

# Aditya Ravuri

STATISTICIAN · DATA SCIENTIST

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## Education

### University of Cambridge

PHD IN COMPUTER SCIENCE

Cambridge, UK

Oct. 2021 - Present

- **Focus:** Probabilistic Machine Learning. Supervised by Prof. Neil Lawrence and funded by the Accelerate Programme for Scientific Discovery.

### University of Cambridge

MPHIL IN MANAGEMENT

Cambridge, UK

Oct. 2016 - Jun. 2017

- Commendation (70%). **Focus:** Strategic Valuation (top prize), Economics. **Audits:** Measure Theory, Philosophy of Science, Physics.
- Jaguar Land Rover consulting project: Modeled the contribution of JLR to the UK economy in a highly collaborative setting. Conducted **original research** on improving the accuracy of input-output multipliers. Highly commended for the work and presentation.
- Coloplast Internship (Aug. '17): Aided implementation of a time series forecasting model (involving splines, linear filters and ARIMA error processes) and automated model fitting.

### Heriot-Watt University

BSC HONS IN ACTUARIAL SCIENCE, **STATISTICS MAJOR**

Edinburgh, UK

Sep. 2013 - Jun. 2016

- **Awards:** Distinction (83%) (top 3%), CT1-8, Volunteering - Bronze (ChessSoc President, Student Union Exec, Mentor). Obtained BSc at age 18.
- **Focus:** Statistics, Quantitative Risk Management, Mathematical Finance. **Project Areas:** GARCH models, copulas, extreme value theory, stochastic calculus, liquidity risk, economic scenario generators and advanced statistical inference. Published in the actuarial magazine.

## Skills

**Programming** R, Python, C/C++ (basic), SQL (basic), Stan, PyTorch, Tensorflow

**Languages** English, Japanese (basic), French (basic), Hindi, Telugu

**Others** Other probabilistic programming languages, ggplot, data.table, git, LaTeX, astrophotography

## Side Projects

**Web** falmity.com: Personal projects (e.g. speech synthesis using Gaussian processes) and minimal examples (e.g. MGCV GAMs as GPs, the Griffin-Lim algorithm, sparse GPs, state-space models). Cross Validated: (Stats Stack Exchange) top 2% contributor in 2018.

**Code** Contributed to SciPy (added an efficient Toeplitz matrix-vector product function), SymPy (fixed a bug in the symbolic multivariate normal density calculation), GPyTorch (added a missing data likelihood class). Co-wrote the code for the paper below, in pyro and gpytorch for running variational GPLVMs with encoders and normalizing flows.

**Papers** Lalchand, V., **Ravuri, A.** and Lawrence, N. D. (2020). *Variational Gaussian Process Latent Variable Models with Normalising Flows*. A smaller part of the work titled "GPLVFs for Massively Missing Data" was accepted at AABI 2021.

## Employment

### Barclays

QUANT ANALYST + DEVELOPER

London, UK

Dec. 2018 - Sep. 2021

- Designed and productionized large-scale statistical models for balance sheet simulation of term deposits and loans, accounting for customer behavior and economic trends. Modeling mainly involved Markovian models, GAMs and time series models.
- In addition to this, I assisted with and reviewed other model implementations (e.g. for current accounts, savings and mortgages). I also piloted new tools, created knowledge-bases, worked on automation and performed exploratory work to identify areas of efficiency (e.g. with Spark, Rcpp, Docker). In some cases, I reduced execution times from days to seconds.

### Sciemus

DATA SCIENTIST + STATISTICIAN

London, UK

Sep. 2017 - Dec. 2018

- Was involved with building and maintaining end-to-end stats/tech related solutions, particularly in the space, weather and power business areas. This involved data cleaning, analysis, modeling, documentation, web-app development and deployment (using Shiny, Dash, Flask), basic server and database maintenance (using postgres), research and development of infrastructure (e.g. aiding development of a distributed computing cluster on AWS).
- On the modeling side, I've worked with GLMs for assessing risk probabilities, Hidden Markov models & sparse Gaussian Processes to model rates based on large-scale weather data, importance sampling & subset simulation to accelerate simulations and other ideas in Bayesian statistics.