Adrián Sager La Ganga
Computational Scientist & Engineer

🌐 Willing to relocate
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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
        👤 IEEE Member after participating in *IEEEXtreme* 24h programming competition
2021   🚀 Member of the EPFL Spacecraft team in the system software pole
        👤 Participated in EPFL's Quantum Computing hackathon
2019   🏆 *European Innovation Academy*, 3-week startup competition ($\sim$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
        🎓 Member of Eta Kappa Nu (electrical engineering and computer science honor society)
2018   🏆 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)
        🎓 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 • Slack • Trello

Additional academic background

Multiprocessing Architectures	• Distributed Memory • Datacenters • GPU architecture • ML Accelerators • Cache Coherence • Memory Consistency
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