

HUANG, HEJUN

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EDUCATION

M.Sc. Department of Aerospace Engineering GPA: 3.4 University of Michigan, Ann Arbor, MI	Dec. 2023
M.Sc. Department of Mechanical and Automation Engineering GPA: 3.7 Chinese University of Hong Kong, HKSAR, China	Nov. 2020
B.Sc. Department of Mechatronics Engineering GPA: 3.2 North China Electric Power University, Hebei, China	Jun. 2019

PUBLICATION

Huang, H., et al. (2023). Privacy-Aware Coverage Design and Analysis in Drone Remote Identification Systems. Under review of *Transactions on Intelligent Systems and Technology*.

Li, Z., **Huang, H.**, & Vincent, Tam (2023). Combining Reinforcement Learning and Barrier Functions for Adaptive Risk Management in Portfolio Optimization.

Huang, H., Mazotti, B., Kim, J., & Li, M.Z. (2023). Remote Identification Trajectory Coverage in Urban Air Mobility Applications. *15th Air Traffic Management R&D Seminar*.

Huang, H., Li, Z., & Han, D. (2022). Barrier Certified Safety Learning Control: When Sum-of-Squares Programming Meets Reinforcement Learning. *6th Conference on Control Technology and Applications*.

Han, D. & **Huang, H.** (2022). Sum-of-Squares Program and Safe Learning On Maximizing the Region of Attraction of Partially Unknown Systems. *13th Asian Control Conference*.

Huang, H. & Han, D. (2022). On Estimating the Probabilistic Region of Attraction for Partially Unknown Nonlinear Systems: A Sum-of-Squares Approach. *41th Chinese Control and Decision Conference*.

EMPLOYMENT

Graduate Research Assistant LATTICE, University of Michigan	Aug. 2022 - Dec. 2023
Research Assistant Department of Mechanical and Automation Engineering, Chinese University of Hong Kong	Sept. 2020 - Jul. 2022
Intellectual Property Department Intern Daimler Greater China Investment Co., Inc. Beijing	Mar. 2019 - Jul. 2019

SKILLSET

Programming language: MATLAB, Python, C++

Technologies: Linux, GIT, Docker, Conda, Pytorch, CARLA, RaiSim, WordPress

Language: Mandarin, Cantonese

RESEARCH INTEREST AND CORE LECTURE

Data-driven **assured decision-making**. Reliable learning algorithm design.

- EECS 592: Foundations of Artificial Intelligence
- AEROSP 567: Statistical Inference, Estimation, and Learning
- AEROSP 588: Multidisciplinary Design Optimization
- AEROSP 584: Navigation and Guidance: From Perception to Control
- EECS 560: Linear Systems Theory
- EECS 562: Nonlinear Systems and Control

PROJECT

Maintained the privacy of drone trajectories in urban detection scenarios	2023
<ul style="list-style-type: none">• Developed strategies for the deployment of Remote ID in urban settings.• Devised a novel approach to evaluate privacy scores beyond conventional Remote ID parameters.• Executed simulations on UAV trajectories to assess Remote ID detection in NYC, LA, and SF.	
Combining RL and barrier functions into Portfolio Optimization	2023
<ul style="list-style-type: none">• Developed "RiPO", an RL-based portfolio optimization framework for balancing risks and profits.• Incorporated barrier functions and dynamic modules for adaptability to market shifts and investor preferences.• Proved RiPO's efficacy in uptrends and its risk mitigation in downtrends.	
Integration of Sum-of-Squares programming and Gaussian process (GP)	2022
<ul style="list-style-type: none">• Integrated Sum-of-Squares programming with GP for barrier certificate calculations.• Expanded the significantly larger barrier-certified region of attraction for systems with partial knowledge.	
Bayesian Inference for Target Sense Center	2022
<ul style="list-style-type: none">• Designed and compared different sample policies for best sample efficiency.• Employed GP regression for target location identification with minimal sampling.	
E-Learning Platform for Engineering Faculty's Junior Teaching Staff	2022
<ul style="list-style-type: none">• Designed and upheld two demo websites.• Cataloged engineering pedagogical techniques into concise micro-modules such as flipped classroom, activity design, and online teaching for efficient staff onboarding.	
Multi-agent Autopilot Formation Control with RL	2020
<ul style="list-style-type: none">• Validated obstacle avoidance using DDPG and MADDPG in 2D highway simulations.	
Patent search and intellectual property maintain	2019
<ul style="list-style-type: none">• Maintained and updated internal intellectual property database for Daimler's business units• Updated patent-search formula for business units with related analysis reports• Assisted in completing Freedom to Operate reports on CN market fuel cells and batteries.	
Rehabilitation Exercise Assistant Robot for Cerebral Palsy Patients	2018
<ul style="list-style-type: none">• Designed a robotic chassis with a cable-driven manipulator, analyzed stress on key joints. <i>Video.</i>	
ReadyGo Maker: Self-service Hot Dog Assembly Machine	2017
<ul style="list-style-type: none">• Designed a dual-manipulator technique for hot dog assembly, and conducted 3D modeling. <i>Video.</i>	

TEACHING EXPERIENCE

ENGG1910 Demystifying AI	2021
Teaching assistant	Hong Kong
Summer Research Project (11 Weeks Program)	2020, 2021
Teaching assistant	Hong Kong

HONORS AND AWARDS

Pedagogical Innovation SILVER, and People's Poster Prize	2021
For top 3% projects in 2021 HK Teaching and Learning Innovation EXPO	
First Class Scholarship	2016, 2017, 2018
For top 5%, 20% students	
Hao Peng Mechatronic Scholarship	2016, 2018
For top 15% students	
Second Prize, Third Prize	2018, 2017
For top 8%, 15% participants in the National Mechanical Product Digital Design Competition	