Ryan Christ

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Visit my portfolio: ryanjchrist.github.io

Education

Duke University - Pratt School of Engineering **May 2026**
Bachelor of Science in Mechanical Engineering & Computer Science - Double Major *Durham, NC*

- **Cumulative GPA:** 3.71 / 4.0, Dean's List 2023
- **Relevant Coursework:** Thermodynamics, Fluid Dynamics, Structure & Properties of Solids, Statics & Dynamics, Mechanical Design, Control Systems, Mechatronics, Computer Architecture, Design & Analysis of Algorithms, Data Structures

Experience

O_3ST - UAVs in Support of Marine Science **September 2024 - Present**
Electrical Engineering Intern *Virtual*

- Designed a custom PCB in KiCad for sensor integration and streamlined wiring of the UAV altimetry system.
- Integrated the LW20/C Laser Rangefinder (I2C) and replacing the Grove GPS with the compact GP1818MK (UART).
- Updated the altimeter for ±1 cm accuracy and compatibility with consumer drones including DJI Phantom, Mavic, Inspire, and Skydio 2+. Redesigned altimeter housing in SolidWorks for better integration.
- Developed firmware using PlatformIO and Arduino IDE on microcontrollers including XIAO SAMD21, ProMicro, & Feather M0.
- Enhanced data logging with IMU tilt compensation, a 1D Kalman filter for noise reduction, and time/date-based file naming.

Duke University - Pratt School of Engineering **August 2024 - Present**
Teacher Assistant - Mechanics of Solids (EGR 201) *Durham, NC*

- Led laboratory sessions and instructed students in the operation of the Tinius Olsen H50KS Load Frame and Tinius Olsen Lo-Torq Machine to analyze tension, torsion, and buckling material failures, emphasizing the practical applications of material testing.
- Taught students how to apply principles of statics, dynamics, mechanics, and stress analysis to solve engineering problems.
- Assisted students in analyzing experimental data to generate stress-strain curves, interpret material behavior, and evaluate properties such as Young's modulus, shear modulus, and material failures.

Monroe County - Department of Transportation **May 2024 - August 2024**
Engineering Intern - Highway & Bridge Engineering *Rochester, NY*

- Calculated moment arms for traffic signal masts through analysis of load factors such as weight, wind, ice, and factors of safety. Ensured compliance with updated engineering standards to maintain structural integrity.
- Streamlined the inspection and reporting process for 192 bridges and 344 major culverts with use of SAP and Excel.
- Analyzed traffic signal electrical and structural assembly schematics. Redesigned parking lot layout plans on AutoCAD.

RJ Christ Excavating & Paving **June 2018 - Present**
Seasonal Construction Worker *Hilton, NY*

- Excavated and installed residential and commercial asphalt driveways.
- Operated and helped maintain a diverse set of heavy machinery including trucks, loaders, excavators, backhoes, and pavers.
- Restored a 1969 Dodge Coronet by rewiring electrical systems, welding body panels, and replacing gaskets, seals, and bearings.

Research & Projects

Duke University - Cyber-Pysical Systems Lab **May 2025 - Present**

- Machined and end-milled shortened carbon fiber arms for the X500 drone, reducing its overall footprint.
- Developed custom ROS nodes and integrated `micro-ROS` with XRCE-DDS agent to control drone via PS4 joystick and Vicon motion capture system. Functionality was first validated in Gazebo and then tested.
- Explored acoustic attack strategies for drone-on-drone engagement as part of adversarial UAV defense research.
- Currently building and testing a custom drone platform for experimental flight and autonomy research.

Duke University - Bass Connections Research **April 2024 - May 2025**

- Conducted drone flights to establish safe flight protocols for capturing elephant body condition images. Optimization variables included flight altitude and speed to minimize disturbance to African elephants.
- Analyzed acoustic profiles of DJI Mavic 3 and Phantom 4 using Python, Raven, and R to assess UAV noise impact on African elephant behavior.

Technical Skills

Technical: Machining, Welding, 3D Printing, Soldering, Laser Cutting
Softwares: SolidWorks, ANSYS, KiCad, LabVIEW
Programming: C, C++, Python, ROS, MATLAB, Java, LaTeX (used to create this document)

Social Engagements

Club Member: Men's Club Soccer, Duke University Triangle LabVIEW User Group, IM Soccer
Volunteer: Hilton Elementary School - TA, Tutoring
Sports-Engagements: Soccer, Climbing, Running, Golf
Interests: Robotics, Automation, Prototyping, Drones