**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](https://www.sqaix.ch/) 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 improving process efficiency.

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 algorithms 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 15 peer-reviewed articles, of which 7 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).  
  Implemented the estimator combining sklearn Gaussian mixture models, Monte Carlo integration and bootstrapping.
* Won Alan Turing Institute Post-Doctoral Enrichment Award to advance ML interpretability research.

R&D Intern – [Faculty AI](https://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.
* 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.

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**](https://github.com/dpiras)**)**

**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