Francisco Cerqueira

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Education

Faculty of Engineering - University of Porto — Porto, Portugal
MSc in Informatics and Computing Engineering - 18/20 (ECTS A) — *Sept. 2022 – July 2024*

Faculty of Engineering - University of Porto — Porto, Portugal
BSc in Informatics and Computing Engineering - 18/20 (ECTS A) — *Sept. 2019 – July 2022*

Experience

Researcher — March 2023 – July 2024
University of Porto — *Porto, Portugal*

- Worked on the "THEIA: Automated Perception Driving" project, a collaboration between Bosch and the University of Porto that aimed to improve the autonomous driving state of the art.
- Conducted a comparative study of methods that leverage unlabeled data in the context of autonomous driving for my master thesis. A software framework was also developed to facilitate the integration of these methods into other domains.
- Secured a research grant to develop a novel Deep-Learning model that combines input data from two modalities, RGB cameras, and LiDAR sensors. This data is used for three simultaneous tasks: object detection, lane segmentation, and LiDAR segmentation.

Projects

See the full projects list at franciscogc.com/projects/.

AutoPark AI | *C#, Unity* — 2024
- Developed an AI agent that learns to park a vehicle in a vertical parking spot using Reinforcement Learning.

Follower Robot using Ordinal Classification | *Python, Pytorch* — 2023
- Developed software for a simulated robot that can track and follow another robot across different intersections.
- Used a computer vision model to predict the relative rotation and distance to the guide robot. Instead of performing a regression task, it was optimized by turning this into a classification problem.
- Used ordinal regression methods to enforce uni-modality in the predictions.

YOLOMM | *Python, Pytorch* — 2023
- Extension of YOLOP model with LiDAR input.
- Paper submission and presentation at CIARP 2023.

Mobile Car Driving | *Python, Java, Pytorch* — 2022
- Implemented a single-stage object detection model capable of detecting multiple types of road obstacles using Pytorch.
- Deployed the model using Pytorch-Mobile, capable of running on any Android device.
- Paper submission and presentation at RECPAD 2022.

Publications

YOLOMM – You Only Look Once for Multi-modal Multi-tasking. F. Campos, F. Cerqueira, R. Cruz, J. Cardoso (2023). Iberoamerican Congress on Pattern Recognition 2023 (CIARP), Springer Nature Switzerland

Mobile App using Object Detection for Car Driving. F. Campos, F. Cerqueira, V. Alves, R. Cruz (2022). Portuguese Conference on Pattern Recognition 2022 (RECPAD)

Technical Skills

Languages: Python, C, C++, C#, Java, SQL, HTML, CSS, JavaScript
Data Science: Pytorch, Numpy, Pandas, Sklearn, Matplotlib,
Web Development: React, Angular, Node.js, Django
Developer Tools: Git, Docker, Hydra, Unity
Writting: LaTeX, Overleaf, Markdown