Daniel Lengyel

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Education

Imperial College London, *Department of Computing, PhD* *Expected Spring 2024*, London, UK
Topics: Numerical Differentiation, Interacting Particle Methods, Derivative Free Optimization, Design of Experiments.

UC Berkeley, *Applied Math, BA; Computer Science, BA* *May 2019*, Berkeley, US

Experience

GSA Capital, *Quant Research Intern* *London, UK*, Summer 2023
- Worked on efficient memory allocation on GPUs and modelling of order-book dynamics.

RISELab at UC Berkeley, *Research Assistant* *Berkeley, US*, Fall 2017–Fall 2019
- Developed an HVAC control algorithm that minimizes energy use while maximizing the comfort of occupants for the XBOS-DR project. Deployed at 10+ commercial buildings across California.

Salzburg Research, *Control and IoT Intern* *Salzburg, AT*, Summer 2017
- Created a self-driving slot-car from scratch. Full details on github.

Mint AI, *Data Scientist* *Vienna, AT*, Summer 2017
- Developed and implemented a recommender system based on user's value-investing beliefs and risk tolerance.

VRVis, *Virtual Reality and Graphics Intern* *Vienna, AT*, Summer 2016
- Developed a realistic real-time simulation of fire in a closed room for a VR fire-extinguishing training program.

Leadership and Teaching

Emeritus, *Subject Matter Expert in Predictive Analytics, ML and Optimization* *London, UK*, Fall 2023

Imperial College Business School, *Graduate Teaching Assistant* *London, UK*, Spring 2022–
Master's Courses: Mathematics for Finance (Fall 22), Computational Finance with C++ (Spring 22).

Imperial College London, Computing, *Graduate Teaching Assistant* *London, UK*, Fall 2019–
Master's Courses: Computational Finance (3x), Computational Optimisation (3x), Mathematics for ML, Deep RL.
Bachelor's Courses: Graphics, Computational Techniques: Linear Algebra and Differential Equations.

Quantum Computing at Berkeley, *Founder and President* *Berkeley, US*, Fall 2017-Spring 2019
- Established and taught "Intro to Quantum Computing" (DeCal).
- Won the best newcomers prize at Rigetti's QC Hackathon for our implementation of a Quantum SVM.
- Awarded the Student Technology Fund of over $\$15,000$.

Berkeley Energy & Resources Collaborative, *Undergrad President* *Berkeley, US*, Fall 2017-Spring 2019

Technical Skills

Languages: Python, CUDA, C++, Java, C, C#, Go, Javascript, Julia. **Frameworks**: Spark, Hadoop, gRPC.
Libraries: RAPIDS, Raft, CuML, Jax, Tensorflow, PyTorch, OpenGL, WebGL, OpenCV, Pandas, NumPy, scikit-learn.

Highlighted Papers

Completed

- **D. Lengyel**, P. Parpas, N. Kantas, N. R. Jennings. Curvature Aligned Simplex Gradient: Principled Sample Set Construction for Numerical Differentiation, Invited talk at ICCOPT, in review at IMA Numerical Analysis.
- R. Pandya, P. Parpas, **D. Lengyel**. From Plateaus to Progress: Unveiling Training Dynamics of PINNs, NeurIPS Machine Learning for Natural Sciences workshop, 2023.
- **D. Lengyel**, A. Borovykh. Efficient regression with deep neural networks: how many datapoints do we need?, NeurIPS Has it Trained Yet? workshop, 2022.
- **D. Lengyel**, J. Petangoda, I. Falk, K. Highnam, M. Lazarou, A. Kolbeinsson, M. Peter Deisenroth, N. R. Jennings. GENNI: Visualising the Geometry of Equivalences for Neural Network Identifiability, NeurIPS Differential Geometry meets Deep Learning workshop, 2020.

In Progress

- **D. Lengyel**, P. Parpas, N. Kantas, N. R. Jennings. Inverse Extended Kalman Filter: A Derivative-Free Optimization method via Simplex Gradients.