Gael Ruta Gatera – US. Citizen (817-404-7470)   Location: Fort Worth, Texas

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Problem solver with 7 years of overall engineering experience. Worked cross-functional software development in the last 3 years on satellite systems at Rogue Space Systems Corporation. Supported payload software development for the SCP - [Rogue SCP Blog](#) on the Barry Orbot™ (Space-X T9) mission. Led the integration of the Robot Operating System (ROS2) with Unity3D.

Software Skills

Languages	Simulation	Robotics	Miscellaneous	UAV Software
Python, C/C++	Unreal, Unity3D	ROS1, ROS2	Nerfs, Gaussian Splats	ArduPilot, PX4
	Unity3D, ros2-for-unity	RVIZ, Gazebo	OpenCV, PyTorch, Open3D	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

Cross functional developer, creating software for R&D projects for the development of the company's Orbots™ that have a Jetson based flight computer. Top Contributions:

- Unity3D for Software-In-the-Loop (SIL) testing of autonomous behaviors written using ROS2 as the middleware framework and source of synthetic data for model training models for spacecraft localization (detection and segmentation).
- 3D Scanning and reconstruction of a Resident Space Object (RSO) using LIDAR and 2D images from RGB cameras
  - Neural Radiance Fields (Nerfs), Gaussian Splatting, Structure from Motion (sfm), point cloud, Iterative Closest Point
- Supported payload deployed on Space X's T-9 bus communicated to Jetson Xavier over UART/RS-485
- ROS2 Real-Time & Docker – Comparing the latency Analysis of RaspberryPi and Jetson boards with Preempt-RT patch.

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

Program manager supported R&D, and led cost reduction calculated more than $400,000 in savings to the company scaled across various efforts. Led document management 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) and 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

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.