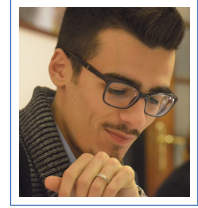


Michele Marolla

R&D Robotics Engineer

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Experience

2022–2024 **R&D Robotics Engineer**, *PRISMA Lab, University of Naples Federico II*

- I co-authored a custom version of the PX4 autopilot firmware, implementing autonomous execution of NDT measurement tasks through direct force control using a custom tilting quadcopter. I also implemented the low-level firmware of the whole robotic system, integrating several actuators and sensors through different communication protocols with STM32 microcontrollers and a real-time operating system, along with a custom driver to enable communication between the microcontroller and the autopilot. A paper describing the system has been submitted to IROS 2024, currently under review.
You can find a video here: youtu.be/IvWUB-oo5Dg
- I developed and maintained the firmware for a 5-DoF robotic arm designed for aerial manipulation, implementing both admittance control and force control for NDT measurements. A paper describing the system has been presented at ISER 2023.
You can find a video here: youtu.be/BuaigozJK-M
- In the context of the AERIAL-CORE (<https://aerial-core.eu/>) H2020 project, I developed the onboard firmware for a robotic arm designed for aerial manipulation, as well as high-level control, trajectory planner and teleoperation running on the drone on-board PC. I spent a total of six weeks in Spain for integrating our robotic arm with the rest of the system and perform live demo. A paper describing the system has been presented at ICINCO 2023.
You can find a video here: youtu.be/HeAgBkeZ3D8

I also realized divulgative and technical videos for PRISMA Lab and Neabotics's projects.

Publications

- 2024 **A semi-autonomous UAV with human supervisory control for non-destructive inspections in interaction with concrete structures**, with S. Marcellini and V. Lippiello
IROS 2024, currently under review.
- 2023 **Development of a semi-autonomous framework for NDT inspection with a tilting aerial platform**, with S. Marcellini, S. D'Angelo, A. De Crescenzo, V. Lippiello and B. Siciliano
ISER 2023.
- 2023 **Application of Intelligent Aerial Robots to the Inspection and Maintenance of Electrical Power Lines**
Contribution for a chapter in *Robotics and Automation Solutions for Inspection and Maintenance in Critical Infrastructures*

2023 **Design and Control of a Novel High Payload Light Arm for Heavy Aerial Manipulation Task**, with *J. Cacace* and *V. Lippiello*
ICINCO 2023.

Skills

Programming	Good knowledge of C++, ROS1/2 and Gazebo. Good knowledge of MATLAB/SIMULINK. Basic knowledge of Python. Good knowledge of low-level microcontroller programming, especially using MbedOS with STM32 microcontrollers. Good capability to integrate sensors and actuators through several communication protocols.
Autopilots	Good knowledge of PX4 autopilot firmware and capability to customize it for advanced applications (e.g. interaction with the environment). Good knowledge of QGroundControl , capability to modify it for custom applications.
Other software	Good knowledge of Linux (Ubuntu); good knowledge of Git and Github; good knowledge of Docker.
Electronics	Basic knowledge of electronics, capability to use laboratory equipment (soldering iron, oscilloscope, and so on).

Education

- 2018–2022 **Automation Engineering, Master Degree**, *University Federico II*, Naples, Italy
Final mark: 110/110 cum laude.
Thesis: Design and prototyping of a small-size quadruped robot.
- 2014–2018 **Automation Engineering, Bachelor Degree**, *University Federico II*, Naples, Italy
Final mark: 110/110 cum laude.
Thesis: Data acquisition and motion planning for a commercial vacuum robot.

Languages

- Italian Native speaker
- English B2 level, certified by ESOL Cambridge Institute.