Antonin Joly

Second year PhD Student, INRIA-CNRS, France, Rennes
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RESEARCH INTERESTS

Graph Machine Learning, Dimensionality Reduction, Frugal Machine Learning, Graph Generation, Sparsity

EDUCATION

University of Rennes, Rennes, France — 04-2024 — Present
PhD Graph Machine Learning
Thesis advisor : Nicolas Keriven, Aline Roumy
Thesis Title: Modern Challenges in Graph Coarsening

ENS Saclay/ IPParis, Palaiseau, France — 09-2022 — 09-2023
Master of Science in Applied Mathematics and Machine Learning MVA — Cumulative GPA: 4.00/4.00
Master advisor : Franco Scarselli
Master Thesis Title: Molecular Generative Markovian Process

Telecom Paris, Palaiseau, France — 09-2020 — 09-2023
Master of Science in Engineering, specializing in Applied Mathematics and Computer Science — Cumulative GPA: 4.00/4.00

Lycée Hoche, Versailles, France — 09-2018 — 06-2020
Intensive formation in Mathematics and Physics preparing for engineering schools exams — Cumulative GPA: 3.92/4.00

ACADEMIC EXPERIENCE

CNRS — Rennes, France
PhD Student in INRIA-CNRS' COMPACT team — 04-2024 — Present
Funded by project SHARP, PEPR IA, FRANCE 2030

- Title subject : Modern Challenges in Graph Coarsening
- Topic includes : Graph Machine learning, Graph spectral analysis, Graph Pooling
- Regular participation in project SHARP research meetings.
- Creation and organization of the PhD reading group within the team, covering diverse ML topics with a special focus on compression.

University of Siena — Siena, Italy
Research Intern in Siena Artificial Intelligence Lab — 04-2023 — 07-2023

- Title subject : Molecular Generative Markovian Process
- Topic includes : Graph Machine learning, Graph Generation, Diffusion process on Graph, Graph-based molecular design.

TEACHING EXPERIENCE

Teaching Fellow — ESIR, Rennes, France
IIA, Introduction to artificial Intelligence, Instructor : Ewa Kijak. — 03-2025 — 05-2025
Managing tutorials (24h) for two groups of third year bachelor students and in charge of grading the final course project.

PUBLICATION

Published paper

- Joly, A., & Keriven, N. (2024). *Graph Coarsening with Message-Passing Guarantees.* **Conference on Neural Information Processing Systems (NeurIPS)**. (Poster session at NeurIPS 2024 Vancouver, LOG2024 Paris Meetup, PEPR IA Days 2025)

Preprint

- Joly, A., & Keriven, N., & Roumy, A. (2025). *Taxonomy of Reduction matrices for Graph Coarsening.* arXiv:2506.11743

INVITED TALKS

- "Taxonomy of Reduction matrices for Graph Coarsening", **GRETSI**, Strasbourg, August 2025. Link to event page
- "Graph Coarsening with Message-Passing Guarantees", **LOG Conference** (Oral Presentation), Online, November 2024 . Link to event page
- "Graph Coarsening with Message-Passing Guarantees", **GdR IASIS** Graph Learning Day, Paris, June 2024. Link to event page

ACADEMIC SERVICES

Reviewer for

- LOG 2025
- Neurips 2025

SELECTED COURSES

Master's Courses

- Machine Learning on Graphs
- Topological data analysis
- Optimal transport
- Advanced learning for text and graph data
- Computational Statistics
- Markov chains and time series
- Reinforcement Learning
- Time Series
- Deep Learning for Medical imaging
- Mathematical methods for neuroscience
- Kernel methods for Machine Learning
- Conditional distributions, mathematical statistics and Martingales

PERSONAL SKILLS

- **Languages :** French (mother tongue), English (C1, 100/120 TOEFL IBT), Spanish (Intermediate)
- **Computer :** Proficient use of Python (PyTorch, PyTorch Geometric)
- **Communication :** Participation in a science mediation workshop for middle school students