Giuseppina Iannotti

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Education

Nov. 2025 – Present
Ph.D. in Robotics and Intelligent Machines, *Humanoids and Human Centered Mechatronics Lab, Italian Institute of Technology (IIT)*, Genova, Italy
Currently conducting research on learning-based loco-manipulation for navigation and manipulation, leveraging foundation models for scene understanding and action generation.

Sept. 2023 – October 2025
Master Degree in Artificial Intelligence and Robotics, *Sapienza University*, Rome, *110/110* cum laude
Concluded an academic path integrating artificial intelligence and robotics, with a focus on advanced control, learning-based methods, autonomous systems and human-robot interaction.

Sept. 2020 – October 2023
Bachelor Degree in Applied Computer Science and Artificial Intelligence, *Sapienza University*, Rome, *110/110 cum laude*
Completed a comprehensive program combining core computer science with specialized coursework in machine learning, deep learning, logic, and automated reasoning.

2015 – 2020
Scientific High School Diploma, *I.I.S. "Galilei Vetrone"*, Benevento, *100/100* cum laude

Non-formal

3-8 Sept. 2023
Challenges in building Billion Users Cloud Applications, *Google*, Varenna
Attended a summer school on large-scale cloud systems, covering data replication, load balancing, and performance optimization. Lectures were delivered by senior Google engineers, including JJ Furman (founder of Megastore), Amer Diwan (head of the Search Platform Forensics team), and Daniel Ardelean (VP of Engineering).

5-18 July 2019
English Summer Program, *Fordham University - Lincoln Center*, New York

Experience

Nov. 2025 – Present
Ph.D. at Italian Institute of Technology, *Humanoids and Human Centered Mechatronics Lab*, Genova, Italy
My Ph.D. research investigates learning frameworks for autonomous navigation and manipulation in complex, unstructured environments. The work focuses on leveraging foundation models (LLMs, VLMs, and VLAs) for semantic perception, task grounding, high-level planning, and action generation, integrating them with reinforcement and imitation learning for robust, adaptive robot control.

April 2025 – October 2025
Learning Distance Functions for Robot Obstacle Avoidance, *Leonardo S.p.A.*, Genova
For my master thesis, I completed an internship at Leonardo S.p.A., under the supervision of Prof. Giuseppe Oriolo (Director of Sapienza's Robotics Laboratory) and Dr. Navvab Kashiri (PI of Robotics Laboratory at Leonardo Innovation Lab). The research focuses on learning distance functions for obstacle avoidance by generating datasets of robot configurations and workspace points, which are used to train neural networks to predict distances to obstacles. A systematic comparison with geometric approaches is carried out, highlighting the improved efficiency and scalability of neural models in addressing obstacle avoidance.

June 2023 – October 2023	**Unmasking Deception: A Deep Learning Approach with Attention Mechanisms**, *Sapienza University*, Rome

As part of my bachelor's thesis, I worked on a project in deception detection under the supervision of Prof. Danilo Avola (R&D Director of Sapienza's Computer Vision Laboratory) and Prof. Daniele Pannone. The work focuses on analyzing facial microexpressions using a unimodal deep learning architecture. The proposed architecture combines an AutoEncoder for sequence reconstruction with a Classifier that employs attention mechanisms to highlight relevant patterns in the data.

Awards

15-16 June 2025	**Best Project Overall Award - SUS8 Hackaton at SIS2025**, *University of Genova*, Genova

Awarded Best Overall Project at Stats Under the Stars 8, a national hackathon held during the SIS2025 Statistical Conference. The event was organized by the University of Genova, endorsed by the Italian Statistical Society (SIS), and sponsored by Rulex company. The solution addresses an Anti-Money Laundering task through graph-based feature engineering and a gradient boosting ensemble, optimized through Bayesian hyperparameter tuning.

Projects

2025 TIAGoCare: Emotion-Aware Interaction for Assistive Robotics

This work explores emotion-aware human-robot interaction using the TIAGo robot through the development of a `ROS1`-based robotic system for assistive scenarios. The system integrates real-time multimodal emotion recognition from face, audio, and body pose with semantic scene understanding and symbolic reasoning based on a knowledge graph, enabling adaptive robot behavior.

2025 Trajectory Optimization for humanoids via centroidal dynamics

This project studies trajectory optimization for humanoid robots using a stiffness-based formulation of centroidal dynamics to model CoM motion and angular momentum in multi-contact scenarios. An optimal control problem with contact and friction constraints is solved using `CasADi` and the IPOPT solver, and validated in simulation on the HRP-4 humanoid robot for standing and walking tasks.

2025 Time-Gated Transformer VAE for Anomaly Detection in Satellite Telemetry

This work presents an anomaly detection model for multivariate satellite telemetry based on a non-autoregressive Transformer and Variational Autoencoder. A time-gated self-attention mechanism emphasizes recent observations while capturing long-term dependencies in non-stationary data. Anomalies are detected via reconstruction error with AUC-ROC and Peak Over Threshold evaluation on the ESA-ADB dataset.

2024 Model Based Offline RL with Trajectory Pruning

This project explores model-based offline reinforcement learning using static datasets. It employs an ensemble of autoregressive dynamics models for trajectory rollout, combined with Q-function evaluation and uncertainty-based pruning to mitigate out-of-distribution actions. The approach is evaluated on MuJoCo benchmark environments.

2024 Distance-Aware Global Path Planning for Mobile Robots

This work investigates global path planning in grid-based environments through the design of a ROS2-based planner. Obstacle clearance is explicitly modeled through a distance map computed via multi-source BFS and transformed into traversal costs using different cost function formulations. An A*-based search exploits these costs to balance path optimality and safety, with qualitative evaluation conducted in simulation through trajectory visualization.

2024 ClipFusion: Cross-Modal Transformer for Video Question Answering

This project addresses multiple-choice Video Question Answering using a cross-modal transformer architecture that integrates BERT-based textual representations with CLIP-extracted video embeddings. Multimodal alignment is achieved through attention mechanisms and a dual-stage decoding process that sequentially models question–video and answer interactions.

2024 **EquiPredict: Interaction Modeling for Multi-Agent Motion Forecasting**
This work tackles the prediction of multiple agents' movements in dynamic environments. It proposes a neural architecture that models interactions between agents using a graph-based structure, clusters behaviors with K-means, and updates their states through self-attention to accurately forecast future trajectories.

2023 **Unpaired Image-to-Image translation via Neural Schrödinger Bridge**
This project presents a model for unpaired image-to-image translation based on the Schrödinger Bridge diffusion process, which trains a stochastic differential equation to map between distinct data distributions. The architecture includes multiple generators and discriminators to enable translation across unpaired domains, addressing limitations of Gaussian priors in conventional diffusion models.

Languages

Italian	Native speaker
English	C1
French	B1

Technical skills

Programming Languages	`Python`, `C`, `C++`, `MATLAB`, `Java`, `SQL`, `Go`, `JavaScript`, `Kotlin`, `RISCV`	Tools & Development	Git, Github, Gitlab, Docker, Visual Studio Code, JupyterLab, IntelliJ IDEA
Packages & Frameworks	`PyTorch`, `NumPy`, `Pandas`, `OpenCV`, `CasADi`, `Tensorflow`, `Keras`	Other Technologies	LaTeX, Office package, HTML/CSS
Control Theory	PD & PID, Adaptive Control, Cartesian Control, Impedance Control, Whole Body Control, MPC	Robotics Simulation	`ROS1`, `ROS2`, Gazebo, Isaac Sim, Isaac Lab, Simulink, RViz
Planning Frameworks	PDDL, STRIPS, FDR		

Interests

My research interests lie at the intersection of artificial intelligence and robotics, with a focus on learning-based approaches in robotics. More recently, the emergence of foundation models has captured my attention, as they open new possibilities for addressing core robotic tasks such as navigation and manipulation. In this context, I am particularly interested in VLA systems that enable a direct mapping from visual observations to actions, and in their integration with reinforcement learning for learning policies on complex robotic platforms, such as quadrupeds with arms.

Personal Links

Portfolio	https://giuseian.github.io
LinkedIn	linkedin.com/in/giuseppina-iannotti-22331535a
Github	https://github.com/Giuseian