

# Pavel Berkovich

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## Education

2018–2019 **University College London**, *MSc Computational Statistics and Machine Learning*  
Courses include: *Deep & Reinforcement Learning (DeepMind)*, *Statistical Data Analysis*,  
*Unsupervised Learning & Approximate Inference (Gatsby Unit)*, *Supervised Learning*  
Thesis: *Variational Non-Parametric Modelling of Spatiotemporal Signals* (top 3% in class)

2013–2016 **University of Cambridge**, *BA (Hons.) Computer Science*  
Courses include: *Stochastic Modelling*, *Artificial Intelligence*, *Numerical Methods*, *Algorithms*,  
*Digital Signal Processing*, *Fourier Methods*, *Information Theory*, *Information Retrieval*

## Publications

arXiv GP-ALPS: Automatic Latent Process Selection for Multi-Output Gaussian Process Models,  
*2nd Symposium on Advances in Approximate Bayesian Inference*, Vancouver, 2019 (preprint)

## Professional Experience

May 2019–  
present **Invenia Labs**, *Gaussian Process Forecasting*, Machine Learning Researcher  
Using multi-output Gaussian Processes to explore dynamics of electric grids

Aug 2016–  
Aug 2018 **Morgan Stanley**, *Securitized Products Group*, European Risk Modelling  
Present-value pricing and predictive risk modelling for European asset-backed securities

Jun-Aug  
2015 **Morgan Stanley**, *FX Electronic Market Making*, Summer Intern  
Improved latency of high-frequency DMA system, reducing transaction costs for clients

Jun-Aug  
2014 **University of Cambridge**, *Computer Laboratory*, Systems Research Intern  
Modelling and simulation of communication protocols in distributed IoT systems

## Technical Expertise

### Data Analysis

Statistics GAMs, MLE, Hypothesis Testing, Stochastic Processes, MCMC, Resampling  
Time-Series HMMs, State Space Models, Gaussian Processes, ARMA, (G)ARCH, VAR models

### Machine Learning

Supervised Neural Networks, Kernel Methods, Decision Trees, Ensembles, SVMs, Online Methods  
Unsupervised Clustering, VAE, (P)PCA / FA, Mixture Models, ICA, LDA, t-SNE, Graphical Models  
Reinforcement Multi-Armed Bandits, Policy-Gradient Methods, Markov Decision Processes, Q-Learning

### Computing

Programming Python (PyTorch, Tensorflow, Keras, Pandas), Julia, C++, R, Kdb+/Q, SQL, MATLAB  
Tools Excel, Jupyter, Git, Unix, Bokeh, L<sup>A</sup>T<sub>E</sub>X, PowerPoint, HTML/CSS, Markdown, BUGS

## Selected Projects

- Adapting Google Brain's state-of-the-art [Transformer](#) seq2seq deep neural attention model to the [task](#) of automatically translating natural language to SQL queries
- Using HMMs to model the eruption pattern of the [Old Faithful](#) geyser
- Breaking substitution ciphers using the Metropolis-Hastings MCMC sampling algorithm
- Using GLMs to explain variations in level of nitrogen oxide in ambient air over time