

CHAO CAO

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Education

Carnegie Mellon University (CMU)

Master of Science in Robotics (Research Program)

Advisors: Matt Travers, Howie Choset, John Dolan

CGPA: 3.95 / 4.00

Pittsburgh, U.S.

September 2017 - May 2019

The University of Hong Kong (HKU)

Bachelor of Engineering in Computer Science

Advisors: Jia Pan, Wenping Wang

CGPA: 3.86 / 4.30

Hong Kong SAR

September 2013 - June 2017

Selected Publications

- **Chao Cao**, Ji Zhang, Matt Travers, Howie Choset, "*Hierarchical Coverage Path Planning in Complex 3D Environments*", IEEE International Conference on Robotics and Automation (ICRA), 2019 (Under Review)
- **Chao Cao**, Peter Trautman, Soshi Iba, "*Dynamic Channel: A Planning Framework for Crowd Navigation*", IEEE International Conference on Robotics and Automation (ICRA), 2019
- **Chao Cao**, Weiwei Wan, Jia Pan, Kensuke Harada, "*An Empirical Comparison of the Effect of Different Supports in Sequential Robotic Manipulation*", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2016
- **Chao Cao**, Weiwei Wan, Jia Pan, Kensuke Harada, "*Analyzing the Utility of a Support Pin in Sequential Robotic Manipulation*", IEEE International Conference on Robotics and Automation (ICRA), 2016
- Chor Hei Ernest Cheung, **Chao Cao**, Jia Pan, "*Multi-Contour Initial Pose Estimation for 3D Registration*", IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2015

Research & Work Experience

Carnegie Mellon University

Robotics Institute, Software/Hardware Engineer

Supervisors: Matt Travers, Sebastian Scherer

- Served as the planning team lead for the DARPA Subterranean Challenge
- Won the 1st place in the Tunnel Circuit Event

Pittsburgh, PA, USA

June 2019 - Present

Honda Research Institute USA

Robotics Intelligence Group, Research Intern

Supervisors: Peter Trautman, Soshi Iba

- *Developed a topology based planning algorithm for mobile robot navigation in crowded human environments*

Mountain View, CA, USA

May 2018 - August 2018

National Institute of Advanced Industrial Science and Technology (AIST)

Manipulation Group, Research Intern

Supervisors: Kensuke Harada and Weiwei Wan

- Developed a framework for robotic manipulators to perform object re-orientation tasks by utilising external dexterity

Tsukuba, Japan

July 2015 - August 2015

The University of Hong Kong

HKU Advanced Robotics Initiative, Research Assistant

Supervisors: Wyatt Newman, Jia Pan and Robert C. Roberts

- Developed an algorithm for point-cloud segmentation and clustering
- Created a Human-Robot Interface to promote safe interactions with the Atlas humanoid robot

Hong Kong SAR

July 2014 - June 2017

Robotics Challenges

DARPA Subterranean Challenge - Member of Team CMU/OSU

September 2018 - Present

- Developed planning algorithms for both ground and aerial robots to autonomously explore and search in subterranean environments
- Developed a multimodal wireless communication system combining WiFi and 900Mhz for field operation

DJI Developer Challenge - Member of Team HKU

March 2016 - August 2016

- Developed a vision-servoing algorithm for a quadcopter to automatically track and land on a moving vehicle

DARPA Robotics Challenge - Member of Team HKU

July 2014 - June 2015

- Developed a point-cloud based pose estimation algorithm for tabletop object manipulation

Amazon Picking Challenge - Member of Team HKU/Dorabot Inc.

November 2014 - May 2015

- Developed motion planning softwares for the pick-and-place manipulation task
- Performed manipulation and reachability analysis of the UR5 robot to design an optimal workspace setup

ACM Collegiate Programming Contest (Hong Kong)

June 2015

- Ranked 10th among 150 teams from Hong Kong and Macau

Asia-Pacific Robot Contest (ABU Robocon) - Member of Team HKU

November 2013 - June 2014

- Embedded system programming and PCB design

Projects**Deep-learned Pedestrian Avoidance Policy for Robot Navigation**

September 2016 - June 2017

- Final year project at HKU, supported by Hong Kong Innovation and Technology Fund
- Golden Award of 2017 Pan-Pearl River Delta Region Universities IT Project Competition
- Third Price of HK X-Tech Final Year Project Supporting Scheme
- First Runner-up of 2017 Pan-Pearl River Delta Region Universities IT Project Competition (Hong Kong Region)
- Champion of HKU Computer Science Final Year Project Competition 2016-17
- More at <https://dodgebot.github.io/>

Qiubot

August 2016 - May 2017

- Designed and built a robot that can balance on a ball. More at <http://www.qiubot.com>

Awards & Honours**ICRA Travel Grant, IEEE Robotics and Automation Society (2019)****IROS Travel Grant, IEEE Robotics and Automation Society (2016)****Undergraduate Research Fellowship, HKU (2016-2017)****Chui's Student Excellence Scheme - Ho Wing Hing Talent Fund, HKU (2016)****The Arthur and Louise May Memorial Fund Scholarship, HKU (2013-2015)****Chiap Hua Cheng's Foundation Scholarships, HKU (2014)****Entrance Scholarships in Electrical and Electronic Engineering, HKU (2014)****Dean's Honors List, HKU (2013-2017)**

Service**Reviewer:** ICRA (2019-2020), RAL(2019), IROS (2016)**Student Volunteer:** ICRA (2014)**Student Volunteer/Judge:** International Robotic Olympiad, 2014