Shihao Cao

shihaocao.com | shihaocao@gmail.com | sfc72@cornell.edu

Looking for challenging projects with dynamic work

EDUCATION

CORNELL UNIVERSITY

GPA: 4.15 / 4.0
Computer Science
May 2022 Expected | Ithaca, NY

THOMAS JEFFERSON HS FOR SCI/TECH

GPA: 4.558 / 4.0
Jun 2019 | Alexandria, VA

LINKS

LinkedIn:// **shihaocao**
Github:// **shihaocao**
YouTube:// **ShihaoCao**
Website:// **shihaocao.com**

COURSEWORK

CORNELL

Mathematical Physics (AEP 3200)
Analysis of Algorithms (CS 4820)
Machine Learning (CS 4780)
Functional Programming (CS 3110)
Discrete Mathematics (CS 2800)
OOP & Data Structures (CS 2110)
Statics (MAE 2020)
Dynamics (AEP 3330)
Linear Algebra (MATH 2940)
Differential Equations (MATH 2930)

HIGH SCHOOL

Quant. Mechanics & Electrodynamics
Multivariable Calculus
Special Functions and Integrals
Computer Vision & AI

SKILLS

MECHANICAL

Fusion 360 ***(CAD & CAM)*** • AutoCAD
ANSYS Fluent • Autodesk CFD
CNC Mill, Router & Lathe
MIG Welding ***(Steel & Aluminum)***

PROGRAMMING

3+ years experience:
Python • Java • C++ • GitHub
OpenCV ***(Python and C++)*** • Embedded
Software Defined Radio • GNURadio
Simulation • Flight Software • Testing

ROBOTICS

RC Aircraft ***(Design, Build and Pilot)***
Autonomous Vehicles • Prototyping
Raspberry Pi • Sensor Integration
Mission Planner • Arduino • Teensy

EXPERIENCE

SPACEX | Manufacturing Engineering Intern

May 2020 - Aug 2020 | Hawthorne, CA

- Responsible for production landscape of two valves on Falcon 9 and Merlin
- Performed root cause analysis of valve ATP failures to prevent recurring issues
- Implement process improvements to eliminate 25% of rebuilds in valve deliveries

EXOANALYTIC SOLUTIONS | Systems Engineering Intern

July 2019 - Aug 2019 | Reston, VA

- Delivered field-deployable satellite detector from concept to product in one month
- Developed RF signal processing and filtering routines using GNU Radio and Python
- Conducted field tests for prototyping, product evaluation and verification

EXOANALYTIC SOLUTIONS | Systems Engineering Intern

Jun 2018 - Aug 2018 | Reston, VA

- Delivered field-deployable drone detector from concept to product in two months
- Implemented motion tracking, and blob detection for threat tracking in OpenCV

RESEARCH

SPACE SYSTEMS DESIGN STUDIO - PAN TEAM | Software Engineer

Sept 2019 - Current | Ithaca, NY

- Software engineer for the Pathfinder for Autonomous Navigation (PAN) project, two 3U Cube Satellites which will autonomously rendezvous and dock in LEO
- Developed C++ drivers and control tasks for attitude controller and GPS module
- Simulated spacecraft sensors and dynamics in software to verify control algorithms
- Devised hardware-in-the-loop unit tests to validate drivers and hardware
- Spoofed orbital GPS RF signals with software-defined radio to verify GPS firmware

CLUBS

TJ UNMANNED AERIAL VEHICLE TEAM | President + Founder

Sept 2017 – Jun 2019 | Alexandria, VA

- Spearheaded and managed development of **the 2019 fixed-wing UAV** for **SUAS**
- Integrated Python software with flight computer, data radio, and camera/sensors

TJ NANOSATELLITE TEAM | Project Manager + Systems Engineer

Sept 2016 – Jun 2019 | Alexandria, VA

- Managed development of **TJREVERB**, a 2U communications satellite
- Spearheaded development, and hardware-in-the-loop testing of flight software

PERSONAL PROJECTS

ELECTRIC STARSHIP HOPPER | May 2020

Together with a partner, we designed and built an **electric VTOL drone** with single point vectored thrust. It delivers weighs about one kg, and can hover vertically. I designed the vehicle and wrote the C++ flight software, and my partner did the testing and GNC code.

REMOTE CONTROL F-86 SABRE | May 2018

I designed, built and flew a 700mm wingspan **RC F-86 Sabre** powered by an EDF. I used Fusion 360 for CAD modelling, and Autodesk CFD to optimize ducting and aerodynamics.

ELECTRIC LONGBOARD | Jun 2015

I built an **electric longboard** powered by a brushless motor and Li-Po batteries. I CNC milled and welded the motor mount to the long board truck. It has a top speed of 30 kph.