

# Adrien DORISE

## RESEARCH ENGINEER IN AI AND EMBEDDED SYSTEMS

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## Profile

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PhD Eng. in Computer Science and Embedded Systems specializing in deploying AI on constrained hardware for real-world applications, particularly in the space sector. Experienced in leading R&D projects and aligning technical innovation with strategic objectives. With a strong interest in designing and deploying advanced intelligent systems, I aim to tackle complex challenges in AI and autonomous systems.

## Skills

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### Artificial Intelligence & Machine Learning

Deep Learning - Machine Learning - Reinforcement Learning - Genetic programming - Computer Vision – Foundation models - Transformers - LLMs - Explainable AI (XAI) - Anomaly Detection - Edge AI / TinyML

### Robotics & Engineering

FPGA (Xilinx) - Microcontrollers (ESP32, Atmel) - ROS 2 - Real-time systems – Embedded systems - CAD (OrCAD, SolidWorks, CATIA, Abaqus) - Automatic controls - Remote Sensing (Optical, Multispectral, SAR)

### Programming & Tools

Python (PyTorch, TensorFlow, Scikit-Learn) - Dataiku - C / C++ / C# - MATLAB - Git - Docker - AWS

English (professional, TOEIC 920) - French (native)

## Experience

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### AI Research Engineer – French Space Agency (CNES)

2024 – Present

#### Embedded AI for Space Image Processing

- Designed an FPGA-compatible CNN-Transformer architecture for onboard satellite computer vision.
- Designed an image restoration model on FPGA (pipeline reduced from 30min to 40s).
- Contributed to image processing systems for Martian rover projects and SAR (radar) images pipelines.

#### Model Robustness & Data Simulation

- Improved model robustness using Explainable AI (XAI) techniques.
- Built a realistic satellite image simulation pipeline for training.

**Tech:** Python / PyTorch / FPGA / Versal / Xilinx / Vivado / Docker / Git

### R&D Manager / AI Research Engineer – LR Technologies

2023 – 2024

#### R&D Strategy & Team Leadership

- Defined and implemented short/mid/long-term R&D strategy.
- Led and managed ~20 engineers across multiple research projects (ISO 9001).
- Supervised a PhD thesis in reinforcement learning and genetic programming applied to HMI.

#### AI Development & Innovation

- Built an open-source ML/DL training framework on multimodal AI for research teams.
- Designed an adaptive HMI system on ESP32 for accessibility applications.

**Tech:** Python / PyTorch / C++ / Dataiku / ESP32 / Git / AWS

## PhD Researcher – French National Centre for Scientific Research (CNRS)

2019 - 2023

### Radiation Fault Detection in Space Systems

- Designed an embedded ML algorithm for radiation detection (+10% detection, 2x faster execution).
- Delivered first proof-of-concept of onboard AI for radiation effects.
- Conducted radiation testing on electronic components.

**Tech:** Python / Tensorflow / Keras / C / C++ / Arduino / Atmel Studio / LaTeX

## Adjunct Professor & Independent Instructor – French Universities

2019 - Present

- Taught at leading institutions (INSA Toulouse, University of Toulouse, Univ. Champollion, NEXA...)
- Designed and delivered MSc-level courses (ML, DL, Reinforcement Learning, LLMs).

## Education

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### PhD in Computer Science & Embedded Systems - National Institute for Applied Sciences Toulouse

*Highest honours (jury congratulations)*

**Graduated: 2022**

### Engineering Degree in Industrial Engineering (Mechanical) - National Institute for Applied Sciences

*Student representative (2013 -2016)*

**Graduated: 2018**

## Publications (Selected)

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### CVPR 2026 / AI4SPACE - *Rethinking Satellite Image Restoration for Onboard AI: A Lightweight Learning-Based Approach*

Proposes **ConvBEERS**, a lightweight learning-based alternative to traditional image restoration methods, optimised for FPGA deployment and enabling real-time onboard AI applications for satellites.

### EvoAPP 2026 - *Assessing Evolving and Learning-Based Controllers for Efficient Cursor Control in Human-Computer Interaction*

Introduces an evolutionary assistance model evaluated on a target user population, demonstrating improved cursor control efficiency (validated via ANOVA analysis).

### EDHPC 2025 - *Explaining Raw Data Complexity to Improve Satellite Onboard Processing*

Applies Explainable AI (XAI) techniques to assess how raw data complexity affects object detection pipelines, improving understanding and optimisation of onboard processing.

### AIR 2024 - *Sequential Decision-Making in Atari 2600 Games: Comparing Temporal Features*

Analyses the impact of temporal information on reinforcement learning performance.

### IFAC SAFEPROCESS 2022 - *DyD2: Dynamic Double Anomaly Detection Application to On-Board Space Radiation Faults*

Introduces **DyD<sup>2</sup>**, an embedded anomaly detection algorithm for dynamic systems, reducing latency and eliminating false negatives compared to state-of-the-art methods.

### RADECS 2021 – *ML as an Alternative to Thresholding for Space Radiation High Current Event Detection*

Demonstrates the effectiveness of ML approaches in detecting radiation-induced micro-latchup.

## Additional

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- GitHub: <https://github.com/Adrien-Dorise>
- Website: <https://lawtechproductions.com/adrien-dorise/>
- Organiser of Scientific Game Jam (research x game dev)
- Guitar maker and Musician (guitar, drums, composition)
- References available on request