Chih-Yuan Chiu

Academic Employment

Georgia Institute of Technology Aug 2024 - now
Postdoctoral Fellow and Research Engineer II,
School of Electrical and Computer Engineering.
Supervisor: Professor Justin Romberg

Education

University of California, Berkeley Sept 2018 - Dec 2023
Ph.D., Department of Electrical Engineering and Computer Sciences
Advisor: Professor Shankar Sastry

National Taiwan University Sept 2014 - June 2018
B.S., Department of Electrical Engineering

Contact Information

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Website: https://chihyuanchiu.github.io/
Google Scholar: https://scholar.google.com/citations?hl=en&user=cl9ModoAAAAJ

Journal Preprints

Chih-Yuan Chiu, Bryce Ferguson. "Robustness of Incentive Mechanisms Against System Misspecification in Congestion Games," (Revise and Resubmit at) *IEEE Control Systems Letters (L-CSS)*, 2025.

Journal Publications

Chih-Yuan Chiu[⋆1], Jingqi Li[⋆], Maulik Bhatt, Negar Mehr. "To What Extent Do Open-Loop and Feedback Nash Equilibria Diverge in General-Sum Linear Quadratic Dynamic Games?" *IEEE Control Systems Letters (L-CSS)*, 2024 (https://ieeexplore.ieee.org/abstract/document/10766403).

Lasse Peters, Andrea Bajcsy, Chih-Yuan Chiu, David Fridovich-Keil, Forrest Laine, Laura Ferranti, Javier Alonso-Mora. "Contingency Games for Multi-Agent Interaction," *IEEE Robotics and Automation Letters (RA-L)*, 2024 (https://ieeexplore.ieee.org/document/10400882).

Forrest Laine, David Fridovich-Keil, Chih-Yuan Chiu, and Claire Tomlin. "The Computation of Approximate Generalized Feedback Nash Equilibria", *SIAM Journal on Optimization*, 2023. (https://epubs.siam.org/doi/epdf/10.1137/21M142530X).

Druv Pai, Michael Psenka, Chih-Yuan Chiu, Manxi Wu, Edgar Dobriban, Yi Ma. "Pursuit of a Discriminative Representation for Multiple Subspaces via Sequential Games", Journal of the Franklin Institute, 2023 (https://www.sciencedirect.com/science/article/pii/S0016003223000960).

Amay Saxena[⋆], Chih-Yuan Chiu[⋆], Ritika Shrivastava, Joseph Menke, Shankar Sastry. "Simultaneous Localization and Mapping: Through the Lens of Nonlinear Optimization," *IEEE Robotics and Automation Letters (RA-L)*, 2022. (https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9793570).

Conference Publications

Chih-Yuan Chiu, Devansh Jalota, Marco Pavone. "Credit vs. Discount-Based Congestion Pricing: A Comparison Study," *IEEE Conference on Decision and Control (CDC)*, 2024. (https://arxiv.org/pdf/2403.13923.pdf)

Chih-Yuan Chiu, Shankar Sastry. "Parameter Estimation in Optimal Tolling for Traffic Networks Under the Markovian Traffic Equilibrium," *American Control Conference (ACC)*, 2024. (https://drive.google.com/file/d/1LM7BwxI4ntOpy8J8TFyOyLXNHIBi4kL7/view?usp=sharing)

Chih-Yuan Chiu, Chinmay Maheshwari, Pan-Yang Su, Shankar Sastry. "Dynamic Tolling in Arc-based Traffic Assignment Models," *59th Annual Allerton Conference on Communication, Control,*

[1] ⋆Equal contribution.

and Computing, 2023. (https://arxiv.org/pdf/2307.05466.pdf)

Chih-Yuan Chiu*, Chinmay Maheshwari*, Pan-Yang Su, Shankar Sastry. "Arc-based Traffic Assignment: Equilibrium Characterization and Learning," *IEEE Conference on Decision and Control (CDC)*, 2023. (https://arxiv.org/pdf/2304.04705.pdf)

Jingqi Li, Chih-Yuan Chiu, Lasse Peters, Fernando Palafox, Mustafa Karabag, Javier Alonso-Mora, Somayeh Sojoudi, Claire Tomlin, David Fridovich-Keil. "Scenario-Game ADMM: A Parallelized Scenario-Based Solver for Stochastic Noncooperative Games," *IEEE Conference on Decision and Control (CDC)*, 2023. (https://arxiv.org/pdf/2304.01945.pdf)

Chih-Yuan Chiu. "SLAM Backends with Objects in Motion: A Unifying Framework and Tutorial," *American Control Conference (ACC)*, 2023. (https://arxiv.org/pdf/2207.05043.pdf).

Jingqi Li, Chih-Yuan Chiu, Lasse Peters, Somayeh Sojoudi, Claire Tomlin, David Fridovich-Keil. "Cost Inference for Feedback Dynamic Games from Noisy Partial State Observations and Incomplete Trajectories," *International Conference on Autonomous Agents and Multiagent Systems*, 2023. (https://arxiv.org/pdf/2301.01398.pdf).

Chih-Yuan Chiu, David Fridovich-Keil. "GTP-SLAM: Game-Theoretic Priors for Simultaneous Localization and Mapping in Multi-Agent Scenarios," *IEEE Conference on Decision and Control (CDC)*, 2022. (https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9992656).

Chinmay Maheshwari*, Chih-Yuan Chiu*, Eric Mazumdar, Shankar Sastry and Lillian J. Ratliff. "Zeroth-Order Methods for Convex-Concave Minmax Problems: Applications to Decision-Dependent Risk Minimization", *25th International Conference on Artificial Intelligence and Statistics* (AISTATS), 2022. (https://proceedings.mlr.press/v151/maheshwari22a/maheshwari22a.pdf).

Chih-Yuan Chiu*, David Fridovich-Keil*, and Claire Tomlin. "Encoding Defensive Driving as a Dynamic Nash Game," *IEEE International Conference on Robotics and Automation (ICRA)*, 2020. (https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9560788)

Forrest Laine, David Fridovich-Keil, Chih-Yuan Chiu, and Claire Tomlin. "Multi-Hypothesis Interactions in Game-Theoretic Motion Planning", *IEEE International Conference on Robotics and Automation (ICRA)*, 2020. (https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9561695).

Forrest Laine, Chih-Yuan Chiu, Claire Tomlin, "Eyes-Closed Safety Kernels: Safety for Autonomous Systems Under Loss of Observability", *Robotics: Science and Systems (RSS)*, 2020. (https://www.roboticsproceedings.org/rss16/p096.pdf).

Theses

(*Ph.D. Thesis*) Chih-Yuan Chiu. "Algorithm Design for Safe and Efficient Societal-Scale Navigation," 2023. (https://www2.eecs.berkeley.edu/Pubs/TechRpts/2023/EECS-2023-267.pdf).

(*Master's Thesis*) Chih-Yuan Chiu. "Simultaneous Localization and Mapping: A Rapprochement of Filtering and Optimization-Based Approaches," 2021. (https://www2.eecs.berkeley.edu/Pubs/TechRpts/2021/EECS-2021-76.pdf).

Invited Oral Presentations

Georgia Tech DCL Symposium Spotlight Talk Apr 2025
"Credit-based vs. Discount-based Congestion Pricing: A Study of Tolling and Toll Relief Mechanisms for Traffic Management."

UC Berkeley ME ICON Research Group Seminar Dec 2024

"Discussion of the Publication, A Survey of Opponent Modeling in Adversarial Domains, by and Dr. Samer Nashed and Dr. Shlomo Zilberstein."

Georgia Tech ECE Decision and Control Laboratory Student Seminar Oct 2024
"Interaction-aware Multi-Agent Control: The Role of Information."

UC Berkeley EECS C106B/206B Guest Lecture Apr 2022
"Simultaneous Localization and Mapping: A Unifying Optimization-Based Framework." (with Ritika Srivastava)

UC Berkeley Semiautonomous Seminar Feb 2022
"Towards a Rapprochement of Estimation, Prediction, and Planning for Autonomous Navigation."

UC Berkeley EE 221A Guest Lecture Dec 2021
"Simultaneous Localization and Mapping: Filtering and Optimization Approaches." (with Amay Saxena)

UC Berkeley Semiautonomous Seminar Sep 2021
"Gradient Free Optimistic Gradient Descent Ascent: Applications to Decision Dependent Risk Minimization." (with Chinmay Maheshwari)

UC Berkeley Semiautonomous Seminar Jun 2021
"Factor Graphs: A Tool for Optimization-Based Inference in Robotics."

UC Berkeley EECS C106B/206B Guest Lecture Feb 2021
"Simultaneous Localization and Mapping: A Unifying Optimization-Based Framework." (with Amay Saxena)

UC Berkeley Semiautonomous Seminar Jun 2020
"Adversarial-to-Cooperative Games."

Teaching Experience

EE 127 (Optimization Models in Engineering) Aug 2023 - Dec 2023
20-hour Graduate Student Instructor for a 16-week semester-long course

EE 221A (Linear Systems Theory) Aug 2021 - Dec 2021
20-hour Graduate Student Instructor for a 16-week semester-long course

EE 16B (Designing Information Devices and Systems II) Jul 2020 - Aug 2020
25-hour Graduate Student Instructor for an 8-week summer course

Journal and Conference Reviewing

Journals

- IEEE Control Systems Letters, 2024.
- IEEE Robotics and Automation Letters (RA-L), 2024.
- Journal of Machine Learning Research (JMLR), 2023.

Conferences

- IEEE Conference on Decision and Control (CDC), 2024.
- American Control Conference (ACC), 2024.
- IEEE International Conference on Robotics and Automation (ICRA), 2022.
- IEEE International Symposium on Multi-Robot and Multi-Agent Systems (MRS), 2021.
- IEEE International Conference on Robotics and Automation (ICRA), 2021.

- IEEE Conference on Decision and Control (CDC), 2020.

Software Skills Python, Matlab, C++, LaTeX

Organizations and Activities

(*Upcoming*) **ACC 2025: Workshop on Mixed-Autonomy Traffic, Co-Organzers** July 2024
Workshop on Emerging Challenges and Opportunities in Mixed Autonomy Transportation Systems (`https://sites.google.com/view/acc2025workshoponmixedautonomy/home?authuser=0`)

Decision and Control Laboratory Student Seminar Co-Organizer Sep 2024 - now
Monthly seminar on emerging challenges in the control of robotic and cyber-physical systems, at Georgia Tech ECE

DREAM Seminar Co-Organizer Sep 2022 - Dec 2023
Weekly seminar on control theory, robotics, optimization, computer vision, and machine learning, at UC Berkeley EECS.

Semiautonomous Seminar Co-Organizer Jan 2020 - Dec 2021
Weekly seminar on control theory, robotics, optimization, computer vision, and machine learning, at UC Berkeley EECS.