Simone Giampà
Robotics & AI Research Engineer

About me

I am a Robotics and AI Researcher with a strong interest in aerospace applications, and an academic background in Computer Science Engineering. My research focuses on developing software for robotics systems and applying Deep Learning to solve challenging problems like autonomous manipulation, navigation and control.

Personal

🎂 21/08/1999
🌐 Nationality: Italian
📍 Genoa, Italy

Areas of Expertise

Robotics · Deep Learning
Artificial Intelligence
Computer Vision · Perception
Parallel Computing

Interests

Robotics · AI · AeroSpace

Contacts

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in Linkedin Profile
○ Github Profile

Programming Languages

C C++ Java
Python Matlab
CUDA C/C++, CUDA Python

Frameworks & Libraries

ROS2, MoveIt2, Nav2 Docker
Gazebo, Mujoco, IsaacSim
Tensorflow, TFLite, TFMicro
PyTorch, TorchVision, TorchRL
Pandas, Scikit-Learn, Scipy

Robots & Sensors

Universal Robots arms
Robotnik mobile robots
AgileX Scout mobile robot
Igus Rebel robotic arm
3D LiDAR RGB-D cameras

Embedded Systems

Arduino Uno, Nano
STM32 Nucleo ESP32

Work Experience

2024 — Present

Robotics and Artificial Intelligence Research Engineer
LEONARDO INNOVATION LABS · Genoa, Italy 📍

Industrial Research on Autonomous Robotics and Deep Learning: working on several research and industrial projects aiming at producing patents and publications in renowned robotics conferences. Main focus on autonomous manipulation tasks for control of mobile manipulator arms, and perception of environment via computer vision algorithms and deep learning models. Currently working on:

- **GCAP Project**: autonomous robotic maintenance of future jet aircrafts.
- **Robotic Edge Sealing Project**: automated assembly process of large fuselage frames in industrial environment with a redundant robotic arm.
- **Mars Sample Return Project**: a joint collaboration with Leonardo Space, ESA and NASA institutions, for the autonomous control of the Mars Sample Retriever Arm, and computer vision tasks for pose estimation of the samples to be collected.
- **MATISSE Project**: European project collaboration for the digital twin simulation of On-Orbit-Servicing robotic manipulation and vision tasks.

Publications

2025

Inverse Kinematics for Path-Tracking of Redundant Robots on a Linear Axis
LEONARDO INNOVATION LABS · IAS Conference, Genoa, Italy 📍

`Autonomous Robotics · Inverse Kinematics · ROS2 · Redundant Robot`

This paper presents a trajectory generation framework for continuous path-tracking on a 7-DoF redundant manipulator (6-DoF arm integrated with a linear axis). By leveraging the system's kinematic redundancy through a multi-objective optimization approach, the method ensures joint-limit avoidance while tracking complex paths in an real industrial use case.

Awards

2025

Igus ROIBOT Award for Low-Cost Automation
IGUS LOW-COST AUTONOMY · 👤 Award and Project Description

My thesis project won the first place of this Award in the university category, a competition in which universities participated from all over the world. My project was awarded for its creativity and novelty for agricultural applications focused on reducing environmental impact.

Education

2021 — 2024

Master's Degree in Computer Science Engineering
POLITECNICO DI MILANO · Milan, Italy 📍
Robotics & Deep Learning specialization - Grade: 106/110

2018 — 2021

Bachelor's Degree in Computer Science Engineering
POLITECNICO DI MILANO · Milan, Italy 📍
Grade: 101/110

Certifications

2025

SPACERAISE International Summer School: AI for AeroSpace
GRAN SASSO SCIENCE INSTITUTE · L'Aquila, Italy 📍
Participation in the Summer School as an Industrial Researcher

2024

Accelerated Computing with CUDA C/C++
NVIDIA DEEP LEARNING INSTITUTE · ❄ Certificate
Programming and exercises on `CUDA C/C++` and acceleration of custom CUDA kernel with concurrent data streams and performance profiling

2024

Accelerated Computing with CUDA Python
NVIDIA DEEP LEARNING INSTITUTE · ❄ Certificate
Programming with Python-based CUDA kernels acceleration with Numba library and kernel performance profiling

2024

Accelerating Data-Science and Machine Learning Workflows
NVIDIA DEEP LEARNING INSTITUTE · ❄ Certificate
Exercises on Data Science and Analytics using GPU-accelerated libraries: `cuDF` (Pandas), `cuML` (Scikit-Learn) and `cuPy` (Numpy)

Master's Thesis Project

2024 — **Development of an Autonomous Mobile Manipulation Robot for Industrial and Agricultural Environments** 📄 Thesis PDF

POLIMI · ARTIFICIAL INTELLIGENCE AND ROBOTICS LABORATORY (**AIRLAB**)

`Autonomous Robotics Systems · SLAM · ROS2 · Nav2 · MoveIt2`

Development of an autonomous mobile manipulation system, composed of a mobile wheeled robot, and a 6-DoF robotic arm manipulator, with a soft pneumatic gripper acting as a robotic hand. The system performs several tasks in industrial environments, such as exploration, navigation of an industrial plant, and interactions with control panels. The robotic system is also programmed to collect fruit from a tree, a demo simulation of a fruit picking task in realistic agricultural environments. The whole system comprises of a multitude of sensors and actuators. The mobile manipulator performs object grasping and interaction tasks completely autonomously. Every component in the system is controlled via ROS2 and the combination of the tasks is orchestrated via complex robot behavior trees.

University Projects

2023 — **Robot head construction: Robotics and Design multi-disciplinary course**

`Workshop Laboratory · 3D printing · Multidisciplinary` ⚙ Repository

Multidisciplinary project of Robotics and Design: building and programming of a 3d printed and programmable robot head capable of mimicking human emotions and expressiveness, while interacting with other robots of the other student groups.

2023 — **Neural Network for Spoken Language Recognition on an Embedded system**

`Tensorflow Lite Micro · Neural Networks · Embedded Systems` ⚙ Repository

Neural network recognizing spoken languages from people, from log-mel spectrogram features. Developed on Arduino Nano (TinyML) with TensorFlow Lite for Microcontrollers.

2023 — **Natural Language Text Processing with Transformer Models**

`Neural Networks · BERT Transformers · Natural Language` ⚙ Repository

Text analysis, sentiment analysis and response generation with BERT Transformer models. Fine-tuning of small scale Large Language Models (LLM).

2023 — **Nonlinear Time Series Classification with Online Machine Learning Models**

`Streaming Machine Learning · Python · River library` ⚙ Repository

Non-linear ARMA time series generation and classification with streaming (incremental learning) machine learning models in Python using the River ML library. Data Analysis and statistical interpretation of forecast data.

2022 — **Deep Learning: Convolutional Neural Networks and Transfer Learning**

`Tensorflow · Python · Image Classification` ⚙ Repository

Image classification challenge with convolutional neural networks and transfer learning of large pre-trained models. Time-series classification challenge with convolutional spectral features and deep multi-layer perceptrons.

2022 — **Mobile Robotics projects with ROS and real-world LIDAR and encoders data**

`ROS · C++ · SLAM · Mobile Robot · Autonomous navigation` ⚙ Repository

Two projects using ROS for data analysis of mecanum wheels encoders, IMU sensors and a LiDAR for autonomous simultaneous localization and mapping (SLAM).

2022 — **STM32 Nucleo with Sensor Systems development board**

`C · Sensors · Microcontroller · Electronics` ⚙ Repository

Development of many small projects aimed at handling a wide variety of sensors connected to the STM32 Nucleo board, using FreeRTOS and several wire communication protocols.

2022 — **STM32 Nucleo with Miosix Embedded OS kernel-space programming**

`C++ · Embedded OS programming · STM32 · Linux` ⚙ Repository

Development of the *Game of Life* cellular automaton on an STM32 running an embedded OS in kernel-space, using a serial interface with an emulated terminal on a Linux machine for visualization of the automaton evolving matrix.

2021 — **Software Engineering project: an online multi-player board game**

`Java · Game · Large group project · Git` ⚙ Repository

Group project development in Java of a multi-player online board game. Large project developed with extensive software engineering principles and applications of a variety of code design patterns.

2021 — **LASER dynamics simulation with cellular automata in Matlab and Java**

`LASER dynamics · Matlab · Java` ⚙ Repository

Simulation of LASER quantum dynamics of population inversion using a cellular automaton

2021 — **Vivado project: image histogram equalization in VHDL**

`Vivado Xilinx · VHDL · FPGA` ⚙ Repository

Logic circuit programming in VHDL of an equalization algorithm for image histograms.

2020 — **A time and memory efficient command-line text editor in C**

`C · Algorithms and Data Structures` ⚙ Repository

Time and memory efficient text editor using optimized algorithms and data structures.