

KARENA X. CAI

website: karenaxcai.com | email: kcai@caltech.edu

EDUCATION

California Institute of Technology, Pasadena, CA 2015-present
PhD Candidate in Control and Dynamical Systems, GPA: 3.9
Advisors: Richard M. Murray, Soon-Jo Chung
Award: Simoudis Discovery Grant Recipient (awarded to an outstanding student working on emerging projects at the intersection of big data, machine learning, and autonomy)

Princeton University, Princeton, NJ 2011-2015
B.S.E. in Mechanical and Aerospace Engineering, *Magna Cum Laude*, GPA: 3.7
Minors: Applications of Computing, Robotics and Intelligent Systems
Awards: George Bienkowski Memorial Prize (awarded to senior student of sound academic standing who contributed to department and engineering through service during career at Princeton), Morgan McKinzie 93 Senior Thesis Prize Honorable Mention

PROFESSIONAL EXPERIENCE

Machine Learning Engineer on Prediction Team Intern at Lyft Level 5

Summer 2020

Used a combination of physics-based modeling and machine learning to design learning algorithms to predict vehicle dynamics. Designed high performance and modular tools in C++ required for feature extraction. Innovated new ML models based and improved the accuracy of existing prediction tools by 30%.

TEACHING EXPERIENCE

Instructional Designer for Caltech CS 142 Distributed Computing present

Collaborating with Caltech professor to design online curriculum for CS 142.

Computing and Mathematical Sciences (CMS) dept TA Fellow Summer 2020-present

Designed website that has TA-FAQs, Scenarios, and Virtual TAing tips, hosting workshop to guide TAs in their role and how to teach, and host events to build community among TAs in the CMS department.

BE107 Exploring Biological Principles Through Bio-Inspired Design Spring 2019

Designed robotics labs for students to program Go-Pi-Go robots in ROS to model biological behaviors and guided students through labs and graded lab reports.

CDS 110/CHE 105 Introduction to Feedback Control Systems Spring 2018

Held office hours, clarified difficult concepts, and graded assignments.

Marshall Fundamental Credit Recovery Program Student Manager 2019—2020

Coordinated orientation, transportation and scheduling for Caltech students; mentored eight graders in math so they could earn credit to graduate from middle school.

TECHNICAL SKILLS

Software: Python, C/C++, TensorFlow, PyTorch, MATLAB, OpenCV | Design: HTML5, CSS3, Adobe Illustrator
Hardware/Fabrication: Arduino, Pro/ENGINEER, ROS, 3D-Printing, Machining Equipment

PROFESSIONAL TALKS

Southern California Controls Workshop 2019

Rules of the Road: Towards Assume-Guarantee Profiles for Autonomous Vehicles.

PEER-REVIEWED PUBLICATIONS

- K. X. Cai, A. Harvard, R. M. Murray and S. Chung. Robust Estimation Framework with Semantic Measurements. American Control Conference, 2019.
- K. X. Cai, T. M. Phan, and R. M. Murray. Towards Assume-Guarantee Profiles of Autonomous Vehicles. Conference on Decision and Control, 2019.