Chih-Yuan Chiu

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EDUCATION

UC Berkeley, Berkeley, CA — Sept 2018 - Present
Ph.D. Student, Department of Electrical Engineering and Computer Sciences

- **Research Advisor**: Professor Shankar Sastry
- **Selected Coursework (Average GPA: 4.0)**:
  Linear Systems Theory (A+), Information Theory (A), Random Processes in Systems (A+), Nonlinear Systems (A+), Machine Learning (A+), Metric Differential Geometry (A), Probability Theory (A+), Hybrid and Intelligent Systems Design (A+), Stochastic Systems (A), Convex Optimization (A), Optimization Analysis and Algorithms (A+), Theory of Multi-armed Bandits and Reinforcement Learning (A+), Introduction to Robotics (A)

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

RESEARCH EXPERIENCE

University of California, Berkeley, Berkeley, CA 94720
First-Year Graduate Student Fellowship — Jul 2018 - Jun 2019
Graduate Research Assistant — Jul 2019 - Present

- Topics—Game Theory, State Estimation, Optimal Control, Computer Vision
- Advisor—Professor Shankar Sastry

TEACHING EXPERIENCE

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

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

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

CONFERENCE REVIEWS

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

LANGUAGES

Mandarin Chinese, Native language

English, Fluent

SOFTWARE SKILL	Python, Matlab, C++, LaTeX, ROS

ORGANIZATIONS
AND ACTIVITIES

Semiautonomous Seminar Co-Organizer   Jan 2020 - Dec 2021
- Content: Weekly seminar on control theory, robotics, optimization, computer vision, and machine learning.

PREPRINTS

Chih-Yuan Chiu, Chinmay Maheshwari, Pan-Yang Su, Shankar Sastry. "Dynamic Tolling in Arc-based Traffic Assignment Models," submitted to *59th Annual Allerton Conference on Communication, Control, and Computing*, 2023. (`https://arxiv.org/pdf/2307.05466.pdf`)

Chih-Yuan Chiu, Shankar Sastry. "Parameter Estimation in Optimal Tolling for Traffic Networks Under the Markovian Traffic Equilibrium," submitted to *59th Annual Allerton Conference on Communication, Control, and Computing*, 2023. (`https://drive.google.com/file/d/1LM7BwxI4ntO py8J8TFyOyLXNHIBi4kL7/view?usp=sharing`)

Chih-Yuan Chiu, Chinmay Maheshwari, Pan-Yang Su, Shankar Sastry. "Arc-based Traffic Assignment: Equilibrium Characterization and Learning," accepted at *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," submitted to *IEEE Conference on Decision and Control (CDC)*, 2023. (`https://arxiv.org/pdf/2304.01945.pdf`)

Lasse Peters, Andrea Bajcsy, **Chih-Yuan Chiu**, David Fridovich-Keil, Forrest Laine, Laura Ferranti, Javier Alonso-Mora. "Contingency Games for Multi-Agent Interaction," (`https://arxiv.or g/pdf/2304.05483.pdf`)

Chih-Yuan Chiu, Kshitij Kulkarni, Shankar Sastry. "A Novel Statistical Independence Test for Dynamic Causal Discovery with Rare Events," submitted to *IEEE Conference on Decision and Control (CDC)*, 2023. (`https://arxiv.org/pdf/2211.16596.pdf`)

CONFERENCE
PUBLICATIONS

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`).

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[⋆], Amay Saxena[⋆], Joseph Menke, Ritika Shrivastava, Shankar Sastry. "Simultaneous Localization and Mapping: Through the Lens of Nonlinear Optimization," *IEEE International Conference on Intelligent Robots and Systems* (IROS), 2022. (⋆: Equal contribution.) (`https://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=9793570`).

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`).

Rahul Arya, **Chih-Yuan Chiu**, and Gireeja Ranade. "Stabilizability of Vector Systems with Uniform Actuation Unpredictability", *IEEE International Symposium on Information Theory (ISIT)*, 2021. (`https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9518286`).

Jingqi Li, **<u>Chih-Yuan Chiu</u>**, 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`).

<u>Chih-Yuan Chiu</u>⋆, 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, **<u>Chih-Yuan Chiu</u>**, 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, **<u>Chih-Yuan Chiu</u>**, 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`).

JOURNAL PUBLICATIONS

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

WORKSHOP PUBLICATIONS

Druv Pai, Michael Psenka, **<u>Chih-Yuan Chiu</u>**, Manxi Wu, Edgar Dobriban, Yi Ma. "Pursuit of a Discriminative Representation for Multiple Subspaces via Sequential Games", *Third Workshop on Seeking Low-Dimensionality in Deep Neural Networks*, 2023 (`https://arxiv.org/pdf/2206.09120.pdf`).

THESES

(*Master's Thesis*) **<u>Chih-Yuan Chiu</u>**. "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`).

REFERENCES

Professor Shankar Sastry
Thomas M. Siebel Professor, Department of Electrical Engineering and Computer Sciences, Professor of Bioengineering, University of California, Berkeley
- Website: `http://people.eecs.berkeley.edu/~sastry/`
- Email: sastry at coe dot berkeley dot edu

Professor Claire Tomlin
Charles A. Desoer Professor, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley
- Website: `https://people.eecs.berkeley.edu/~tomlin/`
- Email: tomlin at berkeley dot edu

Professor David Fridovich-Keil
Assistant Professor, Department of Aerospace Engineering and Engineering Mechanics, University of Texas, Austin.
- Website: `https://dfridovi.github.io/`
- Email: dfk at utexas dot edu

Professor Forrest Laine
Assistant Professor, Department of Computer Science, Vanderbilt University.

- Website: `https://4estlaine.github.io/`
- Email: forrest dot laine at berkeley dot edu

Professor Lillian Ratliff
Assistant Professor, Department of Electrical Engineering and Computer Sciences, University of California, Berkeley.

- Website: `http://faculty.washington.edu/ratliffl/`
- Email: ratliffl at uw dot edu