

# JOYCE SUDI

Ph.D. Candidate | Flight Control & GNC Engineer for Autonomous UAVs

+33 6 05 78 39 02 | joycesudi@outlook.com | joycesudi | joycesudi



Ph.D.-level engineer with expertise in control systems, robotics, estimation, and autonomous systems. Interested in industrial R&D roles focused on advanced control, navigation, and robotic autonomy.

## EXPERIENCE

### Autonomous Driving Research Engineer @ Stellantis

Since February 2024 | Poissy, France

- Develop control algorithms for autonomous driving and ADAS with applications to vehicle dynamics and motion control.
- Contribute to model-based decision and control strategies for autonomous vehicles in an industrial R&D environment.

### R&D Engineer Intern @ Stellantis

Feb. 2023 - Aug. 2023 | Poissy, France

3D Vehicle Digital Twin for Load Identification Using Real Driving Data

- Developed a load identification method for vehicle suspension systems using an augmented and constrained Extended Kalman Filter (EKF) applied to a nonlinear half-vehicle multibody model.
- Industrialized the methodology in a Python environment to support its integration into the company's engineering workflow.

### Robotics Engineer @ Clubelek - INSA Lyon

Sept. 2020 - Feb. 2023 | Villeurbanne, France

- Contributed to the development of a competition robot for the **French Robotics Cup** within Clubelek, INSA Lyon's mechatronics and robotics club.
- Worked on module coordination and systems integration.
- Contributed to robot localization and path planning in a ROS-based robotics environment using Python and C/C++.

## EDUCATION

### Ph.D. Candidate in Automatic Control @ IRIMAS UR 7499 - Univ. de Haute-Alsace

2024 - 2027 | Mulhouse, France

**Research area** : Decision and Control Systems for Autonomous Vehicles; Multi-Objective Optimal Control.

**Thesis title**: Design of multi-controller architectures for automated driving in heterogeneous and critical scenarios

**Selected training**:

- Learning-Based Model Predictive Control (Prof. Dr. M. Zeilinger, EECI-IGSC)
- Model Predictive Control and Reinforcement Learning (Prof. Dr. M. Diehl)
- Adaptive control (Prof. Dr. R. Orjuela)

### MEng Mechanical Engineering @ INSA Lyon

2020 - 2023 | Villeurbanne, France

**Major** : Mechatronics and systems

**Selected coursework**: Vehicle Dynamics, Optimization, Multi-Physical Systems Modeling, Identification and Active Control of Structures, Actuator Architecture, Design and Sizing

## LINKS

Website: [joycesudi.github.io](http://joycesudi.github.io)

GitHub: [github.com/joycesudi](https://github.com/joycesudi)

LinkedIn: [linkedin.com/in/joycesudi](https://linkedin.com/in/joycesudi)

Google Scholar: [profile](#)

ORCID: [0009-0005-0147-2258](https://orcid.org/0009-0005-0147-2258)

## SKILLS

### Mathematics & Control Engineering

- Nonlinear & Optimal Control
- Data-driven Control
- Optimization & Metaheuristics
- Modeling & Simulation of Dynamical Systems
- State Estimation
- Signal Processing

### Programming Languages

- Proficient**: C/C++, Java (Android Development), Bash
- Experienced**: MATLAB/Octave, Python
- Markup**:  $\LaTeX$ / $\TeX$ , XML, Markdown

### Libraries & Frameworks

- Numerical & ML**: NumPy, SciPy, Matplotlib, pandas, scikit-learn, TensorFlow, PyTorch
- Robotics**: ROS & ROS 2

### Tools & Platforms

- OS**: GNU Linux (Ubuntu, Debian), MS Windows.
- Version Control**: Git (GitHub, GitLab)
- Electronics and embedded systems**: Arduino, STM32, Raspberry Pi, KiCAD

### Languages

- French (*native*)
- English (*Linguaskill 180/180*)
- Swahili (*B1*)
- German (*A1/A2 courses*)

## MSc Mechanical Engineering – Visiting Student (Exchange Program) @ EPFL

2021 - 2022 | Lausanne, Switzerland

**Selected coursework:** Basics of mobile robotics, Basics of robotics for manipulation, Nonlinear control, Multivariable control, Embedded motor control.

## SELECTED PROJECTS

### Design and Development of a Quadcopter Testbed (Master's Thesis) @ Ampère Laboratory - CNRS UMR 5005

Sept. 2022 - Feb. 2023 | Villeurbanne, France

- ▶ Modeled and simulated quadcopter flight dynamics for educational and experimental use in aerospace systems control.
- ▶ Designed and implemented control laws for UAV stabilization.
- ▶ Built and validated a functional prototype through testing and experimental verification.

### CubeSat Prototyping and Testing @ Mechanical Engineering Department - INSA Lyon

Feb. 2022 - Jun. 2023 | Villeurbanne, France

- ▶ Designed the on-board computer and embedded electronics architecture of a university CubeSat.
- ▶ Contributed to prototyping and validation activities for the satellite's electronic subsystems.

## PUBLICATIONS

### Context-Aware Hierarchical MPC for Autonomous Vehicle Path Tracking

Under review at 2026 IEEE International Conference on Systems, Man, and Cybernetics (SMC 2026)

Joyce Sudi Bin-Ali, Imane Mahtout, Michel Basset, Rodolfo Orjuela

### Multi-Scenario Multi-Objective Predictive Controller for Lateral Control of Autonomous Vehicles

Published article in the IFAC IAV 2025 conference proceedings – doi.org/10.1016/j.ifacol.2025.07.013

Joyce Sudi Bin-Ali, Imane Mahtout, Michel Basset, Rodolfo Orjuela

## PATENTS

### Multi-Scenario Control Strategy for Autonomous Vehicles

Patent application pending – awaiting conflict review

## ACTIVITIES & INTERESTS

- ▶ Volleyball and cycling
- ▶ Chess
- ▶ Reading, especially classical literature and science fiction