Chih-Yuan Chiu

Academic Employment

Georgia Institute of Technology Aug 2024 - now
Postdoctoral Fellow and Research Engineer II,
Department 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

Emails: cyc@gatech.edu, chihyuanfrankchiu@gmail.com.
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," (submitted to) *IEEE Control Systems Letters (L-CSS)*, 2025.

Journal Publications

Chih-Yuan Chiu*, 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).

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. (*Equal contribution.) (https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9793570).

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

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, 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. (*Equal contribution.)(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).

Chih-Yuan Chiu*, Chinmay Maheshwari*, 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. (*Equal contribution.) (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. (*Equal contribution.) (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

(*Upcoming*) Dec 2024
"Discussion of the Publication, A Survey of Opponent Modeling in Adversarial Domains, by and Dr. Samer Nashed and Dr. Shlomo Zilberstein."

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."

UIUC ECE Seminar Mar 2024
"Towards Safe and Efficient Mobility."

Duke University ECE and ME Seminar Mar 2024
"Towards Safe and Efficient Mobility."

UT Dallas CS Seminar Feb 2024
"Towards Safe and Efficient Mobility."

Washington University at St. Louis ESE Seminar Jan 2024
"Towards Safe and Efficient Mobility."

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

Conference Reviewing

Conferences and Journals

- IEEE Control Systems Letters, 2024.

- IEEE Conference on Decision and Control (CDC), 2024.
- IEEE Robotics and Automation Letters (RA-L), 2024.
- American Control Conference (ACC), 2024.
- IEEE International Conference on Robotics and Automation (ICRA), 2022.
- Journal of Machine Learning Research (JMLR), 2023.
- 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.

Academic Translation Yung, Chee Fai, *Linear Algebra*, 2nd ed., 2012, Wuhan Book Co., Ltd., Taiwan (to be published).

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.