Joe Najm

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Summary — EPFL Master's graduate with a strong passion and interest for computer vision, machine learning and data science, with previous experience in research and Formula One!

Education

Ecole Polytechnique Fédérale de Lausanne (EPFL)
Master's of Science in Electrical Engineering with specialisation in signal, image and video processing *2021-2024*
Bachelor of Science in Electrical and Electronics Engineering *2018-2021*

Experience

Alfa Romeo/Stake Sauber Formula One Team **Sep 2023 – Sep 2024**
Data Analysis Intern

- Main task: Extract trajectory information (Yaw Rate and velocity) from monocular on-board Formula One footage.
- Applied Visual SLAM and Visual Odometry algorithms for State and Pose estimation.
- Trained and Deployed deep networks for the automatic extraction of Yaw Rate and Velocity.
- Developed python based graphic interfaces for data visualisation and analysis of results.
- Performed statistical analysis on the results to evaluate the robustness of the experimented methods.

Centre hospitalier universitaire vaudois (CHUV) **Jul 2022 - May 2023**
Student Research assistant at the Medical Image Analysis Laboratory (under Dr. Meritxell Bach Cuadra)

- Main task: improve the current networks for the classification of brain lesions, and find a good and easy way to automatically deploy deep networks to clinicians without having them to use any code (networks should be accessible with just a few clicks).
- Trained deep networks for the detection and classification of Multiple-Sclerosis lesions in brain MRI images.
- Developed a software tool to deploy the model to clinicians using docker (More details can be found on my website).
- Published an abstract at the ECTRIMS 2023 conference, regarding the robustness of the deep model to shifts in the centre-patch selection. The abstract is publicly available over here.

EPFL Racing Team **Sep 2021 - Aug 2023**
Head of Perception group - Driverless Division

- Main task: Supervised and led a team to develop the vision/perception pipeline for a self-driving racing car with important constraints: the code should be robust to potential sensor failures, accurate and run in real-time on an embedded computer (Nvidia Jetson Orin).
- Developed a real-time object detection and distance estimation algorithms, using a monocular camera and a LiDAR.
- Performed sensor fusion using computer vision projections to obtain better results.
- Made sure to obtain the most robust algorithms, while respecting the real-time constraint.
- Integrated the algorithms to the main pipeline using ROS2 and successfully tested them on a Nvidia Jetson.
- Part of the squad that developed the first self-driving of our team's history! More details available on my website

Projects

Android Applications developer **Sep 2023 – Present**

- Independent android app developer during my free time, using Kotlin and Kotlin Jetpack-Compose.
- All my projects are open source and available on my github, as well as on the project page of my website with a small description and more details! All my projects are meant for every-day use.

ApiZoom **Feb 2021 – July 2021**

- Bachelor thesis with Prof. Jean-Philippe Thiran. Main task: use deep learning to automatically detect toxic "bee-killer" parasites on bee-hive images.
- Successfully trained a YOLOv5 network for the automatic detection of the toxic varroa mites. More details over here.

Skills

OS Debian, Ubuntu, Windows, Docker
Machine Learning Pytorch, Scikit-learn
Languages Python, C++, Kotlin, Matlab
Project management GIT, Jira, Scrum Master
Data analysis NumPy, SciPy, Pandas, Plotly, Gradio
Computer Vision OpenCV, Deep nets, Visual Odometry/SLAM