

Wenhan (Winston) Cao

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RESEARCH INTERESTS

My research interests are optimal filtering and optimal control, with applications to autonomous vehicles and robots.

EDUCATION

The University of Manchester, Manchester, UK

Visiting Ph.D. Student, Department of Computer Science, January 2023-now

Supervisor: Dr. Wei Pan, Senior Lecturer of Computer Science

Technical University of Munich, Munich, Germany

Visiting Ph.D. Student, School of Computation, Information and Technology, September 2023-December 2023

Supervisor: Dr. Sandra Hirche, Professor of Control and Optimization

Tsinghua University, Beijing, China

Ph.D. Student, School of Vehicle and Mobility, September 2019-now

Supervisor: Dr. Shengbo Eben Li, Professor of Mechanical Engineering

Beijing Jiaotong University, Beijing, China

Bachelor of Engineering, School of Electrical Engineering, September 2015-June 2019

GPA ranking: 1/305

SELECTED PAPERS

Cao, W., Liu, C., Lan, Z., Li, S. E., Pan, W., & Alessandri, A. *Robust Bayesian Inference for Moving Horizon Estimation*. Submitted to Automatica (Available at <https://arxiv.org/abs/2210.02166>).

Cao, W., Pan, W. (2024). *Impact of Computation in Integral Reinforcement Learning for Continuous-Time Control*. Accepted by 2024 International Conference on Learning Representations (ICLR). **(Spotlight)**

Cao, W., Liu, C., Lan, Z., Piao, Y., & Li, S. E. (2023, May). *Generalized Moving Horizon Estimation for Nonlinear Systems with Robustness to Measurement Outliers*. In 2023 American Control Conference (ACC) (pp. 1614-1621). IEEE.

Duan, J., **Cao, W.**, Zheng, Y., & Zhao, L. (2023). *On the Optimization Landscape of Dynamic Output Feedback Linear Quadratic Control*. IEEE Transactions on Automatic Control. **(Regular Paper)**

Cao, W., Duan, J., Li, S. E., Chen, C., Liu, C., & Wang, Y. (2022, December). *Primal-Dual Estimator Learning Method with Feasibility and Near-Optimality Guarantees*. In 2022 IEEE 61st Conference on Decision and Control (CDC) (pp. 4104-4111). IEEE.

Cao, W., Chen, J., Duan, J., Li, S. E., Lyu, Y., Gu, Z., & Zhang, Y. (2021). *Reinforced Optimal Estimator*. IFAC-PapersOnLine, 54(20), 366-373.

HONORS & AWARDS

Student Best Paper Finalist of 2021 IFAC Modeling, Estimation and Control Conference, Texas, USA, 2021

National Scholarship, Beijing, China, 2016

The First Prize Scholarship, Beijing, China, 2016 – 2018

INVITED TALKS & CONFERENCES PRESENTATIONS

Generalized Moving Horizon Estimation for Nonlinear Systems with Robustness to Measurement Outliers in 2023 American Control Conference, San Diego, CA, USA (Oral Presentation), May 2023.

Learning-based state estimation methods at the Technical University of Munich, Munich, Germany (Online Presentation), hosted by Prof. Sandra Hirche, February 2023.

Primal-Dual Estimator Learning Method with Feasibility and Near-Optimality Guarantees in 2022 IEEE 61st Conference on Decision and Control, Cancún, Mexico (Oral Presentation), December 2022.

Reinforced Optimal Estimator in 2021 IFAC Modeling, Estimation and Control Conference, Texas, USA (Oral Presentation), October 2021.

Accelerated Inverse Reinforcement Learning with Randomly Pre-sampled Policies for Autonomous Driving Reward Design in 2019 IEEE Intelligent Transportation Systems Conference, Auckland, New Zealand (Oral Presentation), October 2019.

PROFESSIONAL SERVICES

I serve as an active reviewer for CDC, ACC, L4DC, RA-L, AAMAS.