ZHOUYU ZHANG

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Georgia Institute of Technology — Ph.D. in Robotics (Advisor: Prof. Glen Chou)   *Aug 2022 – Present*

Georgia Institute of Technology — M.S. in Electrical and Computer Engineering   *Aug 2022 – May 2025*

Tsinghua University — B.Eng. in Engineering Physics   *Sept 2018 – Jul 2022*

RESEARCH INTERESTS

Robot Optimization-based Control & Planning, Multi-Agent Systems, Safe Control, Inverse Optimization, Learning from Demonstration, Reinforcement Learning, Inverse Reinforcement Learning

PUBLICATIONS *(* INDICATES EQUAL CONTRIBUTION)*   *[J]=JOURNAL, [C]=CONFERENCE, [W]=WORKSHOP*

[**J1**] **Zhouyu Zhang***, Jia Shen*, Junhyoung Ha, Yue Chen. *"Toward Extending Concentric Tube Robot Kinematics for Large Clearance and Impulse Curvature"*, IEEE Robotics and Automation Letters, 2024. [paper]

[**J2**] **Zhouyu Zhang***, Chih-Yuan Chiu*, Glen Chou. *"Constraint Learning in Multi-Agent Dynamic Games from Demonstrations of Local Nash Interactions"*, IEEE Robotics and Automation Letters, Under Review. [paper]

[**J3**] Chih-Yuan Chiu*, **Zhouyu Zhang***, Glen Chou. *"Learning Constraints from Stochastic Partially-Observed Closed-Loop Demonstrations"*, IEEE Control Systems Letters, Under Review. [paper]

[**W1**] **Zhouyu Zhang**, Chih-Yuan Chiu, Glen Chou *"Constraint Learning in Multi-Agent Dynamic Games from Demonstrations of Local Nash Interactions"*, ICRA 2025 Workshop on Robot safety under uncertainty from "intangible" specifications, 2025. [paper]

EXPERIENCE

Georgia Tech Open Source Program Office ⬀   *May 2025 – Aug 2025*
Virtual Summer Internship Program (VSIP)   *Supervisor: Dr. Frank Dellaert*
– Designed and implemented factor-graph-based optimal control examples in **GTSAM** ⬀, a widely used open-source SLAM library with **3k+ GitHub stars**. Derived factor-graph formulations linking optimal control problems to factor graph optimization, enabling native LQR/iLQR implementations.
– Developed public benchmark examples: ⬀ LQR (linear) and ⬀ iLQR (nonlinear), serving as official tutorials for new users.
– Participated in GitHub code reviews and CI pipeline updates to maintain quality and reproducibility for an active community of contributors.

Trustworthy Robotics Lab   *Jan 2025 – Present*
Graduate Researcher   *Supervisor: Dr. Glen Chou*
– Developing optimization-based learning-from-demonstration (LfD) techniques for multi-agent systems, formulating problems as **mixed-integer programs (MIP)** and **nonlinear programs (NLP)** optimization problems. [**J2**][**J3**]
– Designed algorithms to extract agent constraints from interactions, combining inverse optimization with game theory for constraint inference. [**J2**]
– Investigating robust optimization approaches to recover feasible constraint sets from noisy demonstrations generated by closed-loop controllers. [**J3**]
– Applying learned constraints to generate safe motion plans via trajectory optimization and model-predictive control. [**J2**]

BioMedical Mechatronics (BM2) Lab   *Sept 2022 – Jun 2024*
Graduate Researcher   *Supervisor: Dr. Yue Chen*
– Developed a Sequential Quadratic Programming (SQP) method for soft-robot kinematics in constrained spaces, achieving **71% accuracy improvement** over state-of-the-art methods [**J1**].
– Maintained and calibrated OptiTrack motion-capture systems; scripted real-time data streaming for experimental validation.

HONORS & AWARDS

– Scholarships for Academic Excellence (2019) and Scientific Innovation (2020, 2021), Tsinghua University
– First Prize, Contemporary Undergraduate Mathematical Contest in Modeling
– STEER (Supporting Teaching ExpERience) Fellowship, Georgia Institute of Technology

TEACHING & SERVICE

– **Teaching Assistant**: ME 6401 (Linear Control Systems, Fall 2023), ECE 4150 (Cloud Computing, Spring 2024), ECE 2035 (Programming Hardware & Software Systems, Summer 2024–Spring 2025)
– **Reviewer**: IEEE RA-L, IROS, CoRL

TECHNICAL SKILLS

Programming C/C++, Python, MATLAB (**Language**) — Git (**Tools**)
Robotics/ML ROS2, Linux, PyTorch (**Tools**)— Reinforcement Learning, Model Predictive Control (MPC) (**Knowledge**)
Optimization CasADi, Gurobi, CVXPY (**Tools**) —Nonlinear Program (NLP), Mixed Integer Program (MIP) (**Knowledge**)