

# KAIGE TAN

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## EDUCATION

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**Ph.D candidate** | *Division: Mechatronics*

Royal Institute of Technology

Dec. 2020 – Present

Stockholm, Sweden

**Master of Science** | *Track: Mechatronics*

Royal Institute of Technology

Sept. 2017 – Sept. 2019

Stockholm, Sweden

**Bachelor of Science** | *Major: Mechatronics*

Harbin Institute of Technology

Sept. 2014– June. 2017

Harbin, P. R. China

## RESEARCH INTERESTS

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- Optimal Control and Reinforcement Learning
- Trustworthy Edge Computing Systems and Applications
- Soft Robotics
- Intelligent Transportation System

## JOURNAL PUBLICATIONS

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1. **Tan, K.**, 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
2. **Tan, K.**, 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
3. **Tan, K.**, 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
4. T. Liu, **Tan, K.**, 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
5. J. Yang, **Tan, K.**, 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
6. J. Yang, **Tan, K.**, L. Feng, A. M. El-Sherbeeney, 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
7. Q. Song, **Tan, K.**, 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
8. Q. Ji, S. Fu, **Tan, K.**, 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
9. X. Zhang, J. Tao, **Tan, K.**, 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
10. J. M. G. Sánchez, N. Jörgensen, M. Törngren, R. Inam, A. Berezovskyi, L. Feng, E. Fersman, M. R. Ramli, and **Tan, K.**, “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

11. X. Cheng, B. Yang, **Tan, K.**, 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

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1. **Tan, K.**, 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, **Tan, K.**, 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, **Tan, K.**, 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, **Tan, K.**, 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

## PROFESSIONAL SERVICES

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- 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

## WORK EXPERIENCE

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<b>MIL system engineer</b> BOSCH Group	Aug. 2019 – Sept. 2020 Shanghai, China
<b>VESC program student</b> Volvo Cars	June. 2018 – July. 2019 Gothenborg, Sweden

## HONORS AND AWARDS

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<b>Jubilee appropriation from the Wallenberg Foundations Travel Scholarship Awardee</b>	Mar. 2024
<b>IEEE Robotics and Automation Society Travel Grant Awardee</b>	July 2023
<b>Karl Engver's Foundation Travel Scholarship Awardee</b>	2022, 2023
<b>The First Prize in China Undergraduate Mathematical Contest in Modeling (CUMCM)</b>	Sept. 2016
<b>Excellent Undergraduate Scholarship</b>	2014 - 2015

## TECHNICAL SKILLS

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- Python, MATLAB/Simulink, Embedded C Programming, Docker, Git, Inkscape, L<sup>A</sup>T<sub>E</sub>X