

Pengcheng Cao

PHD CANDIDATE · MECHANICAL ENGINEERING

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Education

University of California San Diego

PHD MECHANICAL & AEROSPACE ENGINEERING

• Advisor: Dr. Thomas Bewley, Dr. Falko Kuester

La Jolla, CA

Sep 2019 - Jun 2024

University of California San Diego

MS MECHANICAL ENGINEERING

• Advisor: Dr. Jan Kleissl

La Jolla, CA

Sep 2016 - Mar 2018

Shandong University

BS ENERGY AND ENVIRONMENTAL SYSTEM ENGINEERING

• Minors in Applied Mathematics
• Honors thesis/undergrad research advisor: Dr. Gongming Xin

Jinan, Shandong, China

Sep 2012 - June 2016

Professional Experience

2019-2024 **Graduate Teaching Assistant**, Dept. of Mechanical & Aerospace Engineering, UCSD
2019-2024 **Graduate Student Researcher**, Qualcomm Institute, UCSD
2018-2019 **Mechanical and Manufacturing Engineer**, Value Windows & Doors Inc, Los Angeles, CA
2017-2018 **Graduate Student Researcher**, Center for Energy Research, UCSD
2015-2016 **Undergraduate Research Assistant**, Heilmholtz Institute Ulm, Ulm, Germany

Teaching Experience

Spring 2024	MAE 242 Robot Motion Planning , Teaching Assistant	UC San Diego
Summer 2023	Introduction to Python Programming , Course Designer & Instructor	UC San Diego
Winter 2023	SE 281 Printable Robotics , Teaching Assistant	UC San Diego
Summer 2022	MAE 143 Signals & Systems , Teaching Assistant	UC San Diego
Winter 2022	SE 281 Printable Robotics , Teaching Assistant	UC San Diego
Winter 2021	SE 281 Printable Robotics , Teaching Assistant	UC San Diego
Fall 2020	MAE 101 Heat Transfer , Teaching Assistant	UC San Diego
Summer 2020	MAE 40 Linear Circuits , Teaching Assistant	UC San Diego
Fall 2019	MAE 180 Spacecraft Guidance , Teaching Assistant	UC San Diego

Awards, Fellowships, & Grants

2023	IEEE IRC Conference Travel Grant , IEEE Computer Society	\$ 800
	Departmental Travel Award , UCSD Dept of Mechanical & Aerospace Engineering	\$ 1,000
	Graduate Research Fellowship , US Army ERDC	\$ 40,000
2022	Departmental Travel Award , UCSD Dept of Mechanical & Aerospace Engineering	\$ 1,000
	Graduate Research Fellowship , US Army ERDC	\$ 30,000
2021	Graduate Research Fellowship , US Army ERDC	\$ 30,000

2016	Strategic Partnership U5 Scholarship , German Academic Exchange Service(DAAD)	\$ 4,000
2015	Second-grade Merit Student Scholarship , Shandong University	\$ 500

Mentoring

2020-2024	Joseph Phillips , Undergraduate Mentee, UC San Diego
2021	Team Weather Report , UCSD Robot Hackathon Winner, UC San Diego
2019-2021	Xuebin Zhu , Undergraduate Mentee, UC San Diego (now MS graduate at Tokyo University, Japan)

Outreach & Professional Development

SERVICE AND OUTREACH

2023	San Diego Miramar Air Show , Volunteering Exhibitor
2020-2022	Robotics Graduate Student Organization (RoboGrads) , Vice President

PEER REVIEW

IEEE Robotics and Automation Letters

2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

2022 & 2023 IEEE Aerospace Conference (Aeroconf)

PROFESSIONAL MEMBERSHIPS

Student Member, American Society of Mechanical Engineers (ASME)

Student Member, IEEE Robotics & Automation Society

Student Member, American Institute of Aeronautics and Astronautics (AIAA)

Publications

PUBLISHED

Pengcheng Cao, Thomas Bewley, and Falko Kuester (2023). "Cluster-based Dynamic Object Filtering via Egocentric Motion Detection for Building Static 3D Point Cloud Maps." 2023 Seventh IEEE International Conference on Robotic Computing (IRC). IEEE, pp. 368-372.

Pengcheng Cao, Joseph Phillips, Thomas Bewley, and Falko Kuester (2023). "QuadGlider: Towards the Design and Control of a Bio-Inspired Multi-Modal UAV with Compliant Wings". In: Proceedings of 2023 IEEE Aerospace Conference. IEEE, pp. 1-17.

Alexandre T Guibert, Robert J Chambers, **Pengcheng Cao**, H Alicia Kim, Shengqiang Cai, and Falko Kuester (2023). "Gripping Aerial Topology Optimized Robot (GATOR)". In: Proceedings of 2023 IEEE Aerospace Conference. IEEE, pp. 01-10

Pengcheng Cao, John T Hwang, Thomas Bewley, and Falko Kuester (2022). "Mission-Oriented Trajectory Optimization for Search-and-Rescue Multi-rotor UAVs in Cluttered and GPS-Denied Environments". In: Proceedings of AIAA AVIATION 2022 Forum, p. 3999.

Pengcheng Cao, James Strawson, Xuebin Zhu, Everbrook Zhou, Chase Lazar, Dominique Meyer, Zhaoliang Zheng, Thomas Bewley, and Falko Kuester (2022). "BeagleRover: An Open-Source 3D-Printable Robotic Platform for Engineering Education and Research". In: Proceedings of AIAA SCITECH 2022 Forum, p. 1914.

Pengcheng Cao, James Strawson, Thomas Bewley, and Falko Kuester (2021). "Decoupled translational and rotational flight control designs of canted-rotor hexacopters". In: Proceedings of AIAA Scitech 2021 Forum, p. 1058.

Strawson, James, **Pengcheng Cao**, Thomas Bewley, and Falko Kuester (2021). "Rotor orientation optimization for direct 6 degree of freedom control of multirotors". In: Proceedings of 2021 IEEE Aerospace Conference (50100). IEEE, pp. 1-12.

Strawson, James, **Pengcheng Cao**, Danny Tran, Thomas Bewley, and Falko Kuester (2021). "Monocoque Multirotor Airframe Design with Rotor Orientations Optimized for Direct 6-DoF UAV Flight Control". In: Proceedings of AIAA AVIATION 2021 FORUM, p. 2431.

IN REVIEW

Pengcheng Cao, Jonathan Klinston, Joseph Phillips, Eric Lo, Thomas Bewley, and Falko Kuester (2024). "Dambot-mini: Towards Autonomous Inspection of Hazardous Infrastructure (Accepted)". In IEEE Robotics and Automation Letters. IEEE

Pengcheng Cao, Eric Lo, John Driscoll, Tanner Norton, Michael Morano, Tara Hutchinson, Shiling Pei, and Falko Kuester (2024). "UAV-Based Video Analysis and Semantic Segmentation for SHM of Earthquake-Excited Structures (Accepted)". In: Proceedings of 2024 World Conference on Earthquake Engineering. The International Association for Earthquake Engineering (IAEE).

IN PREP

Pengcheng Cao, Muhan Zhao, Benjamin Hanson, Eric Lo, Thomas Bewley, and Falko Kuester (2024). "Probabilistic Target Search and Path Planning Framework for Minimizing Non-detection Objectives for Limited UAV Onboard Sensing Capabilities."