

Caio Victor Gouveia Freitas

☎ +55 11 95476 3936
✉ caiovgfreitas@proton.me
in caiovgfreitas
🌐 caio-freitas
EU citizen (Portuguese)

Education

- July 2021 – May 2024 **Technical University of Darmstadt**
M.Sc. in Electrical Engineering and Information Technology - Specialized in Automation Engineering
- **Coursework:** Foundations of Robotics for Mechatronics, Robot Learning, Data Science II, Fundamentals of Reinforcement Learning,
 - Master's Thesis: Graph Diffusion for Imitation Learning in Robotics
- Feb 2018 - (Dec 2024) **University of São Paulo**
B.Sc. in Electrical Engineering - Specialization in Control and Automation
- **Coursework:** Algorithms and Data Structures, Object Oriented Programming, Pattern Recognition and Machine Learning,

Professional Experience

- Sept 2023 – July 2024 **Wingcopter GmbH.**
Weiterstadt, Germany Working Student - Backend and Communication Engineering
- Improved hardware testing by developing and implementing hardware-in-the-loop (HIL) simulations using Python
 - Implemented automated test cases that produced detailed reports, by integrating the CAN and UART interfaces into the simulation
 - Automated control station updates decreasing manual intervention using Ansible and Python scripts
 - Reduced the time spent on maintenance and update of embedded Linux systems on proprietary hardware by automating the process with Python
- Dec 2022 – Sept 2023 **Nexplore Technology GmbH.**
Darmstadt, Germany Working Student - Robotics and Data Processing
- Applied 3D coverage path planning algorithm to guarantee efficient construction progress monitoring using Boston Dynamics' Spot
 - Tracked progress based on benchmarking BIM models with 3D reconstructions from the collected sensor data
 - Designed an active learning pipeline to continuously improve the performance of object detection models
 - Deployed data annotation tool to Azure, improving access and integration with the active learning pipeline
- Oct 2021 – Dec 2022 **Simulation, Systems Optimization and Robotics Group (TU Darmstadt)**

- Darmstadt, Germany Research Assistant (HiWi) - UI Development for Robotics
- Designed and integrated new features into the existing ROS-based user interface for the robot, based on QML and JavaScript
- July 2019 – Feb 2020 **INVTech Ltda.**
São Paulo, Brazil Aerial Robotics Intern
- Prototyped an autonomous hexacopter drone using PX4 within the first month, achieving fully autonomous flight capabilities
 - Developed ROS-based mission planner nodes and state machines for planning and executing flight missions

Leadership & Projects

- Feb 2018 – Feb 2021 **Skyrats - Autonomous Drones Team (Volunteer)**, São Paulo, Brazil
- Managed the software team, composed of 15 undergraduate members, with Agile methodologies
 - Developed software base used in national and international competitions using ROS, C++, and Python running on embedded Linux
- Sept 2019 **IMAV 2019 - Internation Micro-Air Vehicle Conference and Competition (Group Project)**, Madrid, Spain
- Achieved 5th out of 16 in the outdoor competition, by deploying package delivery, live object detection, and mapping systems
 - Achieved 6th place in the indoor competition navigating in GPS-denied environments using vision-based localization to catalog objects in a warehouse and deliver packages
- Apr 2024 **GraphARM @ github.com/caio-freitas/GraphARM**
- Implemented the paper Autoregressive Diffusion Model for Graph Generation, originally proposed for molecule generation.
 - Tools Used: Python, PyTorch, PyTorch Geometric

Language Skills

Portuguese (Native), English (Fluent), German (Advanced)

Technologies

Languages Python, C++, C, SQL, JavaScript
Technologies Linux, Git, Docker, ROS, GNNs, Diffusion Models

22.10.2024



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