DAVIDE PIRAS – dr.davide.piras@gmail.com – Website – LinkedIn – PhD thesis – Google Scholar

Summary

Physicist, ML researcher and AI consultant with a PhD in Data Science (UCL). 8+ years of experience applying machine learning to complex scientific and industry problems. Specialised in deep learning, Bayesian inference, statistical analysis and generative models to build efficient and scalable ML pipelines.

Work Experience

Freelance AI consultant – SQAIX since 2024

- Developing solutions to personalise education experience and improve food safety using AI-driven approaches.
- Discussing challenges with clients, delivering production-ready code, and developing bespoke AI-based solutions.

Postdoctoral researcher – University of Geneva since 2023

- Developed neural networks in JAX/TensorFlow, integrated them into differentiable pipelines for Bayesian analysis on GPUs, cutting processing time from years to hours with 100% accuracy.
- Developed variational algorithm to compress high-dimensional data and interpret them. My explainable variational autoencoder compresses sequential data by 500x while retaining 99% accuracy and being physically interpretable.
- Developing open-source software for scientific research (100+ GitHub stars), contributing to scientific ML applications.
- Producing scientific papers (more than 20 peer-reviewed articles, of which 10 as lead author) and writing grants.

Research fellow in explainable AI – University College London (UCL) 2021-2022

- Developed information-theoretic estimator for deep neural networks, published at NeurIPS (3K+ downloads, featured by IoP). Implemented the estimator combining sklearn Gaussian mixture models, Monte Carlo integration and bootstrapping.
- Started new collaboration with neuroscientists to use AI to discover intuitive physics in the human brain.
- Won Alan Turing Institute Post-Doctoral Enrichment Award to advance ML interpretability research.

Teaching assistant – London Business School 2018-2021

- Delivered basic and intermediate Python courses for Management, Finance, Decision Analytics, Business Administration.
- Supported students through lesson preparation, one-on-one mentoring, and group discussions.

R&D Intern – Faculty AI 2020

- Developed a variational algorithm in PyTorch to improve privacy for sensitive data by 10x with same accuracy.

Education

PhD in Data Intensive Science – University College London (UCL) 2017-2021

- Developed GenAI algorithms to accelerate Bayesian analyses of scientific data by several orders of magnitude. My generative convolutional adversarial network can reduce data generation time by 99.9% with 99% accuracy.
- Perren PhD Prize winner for exceptional PhD thesis. Doctoral Research Awards finalist (top 1% in UK).
- Strong interdisciplinary training in physics and data science, with bespoke courses and seminars.

Master's Degree in Physics – University of Padova, Italy 2015-2017

- 110/110 with honours. Advanced courses on theoretical and applied physics, mathematics, statistics, programming.
- Final project on modelling statistical effects in physical simulations using Python.
- Prize for best master's thesis in physics and best STEM student across the entire university.

Bachelor's Degree in Physics – University of Padova, Italy 2012-2015

- 110/110 with honours. Courses on theoretical and applied physics, calculus, chemistry, geometry, computational methods.

Skills (GitHub)

Deep Learning: TensorFlow (7+ years), JAX (4+ years), Keras (7+ years), PyTorch (5+ years)
Data Science: NumPy, SciPy, pandas, scikit-learn, seaborn
Software Development: Python, C++, Git, MATLAB, Fortran
High-performance computing hardware: GPUs, TPUs, CPUs, Google Colab, AWS, Slurm, PBS
Research: Generative models, Bayesian inference, Simulation-based inference, MCMC, Explainable AI