

Adrián Sager La Ganga

Computational Scientist & Engineer



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- Artificial Intelligence
 - Software Engineering
 - Applied Mathematics

EXPERIENCE

IBM Master Thesis

Sep. 2022 — Jan. 2023

IBM Research Zürich

Zürich, Switzerland

- Developed and validated novel AI-based metrics using uncertainty quantification (UQ) techniques, enabling automatic identification of sustainability in chemistry
- Leveraged BERT and XGBoost models to predict sustainable properties in chemical reactions, leading to more informed decision-making
- Enhanced Monte Carlo tree search algorithm by integrating AI-based metrics, ultimately enabling the identification of sustainable chemical synthesis paths

System Engineer (Full-time Intern)

Mar. 2022 — Sep. 2022

Beyond Gravity

Zürich, Switzerland

- Improved C++ rover simulation software under ESA's contract for the ExoMars mission:
 - Devised a Gaussian process regression (GPR) algorithm to enhance the accuracy of terrain images for the proposed landing site
 - Designed realistic visualization in a game engine (C#; OpenGL)
 - Created pseudo-3D engine for fast visualization
 - Conducted thorough analysis of simulation accuracy by validating with real test data

Data Scientist (Full-time Intern)

Mar. 2020 — May. 2020

Dynatrace

Hagenberg campus (Linz), Austria

- Worked in the Machine Learning research for anomaly detection and diagnostics team
- Streamlined Machine Learning algorithms by migrating from Python to Java, resulting in faster and more efficient processes

EDUCATION

Master of Science, Computational Science & Engineering, EPFL, Final GPA: 5.57/6.00

Sep. 2020 — Feb. 2023

Bachelor of Science, Computer Engineering, Polytechnic University of Turin, Final grade: 110/110

Oct. 2017 — Jul. 2020

AWARDS & INTERESTS

- 2022** 🎓 **Young Talents Fellowship** from the Swiss *National Centres of Competence in Research – Catalysis* to fund thesis on sustainability
- 2021** 👤 IEEE Member after participating in *IEEEExtreme* 24h programming competition
- 2021** 🚀 Member of the EPFL Spacecraft team in the system software pole
- 2021** 👤 Participated in EPFL's Quantum Computing hackathon
- 2019** 🏆 *European Innovation Academy*, 3-week startup competition (~200 participants):
 - **Awards:** **U.S. Provisional Patent** from Nixon Peabody; **Top Team;** *HAG Venture Accelerator award; 10-day Project and People Management Summer School*
 - Selected as CTO in a team of 5 ideating and presenting a prototype for safer space travel, including an investor pitch
- 2018** 🎓 Member of Eta Kappa Nu (electrical engineering and computer science honor society)
- 2017** 🏆 Awarded *Like@Home* hackathon *Reply* prize: Innovate in 24h in a team of 5 using Google's Voice Kit
- 2017** 🎓 Scholarship *ToPolito* (**top 17** best performing international engineering students)
- 2017** 🎓 Young Talents Project (**top 5%** best performing engineering students)

PROJECTS & RESEARCH

Computer Vision to stabilize video of a fly's neural activity, Ramdya Lab (EPFL)

Sep. 2021 — Jan. 2022

- Designed a novel stochastic and unsupervised metric based on the Wasserstein distance founded on desired properties, proven convergence, and conceptual accuracy
- Created $\times 770\%$ faster and $\times 186\%$ lower MSE transform than baseline
- Trained UNet and hypernetwork SOTA on big dataset exploiting dynamic memory allocation
- Achieved and analyzed $\times 1.4$ asymptotic speedup on non-linear optimal transport baseline using GPU

github.com/Sager611/stabilize2p

Develop Minimal Deep Learning Framework with Backprop, Deep Learning course (mandatory project; EPFL)

Apr. 2021 — Jun. 2021

Distributed Learning: Study of the most Efficient Topologies, Optimization for ML course (EPFL)

Apr. 2021 — Jun. 2021

github.com/eelismie/OptForML-Project

Deep Learning to predict stellar properties, Laboratory of Astrophysics (EPFL)

Mar. 2021 — Jul. 2021

- Trained a Denoising Autoencoder for interpolation of stellar spectra with secondary MLP head for multi-task regression
- $+20\%$ performance over literature by employing a Locally Connected Network with uncertainty estimation
- Accepted contract to continue documenting framework in July 2021

Machine Learning to predict protein pair interactions, Machine Learning course (EPFL)

Nov. 2020 — Dec. 2020

- Researched performance differences of Siamese CNN, XGboost with bayesian optimization, and an MLP

github.com/maximocrv/ml_protein_interactions

Investigated Quantum Limit of Path Integral and Ring Polymer MD in a Water Dimer,

Computational Methods in Molecular Quantum Mechanics course (EPFL)

Sep. 2020 — Jan. 2021

FPGA, CNN inference, Computer Architecture course (Polytechnic University of Turin)

Mar. 2019 — Jul. 2019

- Programmed 6 CNN layers for inference in an FPGA: 2D Convolution, Max/Mean Pooling, and Sigmoid/ReLU/Tanh activations
- Engineered block design leveraging DMA for CPU-FPGA transmission

gitlab.com/adriansagerlaganga/pynq-cnn-caffe

LANGUAGES

- English (fluent)
- German (B1.1)
- French (B1.1)
- Italian (fluent)
- Spanish (native)

SKILLS

Python	• Tensorflow/Keras	• PyTorch	• JupyterLab	• Scikit-learn	• SciPy	• Pandas	• OpenCV (cv2)	• Sphinx
	• JAX (basic)							
Programming	• C/C++	• CMake	• Docker	• SQL	• Java	• C# (basic)	• JavaScript	• HTML/CSS
	• React & Redux (basic)	• Assembly for GDB	• CUDA	• OpenMP				
Teamwork	• Agile (Scrum)	• JIRA	• Git					

ADDITIONAL ACADEMIC BACKGROUND

Multiprocessing Architectures	• Distributed Memory	• Datacenters	• GPU architecture	• ML Accelerators	• Cache Coherence
Advanced Algorithms	• Linear Programming	• Greedy	• Streaming algos.	• Randomized algos.	• Spectral Graph Theory
Information Security	• Binary exploits	• Web App Vulnerabilities	• TLS	• Applied Cryptography	• Database Security
	• Machine Learning and Privacy	• Blockchain and Decentralization			