

Alexandru Meterez

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Research Interests

Theoretical: Deep Learning theory, Optimization, Theory of Large Language Models

Applications: AI in Healthcare, Bioinformatics

Education

ETH Zürich

Zürich, Switzerland

MSc Data Science

2020 - Present

- *Advisors:* Prof. Gunnar Rätsch, Prof. Francesco Orabona (KAUST)
- *GPA:* 5.7/6
- *Thesis topic:* Avoiding gradient explosion in orthogonal neural networks with batch normalization
- *Selected courses:* Advanced Machine Learning, Fundamentals of Mathematical Statistics, Computational Biology, Statistical Models in Computational Biology

University Politehnica of Bucharest (UPB)

Bucharest, Romania

BSc Computer Science

2016 - 2020

- *Advisor:* Prof. Iuliu Vasilescu
- *GPA:* 9.58/10 (top 7%)
- *Selected courses:* Probability and Statistics, Linear Algebra, Signal Processing, Numerical Methods, Data Structures and Algorithms, Algorithm Design, Programming Paradigms

Research

Preprints

Why do Learning Rates Transfer? Reconciling Optimization and Scaling Limits for Deep Learning

arXiv 2024

L. Noci*, [Alexandru Meterez](#)*, T. Hofmann, A. Orvieto

Publications

Towards Training Without Depth Limits: Batch Normalization Without Gradient Explosion

ICLR 2024

[Alexandru Meterez](#)*, A. Joudaki*, F. Orabona, A. Immer, G. Rätsch, H. Daneshmand

Aligning Distant Sequences to Graphs using Long Seed Sketches

RECOMB 2023 & Genome Research (2023): gr-277659.123

A. Joudaki*, [Alexandru Meterez](#)*, H. Mustafa, R. Groot Koerkamp, A. Kahles, G. Rätsch

Towards Workflows for the Use of AI Foundation Models in Visual Inspection Applications

EUROSTRUCT 2023

M. Rigotti, D. Antognini, R. Assaf, K. Bakirci, T. Frick, I. Giurgiu, K. Janoušková, F. Janicki, H. Jubran, C. Malossi, [Alexandru Meterez](#), F. Scheidegger

*: Equal first authors

Experience

Max Planck Institute for Intelligent Systems (MPI Tübingen)

Tübingen, Germany

Research Intern

Nov. 2023 - May. 2024

- » Research in Deep Learning theory, specifically on the optimization landscape of models under Maximal Update Parametrization (μ P), supervised by Dr. Antonio Orvieto.

IBM Research

Zürich, Switzerland

Research Intern

Sept. 2022 - Feb. 2023

- » Used Neural Radiance Fields to inspect civil infrastructure for defects in the 3D domain and segment the defects on the surfaces, supervised by Dr. Florian Scheidegger and Dr. Cristiano Malossi.

Adobe

Bucharest, Romania

Software Engineering Intern

Jul. 2019 - Oct. 2019

- » Built the Frontend Regression Validator (FRED), a tool that uses deep learning for visual regression testing the layout of a website between deployments, supervised by Dr. Tiberiu Boros.

» Deployed FRED using Docker and built a web-based graphical user interface.

CAMPUS Research Institute, UPB

Student Researcher

Bucharest, Romania

Jul. 2018 - Jul. 2020

» Worked on computer vision for robotics, supervised by Prof. Iuliu Vasilescu.

Sparktech Software

Software Engineering Intern

Bucharest, Romania

Jul. 2018 - Oct. 2018

» Used NLP to build a recommender system for users in a social media platform designed for researchers.

» Used Kafka and Redis to connect the inference process between backend and frontend.

Teaching Experience

Big Data & Big Data for Engineers, ETH Zürich

Zürich, Switzerland

Teaching Assistant for 100+ students

2021 and 2022

Wrote exercises, held weekly teaching sessions and worked on [RumbleDB](#). Courses taught by Prof. Ghislain Fourny.

Analog Electronics & Digital Electronics, UPB

Bucharest, Romania

Teaching Assistant for 50+ students

2018 and 2019

Wrote exercises, held weekly teaching sessions and built electronic circuits. Courses taught by Prof. Iuliu Vasilescu.

Awards

Grade I Scholarship

2017

Granted by UPB to students with the best grades in the year ($\text{GPA} \geq 9.5$).

Performance Scholarship

2018

Granted by UPB to students with the best grades in the year ($\text{GPA} \geq 9.7$) that participated in extracurricular research and contests.

3rd place at the Robotics Student Science Fair

2018

Granted by UPB for building a system that a drone can use to plot its trajectory using optical flow, combining data from several sensors using a Kalman filter.

Qualified at the Romanian National Mathematics Olympiad

2014 and 2015

Qualified in high-school during my 11th grade and 12th grade.

Volunteering

CaCTüS Internship at MPI Tübingen

2024 (summer)

Project advisor for CaCTüS at MPI, addressed to talented students with financial or societal constraints.

References

Prof. Gunnar Rätsch, ETH Zürich

Contact: raetsch@ethz.ch

Prof. Francesco Orabona, KAUST

Contact: francesco.orabona@kaust.edu.sa

Prof. Iuliu Vasilescu, UPB

Contact: iuliu.vasilescu@cs.pub.ro