

OSWIN SO

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RESEARCH INTEREST

Safe Autonomous Systems; Control Theory; Machine Learning; Reinforcement Learning; Robotics

EDUCATION

Massachusetts Institute of Technology

Incoming Ph.D. Student in Aeronautics and Astronautics

May 2024 -

Advisor: [Chuchu Fan](#)

Massachusetts Institute of Technology

Master of Science in Aeronautics and Astronautics, GPA: 5.0

Aug. 2022 - May 2024

Advisor: [Chuchu Fan](#)

Georgia Institute of Technology

Bachelor of Science in Computer Science, GPA: 4.0

Aug. 2018 - May 2022

Advisor: [Evangelos Theodorou](#)

- [Thesis](#): Distributionally Robust Optimization Techniques for Stochastic Optimal Control

PUBLICATIONS

CONFERENCE

12. [ICRA'24] [Oswin So](#), Zachary Serlin, Makai Mann, Jake Gonzales, Kwesi Rutledge, Nicholas Roy, Chuchu Fan. "How to Train Your Neural Control Barrier Function: Learning Safety Filters for Complex Input-Constrained Systems." *IEEE International Conference on Robotics and Automation*, 2024. [\[pdf\]](#)
11. [RSS'23] [Oswin So](#), Chuchu Fan. "Solving Stabilize-Avoid Optimal Control via Epigraph Form and Deep Reinforcement Learning." *Robotics: Science and Systems*, 2023. [\[pdf\]](#)
10. [ICRA'23] [Oswin So](#), Paul Drews, Thomas Balch, Velin Dimitrov, Guy Rosman, Evangelos A Theodorou. "MPOGames: Efficient Multimodal Partially Observable Dynamic Games." *IEEE International Conference on Robotics and Automation*, 2023. [\[pdf\]](#)
9. [NeurIPS'22] Guan-Horng Liu, Tianrong Chen*, [Oswin So](#)*, Evangelos A Theodorou. "Deep Generalized Schrodinger Bridge." *Neural Information Processing Systems*, 2022. [\[pdf\]](#)
8. [NeurIPS ML4PS'22] [Oswin So](#), Gongjie Li, Evangelos A Theodorou, Molei Tao. "Data-driven discovery of non-Newtonian astronomy via learning non-Euclidean Hamiltonian." *Neural Information Processing Systems, Machine Learning and the Physical Sciences*, 2022. [\[pdf\]](#)
7. [RSS'22] Marcus A Pereira, Augustinos D Saravanos, [Oswin So](#), Evangelos A Theodorou. "Decentralized Safe Multi-agent Stochastic Optimal Control using Deep FBSDEs and ADMM." *Robotics: Science and Systems*, 2022. [\[pdf\]](#)
6. [ICRA'22] [Oswin So](#), Ziyi Wang, Evangelos A Theodorou. "Maximum Entropy Differential Dynamic Programming." *IEEE International Conference on Robotics and Automation*, 2022. [\[pdf\]](#)
5. [RSS'21] Ziyi Wang*, [Oswin So](#)*, Jason Gibson, Bogdan Vlahov, Manan S Gandhi, Guan-Horng Liu, Evangelos A Theodorou. "Variational Inference MPC using Tsallis Divergence." *Robotics: Science and Systems*, 2021. [\[pdf\]](#)

4. [L4DC'21] Ziyi Wang, Oswin So, Keuntaek Lee, Evangelos A Theodorou. “Adaptive Risk Sensitive Model Predictive Control with Stochastic Search.” *Learning for Dynamics and Control*, 2021. [\[pdf\]](#)

IN SUBMISSION

3. Allen M Wang, Oswin So, Charles Dawson, Darren T Garnier, Cristina Rea, Chuchu Fan. “Active Disruption Avoidance and Trajectory Design for Tokamak Ramp-downs with Neural Differential Equations and Reinforcement Learning.” [\[pdf\]](#)
2. Songyuan Zhang, Oswin So, Kunal Garg, Chuchu Fan. “GCBF+: A Neural Graph Control Barrier Function Framework for Distributed Safe Multi-Agent Control.” [\[pdf\]](#)
1. Justin Lidard, Oswin So, Yanxia Zhang, Jonathan DeCastro, Xiongyi Cui, Xin Huang, Yen-Ling Kuo, John Leonard, Avinash Balachandran, Naomi Leonard, Guy Rosman. “GAME-UP: Game-Aware Mode Enumeration and Understanding for Trajectory Prediction.” [\[pdf\]](#)

EXPERIENCES

- | | |
|---|----------------------|
| Toyota Research Institute (Cambridge, MA)
<i>Research Intern</i> | May 2022 - July 2022 |
| • Project: Efficient Multimodal Partially Observable Dynamic Games | |
| Aurora Innovation (Pittsburgh, PA)
<i>Motion Planning Intern</i> | May 2021 - July 2021 |
| • Project: Cost function learning for autonomous driving. | |
| Amazon Robotics (Boulder, CO)
<i>Software Development Engineer Intern</i> | May 2020 - July 2020 |
| • Project: LiDAR scan matching for improving docking of autonomous robots. | |
| Greenzie (Atlanta, GA)
<i>Robotics Engineer Intern</i> | May 2019 - July 2019 |
| • Project: Communication and control of autonomous lawn mowing robots. | |

HONORS AND AWARDS

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| Yao T. Li (1938) Fellowship | 2022 |
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INVITED TALKS

1. “Solving Stabilize-Avoid Optimal Control via Epigraph Form and Deep Reinforcement Learning.” Safe RL Seminar, Virtual, 2023.