

EDUCATION

- **Cornell University, College of Engineering** Ithaca, NY
Bachelors of Science in CS & ECE, Dyson Business Minor — GPA: 4.169 Aug. 2023 - Present
 - **Relevant Coursework:** Object Oriented Programming and Data Structures, Discrete Structures and Algorithms, Differential Equations, Linear Algebra, Intro to ORIE, Functional Programming, Digital Logic, Micro-Econ
- **Choate Rosemary Hall** Wallingford, CT
High School Diploma — GPA: 4.35 Weighted Sept. 2019 – May 2023

EXPERIENCE

- **Cornell Electric Vehicles (CEV) | Autonomy Subteam Lead** Oct. 2023 - Present
 - **Extended Kalman Filter:** Created a ROS 2 library for a custom EKF which supports model pipelining and a custom Ackermann update model. Currently pipes in an IMU/Encoders/Steering angle and incorporates odometry with SLAMToolbox.
 - **Auto-braking and steering:** Created an auto-braking and cruise-control system incorporating Arduino, Raspberry Pi, and an RPLidar with ROS2 and a custom serial communicator on an RC-car.
 - **AutoDrive IROS 2024 Competition:** Currently competing in an online autonomous racing competition. Have already implemented a model for odometry based on simulator physics, incorporated LIDAR SLAM with Slam Toolbox, and wrote a basic local planner based on map data.
 - **Global and Local Planning:** Created a custom simulation for occupancy grid-based planning algorithms. Implemented various algorithms like RRT* and developed my own which uses raytracing. Created my own MPC-based local planner with a SciPy optimizer and a simulation package for debugging.
- **Cornell Embodied Intelligence Lab | Researcher** Aug. 2024 - Present
 - **SAW Robots:** Working on making an autonomous swarm of wave-shaped robots for terraforming granules.
- **Applied Materials (AMAT) | Algorithm Developer (Intern)** June 2024 - Aug. 2024
 - **Network Algorithms:** Used Network algorithms to develop a new 'Evolutionary Tree' structure for R&D experimental data, and created an API to construct trees from existing data, mine, and visualize them.
 - **Node Tree Visualizer:** Created a custom application for visualizing the above tree data using React/ReactFlow with a Python FastAPI backend, using Neo4J and MongoDB as databases.
 - **Regression Analysis:** Used data analysis methods, including correlation and regression analysis, to find the most related input and output features in R&D tests. Methods included Phi-K correlation, LASSO, and XGBoost. Also used XGBoost to create models used to predict effective inputs for future tests.
- **Choate FRC Robotics Team | Lead Programmer, Technician** Sept. 2021 - May 2023
 - **Programming Lead:** Led the programming team of the FRC Wired Boars (7407). Won multiple regional and district competitions and helped bring the team to semifinals at FRC Worlds, winning the Innovation in Control award.
 - **Autonomy and Pose Estimation:** Incorporated Computer Vision for ball shooting and tracking, an IMU, April Tag tracking for pose estimation, and other sensors (IR, color, limit, etc.) for mechanism and game piece handling.
 - **Autonomous Route Planning GUI:** Created a GUI with PyGame to visualize and adjust robot autonomous pathing with regards to kinematics constraints (AutoBoard).
- **Cognite | Robotics Engineering Intern** June 2022 - Aug. 2022
 - **Web Dashboard Sensor Integration:** Created an acoustic gas leak detection system for Boston Dynamics Spot and integrated it with Cognite's data and robotics software platform using Java, Python, Linux + Bash, and JS.
 - **CV Leak Detection:** Used computer vision (OpenCV, Tensorflow) on acoustic gas leak detection output to estimate likelihood of gas leaks with over 95% accuracy and demoed the product to the client team.

AWARDS AND SCORES

- **FRC Worlds (2023):** Innovation in Control Award - Hopper Division
- **Choate Rosemary Hall (2023):** Excellence in Robotics Award, Dean's List All Terms
- **PicoCTF (2022):** Captain of a team which placed 14th Nationally out of ~15000 competing students.
- **ACT:** 36

SKILLS AND TOOLS

Languages: Python [MongoDB, FastAPI, Flask, NumPy, SciPy, Scikit-Learn, Pandas, Phi-K, Matplotlib, OpenCV], OCaml, C++, Rust, Java, JS [ReactJS, Plotly], Bash
Data Analysis: LASSO, Ridge, XGBoost, TensorFlow, Phi-K
Tools: ROS, ROS 2, Docker, Git, GCP, gRPC, Neo4J, REST, Tesseract
CAD: Fusion 360, Onshape
