Yansong Li (Jack) *Curriculum Vitae*

Mail:	Department of Electrical and Computer Engineering
	University of Illinois Chicago
	851 S. Morgan St., Ste. 1020 (MC 154)
	Chicago, IL 60607
E-mail:	`yli340@uic.edu`
Web:	`https://jackyansongli.github.io`
Phone:	(224) 334-0452
Pronouns:	He/Him
Born:	Aug 1997

EDUCATION

Ph.D. in Department of Electrical and Computer Engineering 06/2025 (*Expected*)
University of Illinois Chicago, Chicago, IL
Advisor: Shuo Han
Thesis: Combining Model-Based and Model-Free Reinforcement Learning

Bachelor in Department of Mathematics 07/2020
Southern University of Science and Technology, Shenzhen, China
Advisor: Luchuan Liu

RESEARCH INTERESTS

Reinforcement Learning; Game Theory; Learning Theory; Optimization and Control; Large Language Model in Decision-Making

PUBLICATIONS

∗: Corresponding author. †: equal contribution

Peer-Reviewed Conference Publications

[1] Zeyu Dong, Yimin Zhu, **Yansong Li**, Kevin Mahon, and Yu Sun∗, "Generalizing end-to-end autonomous driving in real-world environments using zero-shot LLMs", in *8th Annual Conference on Robot Learning*, 2024.

[2] **Yansong Li**∗ and Shuo Han, "Efficient collaboration with unknown agents: Ignoring similar agents without checking similarity", in *Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2024, Auckland, New Zealand, May 6-10, 2024*, Mehdi Dastani, Jaime Simão Sichman, Natasha Alechina, and Virginia Dignum, Eds., International Foundation for Autonomous Agents and Multiagent Systems / ACM, 2024, pp. 2363–2365. DOI: 10.5555/3635637.3663161.

[3] **Yansong Li**∗ and Shuo Han, "Solving strongly convex and smooth stackelberg games without modeling the follower", in *American Control Conference, ACC 2023, San Diego, CA, USA, May 31 - June 2, 2023*, IEEE, 2023, pp. 2332–2337. DOI: 10.23919/ACC55779.2023.10156010.

[4] **Yansong Li*** and Shuo Han, "Accelerating model-free policy optimization using model-based gradient: A composite optimization perspective", in *Learning for Dynamics and Control Conference, L4DC 2022, 23-24 June 2022, Stanford University, Stanford, CA, USA*, Roya Firoozi, Negar Mehr, Esen Yel, Rika Antonova, Jeannette Bohg, Mac Schwager, and Mykel J. Kochenderfer, Eds., ser. Proceedings of Machine Learning Research, vol. 168, PMLR, 2022, pp. 304–315.

Preprints

[1] **Yansong Li***†, Zeyu Dong†, Ertai Luo, Yu Wu, Shuo Wu, and Shuo Han, *When to trust your data: Enhancing dyna-style model-based reinforcement learning with data filter*, 2024. arXiv: 2410.12160 [cs.LG].

[2] **Yansong Li***†, Zeyu Dong†, and Shuo Han, "Bayes-Optimal, Robust, and Distributionally Robust Policies for Uncertain MDPs", *preprint*, Oct. 2024. DOI: 10.25417/uic.27138990.v1.

[3] **Yansong Li***, Zeyu Dong, and Shuo Han, "Removing Redundant Partner Policies May Be Unnecessary for Ad Hoc Teamwork", *preprint*, Oct. 2024. DOI: 10.25417/uic.27139116.v1.

[4] Da Shen*, Nian Liu†, **Yansong Li**†, Duolei Wang, and Leiyu He, *Goldfish Scheme: A Scheme Interpreter with Python-Like Standard Library*. LIII NETWORK, 2024.

INTERNS

Reseach Interns

LLM in End-To-End Autonomous Driving   05/2024-08/2024
Stony Brook University
Advisor: Dantong Yu
CORL has accepted our work as a conference paper

Learning to Help in Multi-Class Classifications and Markov Decision Processes   08/2024-Now
Rutgers University
Advisor: Anand D. Sarwate
Under review

Industry Intern

Developer: Scheme Compiler & GNU T_EX_{MACS}/Mogan   05/2024-Now
LIII NETWORK
Advisor: Da Shen
Develop a Scheme compiler with Python-like standard library functionalities and enhance the LaTeX export capabilities of GNU TeXMACS/Mogan.

TEACHING EXPERIENCE

Southern University of Science and Technology:
MA213-16	Calculus I (Tutorial, Fall 2020)
MA101B	Mathematical Analysis (Tutorial, Spring 2019)
Online	Control Theory and Optimization (Lecturer, Summer 2021)
Online	Reinforcement Learning and Game Theory (Lecturer, Summer
LIII NETWORK	

Online	Academic writing with Mogan (Fall 2024)
Online	SICP (Fall 2024)

RESEARCH EXPERIENCES

Combining model-based & model-free reinforcement learning. 09/2020-Now
Project Organizer & Corresponding Author
We develop two algorithms that leverage gradient information from an estimated model to accelerate model-free training. The experiments are conducted on an additive nonlinear system with a linear estimated model (published in *L4DC*) and in the `mujoco` environment with a Gaussian estimated model (under review for *AAAI* and *ICLR*).

AI agent that can effectively collaboration with human 11/2021-2024/05
Project Organizer & Corresponding Author
We utilize stochastic game theory and Stackelberg game formulation. In our setting, human agents are not assumed to be rational, and their utility functions are unknown. Based on these constraints, we develop two algorithms: one for Stackelberg games and another for stochastic games, both designed to facilitate AI-human collaboration. Experiments are conducted in the Overcooked-AI environment. The results have been published in the *ACC* and the *AAMAS* extended abstract. Additionally, two papers extending this formulation to partial observations are available as open-access preprints and are currently under review.

LLM for end-to-end autonomous driving 05/2024-Now
Coauthor
We develop a hybrid system that leverages a large language model (LLM) to provide high-level instructions at low frequency, enhancing the generalization capability of a high-frequency onboard controller running on an iPhone for autonomous driving. This design mitigates the high-latency challenges of LLMs, making our experiments the first real-world implementation of LLMs in this context. The results have been published in the *CORL*. Ongoing research has been submitted to *CVPR* and is currently under review.

OPEN SOURCE COMMUNITY

GNU T$_{\text{E}}$X$_{\text{MACS}}$/Mogan 09/2022-Now
Contributor
A WYSIWYG editor that can type equations 10 times faster than LaTeX. See "A quick tour of T$_{\text{E}}$X$_{\text{MACS}}$" for a 3-minute short introduction. Plugins I developed (vim-like keybindings and algorithm2e package) can be found in Jack's Github.

Goldfish Scheme 07/2024-Now
Main developer
A `Scheme` compiler based on `S7 Scheme` and `C++`. This compiler matches the speed and simplicity of `S7 Scheme` while offering improved support for Microsoft Windows. In `Goldfish Scheme`, we have implemented the complete set of features from R7RS and included many functionalities inspired by the `Python` standard library. `Goldfish Scheme` will be the foundation for GNU T$_{\text{E}}$X$_{\text{MACS}}$/Mogan in the future.

PROFESSIONAL SERVICE

Reviewer

Journals
Science China Information Sciences

Conferences
International Conference on Learning Representations (ICLR)
IEEE Conference on Decision and Control (CDC)
International Conference on Identification, Information and Knowledge in the Internet of Things (IIKI)

INVITED TALKS

1. "Bayes-Optimal, Robust, and Distributionally Robust Policies for Uncertain MDPs", RINGS informal seminar, Rutgers University-New Brunswick, 08/2024.

2. "Efficient Collaboration with Unknown Agents: Ignoring Similar Agents without Checking Similarity", Digital Economy Lecture, Beijing Normal University & Hong Kong Baptist University United International College, 10/2023.

3. "Solving Strongly Convex and Smooth Stackelberg Games Without Modeling the Follower", 2023 American Control Conference, San Diego, 06/2023.