. J. Yang, **K. Tan**, L. Feng, and Z. Li, "A model-based deep reinforcement learning approach to the nonblocking coordination of modular supervisors of discrete event systems," *Information Sciences*, vol. 630, pp. 305–321, 2023

7. J. Yang, **K. Tan**, L. Feng, A. M. El-Sherbeeny, and Z. Li, "Reducing the learning time of reinforcement learning for the supervisory control of discrete event systems," *IEEE Access*, vol. 11, pp. 59840–59853, 2023

8. Q. Song, **K. Tan**, P. Runeson, and S. Persson, "Critical scenario identification for realistic testing of autonomous driving systems," *Software Quality Journal*, vol. 31, no. 2, pp. 441–469, 2023

9. Q. Ji, S. Fu, **K. Tan**, S. T. Muralidharan, K. Lagrelius, D. Danelia, G. Andrikopoulos, X. V. Wang, L. Wang, and L. Feng, "Synthesizing the optimal gait of a quadruped robot with soft actuators using deep reinforcement learning," *Robotics and Computer-Integrated Manufacturing*, vol. 78, p. 102382, 2022

10. X. Zhang, J. Tao, **K. Tan**, M. Törngren, J. M. G. Sanchez, M. R. Ramli, X. Tao, M. Gyllenhammar, F. Wotawa, N. Mohan, *et al.*, "Finding critical scenarios for automated driving systems: A systematic mapping study," *IEEE Transactions on Software Engineering*, vol. 49, no. 3, pp. 991–1026, 2022

11. J. M. G. Sánchez, N. Jörgensen, M. Törngren, R. Inam, A. Berezovskyi, L. Feng, E. Fersman, M. R. Ramli, and **K. Tan**, "Edge computing for cyber-physical systems: A systematic mapping study emphasizing trustworthiness," *ACM Transactions on Cyber-Physical Systems (TCPS)*, vol. 6, no. 3, pp. 1–28, 2022

12. X. Cheng, B. Yang, **K. Tan**, E. Isaksson, L. Li, A. Hedman, T. Olofsson, and H. Li, "A contactless measuring method of skin temperature based on the skin sensitivity index and deep learning," *Applied Sciences*, vol. 9, no. 7, p. 1375, 2019

CONFERENCE PUBLICATIONS

1. **K. Tan**, L. Feng, and M. Törngren, "Collaborative collision avoidance of connected vehicles using admm with pi-regulated lagrangian multipliers," in *2023 IEEE 19th International Conference on Automation Science and Engineering (CASE)*, pp. 1–8, IEEE, 2023

2. T. Liu, **K. Tan**, W. Zhu, and L. Feng, "Optimal and adaptive engine switch control for a parallel hybrid electric vehicle using a computationally efficient actor-critic method," in *2023 IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, pp. 416–423, IEEE, 2023

3. T. Liu, W. Zhu, **K. Tan**, M. Liu, and L. Feng, "A low-complexity and high-performance energy management strategy of a hybrid electric vehicle by model approximation," in *2022 IEEE 18th International Conference on Automation Science and Engineering (CASE)*, pp. 455–462, IEEE, 2022

4. Q. Song, **K. Tan**, P. Runeson, and S. Persson, "An industrial workbench for test scenario identification for autonomous driving software," in *2021 IEEE International Conference on Artificial Intelligence Testing (AITest)*, pp. 81–82, IEEE, 2021

WORKING PAPERS

1. X. Niu*, **K. Tan***, L. Feng, and D. G. Broo, "Optimal gait control for a tendon-driven soft quadruped robot by model-based reinforcement learning." submitted to *International Conference on Robotics and Automation (ICRA2025)*

2. T. Zhao*, **K. Tan***, and L. Feng, "Towards mitigating communication latency influence in connected vehicle networks by stochastic decentralized model predictive control." submitted to *European Control Conference (ECC2025)*

PROFESSIONAL SERVICES

- Journal Reviewer: IEEE Robotics and Automation Letters, Robotics and Autonomous Systems, IEEE Transactions on Wireless Communications, IEEE Transactions on Mobile Communications, IEEE Transactions on Computers, Journal of Cleaner Production, Foundations and Trends in Electronic Design Automation, etc.
- Master Thesis Supervisor, Teaching Assistant

HONORS AND AWARDS

The Chinese Government Award for Outstanding Self-financed Students Abroad	July 2024
Jubilee appropriation from the Wallenberg Foundations Travel Scholarship Awardee	Mar. 2024
IEEE Robotics and Automation Society Travel Grant Awardee	July 2023
Karl Engver's Foundation Travel Scholarship Awardee	2022, 2023
The First Prize in China Undergraduate Mathematical Contest in Modeling (CUMCM)	Sept. 2016
Excellent Undergraduate Scholarship	2014 - 2015

TECHNICAL SKILLS

- MATLAB/Simulink, Python, C/C++, ROS/ROS2, Docker, Git, Inkscape, LaTeX