

Shihao Cao

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To build anything real, we have to build something an order of magnitude larger to breathe life into it

EDUCATION

CORNELL UNIV.

GPA: 3.95 / 4.0

Computer Science

Dec 2022 | Ithaca, NY

THOMAS JEFFERSON HS FOR SCI/TECH

GPA: 4.56 / 4.0

Jun 2019 | Alexandria, VA

LINKS

Website:// shihaoacao.com

LinkedIn:// [shihaoacao](https://www.linkedin.com/in/shihaoacao)

Github:// [shihaoacao](https://github.com/shihaoacao)

Twitter:// [shihao_cao](https://twitter.com/shihao_cao)

COURSEWORK

OS + Prac. (CS 4410)

Compilers + Prac. (CS 4120)

Computer Arch. (ECE 4750)

Adv. Systems (CS 6410)

Algorithms (CS 4820)

Adv. ML Systems (CS 6787)

Intro ML (CS 4780)

Numerical Comp. (CS 4220)

Computer Sys. (CS 3410)

Computer Vision (CS 4670)

Functional Progr. (CS 3110)

Discrete Math (CS 2800)

OOP & DataS. (CS 2110)

Abstract Alg. (MATH 3340)

Probability (MATH 4710)

HIGH SCHOOL:

ML • CV • AI • Robotics

Linear • DiffEq • MultiVar

Quantum Mechanics

SKILLS

PROGRAMMING

4+ years experience:

Python • Java • C++

HOOTL/HITL Testing

RC Aircraft (*Design, Build, Pilot*)

Embedded SW • Sensors

I2C • Serial • Arduino

Simulation • Flight Software

OpenCV (*Python and C++*)

Experienced:

C • Scikit-learn • NumPy

TensorFlow • InfluxDB

HOBBIES

Photography • Longboarding

EXPERIENCE

JUMP TRADING | SOFTWARE ENGINEERING INTERN

Jun 2022 - Aug 2022 | Chicago, IL

- Built custom cache aware low latency (ns range) high rate (10Gbps+) stats framework in C++
- Architected data flow thru 100+ apps, 10+ hosts, shared mem, databases, and frontends
- Deployed stats framework into two production clusters, 10x-ing existing stats data flow

SPACEX | STARSHIP FLIGHT SOFTWARE INTERN

Jun 2021 - Aug 2021 | Hawthorne, CA

- Upgraded inter-process data sharing, deprecating 2 relay systems and 40+ config files
- Owned, and supported inter-process data sharing for flight software (200+ devs)
- Restructured GNC->FSW->Network data flow for new distributed compute architecture
- Architect-ed flight software abort relay verification system, catching 4 critical bugs
- Optimized generation speed by 100x through data caching and multi-threaded workflows

SPACEX | VEHICLE ENGINEERING INTERN

May 2020 - Aug 2020 | Hawthorne, CA

- Responsible for production landscape and engineering of two valves on Falcon 9 and Merlin
- Iterated design and process to eliminate 90% of rebuilds, doubling production rate

EXOANALYTIC SOLUTIONS | SYSTEMS ENGINEERING INTERN

Jun 2018 - Aug 2018 | July 2019 - Aug 2019 | Reston, VA

- Built a field-deployable RF satellite detector and a RF/CV drone detector in 1 and 2 months
- Developed RF detection algos in GNURadio/Python, and object tracking in OpenCV/Python

RESEARCH AND TEAMS

SPACE SYSTEMS DESIGN STUDIO - PAN TEAM | CO-LEAD

Sept 2019 - May 2022 | Ithaca, NY

- Spearheaded software development for the Pathfinder for Autonomous Navigation (PAN) project, two 3U Cube Satellites which will autonomously rendezvous and dock in LEO
- Developed C++ drivers and flight software for attitude control pipeline and GPS
- Devised HITL/HOOTL tests to validate drivers, state-machines, and hardware

CORNELL DATA SCI - SELF DRIVING CAR | PROJECT LEAD + SOCIAL CHAIR

Jan 2021 - Current | Ithaca, NY

- Founded and now leading a team of 7 to build a webcam based car autopilot system
- Architect-ed Python control loop to integrate CV, SLAM, and actuators on a Linux platform

TJ UNMANNED AERIAL VEHICLE TEAM | PRESIDENT + FOUNDER

Sept 2017 - Jun 2019 | Alexandria, VA

- In one year, lead team of 20 to design and build the 2019 fixed-wing UAV for SUAS
- Spearheaded flight software, power system, CONOPS, and mech. design/manufacturing

TJ NANOSATELLITE TEAM | FULL TEAM LEAD

Sept 2016 - Jun 2019 | Alexandria, VA

- Managed development of TJREVERB, a 2U RPi Zero W communications satellite
- Spearheaded development and architecture of Python flight software, testing, and CONOPS

PERSONAL PROJECTS

ELECTRIC STARSHIP HOPPER | MAY 2020

With a partner, we designed and built an **electric VTOL drone** with single point vectored thrust. I designed the vehicle, wrote the C++ flight software, sensor/action pipeline, and telemetry flow

REMOTE CONTROL F-86 SABRE | MAY 2018

I designed, built and flew a 700mm wingspan **RC F-86 Sabre** powered by an electric ducted fan.