

Hao-Lun Hsu

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RESEARCH INTERESTS

I develop game-theoretic foundations for autonomous learning systems, including large language models, reinforcement learning, and bandit algorithms. My research explores their applications in robotics, autonomous driving, healthcare and computer-use agents.

RESEARCH EXPERIENCE

Google DeepMind

Student Researcher, Frontier AI, Game Theory Team

London, UK
09/2026 - Present

- Host: Luke Marris
- Topic: Strategic reasoning improvement through RL post-training

Waymo

Research Intern, AI Foundation Team

Mountain View, CA, USA
05/2026 - 08/2026

- Host: Dominik Notz, Jimmy (Tsung-Yen) Yang
- Topic: Self-supervised latent encoders as world model for Efficient model inference

Amazon

Applied Scientist Intern, Applied AI Team

Bellevue, WA, USA
06/2025 - 09/2025

- Host: Jing Xu, Nikhil M. Vichare, Francesco Carbone
- Topic: Multi-agent LLM system with RL post-training for long-horizon tasks

EDUCATION

Duke University

Ph.D. in Computer Science

M.A. in Economics

Medical Robotics Certificate

Durham, NC, USA
08/2022 - Present

- Advisor: Miroslav Pajic
- Committee: Miroslav Pajic (advisor), Ronald Parr, Vahid Tarokh, Michael Zavlanos
- Collaborator: Pan Xu, Vahid Tarokh, Giuseppe Carenini (University of British Columbia)
- Thesis Topic: Strategic Interactive Decision Making with Endogenous Dynamics

Georgia Institute of Technology

M.S. in Biomedical Engineering

Atlanta, GA, USA
08/2019 - 05/2021

- Advisor: Sehoon Ha, Babak Mahmoudi
- Collaborator: Qiuhua Huang (Pacific Northwest National Laboratory)
- Topic: RL for robotics, healthcare, and power system control

PUBLICATIONS

* Equal Contribution

Conference Papers

- [C1] NNiT: Width-Agnostic Neural Network Generation with Structurally Aligned Weight Spaces
J Kim, S Mehta, **HL Hsu**, H Ryu, Y Liu, M Pajic
International Conference on Machine Learning (ICML), 2026 [Paper]
- [C2] Variational Adversarial Training Towards Policies with Improved Robustness
J Dong*, **HL Hsu***, Q Gao, V Tarokh, M Pajic
International Conference on Artificial Intelligence and Statistics (AISTATS), 2025 [Paper]
- [C3] Safe Cooperative Multi-Agent Reinforcement Learning with Function Approximation
HL Hsu, M Pajic
Learning for Dynamics and Control Conference (L4DC), 2025 [Paper]
- [C4] Randomized Exploration in Cooperative Multi-Agent Reinforcement Learning
HL Hsu*, W Wang*, M Pajic, P Xu
Advances in Neural Information Processing Systems (NeurIPS), 2024 [Paper]
- [C5] Steering Decision Transformers via Temporal Difference Learning
HL Hsu, A Bozkurt*, J Dong*, Q Gao, V Tarokh, M Pajic
International Conference on Intelligent Robots and Systems (IROS), 2024 [Paper]
- [C6] StressFADS: Learning Latent Autonomic Factors of Stress in the Context of Trauma Recall and Neuromodulation
A Gazi, M Chan, **HL Hsu**, D Bremner, C Rozell, O Inan
International Conference on Wearable and Implantable Body Sensor Networks (BSN), 2024 [Paper]
- [C7] Robust exploration with adversary via Langevin Monte Carlo
HL Hsu, M Pajic
Learning for Dynamics and Control Conference (L4DC), 2024 [Paper]
- [C8] REFORMA: Robust REinFORceMent Learning via Adaptive Adversary for Drones Flying under Disturbances
HL Hsu, H Meng, S Luo, J Dong, V Tarokh, M Pajic
International Conference on Robotics and Automation (ICRA), 2024 [Paper]
- [C9] Finite-Time Frequentist Regret Bounds of Multi-Agent Thompson Sampling on Sparse Hypergraphs
T Jin, **HL Hsu**, W Chang, P Xu
Association for the Advancement of Artificial Intelligence (AAAI), 2024 [Paper] [Oral, 2.3 %]
- [C10] ϵ -Neural Thompson Sampling of Deep Brain Stimulation for Parkinson Disease Treatment
HL Hsu, Q Gao, M Pajic
International Conference on Cyber-Physical Systems (ICCPS), 2024 [Paper]
- [C11] Automated Tuning of Closed-loop Neuromodulation Control Systems using Bayesian Optimization
P Sarikhani, **HL Hsu**, B Mahmoudi
International Conference of the Engineering in Medicine & Biology Society (EMBC), 2022 [Paper]
- [C12] Improving Safety in Deep Reinforcement Learning Using Unsupervised Action Planning
HL Hsu, Q Huang, S Ha
International Conference on Robotics and Automation (ICRA), 2022 [Paper]

Journal Papers

- [J1] Active Guidance in Ultrasound Bladder Scanning Using Reinforcement Learning
HL Hsu*, M Zahir*, G Li, R Mukaddim, H Lee, J Grube, M Wilson, S Schmidt, G Ghoshal, B Raju
Scientific Reports, 2026 [Paper]
- [J2] Reinforcement Learning for Closed-loop Regulation of Cardiovascular System with Vagus Nerve Stimulation: A Computational Study
P Sarikhani, **HL Hsu**, M Zeydabadinezhad, Y Yao, M Kothare, B Mahmoudi
Journal of Neural Engineering, 2024 [Paper]

Workshop Papers

- [W1] Neuroweaver: Towards a Platform for Designing Translatable Intelligent Closed-loop Neuromodulation Systems
P Sarikhani, **HL Hsu**, JK Kim, S Kinzer, E Mascarenhas, H Esmaeilzadeh, B Mahmoudi
NeurIPS Research2Clinics Workshop, 2021
Brain Stimulation: Basic, Translational, and Clinical Research in Neuromodulation, 2021

HONORS & AWARDS

ICML Silver Reviewer	05/2026
First Annual Meta PhD Forum Cohort [80 Ph.D. students around the world]	10/2025
2025 NSF CPS (Cyber-Physical Systems) Rising Star [acceptance rate: 17 %]	02/2025
AAAI 2024 Oral [acceptance rate: 2.3 %]	2024
NSF TAST-NRT Fellowship [1 of 6 awardees]	08/2022 - 07/2023
Ph.D. Computer Science Departmental Fellowship, Duke	08/2022 - 07/2024
Thank a Teacher Award, Center of Teaching and Learning, Georgia Tech	04/2021
Material Innovation Award, Material Research Society Taiwan	10/2016
Third Prize, Manufacturing Competition, Mechanical Engineering, National Taiwan University	01/2015

TALKS & PRESENTATIONS

Athena Seminar Video Link	02/2026
IBM, Machine Learning Seminar (Host: Miao Liu, Youssef Mroueh)	11/2025
First Annual Meta PhD Forum (Poster)	10/2025
NSF CPS Rising Star Workshop (Poster)	03/2025
AFOSR Center “Assured Autonomy in Contested Environments”	05/2024
CS370 Artificial Intelligence, Duke University (guest lecture)	04/2024
Georgia Tech Robotics Research Showcase (Poster)	03/2022

RESEARCH MENTORING

Research Mentoring:**PhD:** Ruiyang Wang, Jiwoo Kim, Visrut Sudhakar**Master:**

- Jay Ding (Duke, Spring'25 - Fall'25)
- Liwen Sun (Duke, Spring'25)
- Weisheng Jin (Duke, Fall'23 - Spring'24)

Undergraduate:

- Yang Chen (UC Berkeley, Fall'23)

High School:

- Abby Hoeppner (Holt High School, Summer'25)
- Tony Yang (Northland christian School, Spring'25)
- Taiwei Wu (University High School, Spring'25)
- Stefan Dragos (St. Augustine Preparatory School, Summer'24)
- Alexander Wang (West Windsor Plainsboro High School North, Fall'23)
The National High School Journal of Science (NHSJS) [\[Paper\]](#)
- Nirav Jaiswal (Foothill High School, Summer'23) *Journal of Student Research (JSR)* [\[Paper\]](#)
- Indu Arimilli (Redmond High School, Summer'23)
- Ian Choe (St. Mark's School, Summer'23)

ACADEMIC SERVICES**Reviewer:**

L4DC (2024 - 2025), ICRA (2023 - 2024), IROS (2023, 2025, 2026), NeurIPS (2023, 2025, 2026), ICLR (2024 - 2026), AISTATS (2024 - 2025), ICML (2024 - 2026), RA-L, TMLR

Teaching Assistant:

Algorithmic Game Theory (Duke, Spring 2024)
Data Science (Duke, Spring 2023)
Network Science (Gatech, Spring, Summer, Fall 2021)
Clinical Application of Medical Electronic Device (NTU, Fall 2017)
Clinical Observation & Demands Exploration (NTU, Summer 2017)

TECHNICAL SKILLS**Programming:**

Python, MATLAB, R, C++, C#, Julia, VBA

Reinforcement Learning:

Stable-Baselines3, verl, OpenManus-RL

Simulation Environment:

OpenAI Gym, MuJoCo

Software:

AutoCAD, SolidWorks, Creo Parametric, ABAQUS, Qblade

OS:

Linux (Ubuntu), Microsoft Windows, macOS