

# Julien de Saint Angel

## AI & Applied Mathematics Engineer

PhD in Applied Computer Science – specialized in hyperspherical neural networks and anomaly detection

4 Rue de la Comtesse  
17000 La Rochelle  
France

+33 6 61 94 16 99  
✉ [julien.desaintangel@gmail.fr](mailto:julien.desaintangel@gmail.fr)

### Education

- 2020–2025 **PhD in Applied Computer Science**, *University of La Rochelle, MIA Laboratory*  
Thesis: "Hyperspherical Layer Neural Networks for Anomaly Detection".
- 2017–2019 **Master in Mathematics and Applications (Merit)**, *University of La Rochelle*  
Specialization: applied mathematics, optimization, differential equations.
- 2014–2015 **Master in Astronomy and Physics**, *Paris-Meudon Observatory*
- 2012–2014 **Master in Mathematics and Education + CAPES**, *University of La Rochelle*
- 2009–2012 **Bachelor in Mathematics**, *University of La Rochelle*

### Professional Experience

#### Scientific Contributions (2021–2024)

- Deep M-SPH SVDD Multi-hypersphere method for anomaly detection.
- Initialization Dedicated initialization method for hyperspherical layer networks (numerical optimization).
- Applications Anomaly detection in time series, visual tide gauge analysis, high-frequency sports analytics.
- Feb.–May 2019 **Internship at XLIM (UMR 7252) and MIA (EA 3165)**  
Supervisors: B. Tremblais and R. Pétéri  
Characterization of sports gestures using high-speed cameras and critical point trajectory analysis.
- May 2018 **Internship at LIENSs Laboratory (UMR 7266)**  
Supervisors: E. Poirier (IGR) and L. Testud  
Development of a visual tide gauge: automated reading of tide scale images.
- Mar.–Jun 2015 **Internship at SYRTE Laboratory (UMR 8630)**, *Paris Observatory*  
Supervisor: J.-Y. Richard  
Development of interpolation algorithms for artificial satellite orbits (differential equations, numerical simulation).

### Technical Skills

- AI CNN, RNN/LSTM, GAN, Transformers, autoencoders, surrogate models, Bayesian optimization.
- Frameworks TensorFlow/PyTorch, Scikit-Learn, OpenCV, PyTorch Lightning, Keras.
- Signal Processing Segmentation, frequency filtering, wavelets, Fourier transform, time-frequency analysis.
- Programming Python (Numpy, Pandas, SciPy, Matplotlib), Java, C, C++, Fortran, MATLAB, Scilab.
- Tools Git, Docker, Jupyter, Linux, LaTeX, Microsoft Office (Excel, Word, PowerPoint).
- Advanced Mathematics Optimization, PDEs, conformal geometry, universal approximation.

### Selected Publications

- [1] **J. de Saint Angel**, C. Saint-Jean, C. Choquet, *Improving Learning for Deep Multi-Sphere Anomaly Detection with Conformal Geometric Algebra*, book chapter, Recent Applications in Deep Learning, 2025.
- [2] **J. de Saint Angel**, C. Saint-Jean, *Dense and Conv2d Hyperspherical Layers via Conformal Geometric Algebra*, ORASIS, 2021.
- [3] **J. de Saint Angel**, C. Saint-Jean, *Approximation Theorem for Hyperspherical Neurons*, GRETSI, 2023.
- [4] **J. de Saint Angel**, C. Saint-Jean, *Multi-Spheres Anomaly Detection with Hyperspherical Layers*, ICMLA, 2024.

### Languages

- Languages French (native), English (B2 – fluent), Spanish & Romanian (B1).

### Interests

Scientific outreach, astrophotography, bird photography, 3D modeling, video animation.

- Keywords Artificial Intelligence, Anomaly Detection, Image Processing, Signal Processing, Image Analysis, Segmentation, CNN, RNN, LSTM, LLM, Optimization, Python, Pandas, Docker, Git, Jupyter, LaTeX, Data Analysis, AI Agents, MLOps