# James Chapman

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## Skills

**Programming Languages (years):**
🐍Python (6), ®R (2), MATLAB (2), >_Bash (4), 🗄SQL (2), ☕Javascript (beginner)

**Machine Learning Tools:**
TensorFlow, PyTorch, Lightning, Scikit-Learn, Pandas, NumPy, SciPy, Jax, HuggingFace

**Machine Learning Techniques:**
Deep Learning, NLP, Computer Vision, Self-Supervised Learning, Reinforcement Learning

**Software Development:**
gitGit, ⚙CI/CD (CircleCI, ⦿GitHub Actions), 🐞Unit Testing (Pytest) ▤Documentation (Sphinx)

## Education & Qualifications

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|---|---|
| 2019 - present | **University College London** *PhD + MRes (Distinction) funded by i4Health CDT*<br>• Researched scalable GPU optimized algorithms for Interpretable Multiview Machine Learning with High-Dimensional Biomedical Data |
| 2013 - 2017 | **University of Oxford** *MEng Engineering, Economics & Management, 1st Class* |
| 2008 - 2013 | **Wellington College** *5 A-Level A\*s (Further) Maths, Physics, Chemistry, Economics* |

## Key Publications

- "Efficient Algorithms for the CCA Family: Unconstrained Objectives with Unbiased Gradients." Presented at ICLR 2024. *Developed an algorithm for efficiently solving classical ML problems including PCA, addressing large-scale data challenges in computer vision. Implemented in Jax.* [Code]

- "CCA with Shared Weights for Self-Supervised Learning." Presented at NeurIPS 2023 Workshop. *Innovated a self-supervised representation learning technique, using PyTorch and Lightning for GPU-optimized computer vision applications.* [Code]

## Software Projects

- **CCA-Zoo**: A comprehensive collection of multimodal machine learning methods integrated with scikit-learn. Modern CI/CD pipelines, robust testing, ML pipeline integration.⦿ CCA-Zoo ★ 161

- **Document-Explorer**: A Large Language Model (LLM) tool to query all of the documents in a project folder. Simple frontend with PySimpleGUI. ⦿ Document-Explorer

## Work Experience

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|---|---|
| 2019 - present | **University College London**, *Assistant Lecturer + Teaching Assistant*<br>• Lectured and designed coursework on *Foundations of AI* and taught *Supervised Learning*, *Numerical Optimisation*, and *Machine Learning for Domain Specialists*. |
| 2022 | **Bank of England**, *PhD Intern: Advanced Research & Outreach*<br>• Solved previously intractable DSGE models using Reinforcement Learning (PPO) in PyTorch, enabling more realistic models of human behaviour. [Code] |
| 2017 - 2019 | **M&G**, *Analyst: Systematic Investment Research Team*<br>• Built version 1 of the €209m Global Maxima quantitative fund using Caret in R.<br>• Built a proof-of-concept tool to analyse newsflow using NLP (word2vec, NLTK) and topic modelling (LDA). |

## Outside of Work

≋ **Rowing** with Vesta Rowing Club, ⚽ **Reading FC** fan for 20 years, and keen follower of 🏎 **Formula 1**