Jamie McGowan

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I am a committed researcher with excellent communication skills. My research interests lie within the **interpretability** and training of **Generative AI** models. I have hands-on experience in prototyping state-of-the-art techniques and proposing research that can **produce value** through products/services. I am fascinated by learning and I seek to understand and exploit this in making **computers more intelligent**.

INTERESTS

Deep Learning | Mathematics | **Artificial Intelligence** | Physics | **Neuroscience** | Machine Learning

EDUCATION

UNIVERSITY COLLEGE LONDON
PH.D. IN THEORETICAL PHYSICS
October 2022 | London

UNIVERSITY OF LEEDS
MPHYS (HONS) IN THEORETICAL PHYSICS
June 2018 | Leeds
Grade - 1:1

SHREWSBURY SIXTH FORM
A-LEVELS: MATHEMATICS (A*), PHYSICS (A*), BIOLOGY (A)
June 2014 | Shrewsbury

SKILLS

PROGRAMMING
Python • FORTRAN • C++ • Git • LaTeX • Bash • Swift • HTML

LIBRARIES
PyTorch • TensorFlow • Keras • Numpy • Scikit-Learn • Pandas • TensorBoard • And others...

REFEREES

Available upon request

For more information please scan the QR code!

RESEARCH EXPERIENCE

SENIOR RESEARCH SCIENTIST | MEDIATEK RESEARCH
Oct 2022 - Present | London

- Led and contributed towards projects associated with the interpretability and application of **Generative AI**.
- Heavily involved in developing new and scalable **optimisation techniques** for pretraining and finetuning LLMs.
- Investigated techniques to enable the application of large AI models in **low resource** environments.

PH.D. STUDENT | MSHT PARTON DISTRIBUTION FUNCTIONS
Oct 2018 - January 2022 | London

- Computational modelling of a variety of unknown **higher order functions** in perturbation theory, describing quantum interactions within particle collisions.
- Fitting approximate theory to datasets via Hessian methods to gain a handle on the **theoretical uncertainties** present in physical quantities calculated in quantum field theory.
- High impact and award winning paper/thesis detailing methodology and results.

MACHINE LEARNING FELLOWSHIP | ASOS
January 2022 - October 2022 | London

- Funded short term **fellowship** to work collaboratively with the Machine Learning team at ASOS working on an industry project.
- Built a prototype system to **predict customer returns** using Graph Neural Networks.
- As a fellow in the project I also **supervised three MSc students** who worked in our team as part of their final project.
- Outcome was a **submission** to the ACM Conference on Recommender Systems.

RESEARCH INTERN | MEDIATEK RESEARCH
June 2020 – Sep 2020 | Cambourne, Cambridge

- Meta-Learning project based on an adaptation of the MAML algorithm for **hierarchical learning**. Working with Python and PyTorch.
- Achieved superior performance compared to similar meta-learning algorithms on **NLP tasks** by exploiting prior knowledge of the language tree.
- Co-authored and published the paper **Cross-Lingual Transfer with MAML on Trees**.

RESEARCH COLLABORATOR | THE ALAN TURING INSTITUTE
April 2021 | London

- Two week intensive 'hackathon' working with ML techniques to produce a **podcast recommendation algorithm**.
- Made use of NLP techniques and various **topic modelling** approaches to achieve the desired outcome.
- **Organised and built** the API for the project from scratch.

COMPUTER VISION PROJECT COLLABORATOR | UKAEA
Jan 2019 – May 2019 | Didcot, Oxford

- Proof of concept project to show that the **calibration of images** from 'shaky' cameras inside a **fusion reactor** could be automated.
- Extensive pre-processing of images using libraries such as OpenCV.
- Compared and contrasted custom and 'off-the-shelf' **ML techniques**.

FURTHER EXPERIENCE

LOCAL ICML ORGANISER | MediaTek Research & UCL

July 2024 | London

- Managed and organised a local meetup for ICML 2024 in London including multiple talks and more than 30 posters.
- Obtained funding from multiple institutions for the event.
- Gathered over 200 attendees from multiple academic and industry affiliations together.

MPHYS STUDENT | Unification of the Standard Model

Oct 2017 – May 2018 | Leeds

- Explored various **unification group** candidates including $SU(5)$, $SO(10)$ and E_6 with and without supersymmetry.
- Used the **running coupling** results to predict the mass scales in the symmetry breaking chain.
- Modelled the predictions using **minimisation techniques** in Python.

UNDERGRADUATE SUMMER RESEARCH | Theoretical & Condensed Matter Research Groups

June 2015 – May 2018 | Leeds

- Two **research projects** undertaken as an undergraduate working on thin film magnets and theoretical phases of matter.
- Made use of various pieces of **lab equipment** to design, build and test carbon based thin-film magnets.
- Computationally modelled **phases of matter** called 'Time Crystals' by manipulating Hamiltonian systems.

TEACHING ASSISTANT | University College London

Jan 2019 – Present | London

- Physics mentor for lower years during my undergraduate studies, providing **weekly workshops** to discuss topics in a small group.
- Postgraduate teaching assistant leading and assisting in **workshops for undergraduate modules** in Maths, Physics and Computing; marking coursework and exams; and answering student forum questions online.
- 3+ years experience in teaching **undergraduate Python** and 2+ years experience teaching **Software Carpentry** (mixture of Bash, Git and Python) at a postgraduate level.

STUDENT AMBASSADOR | University of Leeds

Jan 2015 – June 2018 | Leeds

- Student **ambassador for Physics**, representing the course at university events whilst giving **talks and tours**.
- Consulted on changes that would **affect undergraduates** (such as the construction of the new Physics building).
- Meeting and discussing with alumni and donors of the university at **networking events**.

PHYSICS COMMITTEE MEMBER | University of Leeds

Mar 2016 – May 2017 | Leeds

- Responsible for **organising trips** to Amsterdam and CERN in Geneva.
- **Applied for funding** to make the trips accessible to all students from **all backgrounds**.
- Able to bring the cost down to £5 per person through several grants championing inclusivity in the Physics society.

AWARDS

HIGH ENERGY PHYSICS PRIZE | 2023

- Highly competitive prize awarded to the **best overall and most impactful** thesis submission of the year.

RESEARCH & LEADERSHIP SCHOLARSHIP | 2015 - 2018

- One of two students selected to receive this scholarship across the faculty of Mathematics and Physical Sciences.
- Included funding for **summer research placements** within two different research groups as an undergraduate.
- Extensive development of **leadership and teamwork skills** through funded training provided by the scholarship.
- Regular opportunities through networking events with alumni and donors of the university to give **talks on my experiences and research**.

DEANS EXCELLENCE SCHOLARSHIP | 2014 - 2018

- Awarded to the **top performing students** in Physics & Astronomy.
- Continued to hold this award **throughout undergraduate** studies.

LIST OF PUBLICATIONS

CROSS-LINGUAL TRANSFER WITH MAML ON TREES | EACL Adapt-NLP, 2021
J. Garcia, F. Freddi, F. Liao, J. McGowan, T. Nieradzik, D. Shiu, Y. Tian and A. Bernacchia

MSHT20 N^{3}LO PARTON DISTRIBUTION FUNCTIONS WITH THEORETICAL UNCERTAINTIES | European Physical Journal C, January 2023
J. McGowan, T. Cridge, L.A. Harland-Lang and R. Thorne

A DATASET FOR LEARNING GRAPH REPRESENTATIONS TO PREDICT CUSTOMER RETURNS IN FASHION RETAIL | FashionXRecSys, 2022
J. McGowan, Ziyang Yan, Elizabeth Guest, Cong Zheng, Charlie Donaldson, Daniel Bunting, Neha Patel, Mason Cusack, Sofie de Cnudde, Fabon Dzogang

RECOMMENDATION SYSTEMS FOR PODCAST DISCOVERY | The Alan Turing Institute, 2021
R. Chan, J. Choudhari, J. Fitzgerald, J. Gamper, O. Glowka, E. Loghmani, J. McGowan, V. Pope, I. Price, K. Roster and L. Zhang

POPULAR SCIENCE ARTICLES

TOPIC MODEL BASED RECOMMENDATION SYSTEMS | Towards Data Science, 2021
J. McGowan

WHAT ACTUALLY HAPPENS IN A PARTICLE COLLISION? | Particle Physics 101, 2021
J. McGowan

CAN MACHINES DREAM? | Towards Data Science, 2021
J. McGowan

GRADIENT DESCENT: OPTIMISATION AND INITIALISATION EXPLAINED | Towards Data Science, 2023
J. McGowan

A DEEP DIVE INTO IMAGEN | Towards Data Science, 2023
J. McGowan

AGI, AI, DL, ML...WHAT'S THE DIFFERENCE? | The Startup, 2021
J. McGowan

RECENT PUBLIC PRESENTATIONS

BEYOND NNLO IN GLOBAL PDF FITS | International Symposium of Multiparticle Dynamics, 2022, Scotland

MSHT20 APPROXIMATE N^{3}LO PARTON DISTRIBUTION FUNCTIONS WITH THEORETICAL UNCERTAINTIES | International Workshop on Deep-Inelastic Scattering and Related Subjects, 2022, Santiago de Compostela | IOP HEPP & APP Annual Conference 2022, RAL Oxford

PREDICTING CUSTOMER RETURNS WITH GRAPH NEURAL NETWORKS | UCL Centre for Doctoral Training in Data Intensive Science Event, 2022, London

PODCAST RECOMMENDATIONS WITH MACHINE LEARNING | The Alan Turing Institute Data Study Group, 2021, London