





Sevi Melvin

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SUMMARY

I am a final-year Master of Research student in the Mathematics, Vision, Apprentissage (MVA) program at ENS Paris-Saclay, the most prestigious master's degree in machine learning in France. My main research interests include Computer Vision and multimodal learning, with a specific focus on Generative AI, Diffusion Models, and Large Language Models. I am eager to pursue a Ph.D. to delve deeper into these areas and contribute to the cutting-edge research in the field.

EDUCATION

ENS Paris-Saclay

*Master of Research MVA (2nd year) in Mathematics and Machine Learning
Mathematics, Vision, Apprentissage (MVA)*

Paris, France

Sep. 2023 - Sep. 2024 (Expected)

Sorbonne University

*Master's degree in Applied Mathematics (1st year) With high honors
top 10% out of 245 students, Cumulative GPA: 3.6/4.0*

Paris, France

Sep. 2022 - Jun. 2023

Sorbonne University

*Bachelor's degree in Mathematics, With honors
Third year GPA : 3.5/4.0, Cumulative GPA: 3.7/4.0*

Paris, France

Sep. 2019 - Jun. 2022

Sorbonne University

*Bachelor's degree in Computer Science, With honors
Third year GPA: 3.5/4.0, Cumulative GPA: 3.5/4.0*

Paris, France

Sep. 2019 - Jun. 2022

MAIN COURSEWORK

Courses MVA: Object Recognition and Computer Vision (taught by G.VAROL, J. PONCE, C. SCHMID, I. LAPTEV, J. SIVIC, M. AUBRY), Deep Learning, Generative Models for Images, Reinforcement Learning, Algorithms for speech and NLP, Convex Optimization, Geometric Data Analysis, Kernel Methods in ML.

PROJECTS

In this section, I present a selection of projects that reflect my research interests in machine learning, computer vision, and statistical modeling. These projects demonstrate my ability to design and implement computational methods, analyze data, and communicate results effectively.

Enhancing IP-Adapter Image Generation Diversity (MVA) | [Report](#) | [Code](#)

- Worked independently on modifying the IP-Adapter model for enhanced text-to-image generation capabilities
- Integrated an additional cross-attention mechanism between image and text features prior to the decoupled cross-attention mechanism used by the authors, yielding qualitative and quantitative improvements.

Referring image segmentation through diffusion models (MVA) | [Report](#) | [Code](#)

- In this project, I am exploring the use of diffusion models for refining image segmentation tasks. Building on recent advances in generative modeling, I aimed to leverage the Visual Perception with a pre-trained Diffusion model (VPD) model to enhance the accuracy and robustness of the methods used by the authors.

Data challenge for sketch drawings images classification (MVA) | [Report](#) | [Code](#)

- As part of a data challenge, I fine-tuned a pre-trained ViT transformer from the Hugging Face library using LoRA and the Peft library for classifying sketch drawing images. My solution ranked among the top submissions among the class (16/60), achieving a high level of accuracy and generalizability.

Graph Neural Networks Benchmarking Paper Review (MVA) | [Report](#)

- I completed a thorough review of the "Benchmarking Graph Neural Networks" paper by Dwivedi et al., providing detailed explanations and insights into the findings and implications of the study.

Numerical Probabilities and Computational Statistics (Sorbonne University) | Notebook

- I implemented the Expectation-Maximization (EM) algorithm for parameter estimation in Hidden Markov Models, demonstrating mastery over numerical probability concepts and computational statistics.

Graph Motif Detection Project (Sorbonne University) | Code

- I developed efficient computational algorithms to detect subgraph structures, known as motifs, in large graphs. By analyzing the distribution and diversity of detected motifs, I characterized the structural properties of the underlying networks.

RESEARCH EXPERIENCE

From April to September, I will undertake a 6-month research internship as part of my MVA master's degree, aiming to publish a paper at top conferences. With a passion for research and a commitment to making valuable contributions, I am excited to collaborate with leading experts and enhance my skills in this dynamic field. Actively seeking opportunities.

PROFESSIONAL EXPERIENCE

Tutoring

2022-2023

- Tutored a small class of 14 second-year bachelor's students in topology, differential calculus, and probability for two consecutive semesters.
- Developed personalized lesson plans and materials, utilizing effective teaching strategies to enhance comprehension and retention.
- Fostered collaborative learning environment, encouraging critical thinking and problem solving skills development.
- Demonstrated subject matter expertise, patience, and dedication to empowering students success.

SKILLS

Programming Languages and Software: Advanced in Python; intermediate in C, Java, and C++; familiarity with NumPy, Pytorch, Pandas, Scikit-learn, OpenCV, SQL, Google Cloud.

Natural Languages: Fluent in French; good command of English; basic understanding of Spanish.

ACHIEVEMENTS

- Graduated with High Honors from the Master's program at SU.
- Ranked 70th out of 833 (top 7%) in the first year Bachelor's program at SU, qualifying for a dual degree in Mathematics and Computer Science (32 spots available).
- Ranked 9th (Mathematics) and 11th (Computer Science) out of 28 students in the Dual Degree Promotion.
- Graduated with honors in both Bachelor's degrees, achieving a cumulative GPA of 3.5.
- Admitted to renowned institutions such as ENSAE Paris and ENS Paris-Saclay upon completing the Master's program at SU, choosing to attend ENS Paris-Saclay.
- Exceeded expectations in Master's level courses:
 - Advanced Probability: Ranked 17th out of 132.
 - C++ Programming: Ranked 6th out of 61.
 - Computational Statistics: Ranked 6th out of 67.
- Achieved notable subject-specific rankings in Bachelor's degree studies:
 - Topology and Differential Calculus (third year): Ranked 25th out of 364.
 - Algebra and Arithmetic (third year): Ranked 8th out of 118.
 - Lebesgue Integral (second year): Ranked 18th out of 391.

INTERESTS AND ACTIVITIES

Chess: Avid chess player with over three years of experience; achieved a peak rating of 1600 on chess.com.

Competitive Sports (Varsity Basketball): Experienced team athlete who played varsity basketball throughout college bachelor's degree.

Music Enthusiast: Passionate about music, particularly Jazz and Hip Hop.