Sevi Melvin

github linkedin melvin.sevi@ens-paris-saclay.fr website

Summury

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 Paris, France
Master of Research MVA (2dn year) in Mathematics and Machine Learning *Sep. 2023 - Sep. 2024 (Expected)*
Mathematics, Vision, Apprentissage (MVA)

Sorbonne University Paris, France
Master's degree in Applied Mathematics (1st year) With high honors *Sep. 2022 - Jun. 2023*
top 10% out of 245 students, Cummulative GPA: 3.6/4.0

Sorbonne University Paris, France
Bachelor's degree in Mathematics, With honors *Sep. 2019 - Jun. 2022*
Third year GPA : 3.5/4.0, Cummulative GPA: 3.7/4.0

Sorbonne University Paris, France
Bachelor's degree in Computer Science, With honors *Sep. 2019 - Jun. 2022*
Third year GPA: 3.5/4.0, Cummulative GPA: 3.5/4.0

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.

Text-to-Image generation control with IP-Adapter (Project at the MVA) On going

- I am contributing to the development of the IP-Adapter model for text-to-image generation by enhancing its creative capabilities. By modifying the existing architecture, we aim to increase the expressiveness and variability of generated images while maintaining high levels of fidelity and realism.

Refining image segmentation through diffusion models (Project at the MVA) 2023-2024

- In this project, I am exploring the use of diffusion models for refining image segmentation tasks. Building on recent advances in generative modeling, I aim to leverage the Unleashing Text-to-Image Diffusion Models for Visual Perception (VPD) framework to enhance the accuracy and robustness of image segmentation techniques. The resulting method could have applications in medical imaging, autonomous systems, and other domains where precise object detection and delineation are critical.
- [Link to Report and Code]: Unleashing Text-to-Image Diffusion Models for Visual Perception

Data challenge for sketch drawings images classification (Project at the MVA) 2023

- 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 private, 20/60 public), achieving a high level of accuracy and generalizability.
- [Link to Report]: Sketch Drawing Classification Data Chellenge MVA - Report

Graph Neural Networks Benchmarking Paper Review (Project at the MVA) 2023

- 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.
- [Link to Report]: Benchmarking GNN's - Report

Numerical Probabilities and Computational Statistics (Project at Sorbonne University) 2023

- I implemented the Expectation-Maximization (EM) algorithm for parameter estimation in Hidden Markov Models, demonstrating mastery over numerical probability concepts and computational statistics.
- [Link to Code]: EM-HMM - Code (French)

Graph Motif Detection Project 2021

- 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

Turoring 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, Google Cloud.
Natural Languages: Fluent in French; good command of English; basic understanding of Spanish.

Achievements

- Graduated with High Honors from the first year Master's program at SU.
- Finished in the top 7% (ranked 70/833) during the first year of the Bachelor's program, qualifying for a dual degree in Mathematics and Computer Science (only 32 spots available).
- Ranked 9th and 11th respectively among all students in the dual degree promotion for Mathematics and Computer Science during the third year out of 28 students.
- Graduated with honors in both Bachelor's degrees, narrowly missing High Honors, achieving a cumulative GPA of 3.5 in the final year in both majors.
- Gained admission to renowned institutions such as ENSAE Paris – Institut Polytechnique de Paris (top french engineering school), Dauphine PSL, and ENS Paris-Saclay upon completing Master's program at SU. Decided to attend ENS Paris-Saclay.

- Exceeded expectations in Master's level courses:
  - Ranked 17/132 in Advanced Probability.
  - Ranked 6/61 in C++ Programming.
  - Ranked 6/67 students in Computational Statistics.
  - Ranked 22/86 students in Statistics.
  - Ranked 14/38 students in Convex Analysis and Optimization.
- Subject-specific rankings in Bachelor's degree studies:
  - Ranked 25th out of 364 students in Topology and Differential Calculus (third year).
  - Achieved 8th place out of 118 students in Algebra and Arithmetic during the (second year).
  - Netted 18th spot out of 391 students in Lebesgue Integral (second year).

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.