Yu-Wen Chen

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Education

University of California, Berkeley Berkeley, CA, USA
Ph.D. in Electrical Engineering and Computer Science (GPA: 4.0/4.0) *Sep. 2022 – Now*
Advisor: Dr. Murat Arcak

National Taiwan University Taipei, Taiwan
M.S. in Electrical Engineering (GPA: 4.0/4.0) *Sep. 2017 – June 2019*
Advisor: Dr. Li-Chen Fu
Thesis: Dynamic Maneuver Control of Multi-Agent System with Input Saturation

National Taiwan University Taipei, Taiwan
B.S. in Electrical Engineering (GPA: 3.7/4.0) *Sep. 2012 – June 2016*

Publications

Journal Publications:

- Y.-W. Chen, M.-L. Chiang and L.-C. Fu, "Three-Dimensional Maneuver Control of Multi-agent Systems with Constrained Input," in *IEEE Transactions on Cybernetics*, 2021
- M.-L. Chiang, Y.-W. Chen, C.-S. Chen and S.-H. Tsai, "Distributed Formation Control of Multi-agent Systems With Specified Order," in *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, 2020

Conference Publications:

- Y.-W. Chen, C. Kizilkale and M. Arcak, "A Two-stage Mechanism for Prioritized Trajectory Planning in Multi-Agent Systems," *American Control Conference (ACC)*, Denver, USA, 2025 (Accepted)
- Y.-W. Chen, C. Kizilkale and M. Arcak, "Solving Monotone Variational Inequalities with Best Response Dynamics," *IEEE 63rd Conference on Decision and Control (CDC)*, Milan, Italy, 2024
- Y.-W. Chen, M.-L. Chiang and L.-C. Fu, "Formation Control with Orientation Alignment by Constrained Input," *21st IFAC World Congress*, Berlin, Germany, 2020
- Y.-W. Chen, M.-L. Chiang and L.-C. Fu, "Ordered formation control and affine transformation of Multi-Agent Systems without global reference frame," *American Control Conference (ACC)*, Philadelphia, USA, 2019
- Y.-C. Huang, J.-T. Shen, M.-L. Chiang, Y.-W. Chen, T.-L. Chua and L.-C. Fu, "Dual Null-Space Based Controller Design with Signal Compensation for Formation with Conflicted Tasks," *IEEE Conference on Control Technology and Applications (CCTA)*, Hong Kong, China, 2019

Thesis:

- Y.-W. Chen, L.-C. Fu, "Dynamic Maneuver Control of Multi-Agent System with Input Saturation," 2019

Teaching Experience

Graduate Teaching Assistant (course: Linear System Theory) Fall, 2023
University of California, Berkeley *Berkeley, CA, USA*
- Held 2-hours recitation section and 2.5-hours office hour both once a week for 25+ graduate students
- Designed and graded 10 homework assignments, midterm, and final problem sets

Graduate Teaching Assistant (course: Adaptive Control Systems) Spring, 2019
National Taiwan University *Taipei, Taiwan*
- Guided 20+ students to accomplish Matlab simulations and their final projects
- Won the *Best Teaching Assistant Award*

Graduate Teaching Assistant (course: Nonlinear System Analysis) Fall, 2018
National Taiwan University *Taipei, Taiwan*
- Lectured stability proofs and preliminaries in Advanced Linear Algebra to 15+ students
- Won the *Best Teaching Assistant Award*

Research Experience

Graduate Research Assistant (Ph.D.) Sep. 2022 – Now
Arcak's Group (Advisor: Dr. Murat Arcak) *University of California, Berkeley*

Graduate Research Assistant (M.S.) Sep. 2017 – Sep. 2019
Advanced Control Laboratory (Advisor: Dr. Li-Chen Fu) *National Taiwan University*

- Participated in 5+ top conference and journal publications and served as the first author in 3 of which
- Being Nominated as the *Best Master Thesis Award* by my advisor Dr. Li-Chen Fu and the oral committee

Undergraduate Researcher in Multi-robot Formation Control Aug. 2015 – June 2017
Advanced Control Laboratory (Advisor: Dr. Ming-Li Chiang) *National Taiwan University*

- Studied Graph and Advanced Linear algebra to present state-of-the-art papers about multi-agent control weekly
- Utilized Lyapunov and input-to-state stability theorems to design asymptotically stable multi-agent controller

Undergraduate Researcher in Game Theory June 2015 – June 2016
Professor Ho-Lin Chen's lab (Advisor: Dr. Ho-Lin Chen) *National Taiwan University*

- Participated in study group to learn topics of auction/bidding, cost-sharing, repeated game, and dynamic game
- Consulted with professor Chen twice a week to devise a cost-sharing mechanism for relieving congestion

Project Experience

Amazon Racing Car Project Fall. 2022 – Fall. 2023
University of California, Berkeley & Amazon *Industry-Academy cooperation*

- Led 3 master's students to design controllers for Amazon racing cars and implement them on hardware platform

Multi-UAV Formation Flying and Applications Sep. 2018 – Nov. 2020
National Chung-Shan Institute of Science & Technology (NCSIST) *National Project*

- Proposed a novel 3D multi-agent formation controller with convergence analysis to achieve online adaptation
- Conducted a 100+ UAVs simulation in Matlab and implemented the algorithm via *MAVROS* to verify the design

Feedback Algorithms Design for Combat Model Aug. 2017 – Aug. 2018
National Chung-Shan Institute of Science & Technology (NCSIST) *National Project*

- Designed a Game Theory based Weapon-Target Assignment and verified it by 5+ attrition models
- Transformed it into Control problem and introduced stability analysis to guarantee the sub-optimal performance

Speech Experience

Invited Talk – Introduction to *ROS* and *MoveIt!* Oct. 2021
Tunghai University *Taichung, Taiwan*

- Promoted *ROS* and *MoveIt!*, frameworks for robot integration and manipulators, to 20+ graduate students

Workshop – 2D & nD Planning Algorithms Dec. 2020
National Taiwan University of Science & Technology *Taipei, Taiwan*

- Introduced 2D navigation problem and SLAM to 15+ graduate students and demonstrated via *ROS* packages
- Presented high-dimensional planning algorithms collected in *Open Motion Planning Library*

Work Experience

MediaTek Inc. May. 2021 – Aug. 2022
R&D Software Engineer *Taipei, Taiwan*

- Designed and maintained middleware framework for camera applications based on clients' requests

New Era AI Robotic Inc. Nov. 2019 – May. 2021
R&D Robotics Engineer *New Taipei, Taiwan*

- Designed motion planning algorithms to prevent Multi-DoF robotic arm from collisions in dynamic environments
- Applied 2D & nD motion planning to Autonomous Mobile Manipulator Robots via *ROS* and *MoveIt!* frameworks
- Processed 3D sensor data and 2D image pipeline to implement robot perception on Jetson AGX Xavier platform