Giulia Mescolini

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Education

2021–2023 **École Polytechnique Fédérale de Lausanne**,
Computational Science and Engineering, Master of Science.
- Double Degree Program with Politecnico di Milano
- **Core Courses:** Optimal Transport, Advanced Numerics, Stochastic Simulation, Machine Learning.
- GPA – 5.6/6

2021–2023 **Politecnico di Milano**,
Computational Science and Engineering, Master of Science.
- **Core Courses:** Real and Functional Analysis, Advanced PDEs, Numerical Analysis for PDEs, Fluid-Dynamics, C++ Programming.
- Member of **Alta Scuola Politecnica** (excellence path)
- GPA – 30.0/30.0

2017–2020 **Politecnico di Milano**,
Ingegneria Matematica, Bachelor of Science.
- **Core Courses:** Mathematical Analysis, Physics, Introduction to PDEs, C Programming, Probability and Statistics.
- GPA – 29.9/30.0

Work Experience

Aug 2022–
Feb 2023 **R&D Intern**, *Nestlé Research*.
- Group of Digital Nutrition
- Worked with state-of-the art Natural Language Processing techniques for food-related text.

Main Projects

Feb – Jun
2022 **Finite-time singularities in the Euler Equation**, *Semester Project @ EPFL*.
- Laboratory: Chair of Mathematical Analysis and Calculus of Variations (Prof. M. Colombo).
- Developed examples and insights starting from T.Elgindi's works on singular solutions to the Euler Equation.

May 2021–
Feb 2022 **PINNs for Fluid-Dynamics**, *Numerical Analysis for PDEs Course Project @ Politecnico di Milano*.
- Developed examples of solutions to fluid-dynamics problems using Physics-Informed Neural Networks (Neural Networks trained to respect physical-based constraints).

Dec 2021–
Jan 2022 **Maxwell Eigenvalue Problem**, *Numerics for Fluids, Structures & Electromagnetics Course Project @ EPFL*.
- Developed analytical proofs around the Maxwell eigenvalue problem in a cavity and implemented a numerical solution with different types of Finite-Elements.

Dec 2021–
Jan 2022 **Pollutant Transport Rare Events**, *Stochastic Simulation Course Project @ EPFL*.
- Implemented a Finite-Element solution and a Monte Carlo-based solution to Darcy's equations in a porous medium.
- Implemented variance reduction and splitting techniques.

Nov – Dec
2021 **Machine Learning Replaces Radiative Transfer**, *Machine Learning Course Project @ EPFL*.
- Laboratory: Laboratory of Astrophysics (LASTRO).
- Implemented a Fully Connected Neural Network and a Convolutional Neural Network to infer astrophysical quantities, enhancing Machine Learning usage in the study of the radiation behavior in the Universe.

Sep – Oct 2021	**Higgs Boson Challenge**, *Machine Learning Course Project @ EPFL*.
	○ Machine Learning Challenge (pre-processing, linear and logistic regression) with CERN dataset (obtained 83% accuracy).
Jun 2020	**Analysis of occupational data**, *Statistical Inference Project @ Politecnico di Milano*.
	○ Analyzed answers of former Mathematical Engineering students to a survey about their satisfaction for the study path and their employment status.

Achievements

July 2021	**Basic Sciences Fellowship**, *EPFL*.
	○ Awarded with a two-years fellowship for the promising profile among the applicants for the Master in Computational Science and Engineering.
Feb 2019	**Best Freshmen Prize**, *Politecnico di Milano*.
	○ For the results obtained in the first year of BSc.
May 2018	**Azione Giovani**, *Rotary Club Spoleto*.
	○ For the high school final mark.
Aug 2016	**Lions Youth Exchange**, *Lions Club Spoleto*.
	○ For the results obtained in high school.
	○ Prize: one month-exchange in Muskegon (USA).

Extra-Curricular Activities

Sep 2022 – Sep 2023	**Tresaurer**, *SIAM Chapter at EPFL*.
	○ Management of the financial expenses of the EPFL Chapter of the Society for Industrial and Applied Mathematics.
Jan 2021 – Sep 2022	**Member of Alta Scuola Politecnica**, *Politecnico di Milano*.
	○ Selected for the excellence multidisciplinary path organized by Politecnico di Milano and Politecnico di Torino.
	○ Courses: *Dynamics of Innovation*, *Design Methods and Processes*, *Complex Decision-Making and Policy Design*, *The Intangible Value of Places*.
	○ Multidisciplinary Project: *WoW - Web of Water*. In collaboration with the company Fluid-o-Tech, the team proposed a new paradigm for water quality monitoring and data sharing in the coffee machine industry.
Jun 2020 – Jun 2021	**Responsible for Academic Relationships**, *AIM - Mathematical Engineering students' association*.
	○ Organization of conferences and events in collaboration with the Mathematics Department of Politecnico di Milano.
Jan 2020 – Jun 2020	**Responsible for Administration**, *AIM - Mathematical Engineering students' association*.
	○ In charge of administration and registration of new association members.

Skills

Code	Python, C/C++, SQL, MATLAB, R, FreeFem++
Frameworks	Keras, PyTorch, Tensorflow
Utilities	Anaconda, Git, LaTeX, Jupyter Notebook, Docker
CFD Software	COMSOL Multiphysics, Ansys Fluent, PHOENICS
Languages	Italian (mothertongue), English (C1), French (B1)