

Joe Makepeace - CV

Socials

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GitHub: github.com/MiscellaneousStuff

Work Experience

Apidura Ltd February 2023 – November 2023
Consultant ML Specialist

- Trained a bespoke object detection model to recognise bike rims with high recognition accuracy and bike wheel location accuracy. Model currently being deployed to automate detection and sizing of bike wheels during user journey. Model achieved mAP@0.5 score of 0.995 which supports 100+ concurrent users on a single CPU Core. Strong performance across different edge cases with low number of trained images.

Technologies used: Python, YOLOv8, Flask, Jupyter Notebook, Docker, Git, Matplotlib, Pandas.

NDA (Cybersecurity Company) April 2023 – October 2023
Consultant Software Engineer / UX Designer

- Re-imagined and redesigned the user experience for the Realtime Dashboard.
- Improved main dashboard page loading time from 2.9 seconds down to 0.8 by improving efficiency of backend calls from the frontend.

Technologies used: HTML5, VanillaJS, Bootstrap, Python, Flask, Bash, SSH.

NDA (AI Tech Startup) October 2022 – December 2022
Consultant ML Specialist

- Created a custom training pipeline which transforms original images to create an augmented dataset to train an object detection model.
- Applied custom training pipeline on over 2,000 training images to create an augmented dataset which was used to recognise digital and analogue odometer readings from dashboards with the bespoke system is now being scaled up by the startup for new projects to deliver crucial functionality for new customers.

Technologies used: AWS Lambda, Python, Git, Bash.

Hackathon Achievements

Anthropic London Hackathon – 2nd Place / 60+ teams 4th November 2023 – 5th November 2023
Project: aGP Chat (Data Sovereignty App) - Team Won \$2k / \$5k Claude Credits

- LLM-based tool which uses Retrieval Augmented Generation (RAG) to gain personalised insights across NHS data, Deliveroo orders, Google history, etc. Featured in a [post](#) on Anthropic's main LinkedIn page.

Gen AI Hackathon – 1st Place / 10 teams 11th November 2023 – 12th November 2023
Project: Lip2Nav (Speech Impairment Accessibility App) - Solo Won \$100k Amazon AWS Credits

- Conceived and developed an AI-based lip-reading technology to aid deaf or speech-impaired individuals in hands-free navigation. This project addressed a significant need for 10/11 million hard of hearing people. Exclusive hackathon with competitors ranging from Google Deepmind, Tesla, Ocado, Amazon, etc.

Education

MEng Computer Science – Merit (68%)
University of Portsmouth

September 2022 – June 2023

Modules: Parallel Programming, Scientific Computing and Simulation, Applied Data and Text Analysis, Computer Vision, Industrial Project

Industrial Project: Semantic Identification of Vehicles Through Traffic Junctions. [GitHub](#).

- Lead programmer and system architect working on the group project, in collaboration with Portsmouth City Council and Colas to identify, count and track vehicles and pedestrians through traffic junctions.
- This is used to infer the usage of routes by different vehicle types (incl. HGVs) and pedestrians.
- System runs continuously on Nvidia Jetson Nano, scraping traffic data for clients to analyse across weeks or months' worth of traffic data to gain insight into vehicle and pedestrian habits.
- Analytics used to assess wear and tear of different roads and pedestrian patterns considered for advertising purposes.

Technologies used: Python, ReactJS, Express, SQLite, PyTorch, Docker, TensorRT, YOLOv8, StrongSORT, HLS Livestreaming, Neptune.ai.

BSc Computer Science - 2:1, 3.42 GPA
University of Portsmouth

September 2018 – June 2022

Dissertation: Surface Electromyography (sEMG) Silent Speech Classification

- Novel training method combining state-of-the-art (SOTA) silent speech transduction and fine tuning of an ASR model to achieve SOTA silent speech classification.
- Final Method reduces required training dataset from 3,817 hours down to 33 hours (x115 dataset reduction) while maintaining similar accuracy (69% WER)
- Also performed ablation on required voiced and silent dataset partitions required to achieve maximum performance.

Technologies used: Python, PyTorch, Neptune.ai.

Projects

OpenAI Whisper (CPU) – Dynamic Quantization
Machine Learning Optimisation

September 2022 – November 2022

- Benchmarked OpenAI's Whisper model with PyTorch's dynamic quantization optimisation applied.
- Demonstrated up to 2.76x model speedup with almost no model modification required.
- Cloned over 3,000 times and discussed in popular machine learning YouTube channel, Yannic Kilcher. (nearly 200k subscribers).

Technologies used: Python, PyTorch.

PyLoL

November 2020 – August 2021

League of Legends v4.20 Reinforcement Learning Environment

- Created and maintained an open-source, OpenAI gym reinforcement learning environment used by over 3,000 users.
- Worked with a pair of researchers to create adversarial agents for the environment which maintain a 50% win rate against each other, but learnt increasingly sophisticated strategies.

Technologies used: Python, C#, Redis, PyTorch, Keras, Neptune.ai.