

Experience**PostDoc** (March 2021 – February 2022, current occupation)

Dipartimento di Ingegneria Informatica, Automatica e Gestionale, Sapienza University of Rome

PostDoc (February 2020 – January 2021)

Dipartimento di Ingegneria Informatica, Automatica e Gestionale, Sapienza University of Rome

My main research interest is humanoid robot locomotion. During my two periods as a PostDoc at DIAG I have been working on expanding the topics developed during my time as a Ph.D. student, which involved the development of a Model Predictive Control scheme for humanoid robots with stability and feasibility guarantees. The main advancements with respect to the original formulation have been:

- Locomotion on uneven ground,
- Locomotion in the presence of disturbances (robust gait generation),
- Extension to the generation of running gaits,
- Application of the same techniques to balancing robots on wheels.

During this period I co-authored several scientific publications and participated in international conferences (see list at page 3). I have also been teaching the material relative to humanoid robotics, as part of the course on Autonomous and Mobile Robotics by prof. Giuseppe Oriolo, as well as supervised several student projects and thesis works.

Ph.D. student (November 2016 – October 2019)

Dipartimento di Ingegneria Informatica, Automatica e Gestionale, Sapienza University of Rome

During this period I have been a Ph.D. student in Automation, Bioengineering and Operation Research (ABRO) at DIAG, under the supervision of prof. Giuseppe Oriolo. During this period I co-authored several scientific publications and participated in international conferences (see list at page 3).

My Ph.D. thesis focused on humanoid robot locomotion, with the main contribution being the development of a Model Predictive Control scheme for humanoids, with guarantees of recursive feasibility and stability.

Visiting student (March 2019 – October 2019)

Model Predictive Control Lab, University of California at Berkeley

I visited the MPC Lab in Berkeley for a period of six months, as part of my Ph.D. program. There I worked with Ugo Rosolia on “Learning Model Predictive Control”, under the supervision of prof. Francesco Borrelli, which resulted in a publication at the 2020 European Control Conference.

Automation Engineer (May 2015 – September 2015)

Comtec s.r.l., Biassono (MB)

Comtec is an Italian company that produces automatic wiring machines. During my six months with them I worked on several tasks, including:

- Mechanical drawing of machine components: Autocad for 2D and Rhino for 3D,
- Maintaining software interfaces of measuring devices (Visual Basic),
- Maintaining documentation.

Education**Ph.D. in Automation, Bioengineering and Operation Research**

Sapienza University, Rome, February 2020

Thesis: Humanoid Gait Generation via MPC: Stability, Robustness and Extensions

Supervisor: prof. Giuseppe Oriolo

Systems engineering

Master degree, "Sapienza" University, Rome, July 2014, final grade 108/110

Thesis: Visual servoing of moving objects using image moments

Supervisor: prof. Giuseppe Oriolo

Mechanical engineering

Bachelor degree, "Sapienza" University, Rome, December 2010, final grade 97/110

Thesis: Design of a small-sized photovoltaic plant

Supervisor: prof. Vincenzo Naso

Scientific high school degree

Liceo E. Majorana, Orvieto (TR), obtained in July 2004 with a final grade of 100/100

Skills and proficiencies

Programming languages i have most experience with

- C / C++
- Python
- Matlab / Simulink

Robotics-related software and platforms:

- V-REP / CoppeliaSim
- SoftBank Robotics NAO / NAOQi
- Kuka LWR
- BHuman framework for NAO
- DART (Dynamic Animation and Robotics Toolkit)
- ROS / Gazebo
- Yalmip

Other software

- Photo / video editing: Adobe Photoshop, Inkscape, Adobe Premiere
- Audio editing: Cubase, Reaper, Audacity

Languages spoken: Italian (native), English

Fluent english speaker, with 6 months of experience living in Berkeley, CA, United States

Publications**International Journals****“Feasibility-Driven Step Timing Adaptation for Robust MPC-Based Gait Generation in Humanoids”**

F. M. Smaldone, N. Scianca, L. Lanari, G. Oriolo - IEEE Robotics and Automation Letters, 2021

“A Behavior-Based Framework for Safe Deployment of Humanoid Robots”

N. Scianca, P. Ferrari, D. De Simone, L. Lanari, G. Oriolo - Autonomous Robots, 2021

“MPC for Humanoid Gait Generation: Stability and Feasibility”

N. Scianca, D. De Simone, L. Lanari, G. Oriolo - IEEE Transactions on Robotics, 2020

“A Multimode Teleoperation Framework for Humanoid Loco-Manipulation: An Application for the iCub Robot”

L. Penco, N. Scianca, V. Modugno, L. Lanari, G. Oriolo, S. Ivaldi - IEEE Robotics & Automation Magazine, 2019

International Conferences**“MPC-Based Gait Generation for Humanoids: from Walking to Running”**

F. M. Smaldone, N. Scianca, L. Lanari, G. Oriolo – I-RIM 3D 2021, Rome, Italy

“Robust MPC-Based Gait Generation in Humanoids”

F. M. Smaldone, N. Scianca, L. Lanari, G. Oriolo – I-RIM 3D 2020, Rome, Italy

“ZMP Constraint Restriction for Robust Gait Generation in Humanoids”

F. M. Smaldone, N. Scianca, V. Modugno, L. Lanari, G. Oriolo - ICRA 2020, Paris, France

“Learning Model Predictive Control for Periodic Repetitive Tasks”

N. Scianca, U. Rosolia, F. Borrelli - ECC 2020, St. Petersburg, Russia

“Gait Generation Using Intrinsically Stable MPC in the Presence of Persistent Disturbances”

F. M. Smaldone, N. Scianca, V. Modugno, L. Lanari, G. Oriolo - Humanoids 2019, Toronto, Canada

“An Integrated Motion Planner/Controller for Humanoid Robots on Uneven Ground”

P. Ferrari, N. Scianca, L. Lanari, G. Oriolo - ECC 2019, Naples, Italy

“Humanoid Gait Generation on Uneven Ground Using Intrinsically Stable MPC”

A. Zamparelli, N. Scianca, L. Lanari, G. Oriolo - SyRoCo 2018, Budapest, Hungary

“Gait Generation via Intrinsically Stable MPC for a Multi-Mass Humanoid Model”

N. Scianca, V. Modugno, L. Lanari, G. Oriolo - Humanoids 2017, Birmingham, UK

“Humanoid Gait Generation for Walk-To Locomotion Using Single-Stage MPC”

A. Aboudonia, N. Scianca, D. De Simone, L. Lanari, G. Oriolo - Humanoids 2017, Birmingham, UK

“MPC-based Humanoid Pursuit-Evasion in the Presence of Obstacles”

D. De Simone, N. Scianca, P. Ferrari, L. Lanari, G. Oriolo - IROS 2017, Vancouver, Canada

“Real-Time Pursuit-Evasion with Humanoid Robots”

M. Cagnetti, D. De Simone, F. Patota, N. Scianca, L. Lanari, G. Oriolo - ICRA 2017, Singapore

“Intrinsically Stable MPC for Humanoid Gait Generation”

N. Scianca, M. Cagnetti, D. De Simone, L. Lanari, G. Oriolo - Humanoids 2016, Cancun, Mexico