Romeo Orsolino | CV

W9 2HQ, London – United Kingdom

+44/7513303907 • orso.romeo@gmail.com •

Work Experience

- **Robotics Technology Associate** — **London (UK)**
  bp (contractor) — *November 2022 – present*
  Advising leadership team on new trends within robotics technology to achieve the net-zero emissions target, deliver proofs of concept and first implementations with disruptive potential for the energy industry.
- **Robotics Research Engineer** — **London (UK)**
  Arrival Ltd. — *December 2020 – October 2022*
  Development of motion planning and control algorithms, real-time computing, data-science and low-latency comms management for the microfactory.
- **Junior Research Fellow (JRF)** — **Oxford (UK)**
  Kellogg College, University of Oxford — *June 2020 – November 2020*
  Tutoring of undergraduate students.
- **Postdoctoral researcher** — **Oxford (UK)**
  Dynamic Robots Systems (DRS) group, University of Oxford — *October 2019 – November 2020*
  Research of new data-driven initialization methods for nonlinear solvers and for interactive motion planning, safety-critical learning for motion planning of legged robots, constrained policy optimization, hardware experiments on the Anymal electric quadruped robot.
- **Postdoctoral researcher** — **Genova (ITA)**
  Dynamic Legged Systems (DLS) lab, Istituto Italiano di Tecnologia (IIT) — *March 2019 – Sept. 2019*
  Conducting research in nonlinear motion planning for legged robots, nonlinear model predictive control, hardware experiments on HyQ and HyQ-real hydraulic quadruped robots.

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 trajectory optimization, for legged robots, optimal control, real-time nonlinear MPC, rigid body dynamics, computational geometry, low dimensional systems modeling, C++ and Python programming, extensive experimental experience with robotic hardware (HyQ robot).
- **Visiting research scholar** — **Pensacola, Florida (USA)**
  Florida Institute for Human and Machine Cognition (IHMC) — *June – Oct. 2018*
  Motion planning and control for quadruped robots, Java programming language
- **European Master in Advanced RObotics (EMARO)** — **Genova (ITA) and Nantes (FR)**
  Double degree: 1^{st} year at UniGe (Ita), 2^{nd} 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)**
  Universitá di Genova (UniGe) — *Sept. 2010 – Oct. 2013*
  Main subjects: linear algebra and advanced geometry, structures' mechanics, linear control theory, C++ programming, fluid dynamics, thermodynamics, etc...

- **Erasmus student** **Berlin (GER)**
  Technische Universität Berlin (TUB) *Sept. 2012 – March. 2013*
  Main subjects: fluid dynamics, control of hydraulic systems, principles of measurements and control

Selected Papers

- 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, Istitituto 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;

Awards

- I was awarded the Best Student Paper Award at the 20^{th} International Conference on Climbing and Walking Robots (CLAWAR) 2017 (special mention for the extensive hardware testing).

Technical skills

- Advanced programming skills in C++, python and matlab (8+ years experience)) and working knowledge of Unix (bash and scripting languages);
- Comfortable with all main robotics middleware (ROS and DDS), communication protocols, version control (Git) and simulation environments (Gazebo, Pybullet, Raisim, Isaac Gym and Mujoco);
- Extensive experience across different electric and hydraulic robots (among others: HyQ, AnyMal, Atlas, Spot, Laikago) and with multiple sensors (lidars, cameras, force-pressure sensors, encoders, IMUs, etc...);
- Sound theoretical background in machine learning, mathematical optimization and in the modeling and control of complex dynamical systems (trajectory optimisation, optimal control, reinforcement learning and their intersections) applied to real-world systems. Personal research interest in interactive and perceptive locomotion and manipulation;
- Passionate about the development of new software tools to enhance productivity (data-science, tooling, logging, continuous integration, testing, agile management, etc.)