Shihao Cao shihaocao@gmail.com 571 405 8937

You can find more information about me at shihaocao.com

Summary

I'm an 11th-grade student interested in a future in Aerospace Engineering. I see myself applying my remote controlled aircraft hobby as a stepping stone for real-world flight sciences.

Experience

Intern at Kashmir World Foundation

October 2016 - Present

-I'm an active researcher and designer of the implementation of drone-based aerial image recognition using neural networks. At KWF, I've constructed multiple drones, all using APM flight controllers.
-Concurrently, I'm helping to design and build a large (2.5-meter wingspan) fixed-wing drone, to help aid long-term animal searches with aerial imaging.
-I'm the main test pilot for fixed wing and multi-copter drone applications at KWF.

Ground Station Team Leader

September 2017 - Present

-As the Ground station Team Leader, I'm in charge of ensuring the completion of TJ REVERB's communications link between TJHSST and the TJ REVERB CubeSat, and the development of a ground station as a base of communications with our CubeSat. We're using C to spearhead the development of our TX and RX code for the APRS radio link. I was the lead coordinator for TJ REVERB's balloon communications test.

Website Manager

September 2016 - June 2017 (10 months)

-As website manager for TJ REVERB, I lead the development team in back-end development as well as graphical design choices.

Education

Activities and Societies: TJ CubeSat, Remote Control Aircraft Club, Go Club, Wrestling, First Robotics Competition

Virginia Space Coast Scholars

2016 - 2017

Virginia Aerospace Science and Technology Scholars

2017 - 2018

Relevant Courses:

-AP Chemistry, AP Physics, AP CS, AP Chinese, Prototyping 1 & 2, Robotics 1 & 2, AP BC Calculus, Artificial Intelligence 1 & 2

Honors and Awards

National Science Olympiad Medalist, Science Olympiad State Champion, Hack TJ 2017 Fannie Mae Award

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Skills

CAD:

-Fusion 360 (CAD and CAM), AutoCAD

Rapid Prototyping:

-3D Printing, Laser Cutting

Prototyping:

CNC Mill	Drill press
CNC Router	Lathe
CNC Lathe	Router
Band saw	Metal Casting (Aluminum)
Table saw	Welding (MIG, Steel and Aluminum)

Programming:

-C (1 year): Program driving code for driving the APRS radio communications link for TJREVERB's CubeSat.

-HTML & CSS (2 years): see shihaocao.com

-Python & Java (3 years): OOP, data visualization, data analysis, pathfinding, machine learning, neural networks, back propagation.

-Arduino & Applied Robotics (3 years): servo operation, XBee data transmission, live sensor feed, brushless motor operation, ESC programming.

Autonomous planned flights, inflight stabilization, automatic fly home, continuous telemetry feed, Mission Planner software

Drone Technology:

-Drone Construction (5 years): Work on large fixed wing drones with 5+ pound payloads, work on quad/hexacopter platforms with onboard Raspberry Pi for data computation. Extensive experience with Arducopter/plane & APM based flight controllers.

-Autonomous Drone Control & Stabilization (2 years): MAV Proxy, Drone Kit, and Mission Planner Software

-Extensive experience in hobby aircraft in developing custom utility flight platforms as well as scale model aircraft for show.

Ongoing Projects:

Reusable Small Rocket Vertical Landing System

SpaceX has developed a system capable of landing reusable rockets vertically. Vertical landing is useful because it minimizes damage to rockets. However, SpaceX's system is designed for a very large liquid-fuel rocket; no analog exists for smaller rockets. I am designing a system, similar to the SpaceX system, capable of landing a small solid-motor rocket vertically, close to a landing target. I will use an EDF (electric ducted fan) to provide thrust needed for maneuvering, and then vector that thrust for orientation and translational stability.