Beniamino Squitieri

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Personal Summary

Robotics Engineer, specialized in **Automation and Advanced Control**, with a strong determination for professional growth. Possesses solid expertise in **control systems, autonomous navigation, and software development for robotic applications**, demonstrating the ability to effectively meet business needs and contribute to technological innovation.
With **excellent communication skills, a strong team-oriented mindset, and a proactive approach**, quickly adapts to new professional environments. Gained experience in **adaptive control, data-driven algorithms, and robotic system programming** through practical projects and research activities.
Combines a **strong theoretical background** with hands-on experience in **ROS2, MATLAB/Simulink, and Artificial Vision** . **Flexibility, adaptability, and a strong sense of responsibility** enable successful handling of new challenges and effective contributions to technological advancements in the field.

Education

Master Degree: Automation and Control Systems
Università degli Studi di SALERNO - SALERNO

- **Thesis Title:** *T-BOT: The Navigation Robot for Optimized Multi-Agent Exploration*
  Final Grade: 110/110

Bachelor Degree in Computer Engineering: Ingegneria Informatica
Università degli Studi di SALERNO - SALERNO

- **Thesis Title:** Monitor4U: progettazione e sviluppo di un'app IOS a supporto della sicurezza domestica
  Final Grade: 110/110 cum laude

Certifications

- **Cambridge English Level 1 Certificate in ESOL International (First)**
- **Certificate of Achievement - Apple Foundation Program @ UniSA**

Results

- **Second Place in the ICIAP OnFire Competition(National machine learning competiontion)**
- **Award for Outstanding Academic Career**

Work History

Research fellow
Aprile 2025 - Attuale
Italian Istitute of Technology - Genova

- I'm working on the navigation tool of the R1 robot

Project management collaborator
Giugno 2021 - Agosto 2021
Minerva - Fisciano
Company Description:

- **Business Area:** Engineering and Design
- **Industry:** Logistics and Transportation

Activities:

- Coordinated various teams, assisting in the management of **SCRUM-related techniques**.

Languages

Italiano: LINGUA MADRE

Inglese: B2
Intermedio superiore

Francese: A2
Elementare

Main projects

T-BOT: Topological Navigation for Optimized Multi-Robot Exploration (Thesis Project) (2024)

- **Objective:** Development of a **topological map-based navigation system** for fleets of mobile robots.
- **Technologies used: ROS2, TurtleBot4, Voronoi Diagrams, Chinese Postman Problem (CPP)**.
- **Main contributions:**Conversion of occupancy grid maps into **topological maps** for more efficient navigation.
  Implementation of **multi-robot coordination strategies** to reduce exploration time.
  Development of a **master-slave election protocol** for dynamic task allocation among robots.
  Validation on **TurtleBot4 in simulation and real-world testing**.

Task Space Impedance Control for the Panda Robot (June 2024 - Sep 2024)

- Implemented **task-space impedance control** for the Panda robot using **ROS2 and Ignition**.
- Designed simulation scenarios in **free-space and obstacle-rich environments**, with trajectories generated via **MoveIt!2**.
- Validated controller performance through **simulated testing and Python-based analysis**.

TurtleBot4 ROS2: Indoor Navigation Algorithm (May 2024 - Jul 2024)

- Developed an **autonomous navigation algorithm** for **indoor environments** (e.g., university corridors).
- Extended the functionality of the official **TurtleBot4 ROS2 repository**.
- Implemented **artificial vision strategies** for road signals recognition.

State-Feedback Control for DC Motor Regulation (May 2024 - Jun 2024)

- Designed and implemented **state-feedback controllers** for **position and velocity regulation**.
- Applied **LQR, pole placement, and anti-windup strategies**.
- Simulated and tested using **MATLAB/Simulink** on **Pololu 37D Metal Gearmotor**.

Mechanical Stabilization System Control (Nov 2023 - Jan 2024)

- Evaluated and improved a **mechanical stabilization system** designed to maintain a shelf in a vertical position.
- Developed alternative controllers(for example **state feedback , gain scheduling**)and compared performance with the existing system.
- Utilized **MATLAB, Simulink, and Stateflow** for simulation and performance analysis.

Data-Driven Control Algorithms for Mobile Robots (Oct 2023 - Dec 2023)

- Developed and tested **data-driven control algorithms** for navigating autonomous robots in complex environments.
- Applied **Forward Optimal Control (FOC) and Inverse Optimal Control (IOC)** techniques.
- Validated on the **Robotarium platform** for both simulation and real-world testing.

Fire and Smoke Detection using 3D CNNs (Jun 2023 - Jul 2023)

- **Objective:** Developed a **Machine Learning algorithm** for detecting fire and smoke in video feeds.
- **Technologies used: 3D Convolutional Neural Networks (CNNs), Python, TensorFlow/Keras**.
- **Main contributions:**Trained and optimized a CNN model for **image and video sequence classification**.
  Created a diverse dataset to improve detection accuracy in various scenarios.
  Tested the model under **different lighting conditions and environments**, enhancing robustness.

Skills

- **Robot Kinematics (Direct and Inverse) and Dynamics**
- **Predictive and Adaptive Control**
- **ROS/ROS2**
- **Autonomous Navigation**
- **Machine Learning**
- **Teamwork**
- **Problem-Solving**
- **Artificial Vision (OpenCV, skimage, scipy, etc.)**
- **Data-Driven Control**
- **Mobile Robot Navigation**
- **Control Algorithms**
- **Computer Programming (C, C++, Java, Python, etc.)**
- **Communication Skills**
- **Organizational Skills**
- **Embedded Digital Controllers**
- **Ability to adapt to different environments and backgrounds**
- **Strong communication and interpersonal skills**
- **Operational autonomy**
- **Excellent stress resistance**
- **Active listening skills**
- **Goal-oriented mindset**
- **Ability to manage deadlines under tight schedules**