

Education

- 2020–Current **Sapienza University of Rome, Rome, Italy.**
- PhD in Automatic Control, Bioengineering and Operations Research (ABRO)
 - Supervisor: Prof. Giuseppe Oriolo
- 2016–2020 **Sapienza University of Rome, Rome, Italy.**
- MSc in Artificial Intelligence and Robotics, *110/110 cum laude*
 - Thesis: “Planning and Executing Humanoid Gaits in a World of Stairs”
 - Supervisor: Prof. Giuseppe Oriolo
- 2015–2016 **University of Leeds, Leeds, United Kingdom.**
- Erasmus+ student in Computer Science
- 2013–2016 **University of Parma, Parma, Italy.**
- BSc in Computer Science, *109/110*
 - Thesis: “Study and Experimentation of Hand Detection Technique with Deep Learning Algorithms”
 - Supervisor: Prof. Federico Bergenti

Research

- 2020–Current **PhD Student at Sapienza University of Rome, Rome, Italy.**
- Studying humanoid robot motion planning and control in dynamic and uneven terrains. Developing a navigation stack for humanoids in uneven environments with support to different localization, mapping, planning and control modules.
- 2023 **Visiting PhD Student at IDH Team, LIRMM, Montpellier, France.**
- Development of NMPC for trajectory tracking using steerable wheeled mobile robots. Experiments performed on the mobile base of the BAZAR dual-arm robot (Neobotix MPO-700). This work has been supervised by Prof. Andrea Cherubini.
- 2020 **Research Fellow at Sapienza University of Rome, Rome, Italy.**
- Studying humanoid robot locomotion and developing footstep planning algorithms working in both known and unknown dynamic rough environments.

Teaching

- 2020–Current **Autonomous and Mobile Robotics, Sapienza University of Rome.**
- Final project supervisor of the module *Autonomous and Mobile Robotics* of the *Master in Artificial Intelligence and Robotics* and the *Master in Control Engineering*. A selected list of supervised projects:
- A navigation stack for a skid-steering mobile robot
 - Autonomous humanoid navigation in multi-floor environments
 - Optimal kinodynamic planning for nonlinear hybrid systems
 - Improving footstep planning algorithms by efficient nearest neighbor searching
- 2022–Current **Controlli Automatici, Sapienza University of Rome.**
- Development of teaching material for the module *Controlli Automatici* of the *Bachelor in Computer and System Engineering*:
- Motion control algorithms in C++, MATLAB and CoppeliaSim for the P3DX wheeled mobile robot

Publications

Journals

- 2023 **M. Cipriano, P. Ferrari, N. Scianca, L. Lanari, G. Oriolo**, Humanoid motion generation in a world of stairs, *Robotics and Autonomous Systems*, vol. 168, 2023.

Conferences

- 2023 **M. Cipriano, M. R. O. A. Maximo, N. Scianca, L. Lanari, G. Oriolo**, Feasibility-Aware Plan Adaptation in Humanoid Gait Generation, *2023 IEEE-RAS International Conference on Humanoids Robots*, Austin, USA.

Projects

- 2023–Current **Safe robot navigation in crowds with TIAGo**, *Master's Degree Thesis*, Final Project Supervisor.
Development of a NMPC module for navigation in complex environments with crowds using TIAGo mobile robot. This project is being developed using Python, ROS and acados.
- 2023–Current **Humanoid motion generation in a world of ramps**, *Master's Degree Thesis*, Final Project Supervisor.
Development of a MPC module for humanoid robot locomotion in uneven environments composed of arbitrarily oriented patches. This project is being developed using C++, Python and CasADi.
- 2023–Current **Push recovery for humanoid robots**, *PhD Research Project*.
A push recovery module for humanoid robots developed using CasADi. The module is responsible for adapting complex footstep plans, even in case of uneven environments composed of multiple stairs.
- 2023 **NMPC for steerable wheeled mobile robots**, *PhD Research Project*.
Development of a NMPC for the control of the BAZAR dual-arm mobile robot. This project has been developed in C++ and Python using ROS, acados and CasADi, and it is part of the work made in IDH Team at LIRMM (Montpellier, France).
- 2020–2023 **Humanoid motion generation in a world of stairs**, *PhD Research Project*.
A C++ framework for humanoid navigation built upon ROS. It provides a set of sensor-based anytime footstep planners, MPC for trajectory generation and support to localization and mapping modules for navigation in both known and unknown dynamic environments.
- Jan 2020 **Planning and Executing Humanoid Gaits in a World of Stairs**, *Master's Degree Thesis*.
Development of a pipeline for humanoid robot locomotion in unknown environments using terrain mapping, footstep planning and variable height MPC. The project has been developed in C++ and Python using ROS and the B-Human framework. Experiments have been performed on a NAO humanoid robot. It has been presented as final project for the *Master Degree in Artificial Intelligence and Robotics* at Sapienza University of Rome, Italy.

Programming Knowledge

- Languages C++, Python, MATLAB, \LaTeX .
- Libraries ROS, Eigen, GridMap. Experience with ROS2, Pinocchio, CasADi and acados.
- Tools git, Make, CMake, catkin, Gazebo, CoppeliaSim.

Awards and Scholarships

- 2023 **Research Project for Mobility Abroad Program of PhD Students, *Scholarship*.**
Winner of the scholarship to visit a research laboratory abroad and work on a research project at IDH Team in LIRMM (Montpellier, France). The scholarship has been awarded by Sapienza University of Rome.
- 2020 **PhD in Automatic Control, Bioengineering and Operations Research (ABRO), *Scholarship*.**
Winner of the scholarship for the PhD in Automatic Control, Bioengineering and Operations Research (curriculum Automatic Control, 36th cycle) in the Department of Computer, Control and Management Engineering (DIAG) of Sapienza University of Rome.
- 2020 **Humanoid locomotion in 3D environments, *Scholarship*.**
Winner of the scholarship on the study and development of motion planning and control algorithms for humanoid locomotion in uneven environments. The scholarship has been awarded by Sapienza University of Rome.
- 2018 **Robothon Intesa Sanpaolo Make it Real, *First Place*.**
Winner of the hackathon organized by Intesa Sanpaolo Innovation Center. The project consisted in programming the robot Pepper and make it interact with people.
- 2016 **Best Software Engineering Project, *First Place*.**
Winner of the best software engineering project for the module *Software Engineering* at University of Leeds. The project (*Risotto: A Restaurant Management System*) has been selected by Elder Studios.
- 2015 **Erasmus+ EU Program, *Scholarship*.**
Winner of the Erasmus+ EU scholarship to study at University of Leeds (Leeds, United Kingdom) during the third year of the BSc in Computer Science.
- 2011-2012 **Italian Olympiads in Informatics, *Bronze Medal*.**
Bronze medal at Italian Olympiads in Informatics (2011). Two stages of preparation for International Olympiads in Informatics (December 2011 and February 2012). Finalist at Italian Olympiads in Informatics (2012).

Summer School

- Jul 2022 **Summer School SIDRA 2022, Bertinoro, Italy.**
 - *Nonlinear and Adaptive Control Techniques for Advanced Aerospace Systems*
 - *Network Systems in Science and Technology*
- Jul 2021 **Summer School SIDRA 2021, Bertinoro, Italy.**
 - *Game Theory and Network Systems*
 - *Modeling and Control of Soft Robots*

Languages

- Italian **Mother tongue**
- English **Professional knowledge**