James Ritchie

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Education

- **University of Edinburgh** **Edinburgh, UK**
  PhD in Machine Learning *September 2018 - March 2023*

  Thesis: Bayesian Inference for Challenging Scientific Models
  Supervisor: Professor Iain Murray
  Successfully applying recent advances in probabilistic machine learning, deep learning and statistics to do Bayesian modelling with complex models of scientific phenomena with extremely large datasets, including problems from physiology and astronomy.

- **University of Edinburgh** **Edinburgh, UK**
  MSc(R) Data Science *September 2017 - August 2018*

  Result: Distinction
  Thesis: Bayesian Hyperparameter Optimisation with Progressively Larger Models

- **University of Cambridge** **Cambridge, UK**
  MEng MA Information and Computer Engineering *October 2010 - June 2014*

  Result: Honours with Merit

Professional Experience

- **Amazon** **Berlin, DE (Remote)**
  Applied Science PhD Placement *September 2021 - November 2021*
  - Working on recommender systems in the Amazon Music ML team.
  - Implemented and evaluated a new learning-to-rank approach using deep learning.
  - Passed placement review with excellent feedback.

- **University of Edinburgh** **Edinburgh, UK**
  Teaching Support Provider *September 2018 - August 2022*
  - Tutoring and marking for postgraduate-level machine learning courses alongside PhD studies.
  - Nominated for the ‘Best Student Who Teaches’ award in 2019.
  - Student Feedback:
    - “James was very approachable and answered questions in a way that you understood the material easily, which I greatly appreciated in a really hard course.”
    - “The tutorials were very enjoyable and interesting . . . The instructor for my group, James Ritchie, was very helpful and took the time to explain concepts that anyone in the group was struggling with.”

- **Kriya (formerly MarketFinance)** **London, UK**
  Data Scientist *December 2015 - August 2017*
  - Created machine learning models for loan pricing and marketing at a financial technology startup specialising in invoice financing.
  - Worked as part of an agile team with stakeholders across the business to identify and solve problems using data.
  - Helped users across the business get the data visualisations and tables they needed using the Looker BI platform.

- Achievements included:
  - Scraping and cleaning data from the Companies House API and using it to train a machine learning model to identify sales leads, which the sales team then converted into customers.
  - Took the initiative to implement a new ETL pipeline from the company platform to our data warehouse, which vastly increased reliability compared to the old system.
  - Built an application for the risk team to scrape news stories about companies and perform sentiment analysis using machine learning. This successfully flagged issues with customers faster than the credit-scoring agencies.

- **Skin Analytics** **London, UK**
  Software Engineer *July 2014 – February 2015*
  Startup using computer vision and machine learning for skin cancer diagnostics. Worked with the CTO and image processing engineers on infrastructure and apps for the company's products.

- **OpenLabTools Project** **Cambridge, UK**
  Team Member *June 2013 – August 2013*
  Project funded by the Raspberry Pi foundation, as part of a team designing and building low cost open-access scientific tools.

- **Shelter Associates** **Pune, India**
  Volunteer Software Developer *July 2012 – September 2012*
  Engineers Without Borders UK placement, volunteering with a local Indian NGO involved in slum redevelopment in the state of Maharashtra. Developed a web application to gather and analyse survey data on urban populations.

- **Thales Optronics Ltd.** **Glasgow, UK**
  Software Engineering Intern *August 2011 - September 2011*

- **Thales Optronics Ltd.** **Glasgow, UK**
  Year in Industry Software Engineering Intern *August 2009 - August 2010*

Open Source Software

- **scikit-rvm** *github.com/JamesRitchie/scikit-rvm*
  Implementation in Python using the scikit-learn API of the Relevance Vector Machine (RVM) technique used for probabilistic regression and classification in machine learning. I gave a lightning talk on this project and scikit-learn development in general at PyData London.

Awards

- **Cside 2018 Model 1 Winner**
  Achieved first place in an inference competition to determine the parameters of ordinary differential equations and gave a talk at the associated conference.

Skills and Technologies

Programming Languages: Python, R.

Machine Learning/Statistics: Bayesian inference, deep learning, numerical optimisation, hyperparameter optimisation, data visualisation, NumPy, SciPy, scikit-learn, Pandas, PyTorch, Jax, Matplotlib, BI Platforms (Looker)

Software Engineering: Version control (Git), unit testing, continuous integration, web application development, cloud computing (AWS), Linux, SQL (PostgreSQL, Amazon Redshift).