



Romeo Orsolino — CV

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Work Experience

- **Robotics Research Engineer - Horizon Europe (HE) projects** **London (UK)**
Ocado Technology *September 2023 – present*
R&D in deep learning, Deep Reinforcement Learning (DRL) and generative models for robotic manipulation and grasping of soft objects. I also integrate in Ocado's system the hardware and software components provided by the partner universities of three different HE projects.
- **Robotics Research Engineer** **London (UK)**
Arrival Ltd. *December 2020 – October 2022*
Development of safe production-level software and motion planning, optimal control and decision making algorithms for mobile robots of different form factors inside the *microfactory* for the production of EV vehicles.
- **Postdoctoral researcher and Junior Research Fellow (JRF)** **Oxford (UK)**
Dynamic Robots Systems (DRS) group, University of Oxford *October 2019 – November 2020*
Nonlinear model predictive control (MPC), Reinforcement Learning (RL), perceptive (with visual-feedback) footstep planning for legged robots, data-driven initialization methods for nonlinear solvers and for safety-critical perceptive motion planning, hardware experiments on the Anymal electric quadruped robot.
- **Postdoctoral researcher** **Genova (ITA)**
Dynamic Legged Systems (DLS) lab, Istituto Italiano di Tecnologia (IIT) *Mar. – Sept. 2019*
Conducting research in both data-driven and model-based motion planning for legged robots, nonlinear model predictive control (MPC), hardware experiments on HyQ and HyQ-real hydraulic quadruped robots. Reachability-based analysis and computational geometry methods for autonomous driving.

Education

- **PhD in Bioeng. and Robotics, "Advanced and Humanoid Robotics"** **Genova (ITA)**
Dynamic Legged Systems lab (DLS), Istituto Italiano di Tecnologia (IIT) *Nov. 2015 – Feb. 2019*
Main activities: online motion planning and data-driven trajectory optimization for legged robots, optimal control, real-time nonlinear MPC, rigid body dynamics, computational geometry, low dimensional systems modeling, supervised and unsupervised machine learning.
- **Visiting research scholar** **Pensacola, Florida (USA)**
Florida Institute for Human and Machine Cognition (IHMC) *June – Oct. 2018*
Motion planning and control for quadruped and humanoid robots; Reachability-based analysis for autonomous driving; Computational geometry and numerical methods for safety-critical motion planning.
- **European Master in Advanced Robotics (EMARO)** **Genova (ITA) and Nantes (FR)**
Double degree: 1st year at UniGe (Ita), 2nd year at ECN (Fr) *Sept. 2013 – Aug. 2015*
Main subjects: nonlinear control theory, optimal control, modeling and control of mechanical manipulators, real-time operating systems, computer vision, artificial intelligence
- **Bachelor's degree in Mechanical Engineering** **Genova (ITA) and Berlin (Ger)**
Università di Genova and Erasmus at Technische Univ. Berlin *Sept. 2010 – Oct. 2013*
Main subjects: linear algebra, structures' mechanics, linear control theory, C++ programming, fluid dynamics, thermodynamics, fluid dynamics, control of hydraulic systems, principles of measurements and control.

Technical skills

- Advanced programming skills in C++ (10+ years experience) and python (5+ years experience); comfortable with Docker and Linux/Ubuntu (bash and scripting languages, systemctl, syslog and systemd services);
- Comfortable with ROS/ROS2 (Robot Operating System), on-board and off-board communication protocols (DDS, serial), version control (Git), project management tracking systems (Jira, ADO), continuous integration and development tools (Gitlab and Jenkins), optimization solvers (IPOPT, Snopt, QPooases, QuadProg, qpmd) and simulation environments (Gazebo, Pybullet, Raisim, Isaac Gym and Mujoco) and ML tools (PyTorch, OpenAI gym, WandB);
- Extensive hardware experience across different electric and hydraulic robots (among others: HyQ, AnyMal, Atlas, Spot, Laikago, Kuka iiwa 14), embedded systems, sensors and microcontrollers (lidars, cameras, force-torque sensors, encoders, IMUs, Arduino, ESP32, Raspberry Pi) and multi-fingered robotic grippers/hands;
- Sound theoretical background in rigid body dynamics, mathematical optimization and in the modeling and control of complex dynamical systems (for trajectory optimisation, optimal control, nonlinear control theory and stochastic optimization). Personal research interest in 3-D computer graphics, computational geometry and numerical methods;
- Passionate about the development of new software tools to enhance productivity (data-science, tooling, logging, telemetry, continuous integration, testing, agile management, etc.)

Selected Papers

- R. Orsolino et al. *Human-inspired Grasping Strategies of Fresh Fruits and Vegetables Applied to Robotic Manipulation*, IEEE ICRA@40, 2024;
- S. Gangapurwala, M. Geisert, R. Orsolino, M. Fallon and I. Havoutis, *RLOC: Terrain-aware legged locomotion using reinforcement learning and optimal control*, IEEE Transactions on Robotics (TRO), 2022
- R. Orsolino, S. Gangapurwala, O. Melon, M. Geisert, I. Havoutis and M. Fallon, *Rapid Stability Margin Estimation for Contact-Rich Locomotion*, IEEE/RSJ IROS, 2021
- R. Orsolino, M. Focchi, S. Caron, G. Raiola, V. Barasuol and C. Semini, *Feasible Region: an Actuation-Aware Extension of the Support Region*, IEEE Transactions on Robotics (TRO), 2020
- PhD thesis: *Actuation-Aware Simplified Dynamic Models for Robotic Legged Locomotion*, R. Orsolino, Istituto Italiano di Tecnologia (IIT), Italy, 2019
- R. Orsolino, M. Focchi, C. Mastalli, H. Dai, D. Caldwell and C. Semini, *Application of Wrench-based Feasibility Analysis to the Online Trajectory Optimization of Legged Robots*, IEEE Robotics and Automation Letters (RA-L), 2018

For a full list of publications please see google scholar [🔍](#) or my own [website](#)

Organized Scientific Workshops

- [Numerical Optimization for Online Multi-Contact Motion Planning and Control](#), Robotics Science and Systems (RSS) conference, Freiburg (Germany), June 2019. Main organizer: R. Orsolino;