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! [*Eligible to work in Switzerland*].

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

Audi Formula One Project (Sauber Motorsport)   **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	**Project management**	GIT, Jira, Scrum Master
Machine Learning	Pytorch, Scikit-learn	**Data analysis**	NumPy, SciPy, Pandas, Plotly, Gradio
Languages	Python, C++, Kotlin, Matlab	**Computer Vision**	OpenCV, Deep nets, Visual Odometry/SLAM