Thomas M. McDonald

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Education

PhD in Computer Science

The University of Sheffield *2020–Present*

- I am working in the probabilistic machine learning group under the supervision of Dr Mauricio. Álvarez.
- My research is focused on Bayesian deep learning, specifically deep Gaussian processes, latent force models and combining the advantages of physically-inspired and deep probabilistic models.

MSc Data Analytics

The University of Sheffield, Distinction (78% average) *2019–2020*

- Involved courses on machine learning, natural language processing, parallel computing and statistical modelling, amongst other topics.
- The focus of my dissertation research project was the development of a probabilistic *deep latent force model*, under the supervision of Dr Mauricio Álvarez.

BSc Physics

The University of Sheffield, 1st Class (76% average) *2015–2018*

- Studying Physics equipped me with a solid mathematical foundation in vector and differential calculus, linear algebra, probability and statistics, as well as developing my ability to solve problems creatively.
- My undergraduate research project involved investigating the correlation between cellular motility and protein distribution via analysis of microscopic images using MATLAB.

Experience

Graduate Teaching Assistant (GTA) **Sheffield, UK**

The University of Sheffield *Oct. 2020 – Present*

- I have worked as a GTA on a number of different courses within the Faculty of Engineering, and currently assist with postgraduate-level courses focused on machine learning, handling data at scale using Spark and High Performance Computing infrastructure.

Pricing Analyst **Leeds, UK**

ENGIE Power Limited. *Oct. 2018 – Aug. 2019*

- My role involved employing statistical modelling to forecast national non-commodity cost components and mitigate the level of risk involved in signing energy supply contracts.
- Implemented seasonal ARIMA forecasting models in Python, with the models routinely returning $<1\%$ error on predictions made three months ahead of time.
- Improved functionality of the VBA gas and electricity price matrices.

Publications, Talks & Reviewing

Publications

- Compositional Modeling of Nonlinear Dynamical Systems with ODE-based Random Features.
  T. M. McDonald, M. A. Álvarez.
  Conference on Neural Information Processing Systems (NeurIPS), 2021.

- The University of Sheffield at CheckThat! 2020: Claim Identification & Verification on Twitter.
  T. McDonald, Z. Dong, Y. Zhang, R. Hampson, J. Young, Q. Cao, J. L. Leidner and M. Stevenson.
  Conference and Labs of the Evaluation Forum (CLEF), Thessaloniki, 2020.

Invited Talks

- Deep Latent Force Models
  The 3rd Sheffield Workshop on Structural Dynamics, 7th-10th December 2020.

Reviewing

- Invited reviewer for AISTATS 2022 (Valencia, Spain)

Summer Schools

- **2021 Oxford Machine Learning Summer School**
  $\sim$ 6% acceptance rate.
- **2020 & 2021 Gaussian Process Summer School**
  Attendee in 2020, organising committee in 2021.

Technical Skills

Languages: Python, C, R, MATLAB, VBA **Data Handling**: NumPy, pandas, Spark
Machine Learning: PyTorch, GPyTorch, TensorFlow, scikit-learn, SciPy
Miscellaneous: Git, GitHub, LaTeX, OpenMP, CUDA, LabVIEW, Excel

Awards & Scholarships

EPSRC Scholarship: In 2020, I was awarded a 3.5 year scholarship from the Engineering and Physical Sciences Research Council (EPSRC) in support of my PhD research project.

epiGenesys Scholarship: I was one of three taught postgraduate computer science students in the 2019/20 academic year to receive a scholarship from software company epiGenesys.

Black & Gold Award: In May 2018, I received this award for sustained commitment and outstanding contribution to sport during my three years with The University of Sheffield baseball team as a member, club secretary, and later club president.