LORENZ WOLF

EDUCATION

MSc Statistics (Distinction, 84%) Imperial College London *2020 - 2021*
- Basil Furneaux Memorial Scholarship (full scholarship), Department of Mathematics Prize (for excellence in Statistics)
- Electives include Advanced Simulation Methods, Machine Learning and Deep Learning
- Dissertation: Variational Autoencoders on Hilbert spaces

First Class Honours (83%) BSc Mathematics with Statistics, Imperial College London *2017 - 2020*
- Modules: Among others Data Science (90%), Scientific Computation (90%), Statistical Learning (83%), Time Series (94%), Stochastic Simulation, Statistical Modelling
- Awards: Dean's List, First Year Project Prize, Representation Team of the Year, Society of the Year
- Additional Course: Entrepreneurship, Pass with Distinction

Marie-Curie-Gymnasium Kirchzarten, Germany *2008 - 2016*
- Abitur: Overall 1.0, best grade achievable
- Awards: DPG and DMV awards for excellency in Physics and Mathematics respectively
- Others: 'Schülerstudium' (Scholarship to study at university simultaneously), Student exchange Chile

RESEARCH EXPERIENCE & PROJECTS

MSc Dissertation, Supervisor Dr Duncan *June - September 2021*

Investigated the suitability of deep learning methods for functional data, linking ideas with functional analysis.
- Improved understanding of Functional analysis and Hilbert space theory.
- Worked on Variational Autoencoders on Hilbert spaces as generative models for functional data.
- Studied kernel induced representations of functions and the Signature transform
- Heavily used TensorFlow, Numpy and Scikit-learn for model development and evaluation in Google Colab and Azure
- Extended the model to a conditional model to deal with mode collapse and IAF to model more complex distributions.
- Communicated research in several presentations and co-authored paper submitted to AISTATS

UROP Statistically Modelling the Spread of HIV, Supervisor Dr Ratmann *August - September 2019*

EPSRC funded research project to investigate the spread of HIV through a phylogeographic analysis based on a continuous-time Markov model.
- Wrote research proposal and successful funding application
- Applied Bayesian Stochastic Search Variable Selection method to identify non-zero transmission rates
- Generated Bayes factor test to assign statistical support for transmission rates
- Wrote an R function streamlining the running of MCMC with BEAST

2nd Year Group Project (84%), Supervisor Dr Bodenham *June 2019*

In a group of five we studied the Energy Statistic and its application as a non-parametric two sample test for one- and multidimensional samples. Then presented Analysis to lecturers and students in a 30 minute presentation.
- Investigated the classes of U and V Statistics and the mathematical justification of the Energy Statistic as two-sample test.
- Implemented an algorithm to efficiently compute the Energy Statistic
- Conducted a simulation study to compare the test's performance to well- known two-sample tests
- According to supervisor more detailed and thorough analysis than anything previously published on the energy statistic.

1st Year Project (86%), Supervisor Dr Ratmann *June 2018*

Studied the influence of unemployment on the UK General Elections with a GLM analysis.
- Analysed the data with various tests and visualised the results with R
- My work was awarded the prize for the best project and my poster was presented at several university open days

Deep Learning *January - May 2021*
- Coded custom model layers such as ResNet blocks, callbacks, and training loops in TensorFlow
- Experience implementing, tuning, and evaluating Neural Network, CNN, VAE, and Normalising Flow models
- Automated hyper-parameter tuning with Bayesian optimisation
- Transfer learning for a personal project using pre-trained image feature extractor

Machine Learning *January - May 2021*
- Studied kernel methods including kernel PCA, kernel k-means and kernel Ridge regression.
- Analysed the impact of distance measures in hierarchical clustering.
- Fit Gaussian processes with gradient descent and investigated different kernels.

Big Data *January - May 2021*
- Leveraged big data technologies such as Hadoop and Spark to perform analysis on large data sets Implemented map reduce programmes, performed statistical analyses with spark mllib, and visualised the results
- Worked with sensor data concerning measurements taken in a building

Data Science *October 2019 - May 2021*
- Implemented Random Forest, Support Vector Machine and Neural Network Classifiers in Python and discussed the suitability of the different models for the given problem with a focus on interpretability and robustness.
- Built a tool combining several APIs in order to estimate the capacity of hospitals during the pandemic

WORK EXPERIENCE & TEACHING

UROP (Teaching Assistant), Imperial College London *August 2020*
Developed teaching materials for the multi-mode delivery of the undergraduate module 'Stochastic Simulation', which allowed me to look at the material from a fresh perspective.

Peer Tutor, Imperial College London *October 2019 - June 2020*
Lead weekly tutorial sessions with a group of first year students. Developed teaching and communication skills and the ability to foster a productive environment.

Technology Consulting Intern, Ernst & Young (London) *July - August 2019*
- Conducted data analyses to improve efficiency of clients' HR department
- Improved communication and presentation skills through various presentations in team internal and client meetings
- Built strong relationships with team and client
- Offered graduate position

TECHNICAL SKILLS & LANGUAGES

Software	R, Python (Pytorch, TensorFlow, Numpy, Pandas, SKlearn), Matlab, Spark
Languages	German (native), English (fluent), Spanish (Conversational)

LEADERSHIP ROLES & EXTRA-CURRICULAR

Vice President, Mathematics Society Imperial College London (elected) *June 2020 - June 2021*
Department Representative, Imperial College London (elected) *June 2019 - June 2020*
Treasurer, Mathematics Society Imperial College London (elected) *June 2019 - June 2020*
Year-2 Academic Representative, Imperial College London (elected) *October 2018 - June 2019*
Student Ambassador, Imperial College London *August 2018 - June 2019*

Other Interests
- McKinsey Keep in Touch programme
- Achieved 1^{st} Kyu in Karate, next belt is 1^{st} black belt
- Passionate about travelling, after my Abitur I took a gab year during which I worked for 3 months and then travelled around the world, I became more independent, and open minded
- As a volunteer with Techo, I worked in a team to build houses and water tanks in poor areas of Valparaíso , Chile