

Lukas Franken

✉ lukas.franken@ed.ac.uk • 📄 lukasfrankenq.github.io • 🌐 LukasFrankenQ

Education

PhD, Machine Learning/Engineering

University of Edinburgh

December 2024 (*exp.*)

- Geospatial machine learning: variance estimation, causal inference, dense features.
- Surrogate modelling, model predictive control and forecasting to evaluate the role of seasonal thermal storages in the energy transformation.
- Remote sensing: Object detection, transfer-learning.

MSc, Physics

University of Cologne

(*Distinction*)

March 2021

- Thesis: Stability in quantum natural gradient descent (1.0/1.0, Prof David Gross)
- Courses in statistical, computational and solid state physics.

BSc, Geophysics

University of Cologne

September 2017

- Thesis: Perturbation of solar wind by water vapor around dwarf planet Ceres (1.3/1.0, Prof Joachim Saur)
- Courses in foundational mathematics, physics and programming.

Experience

The Alan Turing Institute, London

Enrichment Scheme Placement

October 2022 - March 2023

- An opportunity for UK based machine learning PhD students to work in a shared environment to foster collaboration and exchange ideas.

PyPSA meets Africa Initiative

Project Lead

Since Summer 2021

- Code and Team lead in a project to infer the electric grid from satellite imagery using object detection and transfer-learning

Fraunhofer Institute IAIS, Sankt Augustin

Researcher

August 2019 - June 2021

- Research in machine learning (published at *ICLR* and *ESANN*).
- Public and science facing publications on quantum computing.
- Extensive coding along professionals, numerous talks, project organisation.

Selected Publications

Heating up decision boundaries: isocapacitory saturation, adversarial scenarios and generalization bounds.

Bogdan Georgiev, Lukas Franken, Mayukh Mukherjee. International Conference on Learning Representations 2021.

Gradient-free quantum optimization on NISQ devices. Lukas Franken, Bogdan Georgiev, Sascha Muecke, Moritz Wolter, Nico Piatkowski, Christian Bauckhage. 2022 IEEE Congress on Evolutionary Computation

Predicting dam locations in West Bengal using Gaussian processes and lightweight data fusion. Lukas Franken, John Fisher, Stephen James Lee. Work in progress.

Scholarships and Awards

- Full PhD Scholarship** funded by the EPSRC (~100 000 £).
- Enrichment Scheme Placement Award** 6 months research visit at the Alan Turing Institute (3 000 £)

Programming Skills

- Languages:** Python, Julia, MATLAB.
- Libraries:** sklearn, numpy, torch, scipy, pandas, geopandas, gdal, jax, detectron2, pypsa.
- Tools:** git, vim, cuda, oop design, unix, testing, Lint.
- Contributor:** atlite, a package to retrieve and transform weather data into renewable generation profiles.

Miscellaneous

- Activities:** Physics Bonn-Cologne Graduate School Student Representative: Event and tutoring organisation.
- Tutoring:** quantum information theory, partial differential equations.
- Reviewer** at AISTATS 2022.
- Cooking Enthusiast.** Favorites: italian cuisine, various curries, Kaiserschmarrn.