Sonia Mazelet

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Education

ENS Paris-Saclay Sep. 2022 – July 2023
M2 MVA (Mathematics, Vision, Learning) *highest honours*
- Courses: Convex optimization and applications in machine learning, Geometrical data analysis, Computational Statistics, Object recognition and artificial vision, Computational optimal transport, Learning for time series, Generative models for images, Kernel Methods for machine learning, Graphs in Machine Learning

ENS Paris-Saclay Sep. 2021 – July 2022
M1 Mathématics and Applications, Hadamard track *high honours*
- Courses: Algebra, Analysis, Probabilities, Spectral theory, Optimisation, Statistics, Image processing

ENS Paris-Saclay Sep. 2020 – July 2021
L3 Mathematics *high honours*
- Courses: Differential calculus, Algebra, Fourier and Hilbertian analysis, PDE, ODE, Algebra, Complex analysis, Integration-Probabilities, Quantum mechanics

Lycée Condorcet (Paris) Sep. 2017 – Sep. 2020
Preparatory School - Intense preparation for the competitive entrance exams to «Grandes Écoles» *highest honours*

Experience

École Polytechnique and Inria Saclay Oct. 2024 – ...
PhD, supervised by Rémi Flamary and Bertrand Thirion *Palaiseau, France*
- Optimal transport on graphs for multi subject fMRI data alignment and brain activity decoding

UC Berkeley - Redwood center for theoretical neuroscience Sep. 2023 – June 2024
Predoctoral research year, supervised by Bruno Olshausen *Berkeley, California*
- Research project on Vector Symbolic Architectures and Sparse Coding for visual scenes factorization.
- Research article presented at the Neuro Inspired Computational Elements conference (NICE 2024): *Compositional Factorization of Visual Scenes with Convolutional Sparse Coding and Resonator Networks.*
- Poster presented at the COSYNE 2024 conference: *A residue-number attractor neural network model of error-correcting updates among grid cell modules.*

Polytechnique - CMAP April 2023 – July 2023
Research internship supervised by Rémi Flamary *Palaiseau, France*
- Research project on Graph Neural Networks and Optimal Transport.
- Contribution to the open source Python library Python for Optimal Transport (POT). Creation of a *Graph Neural Network module*, implementation of a graph classification Graph Neural Network and an example of use.
- Creation and implementation of a node classification Graph Neural Network based on the Fused Gromov-Wasserstein optimal transport distance.

Oxford university - Statistics department April 2022 – June 2022
Research internship supervised by Alison Etheridge *Oxford, UK*
- Research project on stochastic processes applied to epidemics dynamics.

ENS Paris-Saclay - Centre Borelli April 2021 – July 2021
Research internship supervised by Laurent Oudre *Saclay, France*
- Research project on time series at the Borelli centre.
- Implementation of an algorithm to detect patterns in time series using Dynamic Time Warping.

Awards/Scolarships

Deepmind scholarship recipient - DeepMind scholar. Sep. 2022 – Sep. 2023
Hadamard foundation scholarship recipient. Sep. 2021 – Sep. 2022

Technical Skills

Languages: Python (Numpy, Pytorch, Pandas, Matplotlib, POT)
Developer Tools: VS Code, Github