

# Publication List

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## Published Papers(\* donotes equal contribution)

- [1] S. Liu\*, W. Cao\*, C. Liu, Z. He, T. Zhang, and S. E. Li. “One Filters All: A Generalist Filter For State Estimation”. In: *The Thirty-Ninth Annual Conference on Neural Information Processing Systems*. 2025.
- [2] T. Zhang, W. Cao, C. Liu, T. Zhang, J. Li, and S. E. Li. “Robust State Estimation for Legged Robots With Dual Beta Kalman Filter”. In: *IEEE Robotics and Automation Letters* 10.8 (2025), pp. 7955–7962.
- [3] W. Cao, C. Liu, Z. Lan, S. E. Li, W. Pan, and A. Alessandri. “Robust Bayesian Inference for Moving Horizon Estimation”. In: *Automatica* 173 (2025), p. 112108. ISSN: 0005-1098.
- [4] T. Zhang, W. Cao, C. Liu, F. Zhang, W. Wu, and S. E. Li. “NANO-SLAM: Natural Gradient Gaussian Approximation for Vehicle SLAM”. In: *2025 IEEE International Intelligent Transportation Systems Conference*. 2025.
- [5] W. Cao, A. Capone, R. Yadav, S. Hirche, and W. Pan. “Computation-Aware Learning for Stable Control with Gaussian Process”. In: *Proceedings of Robotics: Science and Systems*. Delft, Netherlands, July 2024.
- [6] W. Cao and W. Pan. “Impact of Computation in Integral Reinforcement Learning for Continuous-Time Control”. In: *The Twelfth International Conference on Learning Representations*. 2024.
- [7] S. Liu, W. Cao, C. Liu, T. Zhang, and S. E. Li. “Convolutional Unscented Kalman Filter for Multi-Object Tracking with Outliers”. In: *IEEE Transactions on Intelligent Vehicles* (2024), pp. 1–12.
- [8] J. Duan, W. Cao, Y. Zheng, and L. Zhao. “On the Optimization Landscape of Dynamic Output Feedback Linear Quadratic Control”. In: *IEEE Transactions on Automatic Control* 69.2 (2024), pp. 920–935.
- [9] W. Cao, C. Liu, Z. Lan, Y. Piao, and S. E. Li. “Generalized Moving Horizon Estimation for Non-linear Systems with Robustness to Measurement Outliers”. In: *2023 American Control Conference*. 2023, pp. 1614–1621.
- [10] W. Wu, C. Liu, W. Cao, C. Chen, H. Li, and S. E. Li. “Multi-Sensor Calibration System for Mobile Robots”. In: *2023 7th CAA International Conference on Vehicular Control and Intelligence*. 2023, pp. 1–7.
- [11] W. Wang, Y. Zhang, J. Gao, Y. Jiang, Y. Yang, Z. Zheng, W. Zou, J. Li, C. Zhang, W. Cao, G. Xie, J. Duan, and S. E. Li. “GOPS: A General Optimal Control Problem Solver for Autonomous Driving and Industrial Control Applications”. In: *Communications in Transportation Research* 3 (2023), p. 100096.
- [12] W. Cao, J. Duan, S. Eben Li, C. Chen, C. Liu, and Y. Wang. “Primal-Dual Estimator Learning Method with Feasibility and Near-Optimality Guarantees”. In: *2022 IEEE 61st Conference on Decision and Control*. 2022, pp. 4104–4111.
- [13] J. Duan, W. Cao, Y. Zheng, and L. Zhao. “On the Optimization Landscape of Dynamic Output Feedback: A Case Study for Linear Quadratic Regulator”. In: *2022 IEEE 61st Conference on Decision and Control*. 2022, pp. 4040–4045.
- [14] Y. Yin, S. E. Li, K. Tang, W. Cao, W. Wu, and H. Li. “Approximate Optimal Filter Design for Vehicle System through Actor-Critic Reinforcement Learning”. In: *Automotive Innovation* 5.4 (2022), pp. 415–426.

- [15] Z. Gu, Y. Yang, J. Duan, S. E. Li, J. Chen, W. Cao, and S. Zheng. “Belief State Separated Reinforcement Learning for Autonomous Vehicle Decision Making under Uncertainty”. In: *2021 IEEE International Intelligent Transportation Systems Conference*. 2021, pp. 586–592.
- [16] W. Cao, J. Chen, J. Duan, S. E. Li, Y. Lyu, Z. Gu, and Y. Zhang. “Reinforced Optimal Estimator”. In: *IFAC-PapersOnLine* 54.20 (2021). Modeling, Estimation and Control Conference 2021, pp. 366–373.
- [17] J. Li, S. Eben Li, K. Tang, Y. Lv, and W. Cao. “Reinforcement Solver for H-infinity Filter with Bounded Noise”. In: *2020 15th IEEE International Conference on Signal Processing*. Vol. 1. 2020, pp. 62–67.
- [18] L. Xin, S. E. Li, P. Wang, W. Cao, B. Nie, C.-Y. Chan, and B. Cheng. “Accelerated Inverse Reinforcement Learning with Randomly Pre-sampled Policies for Autonomous Driving Reward Design”. In: *2019 IEEE Intelligent Transportation Systems Conference*. 2019, pp. 2757–2764.

## Preprints

- [19] W. Cao, T. Zhang, Z. Sun, C. Liu, S. S.-T. Yau, and S. E. Li. “Nonlinear Bayesian Filtering with Natural Gradient Gaussian Approximation”. In: *arXiv preprint arXiv:2410.15832* (2024).
- [20] W. Cao, S. Liu, C. Liu, Z. He, S. S.-T. Yau, and S. E. Li. “Convolutional Bayesian Filtering”. In: *arXiv preprint arXiv:2404.00481* (2024).