

RUI CHEN

Curriculum Vitae ◇ Personal Website: <https://ruichen.pub/> ◇ ruic3@andrew.cmu.edu · richen@umich.edu

EDUCATION

Ph.D. in Robotics Robotics Institute. Carnegie Mellon University, Pittsburgh.	Sep. 2020 - Present CGPA: 4.09/4.00
M.S. in Electrical and Computer Engineering / Robotics, CV Rackham Graduate School. The University of Michigan, Ann Arbor.	Sep. 2017 - Dec. 2018 CGPA: 3.96/4.00
B.S. in Computer Engineering Joint-Institute, College of Engineering. Dual-Degree Program. Shanghai Jiao Tong University, Shanghai, China - University of Michigan, Ann Arbor, U.S.	Sep. 2013 - Aug. 2017 CGPA: 3.75/4.00

DEMONSTRATIONS

Demonstrated collaborative robotics in manufacturing to the U.S. President at Mill 19. Jan. 2022

SKILLS AND INTERESTS

Interests	Safe and Optimal Control, Reinforcement Learning, Probabilistic Graphical Models.
Application	Safe Robots, Intelligent Manufacturing, Human-Robot Interaction, Autonomous Vehicles.
Skills	Kinova Gen3, Speedgoat, PCL, Cuda, Polysync, ROS, PyTorch, Tensorflow, RTOS, Embedded Systems, Computer Networks, Distributed/Parallel Computing.
Software	Openpose C++, Intel RealSense SDK 2.0, Kinova Kortex C++, Unreal Engine 4 C++.
Languages	C/C++, Python, Matlab, Arduino.

PUBLICATION

- R. Chen**, A. Shek, and C. Liu. “Robust and context-aware real-time collaborative robot handling via dynamic gesture commands.” *IEEE Robotics and Automation Letters* (2023).
- R. Chen**, W. Zhao, C. Liu, “Safety Index Synthesis with State-dependent Control Space,” *American Control Conference (ACC)*, 2024.
- R. Chen**, W. Zhao, R. Liu, W. Zhang, and C. Liu, “Real-time Safety Index Adaptation for Parameter-varying Systems via Determinant Gradient Ascend,” *American Control Conference (ACC)*, 2024.
- R. Chen**, C. Wang, T. Wei, C. Liu, “A Composable Framework for Policy Design, Learning, and Transfer Toward Safe and Efficient Industrial Insertion,” *IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2022.
- R. Chen**, M. Arief, W. Zhang and D. Zhao, “How to Evaluate Proving Grounds for Self-Driving? A Quantitative Approach,” in *IEEE Transactions on Intelligent Transportation Systems (T-ITS)*, vol. 22, no. 9, pp. 5737-5748, Sept. 2021, doi: 10.1109/TITS.2020.2991757.
- R. Chen***, P. Huang*, L. Shi*, “Latent Goal Allocation for Multi-Agent Goal-Conditioned Self-Supervised Imitation Learning,” in *Bayesian Deep Learning workshop, NeurIPS*, 2021.
- X. Chen, **R. Chen**, Z. Sui, Z. Ye, Y. Liu, R. I. Bahar, and O.C.Jenkins, “GRIP: Generative Robust Inference and Perception for Semantic Robot Manipulation in Adversarial Environments,” *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 2019, pp. 3988-3995, doi: 10.1109/IROS40897.2019.8967983.
- W. Zhao, T. He, **R. Chen**, T. Wei, and C. Liu, “State-wise safe reinforcement learning: a survey,” In *Proceedings of the Thirty-Second International Joint Conference on Artificial Intelligence (IJCAI '23)*, 2023, Article 763, 6814–6822. <https://doi.org/10.24963/ijcai.2023/763>

- W. Zhao, **R. Chen**, Y. Sun, T. Wei, C. Liu, “State-wise Constrained Policy Optimization,” Transaction on Machine Learning Research, 2024.
- C Zhang, R Chen, J Zhu, W Wang, C Liu, L Sun, “Interactive Car-Following: Matters but NOT Always,” IEEE 26th International Conference on Intelligent Transportation Systems (ITSC), 2023.
- A. Chari, **R. Chen**, J. Grover, C. Liu, “An Optimal Control Framework for Influencing Human Driving Behavior in Mixed-Autonomy Traffic,” American Control Conference (ACC), 2024.
- A. Chari, **R. Chen**, C. Liu, “Space-Time Conflict Spheres for Constrained Multi-Agent Motion Planning,” IEEE Intelligent Vehicles Symposium, 2023.
- R. Liu, **R. Chen**, Y. Zhao, C. Liu, “Jerk-Bounded Position Controller with Real-Time Task Modification for Interactive Industrial Robots,” in *IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM)*, 2022.
- W. Zhao, **R. Chen**, Y. Sun, R. Liu, T. Wei, C. Liu, ”Guard: A safe reinforcement learning benchmark,” Transaction on Machine Learning Research, 2023.
- R. Liu, **R. Chen**, and C. Liu. ”Task-agnostic adaptation for safe human-robot handover.” IFAC-PapersOnLine 55.41 (2022): 175-180.
- R. Liu, **R. Chen**, C. Liu, “Safe Interactive Industrial Robots using Jerk-based Safe Set Algorithm,” in *International Symposium on Flexible Automation (ISFA)*, 2022.
- R. Liu, **R. Chen**, A. Abuduweili, C. Liu, ”Proactive human-robot co-assembly: Leveraging human intention prediction and robust safe control.” 2023 IEEE Conference on Control Technology and Applications (CCTA). IEEE, 2023.
- A. Shek, BY. Su, **R. Chen**, C. Liu, ”Learning from physical human feedback: An object-centric one-shot adaptation method.” 2023 IEEE International Conference on Robotics and Automation (ICRA). IEEE, 2023.
- R. Chen**, W. Wang, Z. Zhao, and D. Zhao, “Active Learning for Risk-Sensitive Inverse Reinforcement Learning”, *arXiv*, 2020. Available: <https://arxiv.org/abs/1909.07843>

PRACTICAL CONTRIBUTIONS

Convex Feasible Set Library for Motion Planning	April. 2021 - July. 2021
Cartesian Following Control on Kinova Gen3 Robotic Arm	Oct. 2019 - Nov. 2019
Intel Real-Sense Camera Support for CMU OpenPose Library	Sep. 2019 - Oct. 2019
Automatic driving scenario generator from OSM data in Carla	April 2018 - Aug. 2018
Lincoln MKZ on-track testing with simulated traffic scenarios at Mcity	Jan. 2018 - May 2018
Surface normal prediction from single color image	March 2018 - April 2018
Particle filter SLAM on mobile bot with RPLIDAR	November 2017 - Dec. 2017
Potential Field Path Planning with Self-balancing robot	October 2017 - November 2017
RGBD-based object manipulation using a 6-DOF robotic arm	Sep. 2017 - October 2017

POSITIONS OF RESPONSIBILITY

Research Intern @Baidu USA LLC, Sunnyvale	Jan. 2020 - Aug 2020
Research Intern @Intelligent Control Lab, Robotics Institute, CMU	Sep. 2019 - Present
Research Assistant @Safe AI Lab, Mechanical Engineering, CMU	Feb. 2019 - Sep. 2019
Research Assistant @Lab 4Progress, The University of Michigan, Ann Arbor	Sep. 2018 - Feb. 2019

Research Assistant @Mcity, Ann Arbor	Jan. 2018 - June 2018
Software Intern @NVIDIA, Santa Clara	May 2016 - July 2016
Teaching & Lab Assistant @UM-SJTU, Shanghai Jiao Tong University, Shanghai	March 2015 - July 2016

AWARDS AND HONORS

University Honors, University of Michigan	Dec. 2015, April 2016, April 2017
Dean's List, University of Michigan	Dec. 2015, April 2016, Dec. 2016, April 2017
Excellent assistant class advisor, Shanghai Jiao Tong University	Aug. 2015
Academic Excellence Scholarship, Shanghai Jiao Tong University	Dec. 2014
Dean's List, Shanghai Jiao Tong University	April 2013, April 2014