
@ contact.r.sala@gmail.com

+33 6 13 77 63 44

sala2code.github.io/portfolio/

Sala2Code

Toulouse, France


# SALA RAPHAËL

## SUMMARY


I am **SALA Raphaël**, a ***Master student in Mathematics and Computer-Science*** aiming to pursue a PhD in **Applied Mathematics for Artificial Intelligence**. I am passionate about optimization, numerical analysis, and AI development, with a focus on making algorithms more efficient and adaptable.

My multidisciplinary background in mathematics, physics, and computer science has provided me with strong analytical and problem-solving skills, as well as practical experience gained through several volunteer internships and academic projects.


## PROJECTS

- **Physics Simulations**

  Soft-body physics and Boids for flocking behavior

- **Optimization Techniques**

  Projects involving parallelization, procedural generation, vectorization, and gradient descent methods

- **Others**
  - Spectral clustering on random graphs
  - Randomization (Cryptography, Simplex Noise)
  - Deep understanding of graphics rendering using OpenGL *(Minecraft-like without game engine)*

## SKILLS

- **Favorite Languages:** Julia, Python, C++, Lean
- **Mathematics:** Measure Theory, Probability, Numerical Analysis, Differential Equations
- **Languages:**
  - **French:** Native
  - **English:** Intermediate (B2)
- **Qualities:** Autonomous, Motivated, Patient, Perserverant, Rigorous, Serious

## WORK EXPERIENCE

- **Internship — Section of Mathematics, University of Geneva (Switzerland)**
  *June - August 2025 (3 months)*

  Introduced a Quantile Universal Threshold strategy for automatic $\lambda$-selection in sparse learning, extending to non-convex penalties and shallow neural networks.

- **Internship — LAAS-CNRS, Toulouse**
  *June - August 2024 (3 months)*

  Explored the design space of energetic nano-materials, using active learning and developed new metrics to evaluate the performance of Gaussian process predictive models.

- **Internship — Institut de Mathématiques de Toulouse, Toulouse**
  *June - August 2023 (2 months)*

  Developed and optimized numerical simulation tools for magnetized plasma physics studies, benchmarking them with Python, MATLAB and Julia *(Dynamic Languages)*.

## EDUCATION

- **Interactions between Computer Science and Mathematics for AI - Master degree**
  *University Paul-Sabatier, Toulouse (2025-2027)*
  Mathematics - Computer Science

- **Selective University Program - Joint degree**
  *University Paul-Sabatier, Toulouse (2022-2025)*
  Mathematics - Physics

- **General Baccalaureate (Mention Bien)**
  *Lycée Jacques Ruffié, Limoux (2019-2022)*
  Mathematics - Physics/Chemistry - Computer Science

## OTHERS

- ANITI Graduate-School Excellence Scholarship (merit-based, 2025)
- Annual projects supervised by a researcher
- Computer science projects (see Portfolio)
- Homework tutoring in middle schools