James Mann

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Education

University College London **Computer Science BSc** **Sept 2024 – May 2027**

- First Year Representative of the AI society
- Relevant Classes: Principles of Programming, Theory of Computation, Algorithms, Software Engineering, Computer Architecture and Concurrency, Logic, Object-Oriented Programming, Security

Carmel College **A Levels** **Sept 2017 – May 2024**

- A*A*AA (Maths, Further Maths, Physics, Computer Science)
- A* EPQ, Can a neural network be called artificial intelligence
- Elected Head Student

Experience

Bruker **Machine Learning Experience Week** **March 2023**

- Applied a **Convolutional Neural Network** to X-Ray Diffractometers, yielding a **100x** speedup in sample alignment times
- Actively engaged with a novel architecture designed for their machines
- Independently developed a **Streamlit** web interface so users could interact with the models and visualise data

Projects

Transformer from scratch github ⧉

- Implemented the **Transformer** architecture inspired by the paper **Attention is All You Need** with only **Numpy**
- Used an **Object Oriented** approach with a library of layers that were stacked to create the transfomer
- Implemented the backpropagation algorithm in order to train the transformer for next token prediction

Conditional Diffusion Model for Image Generation kaggle ⧉

- Implemented a **Denoising Diffusion Probabilistic Model** in **Pytorch** trained on CIFAR100 to generate novel images, iteratively improving the architecture and optimising hyperparameters
- Created a webapp to interface with the model using a **Flask** / **Postgresql** backend to store images, all self hosted on a Raspberry pi

Extended Project on Aligning Deep Learning Models PDF ⧉

- Engineered a trained **Convolutional Neural Network** to classify bird species
- Designed **Mechanistic Interpretation** functionality to construct human friendly visualisations of learnt features
- Practically discussed and critically analysed key ethical questions about AI

Technologies and Interests

Languages: Python, C, Javascript, SQL

Technologies: Pytorch, Tensorflow, Flask, Postgresql, Numpy, Pandas, Raspberry pi

Interests: Rowing, Chess, Reading, Running, Football