Andres Felipe **Palomino Suescun**

Mechatronics Engineer · Robotics and UAVs Specialist

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"Learn , share and be the change that you want to see in the world."

Summary

Robotics and C++ engineer with 8 years of experience in research and development of embedded systems. Extensive knowledge of embedded control systems, autonomous navigation, and real-time operating systems. Proven expertise in the design and implementation of complex software systems. Applying for a position as a Senior Software Engineer

Work Experience

Eurecat

Barcelona, Spain

Robotics aerial researcher — *Oct. 2019 - Present*

- Developed C++ and Python algorithms to solve complex problems like motion planning, path optimization and SLAM (Simultaneous Localization And Mapping) using ROS middle-ware to enable aerial robotic platforms to autonomously navigate in an unknown environment.
- Improved the autonomous maneuverability of aerial robotic platforms by implementing algorithms on embedded Linux devices to allow them to perform autonomous maneuvers in sewers and tunnels.
- Integrated hardware from original equipment manufacturers to three different robotic aerial platforms, and tested in underground rail tunnels to perform autonomous inspections. Leveraged coverage algorithms and state estimation from sensors on board to complete the task.
- Improved system performance through a deeper understanding and application of extended kalman filter based algorithms, drones dynamics analysis, and model predictive control for robotics achieving autonomous test objectives with a maximum of 90% success rate by leveraging the adopted algorithms.

Sistemas de Información Territorial y Posicionamiento (SITEP)

Barcelona, Spain

Robotics Engineer — *Mar. 2019 - Oct. 2019*

- Integrated hardware from original manufacturers like GNSS, Lidar and IMU to implement sensor fusion for outdoor localization of mobile robots in the field of assets localization on ground.
- Designed and implemented advanced algorithms for object recognition using embedded devices on aerial platforms and trains, with a focus on direct georeferencing of assets using a set of RGB and BW cameras plus OpenCV tools on enbedded devices.
- Played a key role in the testing and optimization of the aerial robots, including advanced propulsion systems and lightweight materials, conducting multiple flight tests and analyzing data to improve their performance and create technical documentation ensuring that they were easy to use and maintain.

Earthrover - Cleandrone

Valldoreix, Barcelona

Software Engineer & Robotics Engineering Intern — *Aug. 2017 - Mar. 2019*

- Developed a software which implements computer vision tools used to recognize the layout, from aerial photography, of over 20 entire solar panel plants providing accurate information on the position and orientation of solar panels and saved results in a dabase using MySql, Qt and OpenCV tools.
- Integrated hardware components into an UAS to undertake thermal imaging surveys of solar farms, including cameras, sensors, and wireless communication systems which lead to electronic assembly and maintenance, field tests and piloting tasks.
- Updated the versions of the Ground control station to plan automatic aerial missions for Unmanned Aerial Systems (UAS), incorporating new features and functionality to enhance mission planning, real-time data exchange and execution using QT, ROS.
- Led the hardware and software integration for the first prototype of an agricultural rover which incorporates GPS, IMU, camera sensors and algorithms for high-precision weeding control.

Fundación Cardiovascular de Colombia

Floridablanca, Colombia

Junior Design and Development Engineer — *Aug. 2012 - Jul. 2014*

- Designed the hardware for the power stage and temperature control of a warming unit for patients after surgery, ensuring optimal performance and reliability.
- Participated in the integration of OEM circuits to a new vital signs monitor, incorporating ECG, SpO2, NIBP, IBP and temperature sensors for accurate measurement of physiological parameters.
- Led the development of a SCADA (Supervisory Control and Data Acquisition) system for continuous and comprehensive patient monitoring, designed to display waveforms and numeric data in a central station and generate alarms for immediate notification of critical changes, improving patient care and safety.

Projects

VIZTA

Eurecat *Jan. 2021 - Dec. 2022*

- Contributed with mission planning and state estimation algorithms for mobile robots to evaluate the impact of the new sensors developed in the VIZTA project in the fields of 3D navigation, 3D reconstruction and defect detection in confined areas.

Assets4Rail

Eurecat *Jan. 2020 - Dec. 2021*

- Applied embedded control strategies for mobile robots which combined sensors such as lidar and artificial vision to detect possible tunnel defects, as well as geography and track wear and noise and vibrations from bridges, with the purpose of maintain safer and more profitable infrastructures under the Assets4Rail project.

Drones in the factory of the future

Eurecat - Seat *Oct. 2019 - Oct. 2021*

- Led the systems integration for developing the pioneering project “Drones in the factory of the future”, which explores the opportunities and advantages of drone autonomous navigation inside the factory to move light parts more quickly, sustainably, and efficiently.

5G Firefighting Drone

SITEP *Mar. 2019 - Oct. 2019*

- Participated in the hardware and software integration of 5G technology to facilitate and optimize fire management, by capturing, processing and transmitting data such as heat maps, geo-located images and location of troops, which are sent to emergency teams in real time using drones and a dedicated broadband network.

CLAWNS

Earth rover *Jun. 2018 - Mar. 2019*

- Created the starting prototypes of the autonomous navigation system of an agricultural rover aimed for high-precision weeding control through concentrated beam technology.

Cleandrone

Cleandrone *Aug. 2017 - Mar. 2019*

- Developed new features and conducted test and validations for 2 UAS (prototype to clean panel surfaces and a product to inspect solar plants) which improved their performance during thermal imaging surveys, including real-time data transmission, autonomous flight, and obstacle avoidance systems.

Fundacion Cardiovascular de Colombia

SignCare *Aug. 2012 - Jul. 2014*

- Contributed to the patent of invention in Colombia for SIGNCARE a ”Device for display, storage and communication of vital signs featuring mobile network and GPS”, based on the integration of the OEM circuits into the new vital signs monitor.

Education

2018	**Universidad Internacional de Andalucía,** Master’s in Design and Development of UAS	*Sevilla, Spain*
2016	**Universidad de Sevilla ,** Master’s in Automation, Robotics and Telematics	*Sevilla, Spain*
2012	**Universidad Autónoma de Bucaramanga ,** Bachelor’s in Mechatronics Engineering	*Bucaramanga , Colombia*

Certifications

Online. University of Pennsylvania

Robotics: Aerial Robotics *2016*

- Certified theoretical basis of control techniques and sensor fusion for aerial robots.

Online. Georgia Institute of Technology

Control of Mobile Robots *2013*

- Reinforced expertise in kinematics, dynamics and control of mobile robots.

Skills, C++, Python, ROS 1 y 2, Git, Nvidia CUDA, OpenCv, TensorFlow, Pytorch, PX4, Gazebo, Qt, Linux, Bash, Cmake, MySql, Matlab, Simulink, Solidworks