

# Alejandro ARGÜELLES

MS in Mathematics and AI at

## MVA – Mathematics Vision Learning

ENS Paris Saclay

Research-oriented student seeking internship & PhD opportunities in **Reinforcement Learning, Representation Learning, and Interpretability**.

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### EXPERIENCE

#### Chief of Deep Learning Estimation — Autonomous (Driverless) Formula Student Car TLS'e Racing 2024 – 2025

Autonomous Driving EKF + Deep Estimation Scrum • Integration

- Led the Driverless Estimation division to develop estimation pipelines combining Extended Kalman Filters with neural estimators.
- Fused IMU, GPS and LiDAR; integrated with perception and planning for closed-loop autonomy.

#### Automatic Code Refactoring with AI — Internship Infotel Consulting Mar 2025 – Aug 2025

- Built a private VS Code extension for automated refactoring with LLMs.
- Applied LoRA fine-tuning, RAG, multi-agent orchestration, and diffusion for synthetic data.
- Improved a published *God Class* detector's F1 score (0.53 → 0.58).

#### Student Consultant Upsilon Student Tech Consulting 2023

- Designed communication strategies and visuals for clients and partners.

### EDUCATION

#### Master — MVA Mathematics, Vision & Learning ENS Paris-Saclay Sep 2025 – Apr 2026

Advanced coursework in modern machine learning theory and applications. Focus on **Reinforcement Learning**, theoretical underpinnings of deep networks, and geometric/topological methods for data analysis and imaging.

Reinforcement Learning Theoretical Foundations of Deep Learning Representation Learning

Optimal Transport Probabilistic Graphical Models Computer Vision Topological Data Analysis

Differential Geometry for Imaging LLMs for Code & Proof Multimodal Explainable AI Statistical Learning

Graphs in ML Large-Scale Distributed Optimization

#### Master — Mathematics & Computer Science for AI Université de Toulouse Sep 2024 – Mar 2025

- **Rank: 1st of the promotion (1/9)**

Statistics Advanced Probabilities Convex Optimization Deep Learning Information Retrieval

Advanced Algorithms Language Theory (Code) Random Simulation Signal Processing

#### Degree — Pure Mathematics Université de Toulouse 2020 – 2023

**Rank: 1st of the promotion (1/93)** — Core foundation across theoretical mathematics: *analysis, algebra, topology, geometry, combinatorics, graph theory, measure theory, probability*.

### AWARDS & OTHERS

- **ANITI Scholarship:** Institute of Natural and Artificial Intelligence in Toulouse.
- **AVENIR Scholarship (2020):** Dialogue Association.
- **Olympiad:** 4th in the 56th Spanish Mathematical Olympiad (2020, Phase I).
- **Languages:** English C1, French C1, Italian (beginner).
- **Complementary interests:** Cybersecurity, Cryptography, Neuroscience.
- **Hobbies:** Filmmaking, Painting, Photography, Pole Vaulting, Gymnastics, Rubik's Cube (BL).

### SKILLS

- **Programming:** Python, Coq, OCaml, R, C, C++, JavaScript
- **Libraries:** PyTorch, TensorFlow, scikit-learn, NumPy, Pandas, Matplotlib, Hugging Face, LangChain, SCIP
- **Soft skills:** Team leadership, communication, problem-solving, adaptability, consistency

