



Valerio Spagnoli



ABOUT ME

Graduated with honors in Computer Science Engineering (BSc) and Artificial Intelligence and Robotics (MSc) at Sapienza University of Rome. I have a strong theoretical background in robotics and AI, along with practical experience in robotics-oriented software engineering. My interests lie in robot perception, sensor fusion, mapping, and motion planning. Competent in Python, C++, and ROS.

WORK EXPERIENCE

 **Spark S.R.L.** – Roma, Italy

City: Roma | Country: Italy | Website: <https://spark4innovation.com/>

Junior Software Engineer (part-time)

[10/2023 – Current]

My role focuses on software development for robotic systems aimed at autonomous exploration in unstructured environments. I contributed to two key projects:

- ROMA: A compact rover designed for autonomous terrestrial exploration and mapping of hazardous or inaccessible areas.
- LEARNER: A planetary rover developed for long-range lunar exploration.

Main contributions include:

- Development of a graph-based SLAM system leveraging RGB-D and IMU data for localization and mapping.
- Integration of core software components within the ROS 2 framework.
- Development of low-level firmware and its integration using Micro-ROS.

Primary programming languages: C++, Python.

EDUCATION AND TRAINING

Master Degree in Artificial Intelligence and Robotics

Università degli Studi di Roma La Sapienza [09/2022 – 24/03/2025]

City: Rome | Country: Italy | Website: <https://corsidilaurea.uniroma1.it/it/corso/2022/30431/home> | Final grade: 110 with Honors | Level in EQF: EQF level 7 | NQF Level: 7 | Type of credits: ECTS | Number of credits: 120 | Thesis: Multi-State Constraint Kalman Filter for Visual-Inertial Navigation

Bachelor Degree in Computer and System Engineering

Università degli Studi di Roma La Sapienza [09/2019 – 22/10/2022]

City: Rome | Country: Italy | Website: <https://corsidilaurea.uniroma1.it/it/corso/2019/29931/home> | Final grade: 110 with Honors | Level in EQF: EQF level 6 | NQF Level: 7 | Type of credits: ECTS | Number of credits: 180 | Thesis: Applications of Artificial Intelligence for Assisted Melanoma Diagnosis

LANGUAGE SKILLS

Mother tongue(s): Italian

Other language(s):

Inglese

LISTENING B2 READING B2 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Software

Python / C/C++ / Java / Git / ROS / Pytorch

Artificial Intelligence and Robotics

Computer Vision / Machine Learning / Deep Learning / Robot Localization

DRIVING LICENCE

Driving Licence: B

PROJECTS

[11/2024 – 03/2025]

Master's Thesis: Multi-State Constraint Kalman Filter for Monocular Visual-Inertial Navigation

This project implements the Multi-State Constraint Kalman Filter (MSCKF), an EKF-based algorithm that fuses visual and inertial data for real-time robot tracking. Instead of adding 3D feature positions to the state vector, MSCKF constrains multiple camera poses observing the same static features, maintaining accuracy while keeping computational overhead bounded. The map is implicitly refined by optimizing camera poses within the EKF.

Key contributions include:

- XFeat Integration: Utilized XFeat, a CNN-based feature extractor, for fast, accurate, and hardware-independent feature matching.
- Epipolar Matching Refinement: Incorporated an epipolar geometry-based step to enhance match accuracy by eliminating false positives with minimal overhead.

Link: <https://github.com/ValerioSpagnoli/Monocular-Visual-Inertial-MSCKF.git>

[10/2022 – Current]

RoboCup SPL: Team member of the SPQR Team at Sapienza University of Rome.

The RoboCup Standard Platform League is an international robotic soccer competition organized by the RoboCup Federation, where teams of seven autonomous Nao v6 humanoid robots compete in fully autonomous matches.

My main contributions focused on agent behavior, strategic planning, and decision-making. I developed systems that leverage the robot's perception of the environment to evaluate situations and select optimal actions during gameplay. This involved both researching and implementing state-of-the-art AI algorithms, as well as designing tailored, task-specific solutions to enhance in-game performance.

Programming language: C++.

Links: <http://spqr.diag.uniroma1.it/> | <https://www.robocup.org/> | <https://spl.robocup.org/>

[07/2022 – 09/2022]

Bachelor's Thesis: Applications of Artificial Intelligence for Assisted Melanoma Diagnosis

The project explored the application of Convolutional Neural Networks (CNNs) for image classification, specifically aimed at distinguishing between benign skin lesions and melanomas.

The work was divided into three main phases:

- Analysis of the medical context and selection/design of an appropriate CNN architecture.
- Model training and testing, including hyperparameter tuning.
- Evaluation and interpretation of results.

The dataset and evaluation metrics were based on Task 3 of the 2016 challenge organized by the International Skin Imaging Collaboration (ISIC): ISIC 2016 Challenge – Task 3.

Links: <https://github.com/ValerioSpagnoli/NeVi-Classification/tree/main> | <https://challenge.isic-archive.com/landing/2016/39/>

According to law 679/2016 of the Regulation of the European Parliament of 27th April 2016, I hereby express my consent to process and use my data provided in this CV and application for recruiting purposes.

Rome, 22/05/2025

Valerio Spagnoli