

YICHENG XU

Mechanical Engineer

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📍 Irvine, CA

🌐 TheBigoranger

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📁 Portfolio

EDUCATION

Ph.D. candidate Mechanical Engineering	University of California, Irvine	3.941/4.0	Sep 2021 - now
Master of Science Mechanical Engineering	University of California, Irvine	4.0/4.0	Sep 2020 - Jun 2021
Bachelor of Science Automation	Southeast University Exchange at UC Irvine in the fourth year	3.6/4.0	Sep 2016 - Jun 2020

SUMMARY

I am a Ph.D. student at UC Irvine studying Systems and Control under the supervision of Professor Faryar Jabbari. I have an education background in mechanical engineering, especially on optimization and control theory. My current interest is multi-agent systems, anti-windup control, event-triggered control, linear parameter varying systems, distributed optimization on graphs, and control barrier functions.

ACADEMIC EXPERIENCE

Graduate Student Lead	Hacker Fab at UC Irvine	Mentoring, Photolithography, PCB	Sep 2024 - Now
<ul style="list-style-type: none">Lead interdisciplinary research team at UCI's branch of Hacker Fab (https://ethanyxu.com/IrvineHackerFab)Spearhead development of optical lithography projects, e.g., tube furnace, spin coater, and patterning.Drive fund-raising initiatives and oversee project management. Cultivate collaborative environment as graduate student leader (https://ethanyxu.com/UROP)			
Teaching Assistant / Instructor	University of California, Irvine	Teaching, Communication	Sep 2021 - Now
<ul style="list-style-type: none">Assist Professor Faryar Jabbari in teaching ENGRMAE 80: Dynamics at University of California, IrvineDeliver one-on-one support to enhance student understanding of complex dynamics conceptsEvaluate and grade homework assignments and exams, ensuring fair assessment			

WORK EXPERIENCE

Mechanical Engineer	UCI's Engineering Design in Industry Program	Arduino, Solidworks, 3D print	Jan 2020 - Mar 2020
<ul style="list-style-type: none">Lead development of innovative personal hygiene device for hot, damp, and sanitized towelette deliveryCollaborate with cross-functional team to optimize product functionality and user experienceMore information on https://ethanyxu.com/WhoopyWipes			
Mechanical Engineer	UCI's Engineering Design in Industry Program	Signal processing, Solidworks	Sep 2019 - Dec 2019
<ul style="list-style-type: none">Develop hands-free, noninvasive clinical solution for enhanced blood vessel visualizationCreate comprehensive Bill of Materials (BOM) for efficient product manufacturingApply principles of objective and quantifiable assessment in medical device design			
Strategy consulting Internship	PricewaterhouseCoopers	Strategy consult, Communication	Sep 2017 - Dec 2017
<ul style="list-style-type: none">Provide strategic consulting services to a prominent Electric and Electronic Manufacturing companyUtilize enterprise analysis techniques to identify market opportunities			

AWARDS

Provincial Third Prize for National College Mathematical Contest in Modeling	Modelling, Optimisation	Sep 2018 - Dec 2018
<ul style="list-style-type: none">Lead team in designing regulation protocol for RGV robots in automated warehouse systemsOptimize working patterns to minimize robot stop time, enhancing overall efficiency		
Excellence Award for 20th electronic design contest of Southeast University	MCU development(STM32), Circuits	Apr 2018 - Jun 2018
<ul style="list-style-type: none">Collaborate in team to design feedback control system for DC power under varying load conditionsTest on bread board with oscilloscope, finalize with PCB board design		
First price for 14th RoboCup of Southeast University	ROS, Python, Pattern recognition	Dec 2017 - Jan 2018
<ul style="list-style-type: none">Program a robot using ROS for navigation and data collectionUse OpenCV in Python to recognize and track objects		

PUBLICATIONS AND PATENTS

[1] P. Ong, Y. Xu, R. M. Bena, F. Jabbari, and A. D. Ames, "Matrix Control Barrier Functions," Aug. 2025. arXiv: 2508.11795.

[2] Y. Xu and F. Jabbari, "Discrete-Time Leader-Following Multiagent Systems: Saturation Constraints and Event-Triggered Control," *IEEE Transactions on Control of Network Systems*, vol. 12, no. 2, pp. 1354–1368, Jun. 2025. DOI: 10.1109/TCNS.2024.3516578

[3] Y. Xu and F. Jabbari, "Distributed Optimization of Finite Condition Number for Laplacian Matrix in Multi-Agent Systems," Jul. 2025. arXiv: 2507.06440.

[4] Y. Xu and F. Jabbari, "Distributed Optimization of Network Weights for Improved Performance," in *2024 American Control Conference (ACC)*, IEEE, Jul. 2024, pp. 1392–1397. DOI: 10.23919/ACC60939.2024.10644563

[5] Y. Xu and F. Jabbari, "Spline-based parameter varying output feedback synthesis with improved L_2 gain," in *2024 IEEE 63rd Conference on Decision and Control (CDC)*, IEEE, Dec. 2024, pp. 1455–1460. DOI: 10.1109/CDC56724.2024.10886461

[6] Y. Xu and F. Jabbari, "Discrete-Time Output Feedback under Bounded Actuators: Single and Multi-agent Problems," in *2022 IEEE 61st Conference on Decision and Control (CDC)*, IEEE, Dec. 2022, pp. 4865–4871. DOI: 10.1109/CDC51059.2022.9992896

[7] Y. Xu, Y. Chen, T. Liu, and W. Chen, "Optimization Algorithm for Power Flow Calculation Using Graph Theory," in *Lecture Notes in Electrical Engineering Proceedings of 2019 Chinese Intelligent Systems Conference*, 2020, pp. 142–150. DOI: 10.1007/978-981-32-9698-5_17

PRESENTATION

- 1. April 2025, "Distributed optimization of the finite condition number of the Laplacian matrix", Presented at 45th Southern California Control Workshop, San Diego, CA, USA Program
- 2. Dec 2024, "Spline-based parameter varying output feedback synthesis with improved L_2 gain", Presented at 2024 IEEE 63rd Conference on Decision and Control (CDC), Milano, Italy Presented Paper
- 3. Jul 2024, "Distributed Optimization of Network Weights for Improved Performance", Presented at 2024 American Control Conference (ACC), Toronto, ON, Canada Presented Paper
- 4. Dec 2022, "Discrete-Time Output Feedback under Bounded Actuators: Single and Multi-agent Problems", Presented at 2022 IEEE 61st Conference on Decision and Control (CDC), Cancun, Mexico Presented Paper
- 5. Oct 2019, "Optimization Algorithm for Power Flow Calculation Using Graph Theory", Presented at 2019 Chinese Intelligent Systems Conference (CISC), Haikou, China Program

SKILLS

Program Language:	Matlab, Python, C/C++, Shell, LaTeX, HTML
Control Theory:	PID Control, Nonlinear Control, Robust Control (H_∞ , l_2 gain and gain scheduling), Event-Triggered Control, Control Barrier Function, Multi-Agent System, Anti-Windup Control, MPC, LQR
Mechanical Engineering:	3D printing, CAD(Solidworks), Lagrangian Mechanic, System Model via first principle, System Identification via Bode Plot, Linear Time-Invariant System,
Electric Engineering:	Micro-Controller Develop (Arduino, STM32, RaspberryPi), PCB desgin(Altium Designer, Easy EDA, KiCad), Oscilloscopes, Soldering, Circuits and Signals, Power and Energy System (AC,DC), DSP
Optimization:	Convex Optimization, Semi-definite Programming, Numerical Methods (Augmented Lagrangian, Interior Point Method, variations of Newton's method), ADMM

LANGUAGES

English: Professional proficiency
Mandarin: Native speaker