Shihao Cao

shihaocao.com | shihaocao@gmail.com

Looking for challenging projects with dynamic work

EDUCATION

CORNELL UNIV.

GPA: 4.07 / 4.0
Computer Science
May 2023 | Ithaca, NY

THOMAS JEFFERSON HS FOR SCI/TECH

GPA: 4.56 / 4.0
Jun 2019 | Alexandria, VA

LINKS

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

COURSEWORK

Analysis of Algorithms
ML • CV • AI
Adv. ML Systems
Operating Systems
Computer Systems
Functional Programming
Discrete Mathematics
OOP & Data Structures
Quantum Mechanics
Mathematical Physics
Linear Algebra
Differential Equations
Multivariable Calculus
Designing New Ventures

SKILLS

PROGRAMMING

4+ years experience:
Python • Java • C++
OpenCV ***(Python and C++)***
HOOTL/HITL Testing
Simulation • Flight Software
Experienced:
C • Scikit-learn • NumPy
TensorFlow • Elasticsearch
Flask • NodeJS • Linux

ROBOTICS

4+ years experience:
RC Aircraft ***(Design, Build, Pilot)***
Autonomous Vehicles
Prototyping • Sensors

HOBBIES

Photography ***(Astro, Portrait)***
Painting • Stargazing • Go
Climbing • Longboarding

EXPERIENCE

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
- Performed root cause analysis of valve failures to iterate design and prevent recurring issues
- Implemented process improvements to eliminate 90% of rebuilds, doubling production rate

EXOANALYTIC SOLUTIONS | Systems Engineering Intern

July 2019 - Aug 2019 | Reston, VA

- Owned and delivered deployable satellite detector from concept to product in one month
- Developed RF signal processing and filtering routines using GNU Radio and Python
- Iterated performance by 10x to reduce performance reqs. from desktop to RPi4 platform

EXOANALYTIC SOLUTIONS | Systems Engineering Intern

Jun 2018 - Aug 2018 | Reston, VA

- Owned and delivered deployable drone detector from concept to product in two months
- Implemented motion tracking, and blob detection with 95% accuracy at 100 meters

RESEARCH AND TEAMS

SPACE SYSTEMS DESIGN STUDIO - PAN TEAM | Co-Lead

Sept 2019 - Current | 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
- Simulated spacecraft sensors and dynamics in software to verify control algorithms
- Spoofed orbital GPS RF signals with software-defined radio to validate GPS code

CORNELL DATA SCI - SELF DRIVING CAR | Team 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

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

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 about one kg of thrust, and can take-off/hove/land vertically. I designed the vehicle, and wrote the C++ flight software, NodeJS ground displays, and sensor data pipeline.

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.