Yang Hu

CS PhD student @ SEAS, Harvard

huyangshcn@gmail.com | yanghu@g.harvard.edu
SEC building, 150 Western Ave, Allston, MA 02134
https://huyangsh.github.io/

Research Interest

I am broadly interested in the theoretical foundations of intelligent systems and **decision making**, with the ultimate goal of obtaining a better understanding of **collective intelligence in complex systems**. More specifically, I am devoted to designing **efficient algorithms** that enables learning-based strategic moves in large-scale multi-agent systems equipped with various dynamics structures, and developing theory that reveals the **fundamental limit** of online decision-making algorithms. My current research focuses on **multi-agent systems**, which lies in the intersection of game theory, online control, reinforcement learning and machine learning, and is thus interdisciplinary by nature.

Education

PhD Student in Computer Science *Sept. 2022 — now*
SEAS, Harvard University, MA
- Co-advised by Prof. Na Li and Prof. Sham Kakade.

B.E. in Computer Science and Technology *Aug. 2018 — Jun. 2022*
IIIS ("Yao Class"), Tsinghua University, Beijing, PRC
- Graduate with *summa cum laude* (GPA: 3.96/4).
- Senior thesis: *Performance Analysis of MPC Controllers with Prediction Errors and Constraints — A Perturbation-based Framework*, advised by Prof. Longbo Huang (Tsinghua) and Prof. Adam Wierman (Caltech), receiving the Excellent Senior Thesis Award.

Other Academic Experience

Undergraduate Researcher (remote) *Jan. 2021 — Feb. 2022*
CMS, California Institute of Technology, CA
- Advised by Prof. Adam Wierman.

Undergraduate Researcher (remote) *Aug. 2021 — May. 2022*
ECE, Carnegie Mellon University
- Advised by Prof. Guannan Qu.

Publications

(Authors with equal contributions are marked with asterisks (*).)

Conference papers

- Yiheng Lin*, **Yang Hu***, Guannan Qu, Tongxin Li, and Adam Wierman. Bounded-regret MPC via perturbation analysis: Prediction error, constraints, and nonlinearity. In *Advances in Neural Information Processing Systems*, vol. 35, p. tbd, 2022.
  Accepted by NeurIPS'22 as Poster.
- **Yang Hu**, Adam Wierman, and Guannan Qu. On the sample complexity of stabilizing LTI systems on a single trajectory. In *Advances in Neural Information Processing Systems*, vol. 35,

p. tbd, 2022.
Accepted by NeurIPS'22 as Poster.

- Yiheng Lin*, **Yang Hu***, Guanya Shi*, Haoyuan Sun*, Guannan Qu*, and Adam Wierman. Perturbation-based regret analysis of predictive control in linear time varying systems. In *Advances in Neural Information Processing Systems*, vol. 34, pp. 5174–5185, 2021.
*Accepted by NeurIPS'21 as **Spotlight (top 3%)**.*

Preprints

- **Yang Hu**, Zhui Zhu, Sirui Song, Xue Liu, and Yang Yu. Calculus of consent via marl: Legitimating the collaborative governance supplying public goods. *arXiv preprint arXiv: 2111.10627*, 2021.
Appear in NeurIPS'21 PERLS Workshop.

Academic Services

Peer review

- *Annual Learning for Dynamics & Control Conference (L4DC)*: 2023.

Honors and Awards

Undergraduate

- National Scholarship for Undergraduates *2019 & 2021*
The highest honor for undergraduates (1 nominee per class each year).
- Silver Medal of "Yao Award" at IIIS, Tsinghua University *2021*
Awarded to outstanding senior undergraduates at "Yao Class" (top 5%).
- First-class Scholarship (in memory of Nanxiang Jiang) at Tsinghua University *2020*
The highest honor for junior undergraduates (1 nominee per department each year).
- Second-class Scholarship for Freshmen *2018*
Awarded to freshmen with outstanding academic talent.

High school

- First Prize of National Mathematical Olympiad (First Round) *2016 & 2017*
- First Prize of National Olympiad in Informatics in Provinces (NOIP) *2015 & 2017*
- Silver Medal of Russian Mathematical Olympiad (10th Grade, Final Round) *2017*