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Problem solver with 7 years of overall engineering experience. Worked cross-functional software development in the last 2 years on satellite systems at Rogue Space Systems Corporation. Developed payload software for the Scalable Compute platform (SCP - [Rogue SCP Blog](#)) on the Barry Orbot™ scheduled to be launched on Transponder 9 Space-X mission. Led the integration of the Robot Operating System (ROS2) with Unity3D and Matlab/Simulink software tools that were used for STTR and SBIR submissions.

Software Skills

Languages	Unity3D	Robotics	Miscellaneous	UAV Software
Python, C/C++/C#	ROS-TCP-Connector,	ROS1, ROS2	Linux, OpenCV	ArduPilot, PX4
Matlab, Simulink	URDF-Importer, ros2-for-unity	RVIZ, Gazebo	TensorFlow, PyTorch	QGroundControl

Awards

- Open Robotics Diversity Scholar 2022 - flagship conference (ROSCon) held in Kyoto, Japan
- NVIDIA Cloud Compute Grant – East Africa Spaceport Feasibility Study (NSBE Aerospace)

Work Experience

Rogue Space Systems

Software Engineer | Dec. 2021 — Now

Rogue Space Systems Startup competes in the On-Orbit Servicing Assembly and Manufacturing (OSAM) business to mitigate Space debris. My roles and responsibilities spanned across different functions. Mainly supported the development of autonomy software for the companies Orbots™ written using ROS2 as the middleware framework and performed Software-In-the-Loop (SIL), Hardware-In-the-Loop (HIL) testing of the software against in-house build Unity3D Simulation environment. Contributions included:

- Command Interpreter for the Barry Orbot™ for the Quantum Leap mission scheduled to launch on Space X's Transporter 9
 - EnduroSAT satellite bus communicated to Scalable Compute Platform ([Rogue SCP Blog](#)) Flight Computer based on Jetson Xavier over UART/RS-485 avionics data bus.
- Flight Control Software for 6 Degrees of Freedom (DOF) Thruster System for Small Satellites - [Submission Video - YouTube](#)
- ROS2 Real-Time & Docker – Comparing the latency Analysis of RaspberryPi and Jetson boards with Preempt-RT patch.
- 3D Scanning of a Resident Space Object (RSO) using LIDAR and/or Stereoscopic Cameras
 - Neural Radiance Fields (Nerfs) for Rendezvous and Proximity Operation scene reconstruction.

MIT Lincoln Labs - Beaver Works Summer Institute (BWSI)

Instructor | June 2021 — Dec. 2021

Responsible for developing course content offered by BWSI that introduced students to programming autonomous systems and their core functionalities (perception, navigation, SLAM, control, etc.). Autonomous Air Vehicle Racing (Summer 2021), Mini Autonomous Racecar (Fall 2021/ part time), and NSBE x BWSI Build-a-CubeSat Challenge (Fall 2021/ part time).

Computer Vision Center (CVC-UAB)

Research Assistant | Jul. 2020 – Dec. 2020

Publication - [E-Pilots: A System to Predict Hard Landing During the Approach Phase of Commercial Flights](#)

Assisted under the supervision of Deborah Gil Resina for the ML1 ([e-pilots](#)) project to develop physics informed Deep Learning models that act as a decision support system for pilots. The problem statement was to predict a Hard Landing scenario during the last 10 meters of descent of flight Data acquired from Flight Monitoring System (FMS) collected from Airbus A319, A320 and A321. Led team in choosing Long Short-Term Memory (LSTM) Neural Networks set up as supervised machine learning problem where the target variable was normal acceleration.

Mitiga Solutions

Software Engineer Intern | Feb. 2020 - Jun. 2020

Improved an existing Convolution Neural Network (CNN) image classifier that detects ash emission in a highly volcanic region in Mexico from 86% to 95% PR-AUC accuracy using TensorFlow. Improved model by pre-processing input images using a Laplacian of the Gaussian Blob Detection Algorithm amongst other steps in the pre-processing layer before being classified by the Neural Network.

KPS Global

Associate Design Engineer | Aug. 2016 - Jul. 2019

Operated as program manager, supported R&D, and let cost reduction project that calculated more than \$400,000 in savings to the company scaled across various efforts. Led design document to adhere to ISO 9000 standards and author of over 80 Product Design Standards (PDS) and Standard Operating Procedures (PDS). Led design to compliance with International Building Codes (IBC), National Sanitation Foundation (NSF).

Education

Autonomous University of Barcelona | Aug. 2019 – Jun. 2020

Master of Science - Data Science

Florida Institute of Technology | Aug. 2011 – Dec. 2015

Bachelor of Science - Aerospace Engineering

Fellowships

[Fellowship. Ai](#) – Cohort 21 (01/22 to 03/2022) – Nike/Mirror training app activity recognition Human Pose Estimation Project

Relevant Coursework

Optimization, Parallel Programming in C/C++, Statistical Inference for Data Science, Bayesian Learning, Functional Data Analysis, Numerical Methods in Python, Resampling Methods in R, Aerodynamics, Controls Systems, Air Stability and Controls

Mentorship, Coaching and Projects

Pan-African Robotics Competition | Competition Page - [hyperlinked](#) | Team: StartUp Africa (KE)

Spring 2023

YouTube Video - [Agricultural Robotics for Africa](#)

The challenge of the competition was to build software to operate the PARC AgRobot (a wheeled mobile robot) to perform Autonomous field navigation and Weed detection. Precision farming tasks included: navigating through a farm, detecting weeds within crop rows using computer vision and autonomously planting seeds on the farm. Our team competed in the simulation phase using the Gazebo Robot Simulator and used state-of-the-art tools and frameworks such as ROS2, MATLAB, OpenCV.



Pan-African Robotics Competition | Competition Page - [hyperlinked](#)

Spring 2022

The Maker's League. Theme was to leverage technology and find solutions that would contribute to ending hunger in Africa and contributing to the achievement of the United Nation's SG2. The technological solution was to demonstrate how CubeSat technology can be used for remote sensing using vegetation indices can be used to detect droughts in the northern parts of Kenya. Students created an Arduino based CubeSat capable of taking pictures and simulated a basic mission in MATLAB Simulink. My students took the **third**-place prize.



AIAA Aerospace Robotics Competition (ARC) - [hyperlinked](#)

Fall 2021

Python & Drone Instructor mentoring BLASS NSBE Junior Chapter for an entry into AIAA's Aerospace Robotics Competition (ARC) in New England for that year's search and rescue (S&R) mission. The goal was for the students to fly to give sets way points simulating the different phases of an S&R operation damage and drop an attached payload. The students used Holybro S500 V2 Drone Kits that use a Pixhawk flight computer running PX4 Firmware as the Autopilot Software.

Zipline Drones | Flight Operations Team

Summer 2016

Zipline International, world leading blood delivery servicing company that currently operates in Rwanda and Ghana invited me to spend a few days as an independent contractor. Tasks and duties included conducting pre and post flight inspections, technical maintenance and troubleshooting of the drones and ground control software and basic test flights.

Hybrid Autonomous Winged Quad Rotor Delivery Drone (HAWK DD) | Aerodynamics Team Lead

Spring 2014 to 2015

The scope of this design project was to create an Unmanned Aerial Vehicle (UAV) that can deliver a payload autonomously from one GPS coordinate to another and return for subsequent missions. This project introduced our team to the Systems Engineering Process derived from NASA's System Engineering Handbook. Personally, led the research to select appropriate airfoil, calculated wing geometry that would allow UAV to meet design requirements. Furthermore, created basic flight control software in C++ to allow control of actuating control surfaces to stabilize/control the aircraft in 6 Degrees of Freedom with Ardupilot APM 2.6 Autopilot. Onboard sensors included wireless receiver with antenna, GPS receiver, ultrasonic range finder, and battery monitors connected and mounted by a wire harness to the Ardupilot system.

A* (A-Star) Algorithm in C

(Link: [Github Gatera Canero - AStar Algorithm](#))

Graduate level optimization project to compute the minimum travelled distance as the cost from Basilica Santa Maria del Mar (Barcelona) to the Giralda (Sevilla) optimized by the A-Star algorithm verified for accuracy that fell within 10 miles of google maps results.