

Mael Macuglia

✉ mael.macuglia@icloud.com | 🌐 Website | 💼 LinkedIn | 🐙 Github

EDUCATION

ETH Zürich, Mathematics Department

Sep 2021 – Sep 2024

MSc Computational Science and Engineering, 151 ECTS, Grade: 5.3/6.0

- Master Thesis: *Mini-Batching Theory: Matrix Product Concentration Methods*, Grade: 6.0/6.0
 - Supervisor: Prof. Afonso Bandeira
 - Contributions: Derived new state-of-the-art error bounds for controlling iterates of stochastic iterative schemes: mini-batch Heavyball Momentum and mini-batch SGD.
- Semester Thesis: *Minimax Lower Bounds for Sparse Causal Estimators*, Grade: (Best)
 - Supervisor: Konstantin Donhauser, Statistical Machine Learning Lab
 - Contributions: Developed a mathematical model abstracting the scenario of differential treatment effects in patient populations with sparse effect estimates. Proved a lower bound on the performance of any algorithm aimed at recovering the support of the difference in treatment effects, contributing to the theoretical foundations of personalized medicine and causal inference
- Courses: *Advanced Numerics, Statistics, Theory of Machine Learning*;

ETH Zürich, Mathematics & Computer Science Department

Sep 2020 – Sep 2021

Transition Year, Additional MSc Requirements at Mathematics Department

- Courses: *Calculus, Numerics, Probability Theory, High Performance Computing*;

ETH Zürich, Mechanical and Process Engineering Department

Sep 2016 – Dec 2019

BSc Mechanical Engineering, Robotics Specialization

PROFESSIONAL EXPERIENCE

University of Zürich, Autonomous Learning and Predictive Intelligence Lab

Oct 2024 – Present

Swiss National Science Foundation (SNF) Funded Researcher, Supervisor: Prof. Giorgia Ramponi

- Developing a unified feedback integration system that incorporates rewards, preferences, and expert demonstrations into a cohesive reinforcement learning process

ETH AI-Center

Research Intern, Supervisor: Dr. Anna Susmelj

Oct 2023 – Mar 2024

- Developed the theoretical foundation of a novel method called *Dropsembles* for uncertainty estimation in tuned implicit functions
- Co-authored paper submitted to the International Conference on Learning Representations (ICLR) 2025 (under review)

BLP Digital AG

Software Engineer Intern, Python

Feb 2019 – Aug 2019

- Developed and implemented a classifier for Swiss bills as part of an ERP process automation project

TEACHING

ETH Zürich, Mathematics Department

2023 – 2024

- Teaching: Numerical Methods for CSE | *workload: 20%, Undergraduate Level*
 - Conducted blackboard lectures for classes of 30 students
- Exam Corrections: Probability and Statistics, Numerical Analysis for Mathematicians

ETH Zürich, Computer Science Department

Spring Fall 2024

- Teaching: Stochastics and Machine Learning | *workload: 20%, Undergraduate Level*
 - Designed and created weekly learning materials, including lecture slides, problem sets, hands-on exercises

SKILLS

Programming: C++, Python, R;

Tools: Git, Latex;

Numerical Libraries: Eigen, LehrFEM++ (software library for implementing and solving PDEs);

Soft Skills: Public Speaking, Teamwork, Creativity, Enthusiasm for learning;

Languages: French (native), Italian (native), German (Bilingual Proficiency), English (Bilingual Proficiency);