NVIDIA - AI Showcase

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UNIVERSITY OF
LIVERPOOL

Showcase event – Unlocking the Future AI & Data Science Research at the University of Liverpool

VEC UNIVERSITY OF LIVERPOOL

Unlocking the Future AI & Data Science

Link-to-Workshop

- Half day discussion/overview of UoL research teams usage of AI
  - Significant usage across the University!
  - Some interesting developments and thoughts on cross-departmental research
  - 16 "Elevator pitches" discussing ongoing work throughout the University.

NVIDIA AI Showcase - Overview

Civic Data Innovation: Ellie Fielding and Seonaid Lafferty shared outcomes from the Liverpool Residents' Assembly on AI and introduced the Data Action Accelerator—a multi-sectoral approach to applying data science in public health and policy.

Clinical AI Applications: Junior doctor Callum Cook presented challenges and opportunities for using AI to interpret EEG data in encephalitis diagnostics, particularly in under-resourced contexts.

Environmental Modelling: Prof Nicoletta Leonardi presented deep learning models applied to eco-geomorphology and long-term coastal interventions.

Veterinary Big Data: Prof PJ Noble introduced PetBERT, an NLP-powered system for animal health surveillance based on millions of veterinary records.

Satellite Imagery for Policy: Ron Mahabir showcased IMAGO, a Turing-backed project to make satellite data usable in public health and the social sciences.

Knowledge Graphs & AI: Valentina Tamma highlighted the growing role of semantic technologies in AI, and the work of the Knowledge Graph Turing Interest Group.

Industry Partnerships: Yang Zhang demonstrated how the Virtual Engineering Centre supports local SMEs and academic collaboration, including social listening projects and enzyme innovation.

Personalised AI Tools for Inclusive Impact: Julia Andrusiak explored how AI systems can support marginalised groups, such as disabled individuals navigating government services, offering insights into bias detection, procedural clarity, and value-driven design across sectors.

- Broad usage of AI
  - LLMS
  - NNs
  - Generative AI
  - AI for Imaging

- But also
  - "I have an idea/dataset and I think we could use AI"

NVIDIA AI Showcase - Overview

- **Innovation in Medical Imaging**: Alex Hill presented research on bedside, low-dose 3D X-ray imaging (OptiX project), with implications for personalised healthcare, early diagnosis, and safer care environments, in collaboration with industry through the LIV.INNO CDT.

- **Cybersecurity & Autonomous Defence**: Valerio Selis showcased CRoCS, a neural-symbolic autonomous agent platform using Transformer-in-Transformer models and LLM-guided adaptation for real-time cyberattack mitigation and network resilience.

- **Pharmacological Data Integration**: Prajith Kumar Introduced PKRxiv, a flexible open-access platform for pharmacokinetics data sharing, featuring visualisations, anonymised data contributions, and advanced search features to support global research and regulatory collaboration.

- **Climate-Resilient Urban Planning**: Yuan Shi demonstrated how AI, GIS, and remote sensing support climate-adaptive urban design, urban heat island mitigation, and environmental health, using local and global datasets for sustainable city planning.

- **AI in Particle Physics**: John Anders and Team highlighted how Liverpool researchers contribute to CERN's ATLAS experiment, using AI for detector calibration, particle classification, and data selection—bridging discoveries in high-energy physics with real-world applications like healthcare diagnostics.

- **AI for Misinformation Detection**: Guangliang Cheng presented research on visual language model (VLM)-powered systems for detecting deepfakes and multimodal misinformation, funded by the Alan Turing Institute under the "Security for All" EPSRC programme.

- **Design and Creativity with AI**: Pardis Biglarbeigi Explored the intersection of AI with human creativity, focusing on how generative AI is used in design thinking and innovation workflows across disciplines—raising questions about authorship, inspiration, and human-AI collaboration.

- **AI for Economic Forecasting** : Prof Rahul Savani Presented a novel general-purpose large language model (LLM) benchmark for economic tasks, evaluating reasoning and accuracy in models like GPT-4 and Claude. His research helps set the foundation for AI models that support robust, transparent, and trustworthy economic decision-making.

- Broad usage of AI
  - LLMS
  - NNs
  - Generative AI
  - AI for Imaging
  - This group!

- But also
  - "I have an idea/dataset and I think we could use AI"

NVIDIA AI Showcase - NVIDIA Tools

- NVIDIA Tools showcase
  - Additionally at the end of the session Paul Graham (NVIDIA) outlined support for academia through grants, GPU resources, teaching kits, developer programs, and university ambassador training to accelerate AI research and adoption.

- There were quite a few slides on potential physics usage/packages
  - Such as heat flow over PCBs
  - Turbulent flow over wind turbines
  - (more options too, please check the slides!)
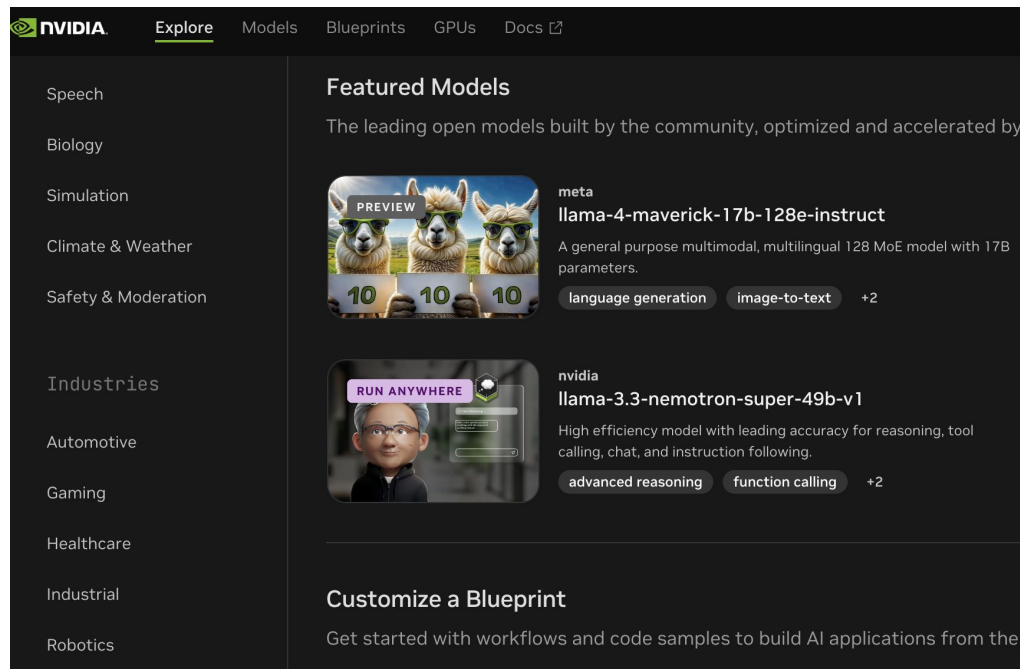
NVIDIA AI Showcase - Conclusions

- Obviously quite a lot of usage of AI through the UoL
  - Most of the topics seem to be LLM based
  - On the medical side, the "analysis of clinical AI data to assist with diagnosis" is probably one of the topics where our work is more easily applicable and could be very interesting
  - Potentially interesting to discuss with the "Satellite imaging" researchers (overlap with imaging?)
  - During a lunch session, a researcher from the School of Life sciences and I discussed a potential collaboration investigating the effects of air quality on health

- Unfortunately due to the session running over time further discussions weren't really possible
  - The discussion session at the end of the day was cancelled due to time constraints…

- Next step, upcoming NVIDIA AI Day (date TBC)