DANIEL DAVIES

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OVERVIEW

I am a diligent and hardworking **Machine Learning Engineer** with a passion for solving complex real-world problems for both business and humanity. **Artificial Intelligence MSc with Distinction** and **BSc First-Class Honours** degrees at Brunel University of London have given me a strong knowledge across a range of areas including deep learning, machine learning, exploratory data analysis, data cleaning, data visualisation, and software engineering. I have also enjoyed working in teams to complete various projects both in business and at university and am comfortable taking leadership roles.

Completing my MSc dissertation, "On Novel Approaches Towards Interpretability: Training and Understanding Turing-LLM-1.0-254M", enhanced my abilities in problem-solving, programming, and project management. I **trained a novel large language model** from the ground up and developed **mechanistic interpretability** approaches for understanding internal features within the model. Build a tool to help illustrate the value of this research, now available on https://turingexplorer.com.

Currently working at Projekt Rising Ltd, where I enjoy contributing in a collaborative team environment to develop cutting-edge artificial intelligence applications. This role has provided me with excellent experience in both technical development and client-facing responsibilities.

TECHNICAL SKILLS

- Extensive knowledge in **Deep Learning** and **Data Analysis**
- Confidence in **Python** (including **PyTorch** and **TensorFlow**) through university and personal projects
- Proficiency in **JavaScript** (including **React.js** and **Node.js**), **HTML**, and **CSS** through work, university, college, and personal projects
- Experience in **R** and **Tableau** through university and personal projects

I am excited to learn any skills necessary to solve problems. See https://github.com/DanielJamesDavies for my most recent personal projects.

WORK EXPERIENCE

Machine Learning Engineer
Projekt Rising Ltd | September 2022 – Present

- Automation – Built several artificial intelligence systems to automate time-intensive processes.
- Tools - Developed tools at scale for organisations to easily construct different types of desired content and documents through a language interface.

EDUCATION

Artificial Intelligence MSc
Distinction
Brunel University of London | September 2023 – December 2024

Deep Learning	A*	Machine Learning	A*
Predictive Data Analysis	A+	Critical Analysis of Modern Data	A+
Artificial Intelligence	A	Quantitative Data Analysis	A

Computer Science (Artificial Intelligence) BSc
First Class Honours
Brunel University London | September 2019 – July 2022

BTEC Level 3 Extended Diploma in IT & GCSEs
West Herts College | *September 2017 – June 2019*
Triple Distinction Star (D*D*D*)

Kings Langley Secondary School | *September 2012 – June 2017*
8 GCSEs including Mathematics and English

KEY PERSONAL PROJECTS

Turing-LLM Explorer

https://turingexplorer.com | https://github.com/DanielJamesDavies/Turing-LLM-Explorer

A mechanistic interpretability tool to understand the internals of Turing-LLM, a large language model. Using this tool, one can navigate the sparse autoencoder latent space of Turing-LLM-1.0-254M and gain an understanding of how language models function internally. Run inference on Turing-LLM and view connections between top latents to better understand how latents work together to form "thoughts".

Used Python, PyTorch, NumPy, Flask, React, JavaScript, and more.

On Novel Approaches Towards Interpretability: Training and Understanding Turing-LLM-1.0-254M

https://github.com/DanielJamesDavies/Turing-LLM-1.0-254M

Trained "Turing-LLM-1.0-254M", a novel large language model built from the ground up, specialised in physics, computing, and mathematics. Developed novel mechanistic interpretability approaches for understanding large language model latents and how they interact. Implemented a synthetic dataset generation system, with its output used to train the LLM. Trained sparse autoencoders for each layer of the novel LLM to find features within activation space. Evaluated the success of the novel interpretability approaches by applying them to latents within "Turing-LLM", including sparse autoencoder features.

Used Python, PyTorch, NumPy, Hugging Face Transformers, and more.

Atlas Story App

https://www.atlas-story.app | https://github.com/DanielJamesDavies/AtlasStoryApp

Developed a large platform for users to create and share stories. Built a large number of features including the ability to create interactive 3D and 2D maps of a story's universe, character relationship charts, Spotify integration, structured story content creation (for characters, plots, locations, etc), a user account system, and much more.

Used React, Node.js, Three.js, MongoDB, Heroku, and more.

Algonet / The Prediction of Energy Consumption of Algorithm Implementations

https://github.com/DanielJamesDavies/Algonet

A project for my BSc dissertation that produced a model that predicts energy consumptions of algorithm implementations. Data was collected by running various types of algorithms on devices and recording their energy consumption.

Used Python, PyTorch, NumPy, scikit-learn, SciPy, JavaScript, and more.

REFERENCES

References available on request.