















SKILLS

Python | C | C++ | Git | GDB | MATLAB | CMake | PyTorch | CUDA | Isaac | Warp | OpenGL | OpenCV | Linux | Deep Learning | Reinforcement Learning | Machine Perception | Docker | ROS | Gazebo | Point Cloud Library | OpenGL | Sysadmin | \LaTeX | Rust | Julia | Blender | Embedded Systems | Spanish (native) | English (bilingual) | Catalan (proficient)

EDUCATION

- MSc Robotics, Systems and Control** ETH Zürich  Zürich, CH  9/2021 – Present
- ESOP Scholar: Merit based scholarship and mentorship given to the top 53 ETH MSc applicants of 2021.
 - **Highlighted courses:** Dynamic Programming and Optimal Control, Solving PDEs in parallel using GPUs, Probabilistic Artificial Intelligence, Vision Algorithms for Mobile Robots, Computational Models of Motion, Machine Perception.
- BEng Robotics Engineering** University of Alicante  Alicante, ES  9/2017 – 6/2021
- Extraordinary award: graduated best-in-class (1st out of 271 students).

EXPERIENCE

- Master Thesis** Robotics Systems Lab  Zürich, CH  4/2023 – Present
- Creating end-to-end safe navigation policies for wheeled-legged robots that leverage perceived terrain semantics, using PyTorch, IsaacGym and Warp.
 - Made a framework for creating realistic procedural terrains with hiking trails, using Blender and its Python API.
- Research Engineer Intern** SONY R&D Center  Zürich, CH  9/2022 – 2/2023
- Researched on small Deep Learning models for object detection with event cameras on embedded hardware.
 - Implemented a CNN-RNN baseline architecture using Pytorch, Lightning and Hydra.
 - Implemented a state-of-the-art Vision Transformer (ViT) model that outperformed the baseline's IoU by 50% while having 5x less parameters.
 - Created a large dataset pipeline: speed-up of 100x while handling 1TB of data.
 - Deployment to embedded hardware using TensorRT and ONNX.
 - Enhanced functionality & resolved issues within the internal codebase, leveraging pytest and GitLab's CI/CD pipeline.
 - Created a pipeline for calibrating a stereo event camera setup for automotive applications.
- Research Assistant** Computational Robotics Lab  Zürich, CH  4/2022 – 8/2022
- Researched the use of learned actuator dynamics using neural networks in a Whole Body Controller (WBC).
- Research Intern** Human Robotics  Alicante, ES  10/2020 – 6/2021
- Research funded by the merit based Collaboration Grant issued by the Spanish Ministry of Education.
 - Bipedal gait generation and tracking through trajectory optimization and a custom made WBC, using C++ and ROS.
- Engineering Intern** QuixMind  Alicante, ES  10/2019 – 6/2020
- Created a robot forklift simulation with ROS, Gazebo and Docker.
 - Pallet pose estimation and alignment on a real forklift, using the Point Cloud Library, ROS Controllers and C++.

PUBLICATIONS

- Path generation and control of humanoid robots during extravehicular activities.
Ramón JL, **Calvo R**, Trujillo A, Pomares J, Felicetti L. 73rd International Astronautical Congress (IAC-22), 18-22 September 2022, Paris, France
- Trajectory optimization and control of a free-floating two arms humanoid.
Ramón JL, **Calvo R**, Trujillo A, Pomares J, Felicetti L. Journal of Guidance, Control and Dynamics 45 (9), 1661-1675. 2022

REFERENCES

- Valentina Cavinato, Engineer at SONY Europe B.V. |  +41 (0) 79 766 38 99 |  valentina.cavinato@sony.com

OTHERS

- 1st Place in the Ideathon for a Novel Sustainable Packaging Material competition by the Student Biolab of ETH Zürich.
- 2nd best national graduate in my engineering category, issued by SEDEA.