

Gaspard BEAUDOUIN

Machine Learning research student

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Research interests: large language models, diffusion & flow matching, RL, agents, world models ...

EDUCATION

- École Normale Supérieure Paris-Saclay** Paris, France
MVA Master — Mathematics, Vision, Learning 2025 – 2026
– Coursework: Advanced learning for text/graphs, DL, Optimal Transport, Probabilistic Graphical Models, Large-Scale LLM Training, Deep Learning theoretical foundations, Multimodal xAI, Generative Modelling, RL, LLM for code and proof.
- École Nationale des Ponts et Chaussées — Institut Polytechnique de Paris** Paris, France
Mathematics and Computer Science Department 2022 – 2026
– Focus: Deep Learning, Machine Learning, Computer Vision, Statistics, Convex Optimization, Stochastic Processes, Advanced Programming, Control Theory and Functional Analysis.
- Fénelon Sainte-Marie** Paris, France
Preparatory Classes in Mathematics and Physics 2020 – 2022
– 1st Year: PCSI; 2nd Year: PSI* (Physics, Mathematics, Engineering Sciences).

EXPERIENCE

- Research Intern — Harvard University** Boston, MA, USA
Harvard AI and Robotics Lab, MEE Feb 2025 – Aug 2025
– Conducted research under Dr. M. Wang on generative modelling and flow matching.
– Proposed DVRF, an inversion-free flow matching framework for text-to-image editing (*AAAI 2026 under review*).
– Co-authored *SplitFlow* (*NeurIPS 2025*) for flow aggregation, and *PAGE-4D* (*ICLR 2026 under review*) for pose and geometry estimation; now working on Masked Diffusion Language Models with a Harvard PhD student.
- ML Engineer Intern — Sinequa** Paris, France
Research Team Aug 2024 – Jan 2025
– Studied LLMs and tool-use agents (SFT and RL); designed evaluation for function-calling models (BFCL), data augmentation and templating.
– Distributed instruction fine-tuning (LoRA and full) and DPO on H100 clusters for tool-use; Docker and Slurm.

PUBLICATIONS

- PAGE-4D: Disentangled Pose and Geometry for 4D Perception** *Under Review at ICLR 2026.*
K. Zhou, Y. Wang, G. Chen, G. Beaudouin, F. Zhan, P. Liang, M. Wang
- Delta Velocity Rectified Flow for Text-to-Image Editing** *Under Review at AAAI 2026, Preprint: 2509.05342.*
G. Beaudouin, M. Li, J. Kim, S.-H. Yoon, M. Wang
- SplitFlow: Flow Decomposition for Inversion-Free Editing** *Accepted at NeurIPS 2025.*
S.-H. Yoon, M. Li, G. Beaudouin, C. Wen, M. Azhar, M. Wang
- (*In preparation: Masked Diffusion Language Model*) Work with J. Kim.

PROJECTS

- GPT MoE Transformer from Scratch** Personal Project
Implemented and trained a PyTorch MoE Transformer in order to generate French poetry with some GPT-OSS recent techniques. I also generated some synthetic training data, and wrote my notes on LLMs: From Pre-Training to RLHF (Draft) 2025
- Mini GRPO** Personal Project
Reimplemented GRPO, from by DeepSeek-R1 and DeepSeekMath, applied to math reasoning tasks. 2025
- Drug Design with Diffusion Models** École des Ponts
Implemented DDPM, explored DiffDock for drug binding discovery (with Sanofi). Poster Available. 2024
- Edge Detection in Images** École des Ponts
C++ research on perceptual boundary saliency; implemented detection algorithms. 2022

SKILLS

- Languages** French (native), English (fluent), Spanish (proficient)
- Technical** Python (PyTorch, Transformers), Docker, Slurm, C++, SQL, R, L^AT_EX

MISCELLANEOUS

- Sports** École des Ponts football team; competitive tennis
- Interests** Passionate about ML research, actively following scientific publications