

SUMMARY

Mechanical Engineer with a Master's in Automation and over 5 years of experience in mechanical design, fluid mechanics, and automation for green energy solutions. Currently contributing to the SEA:ME program, where I design and implement solutions for autonomous driving and mobility ecosystems, within a SCRUM-based agile development framework.

This work has strengthened my expertise in C++ programming, embedded systems, and real-time control, alongside hands-on experience with communication protocols (CAN bus and I2C), microcontroller programming, and sensor integration.

Experienced in developing computer vision and control algorithms for lane detection, trajectory planning, and autonomous navigation. Highly adaptable, with a proven ability to work in fast-paced, multidisciplinary environments and to bridge mechanical engineering expertise with advanced software development for embedded platforms.

WORK EXPERIENCE

SEA:ME Internship, SEA:ME Porto

Nov 2024 - Current

- Developed a full software stack for an autonomous vehicle platform: **modularized navigation, control, and visualization services using C++** to enable real-time decision-making.
- Implemented and optimized **deep learning models** for lane detection, road segmentation, and object recognition, supporting three concurrent vision models running on an **NVIDIA Jetson Nano** in real time, reducing inference time from 120 ms to 30 ms and increasing image processing from 8 FPS to 30+ FPS.
- Built dataset generation tools and trained computer vision models in **PyTorch** for traffic sign and obstacle classification.
- Developed embedded **microcontroller firmware (Arduino/C++)** for sensor integration and **CAN-bus** communication, ensuring reliable, low-latency data exchange between vehicle subsystems.
- Designed and optimized control algorithms, including a **Model Predictive Controller (MPC)**, improving lane-keeping precision and vehicle stability.
- Delivered a fully autonomous lab vehicle capable of continuous lane keeping without driver intervention, enhanced with obstacle avoidance and traffic sign recognition.

R&D Engineer , VisBlue Portugal

Mar 2019 - Nov 2023

- Led the mechanical design of a type of batteries **from concept to production**, ensuring manufacturability, durability, and performance optimization.
- Developed production and assembly processes for complete battery systems, including metal structures, fluid pumping systems, and seamless integration with electrical subsystems.
- Collaborated with suppliers and partners to refine designs, optimize components, and ensure compliance with technical and quality requirements.
- Produced detailed **technical drawings**, 3D models, and assembly documentation, supporting efficient manufacturing and quality control.

Research Grant, Faculdade de Engenharia da Universidade do Porto

Oct 2017- Mar 2019

- Developed the mechanical design of a vanadium redox flow battery system and all the hydraulic circuit and actively contributed to the definition of the general behavior of the battery system (BMS).

EDUCATION

42 Porto - Software Development | Computer Science

Aug 2023 - Feb 2025

- Gained practical expertise in **C, C++, Linux, and Docker**, with additional skills in programming, system administration, and collaborative development workflows.
- Completed 20+ peer-reviewed projects, including 4 group projects.
- Conducted 100+ code reviews, testing functionality and providing constructive feedback to peers.

Faculdade de Engenharia da Universidade do Porto - MSc in Mechanical Engineering

Sep 2012 - Oct 2017

- Specialization in Automation
- Thesis on "Development of an active transfemoral prosthesis"
- Degree Grade 17/20 - Grade A**

PROJECTS

Participation in Hackathons (in teams):

- Caetano Bus (Jul 2024):** BD2Interface – Database for production planning (focused on Django and React)
- Google Cloud (Jun 2024):** Leveraging AI for Portugal - Smart Agent to aid hospital triage (focused on using Google Cloud services and Python)
- Vicaima (May 2024):** HR Performance Dialogue Platform (focused on Django and CSS)

SKILLS

- Programming Languages:** C, C++, Python, JavaScript
- Frameworks & Tools:** PyTorch, OpenCV, Docker, Git, Zenoh
- Embedded & Systems:** Linux, Embedded Systems, CANbus, I2C, SPI, Threading
- Development Practices:** Agile(Scrum), CI/CD Pipelines
- Technical Skills:** Automation, Mechanical Design, SolidWorks, Inventor, Programming
- Languages:** Portuguese, English