

EDUCATION

Stanford University, 2013 – 2015
M.S., Aeronautics & Astronautics, GPA: 3.96

Fellowships & Awards

- National Science Foundation GRFP
- De Pietro Fellowship, HMC
- Harry E. Williams Mechanics Prize, HMC (1 out of ~ 70 students)

Harvey Mudd College (HMC), 2009 – 2013
B.S. with High Distinction, General Engineering, GPA: 3.81

- Phillips Award for Experimental Technique & Engineering Judgment, HMC (1 out of 20 teams)
- Tau Beta Pi Engineering Honor Society
- Dean's List, HMC, 2009-2013

PROFESSIONAL EXPERIENCE

Team Lead for Planning & Controls, Shield AI 2018/05 – present

- Led a team of 6 other engineers, mentoring them in their professional and personal development.
- Established technical direction for long-term (~2 years) development and short-term demonstrations.
- Acted as team scrum master, effectively prioritising bug fixes & feature development to maximise system performance.
- Guided and contributed to the development of key features and capabilities, such as:
 - the transition of a 2D planning pipeline to a completely 3D pipeline, including leveraging a motion-primitive-library & optimisation-based local planning strategy, as well as a viewpoint-based exploration strategy
 - a 3D, AI-assisted teleoperation mode that avoids obstacles in real-time
 - a cloud-based simulation and analysis framework to help prevent regressions and develop new features

Planning & Controls Engineer, Shield AI 2017/01 – present

- Implemented L1 adaptive controllers and nonlinear controllers on quadrotor within PX4 firmware.
- Implemented a local planner that avoids dynamic obstacles while minimising snap within ROS.
- Implemented frontier and information-theoretic-based strategies for exploration and global path planning.
- Led the development of modeling capabilities for quadrotor rigid-body and motor dynamics in Simulink.
- Led the development of control analysis tools in MATLAB and started porting to Julia.

GNC Engineer, Boeing Research & Technology 2015/08 – 2017/01

- Developed shape-memory-alloy remote-controlled-actuation system for wind tunnel tests.
- Synthesised and implemented controller for shape-memory-alloy actuators using MATLAB & Simulink.
- Re-factored code base on 16-bit microcontroller, including sampling analogue and digital sensors, communicating with control computer via UART, and integrating new control law.
- Developed LIDAR model for measuring airspeed, temperature, pressure to study reliability and perform trade studies of optical air data systems.
- Communicated with LIDAR suppliers to define requirements and ensure proper systems integration.

Dynamics Environments Internship, SpaceX 2014/06 – 2014/09

- Designed and tested acoustic resonator technology, which decreased fairing sound pressure levels by 6dB.
- Automated data processing and analysis task, which decreased run-time by factor of 5.
- Led a team of 3 professionals on study of safety of random vibration testing and provided testing guidelines.

SKILLS

I'm a proponent of agile methodologies. I have effectively leveraged test-driven development to aid in continuous integration, delivery, and deployment. I have experience with a wide range of tools, including Atlassian products (Jira, Portfolio, Bitbucket), Gitlab/Github, and the following:

Languages

Proficiency: C++ 11/14/17, Matlab/Simulink, Julia.
Familiarity: C, Python 2/3, Bash.

Libraries & frameworks: STL, Boost, Eigen, ROS, PX4.

Tools: git, bazel, cmake, gcc/g++, clang, gdb, docker.

OS: Linux, Windows, NuttX.

EXTRACURRICULAR ACTIVITIES

Mentoring & Tutoring

I love helping people develop their skills and thoughts. I've participated in science outreach programs at elementary schools, tutored undergraduates at Stanford and HMC, and was a mentor for the Asian Pacific-Islander Sponsor Program at Harvey Mudd College. I currently enjoy acting as a mentor at work, especially when on-boarding new employees.

Hobbies

I enjoy learning new programming languages (most recently Julia) and tinkering with my desktop workflow (e.g. installing the window manager, i3.). I also enjoy Olympic weightlifting, coffee, Singaporean cuisine, basketball, travelling (particularly via bicycle).