

Giovanni Franzese

PHD IN ROBOTICS

SENIOR RESEARCHER ON INTERACTIVE IMITATION LEARNING FOR ROBOT MANIPULATION.
AUTONOMOUS ROBOTICS RESEARCH CENTER, TECHNOLOGY INNOVATION INSTITUTE, ABU DHABI (UAE) ·

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About

I am passionate about bringing robots into our daily lives, enabling them to learn from and collaborate with humans in industrial, warehouse, and service settings. My main research focused on control and learning strategies for safe and efficient robot learning, with applications in single-arm and bimanual manipulation from different perception inputs, i.e. proprioceptive, tactile, RGB, keypoint and pointclouds. I promote manipulation strategies that can be fully learned from human demonstrations and corrections. And I demonstrated the effectiveness of this interactive learning approach by successfully tackling and winning various robot competitions. I have led multidisciplinary projects on robot dressing, assembly and disassembly tasks, surface polishing, and warehouse automation. I foster knowledge-sharing among my collaborators, thriving in an environment of healthy competition. I am a strong proponent of developing and validating solutions on real robotic hardware.

Skills

Robot Learning	Low-level and high-level skill learning from human interactive demonstrations. Behavioral Cloning.
Robot Control	Variable Impedance Control for Single and Bimanual Manipulation. Safe control design.
Machine Learning	Bayesian and Deep Learning. Incremental and Active Learning. Uncertainty quantification.
Probabilistic Modeling	Gaussian Process, Variational Autoencoder, Conditional Flow Matching, Graph Attention Network
ML Frameworks	PyTorch, Sklearn

Experience

Senior Research Scientist @ Technology Innovation Institute

Abu Dhabi, UAE

RESEARCHER ON HUMANOID MANIPULATION. SENIOR TEAM LEAD: PAOLA ARDON AND DANILO CAPORALE

Mar. 2025 - now

I am currently working in the Humanoid team on spatial-aware and data-efficient diffusion models for robot picking and behavior generation. My research goal focuses on motion generalization in different situations and aims to create valuable industrial technology from the retail to household environments.

PostDoc @ Delft University of Technology

Delft, Netherlands

POSTDOCTORAL RESEARCHER ON GENERALIZABLE ROBOT MANIPULATION. MENTOR: COSIMO DELLA SANTINA.

Sep. 2023 - Mar. 2025

I managed the Franka Emika lab at the Cognitive Robotics Department, where my research focused on learning and generalizing manipulation skills from a limited set of demonstrations. Key areas of application included reshelving in retail environments, assembly and disassembly lines, and plant de-leafing operations.

Team Lead @ PLATOnics (TU Delft team for Robothon Challenge)

Delft, Netherlands

TEAM LEADER OF TU DELFT COMPETITION GROUP FOR ROBOTHON MANIPULATION CHALLENGES

Jan 2023 - Jan 2025

My team's solution for dexterous robot manipulation relied entirely on learning from human demonstrations and corrections. It was recognized as the best versatility solution at the Eurobin Manipulation Skill Versatility Challenge 2024. Visit www.platonics.nl for more info.

Visiting Ph.D. @ University College London

London, United Kingdom

VISITING PH.D. IN THE STATISTICAL MACHINE LEARNING GROUP. MENTOR: MARC DEISENROTH.

Sep. 2022 - Feb 2023

My research focused on using Sparse Variational Gaussian Process to perform calibrated classification on high-dimensional representations, such as graphs.

Ph.D. @ Delft University of Technology

Delft, Netherlands

PH.D. IN INTERACTIVE IMITATION LEARNING FOR ROBOTICS. MENTORS: JENS KOBER AND LUKA PETERNEL. PROJECT: TERI.

June. 2019 - June 2023

My research focused on uncertainty-aware interactive imitation learning for robot manipulation, developed entirely on real robot hardware. I validated my algorithms by tasking non-expert users to teach robots complex manipulation skills, such as picking at non-zero velocity, plugging, and bimanual box picking. I defended my Ph.D. on the 4th of November 2024.

Education

Visiting M.Sc. @ Eindhoven University of Technology

Eindhoven, Netherlands

MASTER THESIS IN DEPARTMENT OF DYNAMICS AND CONTROL. MENTOR: ALESSANDRO SACCON.

Feb. 2018 - July 2018

I investigated the computational trade-offs and advantages of incorporating second derivatives in motion planning for robot manipulators.

M.Sc. @ Politecnico di Milano

MASTER'S DEGREE IN MECHANICAL ENGINEERING (MECHATRONICS AND ROBOTICS). FINAL GRADE: 107/110.

Milano, Italy

Sep. 2016 - Dec. 2018

B.Sc. @ Politecnico di Milano

BACHELOR'S DEGREE IN MECHANICAL ENGINEERING. FINAL GRADE: 104/110.

Milano, Italy

Sep. 2013 - Sep. 2016

Teaching

2022-24	Lecturer on Gaussian Process for Control M.Sc. course on Intelligent Control Systems.	<i>TU Delft</i>
2020-21	Teaching Assistant M.Sc. course on Machine Learning for Robotics.	<i>TU Delft</i>
2020-24	Supervisor for Master and Bachelor projects I proposed and supervised a dozen student final projects.	<i>TU Delft</i>

Grants and Awards

2024	Winner EUrobin Manipulation Skill Versatility Challenge "MSVC" Competition at the International Conference on Intelligent Robots and Systems in Abu Dhabi.	<i>IROS Abu Dhabi</i>
2022	TAILOR Connectivity grant Awarded 15.000 € for visiting University College London from September 2022 to February 2023.	<i>London</i>
2022	ELLIS PhD Student ELLIS PhDs conduct cutting-edge curiosity-driven research in machine learning or a related research area with the goal of publishing in top-tier conferences in the field.	
2022	Winner Franka-Emika Manipulation Hackathon at the European Robotics Forum.	<i>ERF Rotterdam</i>
2021	Winner of Best Late Breaking Results Poster Award IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM) for ILoSA (Interactive Learning of Stiffness and Attractors).	<i>AIM Delft</i>

Selected Publications

2025	MUKCa: Accurate and Affordable Cobot Calibration Without External Measurement Devices G Franzese*, M Spahn*, J Kober, C Della Santina, Under review for Nature Engineering	<i>Nature</i>
2024	Generalizable Motion Policies Through Keypoint Parameterization and Transportation Maps G Franzese, R Prakash, C Della Santina, and J Kober. IEEE Transactions on Robotics.	<i>T-RO</i>
2024	Learning Multi-Reference Frame Skills from Demonstration with Task-Parameterized Gaussian Processes MR Montero*, G Franzese*, J Kober, C Della Santina. International Conference on Intelligent Robots and Systems.	<i>IROS</i>
2023	Interactive Imitation Learning in Robotics: A Survey C Celemin*, R Pérez-Dattari*, E Chisari*, G Franzese*, L de Souza Rosa, R Prakash, Z Ajanović, M Ferraz, A Valada, J Kober. Foundations and Trends in Robotics.	<i>Foundations and Trends in Robotics</i>
2023	Interactive Imitation Learning of Bimanual Movement Primitives G Franzese, L de Souza Rosa, T Verburg, L Peternel, J Kober. IEEE/ASME Transactions on Mechatronics.	<i>T-MECH</i>
2022	Learning to Pick at Non-Zero-Velocity from Interactive Demonstrations A Mészáros, G Franzese, J Kober. IEEE Robotics and Automation Letter.	<i>RA-L</i>
2021	ILoSA: Interactive Learning of Stiffness and Attractors G Franzese*, A Mészáros*, L Peternel, J Kober. IEEE International Conference on Intelligent Robots and Systems.	<i>IROS</i>
2020	Learning interactively to resolve ambiguity in reference frame selection G Franzese, CE Celemin, J Kober. Conference on Robot Learning.	<i>CoRL</i>

Interests

Debating I enjoy engaging in lively discussions over dinner and lunch with friends and colleagues, exchanging perspectives and challenging ideas, both my own and those of others.

Strength and Conditioning Training I regularly attend group fitness classes.

3D printing I learned how to 3D model during my Bachelor and now, in my free time, I design and print tools and ornaments.