Joe Najm

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Summary — EPFL Master's graduate with a strong passion and interest in 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 Analytics Intern

- Extract trajectory information (Yaw Rate and velocity) from monocular on-board footage.
- Applied Visual SLAM and Visual Odometry algorithms for State and Pose estimation.
- Trained and Deployed deep networks for 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

- Part of the Medical Image Analysis Laboratory under Dr. Meritxell Bach Cuadra.
- Trained deep networks for the detection and classification of Multiple-Sclerosis lesions in brain MRI images.
- Developed software tool to deploy the model to clinicians using docker (More details can be found on my website over here).
- 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

- Supervised and lead a team to develop the perception algorithms of the EPFL Racing Team driverless division.
- Developed realtime 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 realtime constraint.
- Integrated the algorithms to the main pipeline using ROS2.
- Successfully tested the algorithms on a Nvidia Jetson Orin.
- Part of the team 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!
- Developed a fully local and offline application to track gym workout, exercises, weights, nutrition ...
- Developed a fully local and offline application to keep track of the expiry dates of medications at home.

ApiZoom **Feb 2021 – July 2021**

- Bachelor thesis with Prof. Jean-Philippe Thiran.
- Trained a YOLOv5 network for the automatic detection of toxic varroa mites in bee hive images.
- 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