HANYANG HU

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EDUCATION

Simon Fraser University, Burnaby, Canada *Sep. 2022 - Present*
Ph.D. in Computing Science
GPA 4.05 / 4.3
Advisor: Prof. Mo Chen

Tsinghua University, Beijing, China *Sep. 2019 - Jun. 2022*
M.S. in Power Engineering and Engineering Thermophysics
GPA 3.77 / 4.0
Advisor: Prof. Junzhi Zhang

Jilin University, Changchun, China *Sep. 2015 - Jun. 2019*
B.E. in Vehicle Engineering, College of Automotive Engineering
GPA 3.79 / 4.0; Rank: 1 / 204

RESEARCH EXPERIENCE

Research on enhancing robustness in RL using Hamilton-Jacobi Reachability *Aug. 2023 - Present*
Graduate Student Researcher with Professor Mo Chen *Simon Fraser University*
- Designed the simulation
- Designing the real-world experiments.

Research on Koopman-Based Control *Jan. 2023 - Aug. 2023*
Graduate Student Researcher with Professor Mo Chen *Simon Fraser University*
- Designed the end-to-end learning framework.
- Designed the baseline experiments.

This project received support from the NSERC Discovery Grants Program, the Canada CIFAR AI Chairs program, and Huawei Technologies Canada Co., Ltd.

Research on multi-agent control via Hamilton-Jacobi reachability analysis *Dec. 2022 - Mar. 2023*
Graduate Student Researcher with Professor Mo Chen *Simon Fraser University*
- Constructed the 2 vs. 1 reach-avoid game.
- Designed Mixed Integer Programming control logic.

This work received support from the SFU-Huawei Joint Lab

Project on intelligent brake-by-wire system for autonomous vehicles *Oct. 2020 - Jun. 2022*
Graduate Student Researcher with Professor Junzhi Zhang *Tsinghua University*
- Established the accurate mathematical model of the front axle modulator used for the braking system.
- Calibrated the dynamic and steady characteristics of the modulators.
- Proposed one flow based pressure control algorithm and demonstrated its effectiveness in HIL simulation tests.
- Applied one patent in China.
- Designed the parameter identification algorithm.

This work is funded by Guangdong Science and Technology Department

Research on vehicle control of fuel consumption planning *Sep. 2019 - Jan. 2020*
Graduate Student Researcher with Professor Junzhi Zhang *Tsinghua University*
- Designed the 'pulse and glide' based controller with braking logic and shifting logic.
- Established the simulation model of the research vehicle.
- Demonstrated the proposed controller's effectiveness in fuel economy performance in simulation.

Research on highway on-ramp merging scenario planning *May. 2018 - Nov. 2018*
Undergraduate Student Researcher with Professor Weiwen Deng *Jilin University*
- Established the highway on-ramp simulation environment in SUMO.
- Proposed the merging algorithm for highway on-ramp vehicles.
- Demonstrated the effectiveness of the proposed algorithm in the simulation environment.

PUBLICATIONS

[1] X. Lyu, **Hu, Hanyang**, S. Siriya, Y. Pu, and M. Chen, "Task-oriented koopman-based control with contrastive encoder," in *Conference on Robot Learning*, PMLR, 2023, pp. 93–105. [Online]. Available: https://proceedings.mlr.press/v229/lyu23a.html.

[2] **Hu, Hanyang*** and Bui, Minh* and M. Chen, "Multi-agent reach-avoid games: Two attackers versus one defender and mixed integer programming," in *2023 62nd IEEE Conference on Decision and Control (CDC)*, IEEE, 2023, pp. 7227–7233. [Online]. Available: https://ieeexplore.ieee.org/abstract/document/10383438.

[3] **Hu, Hanyang**, C. He, H. Ma, *et al.*, "Minimum fuel consumption strategy in autonomous adaptive cruise control scenarios," in *2021 40th Chinese Control Conference (CCC)*, IEEE, 2021, pp. 6004–6009. [Online]. Available: https://ieeexplore.ieee.org/abstract/document/9549949.

[4] M. Shen, **Hu, Hanyang**, B. Sun, and W. Deng, "Heuristics based cooperative planning for highway on-ramp merge," in *2018 21st International Conference on Intelligent Transportation Systems (ITSC)*, IEEE, 2018, pp. 1266–1272. [Online]. Available: https://ieeexplore.ieee.org/abstract/document/8569341.

(means equal contribution)*

TEACHING EXPERIENCE

Teaching Assistant *Jan. 2024 - Apr. 2024*
TA of the course CMPT 410/726 Machine Learning *School of Computing Science,Simon Fraser University*
- Designed assignments.
- Held office hours for answering questions.

Research Assistant *Jan. 2023 - Apr. 2023, May. 2023 - Aug. 2023, Sep. 2023 - Dec. 2023*
Research Assistant with Professor Mo Chen *School of Computing Science,Simon Fraser University*
- Participated in academic research.

Teaching Assistant *Sep. 2019 - Jan. 2020*
TA of the course Alternative Vehicle Propulsion System *School of Vehicle and Mobility, Tsinghua University*
- Designed assignments.
- Held office hours for answering questions.

PROFESSIONAL SKILLS

Programming Language: Python, MATLAB
Simulation Software: CarMaker, CarSim, SUMO, Simulink
Laboratory skill: Hardware in loop (HIL) simulation tests, signal processing, mechatronics, etc.
Theoretical knowledge: Control theory, especially in optimal control, convex optimization, machine learning and reinforcement learning.

HONOR

The First Prize Scholarship *2017 - 2018*
National Scholarship *2016 - 2017*
National Scholarship *2015 - 2016*