Callum McMahon

mcmahon.callum@gmail.com
07576 630365
callummcmahon.github.io

Education

University College London Sep 2019–Sep 2020
M.Sc in Machine Learning, Distinction with 89% average

- Thesis: On Stylistic differences between 3D meshes
- Modules: Supervised learning, Unsupervised learning, Machine vision, Reinforcement Learning, Statistical natural language processing, Inverse problems, Applied ML, Intro to Deep Learning

University of St Andrews 2016–2019
B.Sc in Mathematics, First Class Honours

- Dean's list for academic excellence awarded for all three years of study

Teesside High School 2014–2016
A-levels: A* Mathematics, A* Further Mathematics, A* Physics

Projects

- **M.sc Thesis (Python, Pytorch, 2020)**
  Translation of 2D image style techniques to 3D meshes. Generalisation to arbitrary meshes over SOTA methods. Debugged and extended functionality of underlying model code base.
- **B.sc Dissertation (Pytorch, openCV, 2019)**
  Full implementation of a custom bounding-box detector for the card game Dobble, from data collection, annotation, model implementation and training, as well as deployment.
  Superhuman performance achieved at over 95% accuracy at 25 predicted frames per second.
- **Evolutionary algorithm (Java, 2018)**
  Implemented a neural network from first principles, controlling an agent in a purpose-built environment. Trained using a neuro-evolutionary algorithm.
- **NLP group research project (Pytorch, 2020)**
  Increased medical code prediction score by 1% over previous SOTA as measured by F1 and AUC score using contextualised word embeddings.
  Decreased training times from 13 to 1.5 minutes per epoch by caching contextualised embeddings.
  Interpretable contributions by comparing levels of contextualisation of medical words to common vocab.
- **Datascience competitions (Scikit-learn, Jupiter Notebooks, 2018-2020)**
  Placed top-10% in four different online data science competitions. Extensive experience with data exploration, as well as hyper-parameter tuning.
- **Bloomberg CodeCon 2017 (Python)**
  Placed 5^{th} at the St Andrews qualifiers, making it to the London finals.

Experience

Hamilton Branding (Full-stack web dev., Part-time, Sep 2017 –Sep 2019)
Built websites for 8 business clients. Custom store location map solution using MySQL, php and Google Cloud.

Total Treasury (Internship, July 2017 –Sep 2017) Visualised colleagues' positions from real-time Bloomberg API data. Summarised financial news in a weekly report read by company executives.

Skills

- **Deep Learning:** Pytorch, JAX, keras, CUDA-accelerated GPUs
- **Visualisations:** Interactive notebooks, web front-end for results
- **Scalable code:** Git, tests, debugging, time complexity analysis
- **Linux:** SSH, Bash, Docker, LaTeX typesetting, comfortable in a terminal

Languages

- **Python (5 yrs experience):** Pytorch, Numpy, Scikit-learn, matplotlib, pandas, openCV
- **R (3 yrs experience):** tidyverse (dplyr, ggplot2)
- **Working knowledge of:** Java, Julia, SQL, PHP, Visual Basic, Fortran