Pietro Gori

Born in Pistoia, Italy, 14 October 1998

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Education

2023-present **PhD Student**

Institute: University of Pisa
Scholarship: "ICT enabling technologies for Industry 5.0"

2020-2023 **Master's Degree in Robotics and Automation Engineering**

Institute: University of Pisa
Exam average: 29/30
Thesis: "Theoretical development and experimental validation of algorithms for gait generation of quadrupedal robot motion through motion phases optimization"
Supervisors: Prof. Manolo Garabini, Prof.ssa Lucia Pallottino, Prof. Franco Angelini
Vote: 110/110 cum laude

2017-2020 **Bachelor's Degree in Electronics Engineering**

Institute: University of Pisa
Exam average: 26.8/30
Thesis: "Convertitore analogico/digitale Delta-Sigma: funzionamento, vantaggi e applicazioni"
Supervisor: Prof. Giuseppe Barillaro
Vote: 109/110

2013-2017 **High School Diploma**

Institute: ITTS Fedi-Fermi, Pistoia
Curriculum: Automazione
Vote: 100/100

Main proficiencies

Locomotion, numerical optimization, optimal control, linear and non-linear control, robust control, system identification for uncertain systems, distributed systems, deep learning, real-time systems programming, iterative learning control, guidance and navigation algorithms, robot manipulators, programming

Main projects carried out during the academic period

Master's thesis

- Specifications: development of algorithms for automatic gait generation for a quadrupedal robot, based on the optimization of the movement and the motion phases of the robot. Real experiments were done through Iterative Learning Control on SOLO-12 to get the best performances.
- Platforms and languages: Ubuntu, ROS 2, Python, Matlab
- Period: November 2022 – May 2023
- Supervisors: Prof. Manolo Garabini, Prof.ssa Lucia Pallottino, Prof. Franco Angelini

European Mushrooms Classification

- Specifications: development at least two CNN (one from scratch and the other pretrained) with the purpose of recognizing four classes of European mushrooms. Classes were Amanita, Boletus, Cortinarius and Russula. The neural networks have been developed using Tensorflow library.
- Platforms and languages: Ubuntu, Python, Google Colab
- Period: February 2023
- Group members: Pietro Gori and Vincenzo Degiacomo
- Supervisors: Prof.ssa Beatrice Lazzerini, Dott. Ing. Michele Baldassini

Land Vehicle Dynamics-Aided Inertial Navigation

- Specifications: development of a particular type of navigation system that can work in absence of non-inertial sensors. It uses both a Fuzzy system and an Indirect Kalman Filter to recognize a motion phase (stationary, straight or cornering) and estimate navigation errors.
- Platforms and languages: Windows, Matlab, Simulink
- Period: September 2022 - December 2022
- Group members: Pietro Gori, Vincenzo Degiacomo and Francesco Iotti
- Supervisor: Prof. Lorenzo Pollini

Nonlinear control for robot manipulator	• Specifications: development of classical and adaptive controls over a 6 DoF serial link. Controllers developed: PD, Computed torque and Backstepping. • Platforms: Windows, Matlab, Simulink • Period: September 2022 • Group: Pietro Gori, Vincenzo Degiacomo and Salvatore Fiorentino • Supervisor: Prof. Antonio Bicchi
Indoor localization system and consensus algorithms for land vehicles	• Specifications: development and installation of an indoor localization system using low cost cameras and ArUco markers. After that, consensus algorithms were developed over real and simulated land robots. Algorithms developed were position and orientation consensus. • Platforms: Ubuntu, ROS, Matlab, Simulink, Python • Period: March 2022 – September 2022 • Group: Pietro Gori, Vincenzo Degiacomo and Salvatore Fiorentino • Supervisor: Prof. Lucia Pallottino
Triple Inverted Pendulum	• Specifications: development of a robust control for a triple inverted pendulum and robustness analysis. Controller used: H_∞, μ, H_∞ structured. • Platforms: Windows, Matlab, Simulink • Period: February 2022 • Supervisor: Prof. Mario Innocenti
Ping-Pong robot	• Specifications: real-time software development for a 2D cartesian robot able to play ping-pong. It can recognize, follow and predict the motion of the ball through a camera and then hit it using a racket. In addiction a simulation environment has been developed to test the simulated robot using Allegro library. Pthread library has been used to sincronize all threads. • Platforms: Ubuntu, C • Period: January 2021 – April 20212023 • Group members: Pietro Gori and Vincenzo Degiacomo • Supervisor: Prof. Giorgio Carlo Buttazzo

Work Experience

September 2023 – November 2024	**Research Fellowship** Research fellowship at Centro di ricerca "E. Piaggio" in "Theoretical and experimental development of algorithms for motion planning and control of multi-phase robotic systems towards locomotion and manipulation based on hybrid systems control theory"

April 2021 – June 2021	**High school professor** I teached Electronics and Automated Systems in two classes. Besides explaining all topics, I had to understand and motivate all my students to stay focused on their job. I also took part to the final exam as an internal member of the exam commission.
June 2016	**Stage at Orange Informatica s.r.l. (Pistoia)** PLC programming in simulation and on real plant in Turin at Eurofork S.p.A.

Languages

Italian	Native language
English	Advanced knowledge in reading, writing, listening and speaking CLI, B1 certification
Spanish	Entry level knowledge

Computer skills

Programming	C/C++, Python, Matlab, Simulink
Platforms	Windows, Ubuntu
Others	Latex, bibtex, Microsoft Office, OpenOffice, OBS Studio, Github, GitKraken, ROS/ROS 2

Volunteer work

2013 – 2022	**Animator at summer oratory**

November 07, 2023

Signature