

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.
 - 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

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*.
○ 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).

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 (mother tongue), English (C1), French (B1)

Extra-Curricular Activities

- Jan 2021 – **Alta Scuola Politecnica**, *Politecnico di Milano*.
Sep 2022 ○ Joined the excellence multidisciplinary path organized by Politecnico di Milano and Politecnico di Torino (1% selected students).
○ Courses: Dynamics of Innovation, Design Methods and Processes, Complex Decision-Making and Policy Design, The Intangible Value of Places: impact and innovation commons.
○ Multidisciplinary Project: *WoW - Web of Water*. In collaboration with the company Fluid-o-Tech, proposed a new paradigm for water quality monitoring and data sharing in the coffee machine industry.
- Jun 2020 – **Responsible for Academic Relationships**, *AIM - Mathematical Engineering students' association*.
Jun 2021 ○ Organized conferences and events in collaboration with the Mathematics Department of Politecnico di Milano.
- Jan 2020 – **Responsible for Administration**, *AIM - Mathematical Engineering students' association*.
Jun 2020 ○ In charge of administration and registration of new association members.