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Advances in Data Science & AI Conference 2024

by

INSTITUTE FOR DATA SCIENCE AND ARTIFICIAL INTELLIGENCE

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3rd - 4th June

Hyatt Regency Manchester

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The 2024 Advances in Data Science and AI Conference is brought to you by The Institute for Data Science and AI which delivers the Data Science and AI theme within The University of Manchester's Digital Futures platform

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Content

Welcome

Professor Magnus Rattray
Director of the Institute for Data Science and AI
The University of Manchester

Welcome to The University of Manchester's Seventh Annual Advances in Data Science and AI Conference

The University's Data Science Institute was founded in 2016 and in 2018 we joined the Alan Turing Institute and rebranded to the Institute for Data Science and Artificial Intelligence (IDSAI).

This has been an exciting year for AI, with continued advances in generative models for language and images, but also with an increasing awareness of the need to deliver trustworthy and reliable technology. In this year's meeting, we have an exciting programme that includes the latest developments in AI Fundamentals, NLP and robotics, as well as impactful applications in health, science, engineering and more.

Conference Organisers:

- Professor Magnus Rattray
- Professor Sophia Ananiadou
- Associate Professor Wei Pan
- Assistant Professor Mingfei Sun

Follow and contribute to the live conference discussion on X (Twitter) using #ADSAI2024

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Programme

Day 1

09:00	**Registration**
09:30	**Welcome | Introduction Day 1** Professor Magnus Rattray | Director of Institute for Data Science & AI at The University of Manchester
09:40	**Robot Control, Learning & Teleoperation** Professor Chenguang Yang | Chair in Robotics at the Department of Computer Science at The University of Liverpool
10:20	**Spotlight Talk 1**
10:35	**Spotlight Talk 2**
10:50	**Refreshments | Networking**
11:20	**Bridging Cognitive Neuroscience with Robotics to Design Robots for Societal Applications** Professor Agnieszka Wykowska | Senior Researcher Tenured - Principal Investigator at The Italian Institute of Technology
12:00	**Lunch, Sponsored by TICM | Networking | Poster Session**
13:20	**The Challenges of Applying Artificial Intelligence to Electronic Health Records** Professor Christopher Yau | Senior Research Fellow at the Big Data Institute at The University of Oxford
14:00	**Spotlight Talk 3**
14:15	**Transforming Healthcare with Advanced Dialogue Systems** Dr Tulika Saha | Lecturer (Assistant Professor) in the Department of Computer Science at The University of Liverpool
14:55	**Refreshments | Networking**
15:20	**Towards Application of AI in Clinical Practice** Dr Claudia Lindner | Senior Research Fellow and Sir Henry Dale Fellow at The University of Manchester
16:00	**Panel Session**
16:30	**Closing Remarks** Professor Magnus Rattray | Director of Institute of Data Science & AI at The University of Manchester
16:40	**Drinks Reception, Sponsored by ELLIS | Networking | Poster Session**
18:00	**Event Close**

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INSTITUTE FOR DATA SCIENCE AND ARTIFICIAL INTELLIGENCE

Programme

Day 2

08:30	**Registration**
09:00	**Welcome | Introduction Day 2** Professor Magnus Rattray | Director of Institute of Data Science & AI at The University of Manchester
09:05	**The "BERT moment" for Music: Large-Scale Self-Supervised Training for Acoustic Music Understanding** Professor Chenghua Lin | Professor of Natural Language Processing at The University of Manchester
09:45	**Spotlight Talk 4**
10:00	**Spotlight Talk 5**
10:15	**Spotlight Talk 6**
10:30	**Refreshments | Networking**
11:00	**Natural and Programming Language Models** Dr Fenia Christopoulou | Senior Research Scientist at Huawei Noah's Ark Lab based in London, UK
11:40	**Spotlight Talk 7**
11:55	**Lunch | Networking | Poster Session**
13:15	**AI for Materials Discovery and Simulation** Dr Robert Pinsler | Senior Researcher at Microsoft Research Cambridge
13:55	**Spotlight Talk 8**
14:10	**Environment Generation for Deep RL** Dr Michael Dennis, Research Scientist at Google DeepMind
14:50	**Refreshments | Networking**
15:20	**The Role of Causal AI in Personalised Medicine** Professor Sotirios A. Tsaftaris | Chair in Machine Learning and Computer Vision at the University of Edinburgh
16:00	**Spotlight Talk 9**
16:15	**Closing Remarks** Professor Magnus Rattray | Director of Institute of Data Science & AI at The University of Manchester
16:25	**Event Close**

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Speakers

Professor Chenguang Yang

Chair in Robotics in the Department of Computer Science, University of Liverpool

Professor Chenguang (Charlie) Yang holds the Chair in Robotics with Department of Computer Science, University of Liverpool, UK. He is a Fellow of Institute of Electrical and Electronics Engineers (IEEE), Institute of Engineering and Technology (IET), Institution of Mechanical Engineers (IMechE), Aisa-Pacific AI Association (AAIA), and British Computer Society (BCS). He is the corresponding Co-Chair of IEEE Technical Committee on Collaborative Automation for Flexible Manufacturing (CAFM), an Editor-in-Chief of Robot Learning, a Specialty Chief Editor for Computational Intelligence in Robotics of Frontiers in Robotics and AI, and a Senior Editor of IEEE Transactions on System, Man and Cybernetics: Systems. He was the President of Chinese Automation and Computing Society in the UK (CACSUK), and have served as general chair of the 27th International Conference on Automation and Computing (ICAC) and the 25th IEEE International Conference on Industrial Technology (ICIT). He was awarded EPSRC Innovation Fellowship and EU FP-7 Marie Curie International Incoming Fellowship grant. As the lead author, he received the prestigious IEEE Transactions on Robotics Best Paper Award (2012) and IEEE Transactions on Neural Networks and Learning Systems Outstanding Paper Award (2022). **Read more about Professor Chenguang**

Talk Title

Robot Control, Learning & Teleoperation

Abstract

Nowadays robots are expected to be of increasing intelligence to deal with a large range of tasks. Especially, robots are supposed to be able to learn skills from our humans and perform dexterous manipulation in a human-like manner. A number of learning algorithms and techniques have been developed and successfully implemented for various robotic tasks. Among these methods, learning from demonstrations (LfD) enables robots to effectively and efficiently acquire skills by learning from human demonstrators, such that a robot can be quickly programmed to perform new tasks. This talk will present my recent research progress on human-in-the-loop learning for robots to acquire and generalize manipulation skills. It will also introduce my studies on human-like control design inspired by human motor behaviours from more than a decade ago. The control and learning technologies I developed have been particularly applied to robot teleoperation, for which I have also extensively investigated the human-robot interaction interface. This talk will also cover my recent work on teleoperation for minimum invasive surgery and ultrasound scanning.

Professor Agnieszka Wykowska
Senior Researcher Tenured - Principal Investigator at the Italian Institute of Technology

Professor Agnieszka Wykowska **leads the unit S4HRI** "Social Cognition in Human-Robot Interaction" at the Italian Institute of Technology (Genoa, Italy), where she is also the **Coordinator of CHT** (the Center for Human Technologies). At IIT, she is also a member of the Board of the Scientific Director. In addition, she is an adjunct professor of Engineering Psychology at the Luleå University of Technology as well as visiting professor at The University of Manchester.
Read more about Professor Agnieszka

Talk Title

Bridging Cognitive Neuroscience with Robotics to Design Robots for Societal Applications

Abstract

As robots are believed to soon populate human environments, they have received enthusiastic support in the scientific community. Most research aims at designing robots with better capabilities to interact with humans. However, there is also the human side to the human-robot interaction. In my lab, we focus on examining the human socio-cognitive mechanisms in interaction with robots. We use cognitive neuroscience methods to understand how social signals, such as gaze contact, initiated by a humanoid robot, influence attentional orienting, or social decision making. We also address the topic of joint action and sense of agency when humans work with robots to achieve a common goal. Finally, our research is also related to the question of whether and under what conditions humans treat robots as social partners and intentional agents. I will present these research themes in my talk and discuss them in a broader context of developing robots for societal applications.

Professor Christopher Yau

Senior Research Fellow at the Big Data Institute at The University of Oxford

Christopher is a Professor of Artificial Intelligence based at the Big Data Institute in Oxford working across the Nuffield Department of Women's and Reproductive Health and the Nuffield Department of Population Health. They are also a Turing AI Fellow and their research is support by a UKRI/EPSRC Turing AI Acceleration Fellowship. Outside of Oxford, Christopher is also a PhD Programme Director at Health Data Research UK, leading the Health Data Research UK-Turing Wellcome PhD programme in Health Data Science.

Read more about Professor Christopher

Talk Title

The Challenges of Applying Artificial Intelligence to Electronic Health Records

Abstract

The analysis of Electronic Health Records (EHRs) using Artificial Intelligence (AI) is a seemingly perfect combination of a rich data resource and a body of advanced learning techniques. AI could form the basis of algorithms that can interrogate patient medical histories and provide individual-level predictions of disease risk, optimal treatment recommendations and enable early prevention of health conditions. This talk will describe recent innovations by the AI community which has seen the emergence of clinical foundation models to provide general purpose machinery for analysing EHRs. I will describe how these developments have been biased by the scarce availability of EHR data sets as well as misunderstandings with respect to the genuine clinical applications. Finally, I will address the challenges with deploying clinical foundation models in real-world use in the context of current medical device regulation.

Dr Tulika Saha

Lecturer (Assistant Professor) in the Department of Computer Science at The University of Liverpool

Tulika is a Lecturer (Assistant Professor) at the Department of Computer Science in the University of Liverpool (UoL), United Kingdom. She is a part of the Natural Language Processing group at UoL. Prior to joining UoL, Tulika worked with Prof. Sophia Ananiadou, as a postdoctoral researcher at the National Centre for Text Mining (NaCTeM), The University of Manchester, UK. She earned her Ph.D. in 2021 from Indian Institute of Technology Patna, India (IITP).

Read more about Dr Tulika

Talk Title

Transforming Healthcare with Advanced Dialogue Systems

Abstract

In recent years, two prominent types of Dialogue Systems (DS) have emerged: Modularized Dialogue Systems and End-to-End Generation Models. In this talk, we will delve into both paradigms through the lens of healthcare applications. Modularized Dialogue Systems offer robustness and interpretability, making it well-suited for applications such as Disease Diagnosis Assistants capable of assisting healthcare professionals by providing accurate and reliable diagnostic support whereas End-to-End Generation Models facilitates more natural and fluid interactions, which is particularly beneficial for developing Motivational Virtual Assistants aimed at mental health analysis. These systems can engage users in meaningful conversations, providing emotional support and promoting mental well-being. By examining these two paradigms, we aim to highlight their respective contributions and potential in revolutionizing healthcare through advanced dialogue systems.

Dr Claudia Lindner

Senior Research Fellow and Sir Henry Dale Fellow at The University of Manchester

Claudia is a Senior Research Fellow and Sir Henry Dale Fellow at The University of Manchester. Her career includes over 20 years of international experience in the development and application of computational methods, working within multi-disciplinary teams in both industrial and academic settings. Claudia uses methods from computer vision, machine learning and data science to develop automatic systems for analysing structures in medical images. She is dedicated to impactful research, actively advancing her work towards real-world solutions. In her role as the Translation Lead for the Christabel Pankhurst Institute for Health Technology Research and Innovation, she focuses on enhancing the academic research culture to facilitate the translation of research outcomes into benefits for society.

Read more about Dr Claudia

Talk Title

Towards Application of AI in Clinical Practice

Abstract

Artificial intelligence (AI) has the potential to transform healthcare by enhancing diagnostic accuracy, optimising treatments, and improving patient outcomes. This talk aims to provide an overview of the opportunities and challenges associated with AI in medical imaging, advocating for a holistic approach that considers translational hurdles from the outset.

Through case studies, I will illustrate how advanced algorithms can enhance automation and precision in diagnosing and treating musculoskeletal conditions. Additionally, I will address the data challenges inherent in developing clinical AI applications, including issues related to data availability, quality, and diversity, emphasising the need for robust AI models. Finally, I will explore the pathway to clinical implementation and discuss strategies for developing AI technologies for clinical settings.

Professor Chenghua Lin

Professor of Natural Language Processing at The University of Manchester

Chenghua Lin is a Professor of Natural Language Processing in the Department of Computer Science at The University of Manchester. His research interests lie in the integration of machine learning and NLP for language generation and understanding, as well as representation learning and generation for music. He has received several prizes and awards for his research, including a CIKM Test-of-Time Award and an INLG Best Paper Runner-up Award. He is the Secretary of the ACL SIGGEN Board, a Member of the IEEE Speech and Language Processing Technical Committee, and a founding Advisor of the Multimodal Art Projection community. His research has been supported by grants from EPSRC, ESRC, Innovate UK, BBC, and Tencent.

Read more about Professor Chenghua

Talk Title

The “BERT moment” for Music: Large-Scale Self-supervised Training for Acoustic Music Understanding

Abstract

In this talk, I will first introduce MERT, an acoustic music understanding model based on large-scale self-supervised training and is akin to the “BERT moment” in NLP, but for Music. We have successfully trained a family of MERT models (with model sizes including 95M and 330M parameters), which demonstrated excellent performance on 14 Music Information Retrieval (MIR) tasks. To address the significant absence of a universal and community-driven benchmark for music understanding, we further developed MARBLE, a universal MIR benchmark. MARBLE facilitates the benchmarking of pre-trained music models for 18 tasks on 12 publicly available datasets, offering an easy-to-use, extendable, and reproducible evaluation suite for this burgeoning community.

Dr Fenia Christopoulou

Senior Research Scientist at Huawei Noah's Ark Lab based in London, UK

Fenia is a Senior Research Scientist at Huawei Noah's Ark Lab based in London, UK. Before joining Huawei in 2021, she spent a year as a postdoctoral researcher at the NaCTeM group of The University of Manchester. She obtained her PhD in 2020 from The University of Manchester, supervised by Prof. Sophia Ananiadou. During her studies, she interned at the National Institute of Advanced Industrial Science and Technology (AIST) in Tokyo, where she worked with Professor Makoto Miwa on Information Extraction problems. She also holds a combined BSc-MSc from the National Technical University of Athens, Greece in Electrical and Computer Engineering.

Read more about Dr Fenia

Talk Title

Natural and Programming Language Models

Abstract

Representing different types of language equally well is an important step towards general language understanding in Language Models. This becomes more challenging when we consider atypical language structures, such as inputs of multiple languages or heavily structured languages like code.
In this talk I will describe our work on models dealing with two different language types: natural languages beyond English and programming languages such as Python. The first part will focus on the natural phenomenon of code-switching among multilingual speakers and how we can take advantage of it to improve Multilingual Language Models. The second part will discuss the task of code synthesis, i.e. converting natural language to code via dedicated Code Language Models.

Dr Robert Pinsler

Senior Researcher at Microsoft Research Cambridge

Robert is the Senior Researcher at Microsoft Research Cambridge working on machine learning for materials discovery. Previously, he was a PhD student at the Machine Learning Group of the University of Cambridge, supervised by Prof. Carl E. Rasmussen and advised by Dr. José Miguel Hernández-Lobato. During his PhD, Robert worked on active learning and sequential decision-making approaches, including Bayesian batch active learning and reinforcement learning for robotics and molecular design.

Read more about Dr Robert

Talk Title

AI for Materials Discovery and Simulation

Abstract

The design of functional materials with desired properties is essential in driving technological advances in areas like energy storage, catalysis, and carbon capture. AI for Materials Discovery and Simulation aims to significantly accelerate this process. In the first part of this talk, I will introduce MatterGen, a novel diffusion-based model that generates stable, diverse inorganic materials across the periodic table and can further be fine-tuned to steer the generation towards a broad range of property constraints. In the second part of this talk, I will present MatterSim, a deep learning model for efficient atomistic simulations at first-principles level and accurate prediction of broad material properties across the periodic table, spanning a wide range of temperature and pressure conditions.

Dr Michael Dennis

Research Scientist at Google Deepmind

Michael is currently a Research Scientist on Google Deepmind's Openendedness team. He was previously a Ph.D. Student at the Center for Human Compatible AI (CHAI) advised by Stuart Russell. Prior to research in AI, Michael conducted research on computer science theory and computational geometry.

Read more about Dr Michael

Talk Title

Environment Generation for Deep RL

Abstract

Generative world models have emerged as a promising path towards supplying Deep RL algorithms with a scalable supply of interactive data. We will discuss the recent Genie model, the first generative interactive environment model trained completely from internet videos, and the implications of this approach for RL algorithm design. When training agents in these simulated generative environments we can loosen many of the standard assumptions — we can assume environments are resettable and reconfigurable. As an example of the power of breaking these assumptions, we discuss the rapid progress in Unsupervised Environment Design (UED) leveraging increased flexibility in configuring environments to make increasingly general and robust RL agents.

Professor Sotirios A. Tsaftaris

Chair in Machine Learning and Computer Vision at The University of Endinburgh

Professor Sotirios A. Tsaftaris, widely known as Sotos, is Chair in Machine Learning and Computer Vision at the University of Edinburgh. He also holds the Canon Medical/Royal Academy of Engineering Research Chair in Healthcare AI. He is the Director of the EPSRC-funded AI Hub for Causality in Healthcare AI with Real Data (CHAI). He leads VIOS a collaboration across industry and universities developing interdisciplinary AI. He is a Fellow of the European Laboratory for Learning and Intelligent Systems (ELLIS). Since 2023 he is a visiting researcher with Archimedes RC a research centre of excellence in AI in Athens, Greece. Between 2017-2023 he was a Fellow of the Alan Turing Institute.

Read more about Professor Sotirios

Talk Title

The Role of Casual AI in Personalised Medicine

Abstract

To realise the true potential of a fair AI in precision and personalised medicine requires that we understand cause and effect relationships. I will use a motivating example on how unfairness arises in retrospective use of archival healthcare data when training predictive models. I will present recent methodological work from our team that bridges diffusion models with causal reasoning, causal discovery and causal representation learning in imaging settings where dimensionality is high. I will then discuss the challenges of making progress in devising and applying causal AI in real healthcare data. I will use this to motivate the need for a large scale academic and stakeholder ecosystem that can work together to make progress against research and practical challenges. I will close by presenting the recently funded, CHAI - EPSRC AI Hub for Causality in Healthcare AI with Real Data, which aims to build such ecosystem to make advances in causal AI for health.

Spotlight Talks

Spotlight Talk 1: Understanding Algorithmic Fairness for Clinical Prediction in Terms of Net Benefit and Health Equity

Jose Benitez-Aurioles (PhD Student, University of Manchester)
Co-authors: Alice Joules (IQVIA), Irene Brusini (IQVIA), Niels Peek (Uni of Cambridge), Matthew Sperrin (Uni of Manchester)

Spotlight Talk 2: The Importance of Sample Size When Developing and Evaluating AI-Based Prediction Models for Healthcare

Richard Riley (University of Birmingham)
Co-authors: Gary Collins, Rebecca Whittle, Lucinda Archer, Kym Snell, Paula Dhiman, Amardeep Legha, Laura Kirton, Glen Martin and Joie Ensor

Spotlight Talk 3: 3D Local Binary Patterns for Texture Analysis of IR Spectroscopy Prostate Cancer

Lyra O'Leary, (PhD Student, University of Manchester)
Co-authors: Dougal Ferguson, Ashwin Sachdeva, Peter Gardner and Hujun Yin

Spotlight Talk 4: Using Sentiment Analysis to Identifying Appeals in Secure Software Engineering

Sam Attwood, Lecturer, Manchester Metropolitan University

Spotlight Talk 5: Self-Supervised Federated Learning Over Relevant Heterogeneous Data

Tahani Aladwani (University of Glasgow)
Co-authors: Christos Anagnostopoulos

Spotlight Talk 6: BALER: Machine-Learning-Powered Data Compression for Scientific Data in Real Time

James Smith (Research Associate, Department of Physics & Astronomy, University of Manchester)

Spotlight Talk 7: Fully Data-Driven Solving of Aerofoil-Wind Interactions in a Single Training of a Single Multi-Output DeepONet

Sebastien Andre-Sloan (Department of Computer Science, University of Manchester)
Co-authors: Dibyakanti Kumar and Anirbit Mukherjee

Spotlight Talk 8: Chaotic Systems and Neural Networks

Claudiu Craciun (University of Manchester)
Co-authors: Anirbit Mukherjee

Spotlight Talk 9: Adaptive AI Decision Agents for Holistic Supply Chain Optimisation: Merging Societal & Business Objectives

Rifny Rachman - CDT Data Analytics, The University of Manchester
Co-authors: Richard Allmendinger, Josh Tingey, Pradyumn Shukla, Wei Pan

Posters

Evaluating Emotional Intelligence in Large Language Models

Peter Eachus
Co-authors: Ashley Weinberg and Anne Pearson

Predicting Cardiac Development Genes: A Machine Learning Approach

Mitra Kabir, Research Associate, University of Manchester
Co-authors: Kathryn Hentges

Development of an Artificial Intelligence Chatbot to Analyse Challenging to Manage Behaviours

1. Prem Deep Mareedu, Data Scientist, Decently Ltd. 2. Tom Handy, Honorary Research Assistant, University of Manchester
Co-authors: Mareedu, P.1, Handy, T.2, Chapman, J.1, Burch, J.1, Dowd, C.1,Teager, A.J.3

The Planetary Classification Catalogue: Towards A New Age in Astrobiology

Mélissa M. Azombo, Independent Researcher; Separately, PhD Student at The University of Manchester

Intelligent Automation in Software Development: A Hybrid Cognitive Architecture Approach

Dr Angel Salazar, Angel AI Ltd

From Sequences to Hierarchies and Space: Comprehensive Review of Embedding, Attention, and Positional Mechanisms in Transformers

Dr Angel Salazar, Angel AI Ltd

The SMARTHEP European Training Network for real-time analysis with ML/AI

Carlos Cocha Toapaxi
Co-authors:Caterina Doglioni, Laura Boggia, Pratik Jawahar, Henrique Pineiro Monteagudo

A Hybrid Approach for Information Extraction and Expert Action Recommendation using Fine-Tuned Base Models, Large Language Models and Knowledge Graphs

Robert Firth, Jonny Palmer, and Ruby George
The Science and Technology Facilities Council (STFC) Hartree Centre; Collaborative Conveyancing Limited

Reconstruct Short-lived Particles at the Large Hadron Collider with Graph-Hypergraph Representation Learning

Zihan Zhang (University of Manchester, Department of Physics and Astronomy)
Co-authors: Callumn Birch-Sykes , Brian Le, Yvonne Peters and Ethan Simpson

Scalable Joint Non-Negative Matrix Factorisation for Paired Single Cell Gene Expression and Chromatin Accessibility Data

William Morgans
Co-authors: Andrew Sharrocks and Mudassar Iqbal

Investigating the Use of Word Embeddings and NLP to Analyse Text from Customers of Telecom Companies

Hesham Abdelmotaleb , University of Plymouth
Co-authors: Craig McNeile, Malgorzata Wojty's

Topology Driven Network Analysis of Multi-Omics Data

Michail Smyrnakis
Co-authors: Nandini Gadhia, Jennifer Kelly and Laura Jayne Gardiner

Uncertainty in Clinical Risk Prediction: Perspectives and Approaches

Lucinda Archer, University of Birmingham
Co-authors: Richard D Riley, Gary S Collins, Laura Kirton, Kym IE Snell, Joie Ensor, Rebecca Whittle, Paula Dhiman

AI-Enabled Categorisation of Clinical Trial Protocol Deviations

Mael Jullien, Dept of CS at Uom & Fouziah Butt, National Cancer Biomaker Centre, UoM
Co-authors: Anja Le Blanc, Hamzah Abassi, Alex Bogatu, Andre Freitas, Harriet Unsworth, Caroline Dive, Louise Carter

Activation Functions in Deep Learning for Aerial Image Segmentation
Raghad Alamri, PhD student, University of Manchester
Co-authors: Terence Morley

AI-Powered Sustainable Destination Recommendation System Linked to Metaverse
Zal Zamaniyan, University of Westminster
Co-authors: Roshan Panditharathna, Nalaka Dissanayake, Abdul Khader Khan Mujawar

Multi-Label Detection of Lexical Semantic Change: A Bi-Directional Approach with Slang Keywords Across Historical and Non-Historical Time Periods
Afnan Aloraini, The University of Manchester
Co-authors: Riza Theresa Batista-Navarro

Crossing Boundaries: Unveiling Disparities in Cricket Player Performance Between International and Domestic T20 Competitions
Ali Iltaf, University of Manchester
Co-authors: Richard Allmendinger, Richard Kingston, Ali Hassanzadeh, Stafford Murray, Hannah Jowitt, Farhan Tinwala


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Digital Futures is a highly interdisciplinary network
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Digital Futures at The University of Manchester

Digital Futures is The University of Manchester's strategic response to the challenges and opportunities presented by the digital revolution.

It brings together a multidisciplinary community of over 1700 researchers from across the University's three faculties with the aim of:

- Providing an integrated view of our digital research, creating a 'front door' for potential partners.
- Bringing together cognate research communities, and exploiting synergies.
- Developing a coherent strategy for addressing major societal and technical challenges

> By creating a coherent framework of societal challenges and cross-cutting capabilities, we've been able to create an integrated and accessible view of our digital research for external stakeholders whilst exploiting synergies and building critical mass internally.
>
> **-Professor Chris Taylor**

The programme is built around challenges and crosscutting capabilities.

- **Societal Challenges** focus on real-world activities that are economically and socially important, building on multidisciplinary strengths within the University.
- **Institutional Challenge**s focus on the potential for digital technology to transform what we do as a University and how we do it: how we conduct research, what and how we teach, and how we function as an organisation.
- **Cross-cutting Capabilities** are digital frameworks, technologies and methods that are important areas of research in their own right and provide the underpinning for addressing the challenges.

Find out more:
digitalfutures.manchester.ac.uk

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The Turing Innovation Catalyst Manchester (TICM)

The Turing Innovation Catalyst Manchester (TIC) is a new not-for-profit focussed on catalysing an Artificial Intelligence (AI) ecosystem within Greater Manchester (GM). Through the delivery of an ambitious programme of work, TIC is leveraging the opportunity presented by AI to power the growth of careers, businesses and the regional economy.

TIC is providing support across GM through numerous initiatives including:

- An AI startup accelerator to support AI startups to scale and access investment.
- Skills programmes designed to improve access to, and progress in, AI careers for women and under-represented groups.
- A Venture Builder to equip ambitious PhD students with the broader commercial skills required to successfully commercialise their innovations.
- A collaborative R&D programme aiming to create a more agile, and collaborative way for researchers and startups, scaleups and SMEs to work together, and increase private sector investment in R&D
- A broad programme of events and workshops designed to bring the existing AI ecosystem together, and to encourage its growth and further development

All of TIC's initiatives are fully funded for GM resident companies and individuals, and have been designed with DEI and ethical considerations at their core.

TIC is committed to unlocking the opportunities presented by AI across GM, with operations in the new ID Manchester district and Fire-Up Rochdale. Two further GM borough locations will be announced in 2024.

TIC is funded as part of the GM Innovation Accelerator, backed by Innovate UK and the Greater Manchester Combined Authority, and is initially being incubated within the University of Manchester.

Find out more:
ticmanchester.org

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European Laboratory for Learning and Intelligent Systems

The European Laboratory for Learning and Intelligent Systems (ELLIS) recently added The University of Manchester as a partner of its global members who strive towards a meaningful contribution to securing Europe's sovereignty and leadership in the research field of modern artificial intelligence (AI).

The University of Manchester has recently strengthened its position as a centre for research into AI fundamentals and impactful applications of AI to improve health, security and sustainability. Last year the University appointed AI Chairs in each of its faculties followed by several excellent machine learning faculty appointments in the department of Computer Science.

The University of Manchester has been a partner of the Alan Turing Institute since 2018 and is home to 33 Turing Fellows.

It has a thriving community of data science and AI researchers, with over 900 researchers affiliated to its Institute for Data Science and AI (IDSAI). Manchester's ELLIS unit brings together experts in AI fundamentals with experts in the application of AI in other fields, with particular strengths in health, and will connect with other leading experts in the ELLIS network across Europe.

The University of Manchester continues to grow as a centre of excellence for AI research and the new ELLIS unit will further strengthen this activity. Through the new ELLIS unit Manchester will be able to better link machine learning researchers across Europe with impactful applications across many disciplines.d a little bit of body text

-Professor Magnus Rattray

The University of Manchester has established a strategic partnership in a shared professorship with the director of the ELLIS unit in Helsinki, Samuel Kaski from Aalto University, Finland. This Northern link will be used in the future to set up the ELLIS units in Manchester and Helsinki as a twin unit, with tight collaboration already under way through research collaboration and exchange.

Find out more:
ellis.eu/units/manchester

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Thank you for attending, we hope to see you next year!