europass Curriculum vitae

PERSONAL INFORMATION

Pierluigi Arpenti

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Date of birth 10 February 1990 | Nationality Italian

WORK EXPERIENCE

March 2024-Present

Assistant Professor

Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione, Università degli Studi di Napoli Federico II, Italy

Development of control strategies, rooted in passivity theory, aimed at regulating the behaviour of the robot during walking, leveraging its interaction with the environment. The objective is to craft controllers that are highly energy-efficient, facilitating intuitive and safe interaction between humans and robots.

Jan 2022- March 2024

Postdoctoral Researcher

Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione, Università degli Studi di Napoli Federico II, Italy

Development of model-based control strategies for mobile robots navigating in hostile environments.

Oct 2016 – Dec 2017

Research Engineer

Consorzio di Ricerca per l'Energia, l'Automazione e le Tecnologie dell'Elettromagnetismo, Naples (Italy)

Developement of vision-based algorithms for industrial and logistic robotics applications.

EDUCATION AND TRAINING

2018–2021

PhD - Thesis Title: "Energy Shaping of Underactuated Systems via Interconnection and Damping Assignment Passivity-Based Control with Applications to Planar Biped Robots" ISCED 6

Dipartimento di Ingegneria Elettrica e delle Tecnologie dell'Informazione, Università degli Studi di Napoli Federico II, Italy

2013–2016

Master of Science in Automation Engineering

Scuola Politecnica e delle Scienze di Base, Università di Napoli Federico II, Italia

- modern control theory (MIMO nonlinear systems in state-space domain)
- robotics
- optimization algorithms
- artificial intelligence

2010–2013

Bachelor of Science in Automation Engineering

Scuola Politecnica e delle Scienze di Base, Università di Napoli Federico II, Italia

- classical control theory (SISO LTI systems in frequency domain)
- electrical machines and drives
- mechanics foundations
- computer programming foundations (C, C++)

PERSONAL SKILLS

Mother tongue: Italian

Other languages

UNDERSTANDING		SPEAKING		WRITING
Listening	Reading	Spoken interaction	Spoken production	
English B2	B2	B2	B2	B2
Cambridge Assessment English B2 (First)				

Levels: A1 and A2: Basic user – B1 and B2: Independent user – C1 and C2: Proficient user
Common European Framework of Reference for Languages

Digital competences

SELF-ASSESSMENT				
Information Processing	Communication	Content creation	Safety	Problem solving
Proficient user	Independent user	Independent user	Independent user	Proficient user

Digital competences - Self-assessment grid

Computer skills
- competent with Matlab-Simulink environment
- competent with Mathematica environment
- competent with C, C++ programming languages
- competent with ROS (Robot Operating System)
- competent with most Microsoft Office programmes

Other skills: Playing electric guitar. Enjoying all sports particularly sailing, basketball, football, and running. Love to travel and experience different cultures.

Driving licence: AM, B

PUBLICATIONS

[1] Xie Zhongqu, Wang Yulin, Luo Xiang, **Pierluigi Arpenti**, Fabio Ruggiero, and Bruno Siciliano. “Three-dimensional variable center of mass height biped walking using a new model and nonlinear model predictive control”. In: *Mechanism and Machine Theory* (2024).

[2] Enrico Franco, **Pierluigi Arpenti**, Alejandro Donaire, and Fabio. Ruggiero. “Integral IDA-PBC for underactuated mechanical systems subject to matched and unmatched disturbances”. In: *IEEE Control Systems Letters* (2024), pp. 568–573.

[3] Mario Selvaggio, Rocco Moccia, **Pierluigi Arpenti**, Riccardo Caccavale, Fabio Ruggiero, Jonathan Cacace, Fanny Ficuciello, Alberto Finzi, Vincenzo Lippiello, Luigi Villani, and et al. “Robotics goes PRISMA”. In: *Robotica* (2024), pp. 1–28.

[4] Enrico Franco, **Pierluigi Arpenti**, and Alejandro Donaire. “Integral passivity-based control of underactuated mechanical systems with state-dependent matched disturbances”. In: *International Journal of Robust and Nonlinear Control* 34.5 (2024), pp. 3565–3585.

[5] Andrea Fimiani, **Pierluigi Arpenti**, Matteo Gatti, and Fabio Ruggiero. “Sensorless Reduction of Cane Oscillations Aimed at Improving Robotic Grapevine Winter Pruning”. In: *Proceedings of the 20th International Conference on Informatics in Control, Automation and Robotics - Volume 1: ICINCO*. INSTICC. SciTePress, 2023, pp. 640–647.

[6] **Pierluigi Arpenti**, Alejandro Donaire, Fabio Ruggiero, and Vincenzo Lippiello. “Uniform Global Exponential Stabilizing Passivity-Based Tracking Controller Applied to Planar Biped Robots”. In: *2022 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2022, pp. 6739–6745.

[7] Ainoor Teimoorzadeh, Alejandro Donaire, **Pierluigi Arpenti**, and Fabio Ruggiero. “Robust energy shaping for mechanical systems with dissipative forces and disturbances”. In: *2022 European Control Conference (ECC)*. 2022, pp. 1409–1414.

[8] **Pierluigi Arpenti**, Riccardo Caccavale, Andrea Giuseppe Fontanelli, Vincenzo Lippiello, Gianmarco Paduano, Bruno Siciliano, and Luigi Villani. “Robots Working in the Backroom: Depalletization of Mixed-Case Pallets”. In: *Robotics for Intralogistics in Supermarkets and Retail Stores*. Ed. by Luigi Villani, Ciro Natale, Michael Beetz, and Bruno Siciliano. Cham: Springer International Publishing, 2022, pp. 81–115.

[9] **Pierluigi Arpenti**. “Energy Shaping of Underactuated Systems via Interconnection and Damping Assignment Passivity-Based Control with Applications to Planar Biped Robots”. PhD thesis. Naples, 2021.

[10] Riccardo Caccavale, **Pierluigi Arpenti**, Gianmarco Paduano, Andrea Fontanellli, Vincenzo Lippiello, Luigi Villani, and Bruno Siciliano. “A Flexible Robotic Depalletizing System for Supermarket Logistics”. In: *IEEE Robotics and Automation Letters* 5.3 (2020), pp. 4471–4476.

[11] Giuseppe Andrea Fontanelli, Gianmarco Paduano, Riccardo Caccavale, **Pierluigi Arpenti**, Vincenzo Lippiello, Luigi Villani, and Bruno Siciliano. “A Reconfigurable Gripper for Robotic Autonomous Depalletizing in Supermarket Logistics”. In: *IEEE Robotics and Automation Letters* 5.3 (2020), pp. 4612–4617.

[12] **Pierluigi Arpenti**, Riccardo Caccavale, Gianmarco Paduano, Giuseppe Andrea Fontanelli, Vincenzo Lippiello, Luigi Villani, and Bruno Siciliano. “RGB-D Recognition and Localization of Cases for Robotic Depalletizing in Supermarkets”. In: *IEEE Robotics and Automation Letters* 5.4 (2020), pp. 6233–6238.

[13] **Pierluigi Arpenti**, Fabio Ruggiero, and Vincenzo Lippiello. “A Constructive Methodology for the IDA-PBC of Underactuated 2-DoF Mechanical Systems with Explicit Solution of PDEs”. In: *International Journal of Control, Automation, and Systems (IJCAS)* (in press).

[14] **Pierluigi Arpenti**, Alejandro Donaire, Fabio Ruggiero, and Vincenzo Lippiello. “Energy pumping-and-damping for gait robustification in underactuated planar biped robots within the hybrid zero dynamics framework”. In: *2020 IEEE-RAS International Conference on Humanoid Robots, Humanoids 2020*. 2021.

[15] Matías Nacusse, **Pierluigi Arpenti**, Fabio Ruggiero, and Vincenzo Lippiello. “Gait Generation for Underactuated Compass-Like Robots Using Dissipative Forces in the Controller”. In: vol. 53. 2. 21th IFAC World Congress. 2020, pp. 9023–9030.

[16] **Pierluigi Arpenti**, Fabio Ruggiero, and Vincenzo Lippiello. “Interconnection and damping assignment passivity-based control for gait generation in underactuated compass-like robots”. In: IEEE International Conference on Robotics and Automation. Paris, F, 2020.

[17] **Pierluigi Arpenti**, Diana Serra, Fabio Ruggiero, and Vincenzo Lippiello. “Control of the TORA System through the IDA-PBC without explicit solution of matching equations”. In: 2019 Third IEEE International Conference on Robotic Computing (IRC). Naples, Italy, 2019.