Shihao Cao

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EDUCATION

CORNELL UNIVERSITY
CS & MechE
May 2023 Expected | Ithaca, NY

THOMAS JEFFERSON HS FOR SCI/TECH
Jun 2019 | Alexandria, VA
GPA: 4.558 / 4.0

LINKS

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

COURSEWORK

CORNELL FALL 2019
Statics (ENGRD 2020)
Differential Equations (MATH 2930)
Linear Algebra (MATH 2940)
OOP & Data Structures (CS 2110)

HIGH SCHOOL
Quant. Mechanics & Electrodynamics
Multivariable Calculus
Special Functions and Integrals
Computer Vision & AI
Energy Systems *(Research)*
Robotics & Prototyping

SKILLS

MECHANICAL
Design Software:
Fusion 360 *(CAD & CAM)* • AutoCAD
ANSYS Fluent • Autodesk CFD
Mathematica • Matlab
Hardware:
CNC Mill, Router & Lathe
MIG Welding *(Steel & Aluminum)*
Laser Cutter • 3D Printing
Fine Woodworking • Metal Casting
Band Saw • Table Saw • Drill Press

PROGRAMMING
2+ years experience:
Python • Shell • Java • C++ • GitHub
OpenCV *(Python and C++)* • Linux Shell
Software Defined Radio • GNURadio

ROBOTICS
5+ years experience:
RC Aircraft *(Design, Build and Pilot)*
2+ years experience:
Raspberry Pi • Flight Computers
Mission Planner • Arduino
MAVProxy • DroneKit

EXPERIENCE

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
- Planned and conducted field tests for prototyping and product evaluation

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
- Planned and conducted field tests for prototyping and product evaluation

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
- Performed unit tests to validate data serialization and I2C communication
- Simulated RF orbital GPS signals with software-defined radio to validate GPS

CLUBS

TJ UNMANNED AERIAL VEHICLE TEAM | President + Founder
Sept 2017 – Jun 2019 | Alexandria, VA
- Directed flight line operations during mission demonstrations and test flights
- Spearheaded and managed development of the 2019 fixed-wing UAV for SUAS
- Applied 3D printing, laser cutting, and CNC techniques to build sub-assemblies
- 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 implementation of Python OS flight software
- Supervised hardware/software integration and design reviews

TJ FIRST ROBOTICS COMPETITION TEAM | Team Member
Dec 2017 – Jun 2019 | Alexandria, VA
- Led team for elevator system, doubled lifting capacity over 20+ iterations
- Integrated the wheeled intake system to elevator system in two days

PERSONAL PROJECTS

THRUST VECTORING EDF VERTICAL ROCKET LANDER | Jan 2018
I designed and built a thrust vectoring system for an EDF (Electric Ducted Fan). It delivers 4 pounds of thrust and has a thrust-to-weight ratio of 1.2, capable of hovering.

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.