

Henrik Abgaryan

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PhD Student, LAMSADE – PSL · Expected Graduation: 2026 · Available for Summer 2026
AI Scientist and PhD Candidate specialized in **Agentic AI, Geometric Deep Learning (GNNs), and Generative Models**. I build rigorous reasoning frameworks (ACCORD, STARJOB) for LLMs for combinatorial optimization. Previously architected generative AI features (Diffusion, GANs) for **150M+ users** at Picsart, combining theoretical depth with production-grade engineering. Highly motivated to apply my expertise in representation learning, topological algorithms, and high-capacity model distillation toward biomedical foundation models and AI for Science.

EDUCATION

PhD, Artificial Intelligence **2023–Present**

LAMSADE, Université Paris-Dauphine PSL

Focus: Machine Learning, Geometric Deep Learning, and Combinatorial Optimization

Advisors: Tristan Cazenave, Ararat Harutyunyan

MSc, Computer Science (AI Systems and Data) **2022**

Université Paris-Dauphine PSL

Graduated with Distinction

B.S. in Computer Science **2017**

American University of Armenia

Relevant coursework:

- CS104 Linear Algebra
- CS111 Discrete Mathematics
- CS107 Probability
- CS108 Statistics
- CS213 Optimization
- CS392 Special Topics in CS: Distributed Algorithms

INDUSTRY EXPERIENCE

Machine Learning Scientist, Picsart AI **2021–2023**

Core Technologies: PyTorch, Diffusion, LoRA, GANs, Distillation, FSDP

- **Generative AI:** Engineered personalized text-to-image systems (LoRA) and geometry-preserving GANs to ensure subject consistency and facial fidelity.
- **Mobile Optimization & Distillation:** Designed Teacher-Student distillation frameworks to compress high-capacity GANs for real-time, on-device edge deployment.
- **Classical CV:** Optimized performance on mobile CPUs by engineering gradient mapping pipelines for material transfer, eliminating neural overhead.
- **Scale:** Architected 4-bit quantization pipelines, reducing end-to-end latency by **12%** for **150M+** monthly active users.
- **Leadership:** Transitioned **35+** research prototypes into production environments using large-scale distributed training systems.

Software Engineer Intern, Synergy International Systems **2019**

Software Engineering & Database Systems

- Engineered core software components and designed a comprehensive database system to optimize business operations.

PUBLICATIONS AND PREPRINTS

[1] **Opening the Black Box: Topologically Guided Latent Steering for Neural Combinatorial Optimization**
Learning and Intelligent Optimization (LION 20), 2026

Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan

- Introduced topologically guided latent steering, bridging geometric deep learning and combinatorial spaces to improve model interpretability and optimization.

[2] **Elitist Sequential Monte Carlo Inference for SchedulExpert: A Neural Network Policy for JSSP**
Annals of Mathematics and Artificial Intelligence, 2026

Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan

- Applied advanced probabilistic inference algorithms to evaluate and enhance the reasoning capabilities of neural network policies.

- [3] **ACCORD: A large-scale open dataset and framework for constraint-aware LLMs**
 NeurIPS 2025 Differentiable Learning of Combinatorial Algorithms Workshop
 Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan [\[Link\]](#)
- Released ACCORD, a **90K** instance dataset and evaluation framework spanning multiple NP-hard problems (Knapsack, Bin Packing, TSP, VRP, JSSP).
 - ACCORD fine-tuning (LLaMA 8B) reduces optimality gaps from $> 80\%$ to as low as 0–12% across problem sizes, outperforming strong prompting baselines.
- [4] **STARJOB: An LLM-native dataset for Job Shop Scheduling**
 AAAI 2025 Workshop on LLMs for Planning (Oral Presentation)
 Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan [\[Link\]](#)
- Released STARJOB, a **120K** instance dataset formatted for LLM fine-tuning and sequential decision-making.
 - To our knowledge, the first large-scale **LLM-native** dataset designed specifically for supervised fine-tuning (instruction/solution format) rather than post-hoc prompting.
- [5] **LLMs can Schedule**
 ECML PKDD 2025 DSO Workshop (Oral Presentation)
 Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan [\[Link\]](#)
- [6] **ScheduExpert: Graph Attention Meets Mixture-of-Experts for JSSP**
 Learning and Intelligent Optimization (LION 19), 2025 (Oral Presentation)
 Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan [\[Link\]](#)
- [7] **Randomized Greedy Sampling for the Job Shop Scheduling Problem**
 Learning and Intelligent Optimization (LION 18), 2024 (Oral Presentation)
 Authors: **Henrik Abgaryan**, Tristan Cazenave, Ararat Harutyunyan [\[Link\]](#)

TEACHING AND LEADERSHIP

- Université Paris-Dauphine PSL** Paris, France
Teaching Associate & Assistant **2023 — 2026**
- Graduate (M1):** Artificial Intelligence, Introduction to ML (MIAGE Apprentissage).
 - Undergraduate (L2):** Data Analytics 2, Algorithms and Programming 2, Computer Tools (HTML/Excel).
- American University of Armenia** Yerevan, Armenia
Teaching Associate & Assistant **2022**
- Undergraduate:** Causal Inference, Data Visualization.

SUMMER SCHOOLS & TALKS

- Generative Modeling Spring School (GeMSS)** **March 2026**
 London, UK. Participated in an intensive European spring school dedicated to state-of-the-art deep generative models, including latent variable, diffusion, flow-based, and autoregressive architectures.
- Data Science Meets Combinatorial Optimisation Euro PhD School** **2025**
 Technical University of Eindhoven, The Netherlands. Participated in advanced doctoral training at the intersection of data science and combinatorial optimisation.
- Talk: "GNNs for Job Shop Scheduling Problem"** **2024**
 Lamsade Doctoral Spring School, Ecole du Luat, Ecouen-Ezanville, France. Presented research on applying Graph Neural Networks to the Job Shop Scheduling Problem.

TECHNICAL EXPERTISE

- Core AI:** Agentic AI, Geometric Deep Learning & GNNs, Generative Models (Diffusion/GANs), Representation Learning, LLM Reasoning (CoT/ToT, GRPO), Probabilistic Inference.
- Software & Tools:** PyTorch, Tensorflow, JAX, Docker, Multi-GPU Training (FSDP).
- Programming Languages:** Python, C++
- Languages:** English, French, Armenian (Native), Russian

HONORS AND AWARDS

- Dauphine Doctoral Scholarship** **2023–2026**
- 1st Place, IASD Master's DL Competition:** Designed a parameter-efficient neural network for Go that outperformed peer models in a round-robin tournament. **2022**

- **PSL Excellence Scholarship** (awarded to top students based on GPA) **2022**
- **National Academic Scholarship** **2017**
- **Oral selections:** AAAI 2025 LLM4Plan; ECML PKDD 2025 DSO; LION 18, 19 & 20
- **Reviewer:** NeurIPS 2024, NeurIPS 2025

INTERESTS

- GYM, Painting, Swimming, Running, Healthy Lifestyle.