# YUXIN CHEN

PhD · Control · Robotics · Machine Learning

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## Summary

I build safe and agile embodied agents that intelligently perceive, interact with, and collaborate within the physical world while adhering to human values. My research emphasizes human-robot interaction, dexterous manipulation, and whole-body control of mobile robots, leveraging state-of-the-art advancements in reinforcement learning, generative models, optimization, and control.

## Education

**University of California, Berkeley** — *Berkeley, CA*
Ph.D. Mechanical Engineering (Control) — *Aug 2022 – May 2027*
- Advisor: Prof. Masayoshi Tomizuka
- Minors: Machine Learning, Optimization

**University of Michigan, Ann Arbor** — *Ann Arbor, MI*
M.S. Robotics — *Aug 2020 – May 2022*
- Advisor: Prof. Ram Vasudevan

**University of Michigan, Ann Arbor** — *Ann Arbor, MI*
B.S.E. Aerospace Engineering (Summa Cum Laude) — *Sep 2018 – May 2020*
- Minor: Computer Science

**Shanghai Jiao Tong University** — *Shanghai, China*
B.S. Mechanical Engineering — *Sep 2016 – Aug 2020*

## Research Experience

**University of California, Berkeley** — *Berkeley, CA*
Graduate Student Researcher — *Aug 2022 – Present*
Faculty member: Prof. Masayoshi Tomizuka
Affiliation: Mechanical Systems Control (MSC) Laboratory & Berkeley AI Research (BAIR) & Berkeley DeepDrive (BDD)

**University of Michigan, Ann Arbor** — *Ann Arbor, MI*
Graduate Student Researcher — *May 2020 – Jul 2022*
Faculty member: Prof. Ram Vasudevan
Affiliation: Robotics and Optimization for the Analysis of Human Motion (ROAHM) Laboratory

**University of Michigan, Ann Arbor** — *Ann Arbor, MI*
Undergraduate Research Assistant — *Oct 2018 – May 2020*
Faculty member: Prof. Ella Atkins & Prof. Brent Gillespie
Affiliation: Autonomous Aerospace Systems (A2SYS) Laboratory & HAPTIX Laboratory

## Working Experience

**Mitsubishi Electric Research Laboratories** — *Cambridge, MA*
Research Intern. (Mentor: Devesh Jha & Diego Romeres) — *May 2024 – Aug 2024*
- Developed algorithms for fine-tuning diffusion policy with human preference
- Explored potential application of vision-language model (VLM) on robotic tasks

**Zoox, Inc.** — *Foster City, CA*
Software Engineering Intern. (Mentor: Rick Zhang) — *May 2021 – Aug 2021*
- Developed real-time motion planning algorithms for autonomous vehicle in uncertain environments with complex traffic conditions
- Conducted vehicle tests at Stanford Linear Accelerator Center (SLAC) National Accelerator Laboratory

**Honda R&D Americas, LLC** — *Ann Arbor, MI*
Student member, Multidisciplinary Design Program (Mentor: Tyler Naes) — *Jan 2021 – Dec 2021*
- Developed a graph neural networks (GNN) model to provide traffic/weather forecast for the on-board navigation system
- Designed the Human-Machine Interface (HMI) of the navigation system on an Acura RLX-5 host vehicle

**ZF (China) Investment Co., Ltd** — *Shanghai, China*

SOFTWARE DEVELOPMENT & TESTING INTERN. *Jan 2018 – Mar 2018*

- Built the CANoe user interface with CAPL and tested the networks for the ECU test platform of Aston Martin
- Wrote test cases in CANoe and tested the Active Kinematics Control (AKC) system for Porsche 992 in CANape

## PUBLICATIONS

**Journal**

[1] P. Ewen, A. Li, **Y. Chen**, S. Hong and R. Vasudevan, "These Maps are Made for Walking: Real-Time Terrain Property Estimation for Mobile Robots," *IEEE Robotics and Automation Letters (RA-L)*, vol. 7, no. 4, pp. 7083-7090, 2022.

**Conference Proceeding**

[1] R. Jalayer, **Y. Chen**, M. Jalayer, C. Orsenigo, M. Tomizuka, "Testing Human-Hand Segmentation on In-Distribution and Out-of-Distribution Data in Human-Robot Interactions Using a Deep Ensemble Model," *under review*, 2025.

[2] **Y. Chen**, D. Jha, M. Tomizuka, D. Romeres, "FDPP: Fine-tune Diffusion Policy with Human Preference," *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025.

[3] T. Zhang, Z. Wu, **Y. Chen**, Y. Wang, B. Liang, S. Moura, M. Tomizuka, M. Ding, W. Zhan, "Physics-Aware Robotic Palletization with Online Masking Inference," *2025 IEEE International Conference on Robotics and Automation (ICRA)*, 2025.

[4] S. Zhao*, X. Zhu*, **Y. Chen**, C. Li, X. Zhang, M. Ding, M. Tomizuka, "DexH2R: Task-oriented Dexterous Manipulation from Human to Robots," *under review*, 2024.

[5] **Y. Chen***, C. Tang*, J. Wei, C. Li, R. Tian, X. Zhang, W. Zhan, P. Stone, M. Tomizuka, "MEReQ: Max-Ent Residual-Q Inverse RL for Sample-Efficient Alignment from intervention," *under review*, 2024.

[6] Y. Xu*, **Y. Chen***, J. Nie, Y. Wang, H. Zhuang, M. Okumura, "Advancing Cross-domain Discriminability in Continual Learning of Vision-Language Models," *Advances in Neural Information Processing Systems (NeurIPS)*, 2024.

[7] **Y. Chen**, C. Tang, R. Tian, C. Li, J. Li, M. Tomizuka and W. Zhan, "Quantifying Interaction Level Between Agents Helps Cost-efficient Generalization in Multi-agent Reinforcement Learning," *Proceedings of the 1st Reinforcement Learning Conference (RLC)*, 2024.

[8] **Y. Chen**, C. Tang, R. Tian, C. Li, J. Li, M. Tomizuka and W. Zhan, "Quantifying Agent Interaction in Multi-Agent Reinforcement Learning for Cost-efficient Generalization," *Proceedings of the 23rd International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*, pp. 2201-2203, 2024.

[9] P. Ewen, J. -P. Sleiman, **Y. Chen**, W.C. Lu, M. Hutter and R. Vasudevan, "Generating Continuous Motion and Force Plans in Real-Time for Legged Mobile Manipulation," *2021 IEEE International Conference on Robotics and Automation (ICRA)*, pp. 4933-4939, 2021.

[10] M. Romano, **Y. Chen**, O. Marshall, and E. Atkins, "Nailed it: Autonomous Roofing with a Nailgun-Equipped Octocopter," *AIAA Aviation 2021 Forum,* pp. 3211, 2021.

## TEACHING EXPERIENCE

**University of California, Berkeley** *Berkeley, CA*

ADVANCED CONTROL SYSTEM I (MECENG 232) - GRADUATE STUDENT INSTRUCTOR *Aug 2024 – Dec 2024*
Instructor: Prof. Masayoshi Tomizuka

ADVANCED CONTROL SYSTEM II (MECENG 233) - GRADUATE STUDENT INSTRUCTOR *Jan 2024 – May 2024*
Instructor: Prof. Masayoshi Tomizuka

AI FOR AUTONOMY (MECENG 292B) - GRADUATE STUDENT INSTRUCTOR *Jan 2024 – May 2024*
Instructor: Dr. Wei Zhan

**University of Michigan, Ann Arbor** *Ann Arbor, MI*

SELF-DRIVING CARS: PERCEPTION AND CONTROL (ROB 535) - GRADUATE STUDENT INSTRUCTOR *Aug 2021 – Dec 2021*
Instructor: Prof. Ram Vasudevan

MOTION PLANNING (EECS 598) - COURSE ASSISTANT *Jan 2021 – Apr 2021*
Instructor: Prof. Dmitry Berenson

INTRODUCTION TO AEROSPACE SYSTEMS (AERO 201) - COURSE ASSISTANT *Aug 2019 – Dec 2019*
Instructor: Prof. Ella Atkins

## ACADEMIC SERVICES

**Journal Reviewer**

- IEEE Robotics and Automation Letters (RA-L)

**Conference Reviewer / Program Committee**

- International Conference on Learning Representations (ICLR)

- IEEE International Conference on Robotics and Automation (ICRA)
- IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)
- Learning for Dynamics & Control Conference (L4DC)
- IEEE International Automated Vehicle Validation Conference (IAVVC)

## Awards and Scholarships

2020 **Outstanding Graduates of Shanghai (top 3%)**, *Ministry of Education of Shanghai*
2020 **Capstone Design Gold Award (top 1%)**, *Shanghai Jiao Tong University*
2020 **James B. Angell Scholar**, *University of Michigan*
2019 **Roger King Scholarship**, *University of Michigan*
2018 **Longey-SJTU Global Elite Scholarship**, *Shanghai Jiao Tong University*
2017 **Rongchang Science and Technology Innovation Scholarship**, *Shanghai Jiao Tong University*
2017 **Undergraduate Academic Excellence Scholarship**, *Shanghai Jiao Tong University*