MOHAMED AHMED MALOUM

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EXPERIENCE

SAFRAN/INRIA - PhD Student

📅 December 2024 – December 2027

The PhD focuses on advanced dense visual-inertial SLAM (Simultaneous Localization and Mapping), using AI-based techniques to leverage visual (monocular) and inertial measurements.

SAFRAN - Research Internship

📅 April 2024 – October 2024   📍 Magny-les-Hameaux

The goal of this internship was to address a critical challenge in robotic autonomy: depth estimation and dense 3D mapping using a monocular camera. Analyzed and enhanced the DROID-SLAM algorithm, known for its high performance, by proposing several optimizations to reduce GPU memory consumption. Validated the improved algorithm through extensive testing on a high-performance computing cluster and an embedded NVIDIA Jetson Orin card.

ASTEK - Research Internship

📅 March 2023 – September 2023   📍 Paris

Development of a **vision-based geolocation technology** for a large-scale civil **drone (UAV)** equipped with a monocular **ventral camera**. The objective was to enable the drone to operate **without GPS**, while navigating various terrains including **urban**, **rural**, and **forested** areas, even in challenging weather conditions such as **rain**, **fog**, and **snow**.
Contributions:
- **State of the art** of existing scientific papers on robust aerial image registration for UAV (drone) geolocation technology.
- Developed a geolocation algorithm based on aerial **image matching**, using **SURF descriptors** and **OpenCV**.

SYSNAV - Engineering Internship

📅 June 2022 – September 2022   📍 Vernon

Modeling and calibration of non-linearities in magneto-inertial sensors.
Contributions:
- Developed and implemented calibration algorithms in **Python**.
- Incorporated a **Kalman filter** algorithm to fuse data from various sensors, ensuring high-performance navigation.

PROJECTS

IonSat Project

Centre Spatial de l'École Polytechnique

📅 August 2021 – September 2022   📍 Palaiseau

Working on the attitude determination and control system (ADCS) for a nanosatellite launch project.
- Studied inertial sensors, actuators, and their modelisation in determination and control algorithms (**Kalman filter**, Bdot).
- **Co-authored a publication** accepted and presented at the 73rd **International Astronautical Congress (IAC)** in Paris.

STRENGTHS & SKILLS

Hard-working   Curious
Motivator & Leader

Python   Pytorch   OpenCV   C++
Matlab, Simulink   Java

LANGUAGES

French, Arabic : Bilingual
English : C1

EDUCATION

Université Côte d'Azur DS4H

PhD Degree, Robotics and Computer Vision

📅 December 2024 – December 2027

ENSTA Paris

Engineering Degree, Robotics and autonomous systems

📅 September 2023 – October 2024

- **Machine learning**, **navigation**, planning and control
- **3D Vision**, **SLAM**, **Deep Learning based computer vision**

Ecole Polytechnique X

Engineering Degree, Electrical engineering

📅 September 2020 – October 2024

- Applied mathematics and computer science
- **Machine Learning**, **Reinforcement Learning**
- Electrical engineering

IPGEI de Nouakchott

Preparatory classes, MPSI/MP*

📅 September 2018 – August 2020

- MPSI and MP*
- Admitted to France's top engineering schools: X, Mines-Ponts