BCSWomen Lovelace Colloquium 2025

Abstract book and programme

Table of Contents

Welcomes

Welcome to Glasgow for this, our 18th colloquium. We're ready for a record breaking year, with more students, more posters and more cake than ever before. We wouldn't be able to do it without an amazing team of volunteers working behind the scenes, and some super sponsors who enable us to put the whole thing on free for presenters (including student travel and accommodation). Check out the "Thanks" section for a list! Also, make sure there's some cake left for me.

Dr Safia Barikzai,
BCSWomen Lovelace Colloquium chair 2025

It gives me immense pleasure to welcome you all to Glasgow for this year's colloquium. We're going to have a great time, and will showcase the excellent facilities in GUU (for the main conference) and Queen Margaret Union (for the social). Luckily, my time as a student predates camera phones, so you won't find any embarrassing photos of me enjoying myself at either venue!

This year's event has a real connection with the University of Glasgow too, with speakers including my former classmate, Sharon Moore MBE, with whom I studied computing here at Glasgow back in the late 90s, and my current colleague Dr Ilyena Hirskyj-Douglas, who does fabulous work in animal-computer interaction.

Dr Matthew Barr
BCSWomen Lovelace Colloquium Local chair 2025

If you'd told me 18 years ago that I'd still be helping to organise this conference, I'd have said "No way!"

Dr Hannah Dee
BCSWomen Lovelace Colloquium founder, and 2025 student chair

Programme

9:00	Registration
10:00	Welcome + keynote : Sharon Moore
11:00	Speaker 1 : Bala Tirumalasetti
11:30	Speaker 2 : Carole Rennie Logan
12:00	Lunch
12:30	Posters (First years, stand by your posters)
13:00	Posters (Second years, stand by your posters)
13:30	Optional talks / activities / quiet time
14:00	Posters (Final years, stand by your posters)
14:30	Posters (MSc students, stand by your posters)
15:00	Coffee
15:30	Speaker 3 : Ilyena Hirskyj-Douglas
16:00	Panel
16:30	Panel+prizes
17:00	Close
17:30	Social

Poster presenters are welcome to stand by their posters outside of the specified slot. Students should be “findable” near their poster during their slot – this means that if there’s a particular poster you’re interested in you should be able to track the author down then.

Talks information:

Sharon Moore – Keynote Speaker, IBM Technology’s CTO for Public Sector in the UK

Sharon's mission is transforming public service with technology; her purpose is to make a difference, for the better. She helps Government do better for citizens, she drives change for good in the tech industry, and she currently does this as IBM Technology’s Global CTO for Government. Sharon has over 20 years of experience working in outsourcing, consulting, and sales, across multiple sectors and diverse technologies, across an ecosystem of partners, and as a non-executive director. She is a catalyst for change in inclusion through BCSWomen, formerly through Scotland Women in Technology, and other organisations, and is a published co-author on the subject. She was awarded MBE in the Queen’s Birthday Honours in June 2018.

Bala Tirumalasetti – Ocado Technologies

Strategic Process Improvement in a Service based Industry

This session explores how organisations can align strategic vision with operational execution through process improvement, digital transformation, and data-driven decision-making. We’ll cover key methodologies such as Agile and project management frameworks, as well as how transparent reporting, KPI automation, and optimisation practices enhance IT value delivery. The talk also looks ahead to future trends shaping the way technology and strategy converge in modern enterprises.

Bala Tirumalasetti is Head of Process and Improvement at Ocado Technology, with over 20 years of experience in strategy, transformation, and process optimization. She specialises in governance, risk management, and performance measurement, and holds an MSc in Information Systems along with certifications in Agile and project management. Bala is passionate about helping organisations align technology with business goals through innovation and continuous improvement. She is also an active mentor with Mission Gender Equity, supporting women in leadership and technology careers.

Carole Rennie Logan – Equator and Glasgow Ladies of Code

Boost your tech career with the power of community

In this session, Carole will discuss a "story so far" of her career and how involvement in tech communities has helped shape this. She'll discuss career milestones, lessons learned and opportunities taken in her engineering career.

Carole is a principal engineer and community Meetup organiser based in Glasgow. With over 14 years experience she is keen to share her technical expertise as well as her interest in the people side of tech industry.

Ilyena Hirskyj-Douglas – University of Glasgow

The Future of Animal-Controlled Computers

This talk will explore how animals in zoos and homes can use technologies to control their environment and video call each other using the internet. Drawing from my research, I will present bespoke technologies designed for animals and their discoveries. We will look at what monkeys want to listen to when using audio players, how dogs can use TV, and unpack what it means for animals to control computers. I will also present my research on animal video call technologies, how this impacts animals, and where I see the future of the animal internet going.

Dr. Ilyena Hirskyj-Douglas develops interactive computer systems for animals to control their environment and access the internet. She directs the Animal-Computer Interaction Lab at the University of Glasgow, where her team creates technologies for animals in homes and zoos worldwide. Her research focuses on designing computers for animals' needs and requirements, developing animal-focused internet devices, and using technology to enhance human-animal relationships and education.

Conference Code of Conduct

All attendees, speakers, sponsors and volunteers at our conference are required to agree with the following code of conduct. Organisers will enforce this code throughout the event. We are expecting cooperation from all participants to help ensuring a safe environment for everybody.

Need Help?

Attendees have our contact details in the emails we've sent.

The Quick Version

Our conference is dedicated to providing a harassment-free conference experience for everyone, regardless of age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. We do not tolerate harassment of conference participants in any form. Sexual language and imagery is not appropriate for any conference venue, including talks, workshops, parties, social events, X and other online media. Conference participants violating these rules may be sanctioned or expelled from the conference at the discretion of the conference organisers.

If a participant's presentation (poster or talk) is about the experience of being a woman in computing or related spheres (e.g. games), and includes sexualised imagery or language as an example or illustration, then such material is acceptable within the academic context.

The Less Quick Version

Harassment includes offensive verbal comments related to age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion or belief, sex, and sexual orientation. It also includes harassing behaviours such as the presentation of sexual images in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention.

Participants asked to stop any harassment are expected to comply immediately.

Sponsors are also subject to the anti-harassment policy. In particular, sponsors should not use sexualised images, activities, or other material. Booth staff (including volunteers) should not use sexualised clothing/uniforms/costumes, or otherwise create a sexualised environment.

If a participant engages in harassing behaviour, the conference organisers may take any action they deem appropriate, including warning the offender or expulsion from the conference with no refund.

If you are being harassed, notice that someone else is being harassed, or have any other concerns, please contact a conference organiser.

Conference organisers and helpers will be happy to help participants contact security, provide escorts, or otherwise assist those experiencing harassment to feel safe for the duration of the conference. We value your attendance.

We expect participants to follow these rules at conference and workshop venues and conference-related social events.

Thanks

It’s dangerous writing a “Thanks” section with lots of names, so we have to start with an apology – if you’ve helped organise, judge or support the event and we’ve missed your name out, sorry!

Sponsors and stallholders

- Ocado Technology (Gold)
- OpenBright (Bronze)
- RS Components (Bronze)
- Oxford University’s AIMS CDT (Prize sponsor)
- P&G (Prize sponsor)
- STFC (Prize sponsor)
- Rewriting the Code
- BCSWomen
- BCS SIGiST
- EY

University supporters and partners

Supporters

These universities are providing financial support directly to the event to help cover student accommodation, lunches, prizes and so on, or significant “in kind” support.

- University of Birmingham (Platinum)
- Aberystwyth University (Gold)
- City, University of London (Gold)
- Exeter University (Gold)
- Glasgow University (Gold)
- London South Bank University (Gold)
- Sheffield University (Gold)
- University of Bath (Gold)
- University of Southampton (Gold)
- Durham University (Silver)
- University of Warwick (Silver)

- Sheffield Hallam University (Bronze)
- University of the West of England (Bronze)

Partners

These institutions pledge to support their own students by covering travel costs to the event.

- Durham University
- Edinburgh Napier University
- Heriot-Watt University
- King’s College London
- Leeds Trinity University
- Manchester Met University
- Nottingham Trent University
- University of Bath
- University of Leeds
- University of Manchester
- University of South Wales
- University of Southampton
- University of St Andrews
- University of Warwick
- University of York

Organising team

- Safia Barikzai, London South Bank University, conference chair
- Hannah Dee, Aberystwyth University, student chair and founder
- Matthew Barr, University of Glasgow, local chair
- Amanda Clare, Aberystwyth University, speaker chair
- Jon Jeffery, BCS
- Anna Doyle, University of Glasgow
- Claire Johnston, University of Glasgow

BCS team

Claire Williams, Georgia Smith, Helen Allison, Krystal Wasike

Abstract reviewers

Every abstract has been read and reviewed by at least two reviewers from outside of their own institution, and then considered by a small team of core organisers. The entire reviewing process is based upon abstract ID so from start to finish, nobody making comments or decisions knows the name or institution of a submission.

We would like to thank the following reviewers; each reviewed at least 10 (some as many as 40) abstracts. We wouldn’t be able to do it without you!

- Adriana Wilde, University of Southampton
- Alexandra Stanhope, Met Office
- Amanda Clare, Aberystwyth University

- Amanda Ford, West College, Scotland
- Annalies Gibson, University of Cardiff
- Carol Long, 3 Triangles
- Carron Shankland, University of Glasgow
- Cigdem Sengul, Brunel University, London
- Daniela Mihai, University of Southampton
- Diana Hintea, Sheffield Hallam University
- Ed De Quincey, University of Keele
- Edel Sherratt, Aberystwyth University
- Elisa Covato, University of the West of England
- Emma Duke Williams, University of Dundee
- Fawzia Zehra Kara-Isitt, Brunel University, London
- Gail Ollis, Freelance early career mentor
- Hannah Dee, Aberystwyth University
- Helen Steward, University of East Anglia
- Herbert Daly, University of Hertfordshire
- Jacqueline Chetty, University of Birmingham
- John Power, Macqarie University, Australia
- Lee Clift, University of Strathclyde
- Maria Luisa Davila Garcia, Sheffield Hallam University
- Matthew Barr, University of Glasgow
- Megan Venn-wycherley, University of Swansea
- Miriam Sturdee, University of St Andrews
- Munira Raja, University of Liverpool
- Myles Dempsey, Sheffield Hallam University
- Neil Walkinshaw, University of Sheffield
- Olga Petrovska, University of Swansea
- Phillipa Ryan, University of York
- Pieter Joubert, University of Birmingham
- Praboda Rajapaksha, Aberystwyth University
- Roger Boyle, Aberystwyth U3A
- Saman Gule, Heriot Watt University
- Samiya Khan, University of Greenwich
- Seth Bullock, University of Bristol
- Sue Beckingham, Sheffield Hallam University
- Tamara Lopez, Open University
- Timi Olabamiyo, NHS
- Tina Eager, Canterbury Christ Church University
- Tom Deakin, University of Bristol
- Victor Onyenagubom, Teeside University
- Wendy Yanez Pazmino, University of Birmingham

Poster judges

- Adriana Wilde, University of Southampton
- Amy Muncer, RS components
- Carron Shankland, University of Glasgow
- David Smith, Ocado Technology
- Edel Sherratt, Aberystwyth University
- Elizabeth Molyneux, OpenBright
- Gethin Norman, University of Glasgow
- Hannah Grimes, P&G
- Jacqueline Chetty, University of Birmingham
- Kelsey Doerksen, Oxford AIMS
- Key Paul Fitton, AWS
- Nicola Martin, BCS SIGIST and BCSWomen
- Pieter Joubert, University of Birmingham
- Wendy Yanez Pazmino, University of Birmingham

Student abstracts

First and foundation year students

The role of technology in supporting Formula 1 racing

Alishba Muhammad
Sheffield Hallam University

Technology has played a crucial role in the development and success of Formula 1, which influences not only the performance of the cars, but also race strategies and overall safety. For example, each F1 car is equipped with more than 300 sensors that transmit more than a million pieces of data per second to engineers via the telemetry system. This automated communication system collects and sends real time information from racetracks, allowing engineers to have access to detailed analysis of vehicle performance and race conditions.

In recent years, Red Bull and other Formula 1 teams have used artificial intelligence tools to predict weather conditions, tyre degradation and race strategies, optimising performance and ensuring safety for the drivers. These technologies make it possible to accurately determine when to change tyres during the races, whether is switching from soft to medium or medium to hard compounds, which minimises the number of pits stops carried out and increasing race efficiency.

This poster will illustrate the main ways in which technology has made Formula 1 even more advanced than it already was and far more competitive, highlighting the importance and benefits of the different technological systems that could be used in this motorsport.

The Cost of Intelligence: AI’s War on the Planet

Anjini Banerjee
Durham University

LLMs like ChatGPT have become an everyday tool, helping us with everything from writing grocery lists to solving complex problems. AI makes life more efficient, but we rarely stop to think about what powers it. Behind every query is a massive data centre consuming vast amounts of electricity and water for cooling. This results in significant CO_2 emissions and water waste—an issue that often goes unnoticed due to a lack of public awareness. Many assume AI exists in the cloud, but in reality, it’s tied to physical infrastructure that has a tangible environmental cost. The rapid adoption of AI has outpaced discussions on sustainability, leaving us reliant on a technology we barely understand the impact of. If we continue at this rate, AI’s carbon footprint will only grow, making it crucial to find ways to reduce its energy consumption. My poster will highlight the hidden environmental costs of AI and explore solutions that can make machine learning more sustainable. I hope to discuss innovations such as Cerebras Wafer-Scale Engines, gradient checkpointing, mixed precision training, and dynamic scaling—all of which help optimize AI models while lowering energy use. As AI becomes more advanced, we need to ensure that progress doesn’t come at the expense of the planet. My goal is to raise awareness and spark conversations on how we can balance technological innovation with sustainability.

AI Warhammer. An analysis of the challenges of automating tabletop war games.

Aowyn Brook
Aberystwyth University

With the advent of Generative and discriminative AI models in the late 2010s and early 2020s, effective automation of these games may be in sight. Multiple challenges must be overcome to achieve a working War Gaming AI—the first is Identification. A Discriminative AI model is required to process the game state and identify game pieces(unit size and type), terrain(buildings and their properties), and locations(where everything is). The Second challenge involves 3D modelling; the information gained about the battle state from discriminative AI then has to be translated into a 3-dimensional model of the battlefield to enable the processing of sight lines and vertical distances. At this point, relevant rules, win conditions, objectives, and potential actions must be retrieved and prepared. Sight lines, in particular, require ray tracing to analyse effectively. Once all this information is correctly loaded and the 3D models are generated, generative AI must take in all this information and determine the best course of action. Overall, a war gaming AI requires combining multiple separate complex systems to form a whole, including discriminative AI, 3D modelling, a rules database, and Generative AI. This model would also require the creation of a "digital table" to set up scenarios to train the generative AI and likely thousands of images to train the discriminative AI. This poster will breakdown the decision making in an example war game(Warhammer 40k) and explain the challenges that need to be overcome in implementing the required systems to play the game effectively.

Computational Creativity: How graph neural networks can inspire material innovations

Ayda Yazdani
University of Bath

Interconnectivity of data is arguably the most powerful tool used to drive decision-making processes in various domains of the modern age, from expanding our social networks online to predicting different drug-disease interactions. Consequently, graph neural networks (GNNs) have rapidly evolved as the backbone to the capturing and modelling of complex relationships between nodes of data. These networks operate through message-passing layers that enable nodes to update their representations by aggregating information from neighbouring nodes. Permutation-equivariant transformations ensure that the network's analysis remains consistent regardless of how the nodes are initially arranged, meaning if you shuffle the order of nodes in a graph, the fundamental insights remain unchanged. Yet, what is even more exciting is the element of creativity that emerges when GNNs are combined with multimodal AI systems, which can integrate visual and auditory cues. In fact, recent research carried out by Professor Markus Buehler at MIT explored such a model for AI. By reducing seemingly unlike creations such as Kandinsky’s “Composition VII” painting and a collection of 1,000 scientific papers about biological materials into knowledge graphs, his algorithm was able to mirror the impassioned qualities of expressionist art to propose an innovative composite material made from mycelium. The material was versatile, providing a unique combination of strength and functionality which could lend itself to fields such as advanced wearable technology. This poster will further explore the idea of interdisciplinary blending and how, when combined with GNNs and generative AI, it can uncover new creative possibilities in materials science.

Quantum Technology in the Space Industry for Satellite Security

Beejalben Amitkumar Patel
Middlesex University

Quantum Technology in the Space Industry for Satellite Security

The integration of quantum technology into the space industry has significantly advanced satellite security, particularly through Quantum Key Distribution (QKD). Unlike traditional encryption methods, which may become vulnerable to quantum computing attacks, QKD ensures secure communication by leveraging quantum mechanics principles such as superposition and entanglement. This enables the generation of encryption keys that cannot be intercepted without detection, making satellite networks highly secure.

A major milestone in quantum communication was achieved with China's Micius satellite, which successfully demonstrated quantum entanglement and secure key exchange over 1,203 km. By transmitting entangled photon pairs, Micius enabled ultra-secure communication between distant ground stations, proving the feasibility of QKD in space-based networks.

QKD operates by transmitting quantum states of photons through optical links between satellites and ground stations. Any interception attempt disturbs the quantum state, alerting the communicating parties to potential eavesdropping. This unique security mechanism makes QKD a promising solution for safeguarding global satellite communications.

However, implementing QKD in space presents challenges. Single-photon detectors used in satellites are highly sensitive and prone to errors. Additionally, photon loss in optical links limits the range of QKD, though ongoing advancements in quantum repeaters aim to extend these distances.

Despite these challenges, QKD has already proven its potential to revolutionize satellite security. With continuous advancements, integrating quantum communication into space infrastructure is becoming essential for protecting global data transmissions from emerging cyber threats.

The Semantic Decay of the Web

Cam Morrison
Aberystwyth University

Put simply, the “Dead Internet Theory” presents the idea that most internet traffic in the modern age comes from bots and algorithms as opposed to human users. It goes on to speculate that many of the social media accounts that people interact with, in actuality, are bots; fake accounts generating fake interactions. While this started as a conspiracy, recent advancements in AI and the public availability of LLMs raise the question that perhaps this theory proves to be more fact than fiction.

Web traffic from bots hasn’t always been harmful. Since the early 90s, web crawlers (some of the first bots to traverse the web) have helped to index pages on the internet, allowing for effortless traversal of the web for users. These still exist today, and contributed around 17.6% of all traffic in 2023, but are dwarfed in number by malicious bots such as those involved in DDOS attacks, scalping, and other criminal activities leading to 32% of web traffic (Imperva, 2024). This has only increased as time has passed, with companies such as Meta announcing that they will be integrating their own AI users onto Instagram and Facebook.

In my poster, I will explore how this creates a concern for the verity of information we find on the internet and discussing the questions of: How can we avoid false information? How can we know that the people we talk to on social media are real people? Is the web dying?

How could 3D Models Be Utilised In The Classroom Environment?

Charlie Grace Smith
Sheffield Hallam University

3D models are seen more and more everyday life, even going as far as being added to PowerPoint's Insert section; where you can find a variety of models such as the earth itself!
An avid nature enthusiast I chose to create a download of 3D fantasy plants while still keeping their real life growth patterns.
Plant growth patterns are in their DNA, every yellow center has the same spiral and their leaves (barring mutation) are always the same; This is called phyllotaxis.
Looking at PowerPoint's 3D models, I then talked with both university and pre-school teachers to see if there was any interest and I found that university professors were really interested in getting their hands on accurate 3D models for the classroom setting.
Even being able to look at the parts of a computer without having to take apart a PC could help further a student's content engagement in the IT field;
Limited access to resources is something every school struggles with at some point, showing people, especially educators that there's a whole other side to the examples that students could be seeing in lessons, regardless of subject, is the first step in application!
This poster will show a variety of applications for this.

The Quantum Revolution in Cybersecurity: Threats, Opportunities, and the Road Ahead

Diya Nair
University of Birmingham

Quantum computing is set to transform computational power, with significant consequences for cyber security. This study scrutinise the potential impact of quantum computing on cyber security: both the threats it pose to traditional encryption systems and the opportunities it offers for developing robust post-quantum cryptographic solutions. A qualitative literature review was conducted, critically appraising landmark research papers, scientific journals, technology reviews, and IEEE standards to explore the evolution,
limitations and future trajectory of quantum technologies.

Despite current scalability challenges, ongoing advancement suggest quantum computing will soon solve highly specialised problems that classical computers cannot tackle efficiently. However, it's implications for cyber security are paradoxical: on the one hand Quantum algorithms undermine existing encryption methods, yet they also provide the foundation for developing quantum-resistant cryptographic protocols to safeguard critical information and data privacy.

This study's key findings indicate that, while quantum competing presents significant risks, its potential benefits outweigh these threats, provided substantial investment in research and strategic development is maintained. Findings highlight the importance of fostering collaboration between policymakers, researchers, and industry leaders to ensure responsible progress. Rather than solely focusing on the security risks associated with quantum advancements, a proactive approach is required - one that prioritises the creation of quantum-proof systems. By carefully considering these emerging technologies, addressing their challenges and encouraging interdisciplinary collaboration, the promising potential applications of quantum can be realised in a secure and constructive manner: advancing
computation, security, and other domains in parallel to benefit global technological infrastructure and society at large.

Could AI have written your favourite book better?

Elena Makanjuola
University of Bath

Could AI have written a better received ending to the infamous final season of Game of Thrones? There have been endings to many popular TV shows, books and movie series that have been hated by fans. With access to the internet, artificial intelligence may be able to get a superior understanding of what the fans may want and craft a more satisfactory ending. However, AI has a long way to go before it can win a Pulitzer.

Large Language Models are machines that are exposed to large amounts of data to recognise patterns; therefore, it can write sentences understandable to humans. However, the very nature of creativity is the ability to look beyond what is known and fabricate something though provoking and new, which currently, LLMs are unable to successfully do.

Although AI is bad at writing novels, a study by the University of Pittsburgh showed that poems generated by ChatGPT 3.5 were preferred to those written by 10 famous English-language poets. AI is much better at writing poetry than novels due to the algorithmic nature of poems themselves.

In this poster I will explain why AI is so good at writing poetry yet fails to create a compelling story. Furthermore, I will discuss potential ways that AI may be able to improve its ability to write in the future. Finally, this poster will explore whether AI may be able to utilise the internet to conceptualising a better ending to a book or series than human writers are able to.

Chatbots and Censorship: Who Decides What AI Can Say?

Emma Cliffe
University of Bath

The number of people using AI chatbots to answer their questions about the wider world has grown rapidly in the last few years, which means that the question of whether AI filters or censors the information it gives us, and whether or not it is right to do so, is more relevant than ever. While we often view artificial intelligence as humanity's proud creation, there are many occasions where it has been programmed to play the role of a helicopter parent instead. For example, the Chinese chatbot 'Deepseek' refuses to discuss topics that reflect badly on the Chinese government, such as the Tiananmen Square Massacre, and also parrots the CCP's official stance on political issues without giving a nuanced perspective. However, this topic is not just limited to politics; a study by Gizmodo showed that chatbots like Gemini and ChatGPT refused to provide answers on a range of topics, such as how to access sites with explicit content and how to commit illegal acts. Other chatbots, however, were happy to do so. My poster will explore the implications of chatbots spreading different messages and taking different stances on what we are 'allowed' to know, the moral and legal reasons that the companies and governments behind them might have for programming them in such a way, and ideas on how this topic can be tackled to ensure that AI remains a fair and helpful resource for everyone.

Is AI the key to the future of quantum computing?

Gaia Fiorillo
Middlesex University

Quantum computing is revolutionising computation through quantum mechanics principles such as superposition and entanglement, enabling massive parallel processing beyond the capabilities of classical computers. Unlike traditional systems that process information in binary, quantum computers can simultaneously evaluate multiple possibilities, enabling breakthroughs in fields like cryptography, material science, and artificial intelligence .

Artificial intelligence is increasingly being used to enhance quantum computing by optimising algorithms, correcting errors, and improving quantum hardware performance. AI driven machine learning techniques refine quantum error correction, a key challenge in stabilising quantum systems, while also assisting in the design of efficient quantum circuits and in the calibration and control of qubits. These applications are critical as quantum systems scale - and current research suggests that AI might be the only tool capable of addressing the complex challenges inherent to realising fault tolerant quantum computing.

Recent advancements, such as IBM’s Willow chip, demonstrate how quantum processors are generally scaling up in power and accessibility. The Willow chip is engineered for greater qubit stability; it marks an important step towards practical quantum computing applications, and has even sparked speculative discussions as some suggest that the chip’s ability to harness superposition hints at the existence of parallel universes. This notion is hypothetical, but underscores the impact of these breakthroughs on our understanding of reality, and as research in AI driven quantum computing continues to evolve, we move closer to unlocking revolutionary computational power that could redefine our approach to complex problem solving.

Beauty Measured: How AI is reducing you to your looks

Hibba Ghouri
University of Derby

Artificial intelligence (AI) is reshaping beauty in ways that challenge decades of progress, pushing us back as a society toward artificial ideals under the guise of innovation. By 2026, it is predicted that up to 90% of online content will be AI-generated, raising ethical concerns on how technology is shaping our ideals and perceptions. Beauty has long been a concept tied to measurability, with mathematicians like Pythagoras exploring what facial proportions are more favourable and the appeal of symmetry through the ‘Golden Ratio’. Yet its appreciation remains deeply subjective; rooted in culture, identity and personal preference. The growing impact of AI however, reduces beauty to fixed data points, ignoring its nuances and potentially damaging the progress we have made toward a more inclusive beauty spectrum.

This poster explores the ethical implications of AI’s integration into the beauty industry; from AI-generated beauty pageants to campaigns like Dove’s ‘The Code’ that challenge these norms, uncovering the intersection of computing and societal values. Are we truly progressing toward inclusivity or slowly conforming to a narrow, algorithmic ideal? It encourages a re-evaluation of AI’s role in shaping beauty standards and advocates for technology that enhances, rather than diminishes, humanity's diverse experiences of beauty.

Guilt within video games

Irene Peleteiro Paniagua
University of Warwick

As the gaming sector grows, an increasing number of stories are told through this lens. In a sense, games are a unique way to consume a story, allowing the player to be an active participant and letting them alter the world as they wish. It can surpass other media, such as books and film, in immersion for this reason. Even pure narrative games force the player to live through the story and see it from within rather than as an outsider.

Many video games, violent or not, have at points managed to make their players feel guilt. The extent and variety of this guilt depends on the game, from games that directly set up and encourage unethical choices for the player to take, only to make them take a step too far, to games that let the player have full free reign, which turns freedom into chaos. Some examples of these games are Cult of the Lamb, which slowly convinces players that another friend sacrificed is worth it, or the Sims, which, by letting the player simulate real life situations, gives them too much power over life and death.

The question then is, should the player feel guilty? Can players feel guilt over a pretend act, over choices they have not actually made? What separates a player from a game and the ethical choices they make within it? And, is guilt within games that deal with ethical issues inevitable, or something developers specifically choose to include?

Speaking Across Species: Can Technology Bridge the Communication Gap?

Isabella Moon
University of Bath

Humans can understand animals, to an extent: we have learnt to interpret body language like a wagging tail or even taught select animal individuals to speak our language (to a degree). There has also been historical success in getting them to somewhat understand us through methods like reinforcement training.

That said, previously we have been limited significantly by our human inability to perceive all ways in which different species communicate and our lack of tools to collect and process large amounts of data that would enable us to assign meaning to a wide range of animal behaviours.
Developments in technology now provide an exciting opportunity to advance our comprehension of one another. While two-way communication methods do not yet exist, early research advancements in decoding communication within a species with the use of AI signal the fascinating possibility of these methods in the future. We have seen AI and mass data collection lead to the building of a sperm whale phonetic alphabet and a stronger understanding of how many species express different concepts. There is now even more basic technology that is enabling interspecies communication at a deeper level than known previously, such as a variety of sound buttons that dogs can be trained to press in order to communicate diverse expressions.

This poster will be exploring the extent to which technology can facilitate communication between humans and animals, and how it can do so: evaluating various current examples, as well as speculating on future developments in the field.

Has technology blurred the line between efficiency and laziness?

Isatou Sowe
Swansea University

In today's society more often than not we can find ourselves using technology. From things as small as fridge door alarms, alerting us to close it and save energy, or as large as satellites that can detect extreme weather allowing us to warn and evacuate targeted areas. As with humans and their constant evolution, some technology induces idleness. Is having a robot that cooks, cleans and does all the housework necessary? Yes, for a lot of people. Yet in the cases of those who are fully able, it may cause the opposite effect. Regardless, it’s impossible to deny the influence technology has had in our history and there is much to say about how it’s improved the lives of many.

Here we will discuss how dependent we’ve become on our technology and although it isn’t necessarily a bad aspect, there can be discrepancies on what something is made for and how it’s used. At what point can we find that humans have gone too far? We always strive to do better but will it ever be enough, our need for improving technology is becoming our very downfall.

AI Weapons: The Ethics of Future Warfare

Isla Sparks
University of Bath

As artificial intelligence (AI) is integrated into military weaponry, the anticipation of combat efficiency must not overshadow the ethical concerns surrounding the use of such technology in life-or-death situations. The primary issue is that of accountability and how the removal of human involvement within the decision-making process complicates who is responsible when unintended consequences occur. Due to the black box nature of AI, writing a program that perfectly adheres to international laws of warfare is very complex, and the question remains if it is possible to design a system that reliably distinguishes between civilians and combatants. Deployment of a fully autonomous system could be reckless because of this element of unpredictability, and may disrupt global power dynamics by inciting an AI arms race. An event that would increase the likelihood of safety measures being overlooked, which could result in tragic accidental outcomes. Further complexity is added to negotiations about the policing of AI arms due to the fact that the mere definition of AI-powered autonomous weapons is ambiguous and disagreed upon between organisations and states. The risks of misuse of autonomous weapons can range from harmless malfunction to a serious escalation of conflict which is why governance of this technology must keep up with its rapid advancements. This poster aims to discuss the ethical dilemmas raised by AI weapons, review whether their use is justifiable, consider the dangers and consequences of such technology and provide recommendations for their regulation.

Optimizing Digital Marketing for SMEs Through Algorithmic Insights on Social Media and E-Commerce Platforms

Jessica Wang
Swansea University

In the digital marketing environment, algorithms are critical to the success of major social media and e-commerce platforms. These algorithms, which power content ranking and recommendation systems, govern how people engage with products and services online. Understanding these mechanisms is critical for small and medium-sized businesses (SMEs) in establishing successful marketing strategies that reach target audiences and simplify sales funnels.

This post will focus on the key rating and recommendation algorithms used by top platforms, such as engagement-based ranking on social media and collaborative filtering in e-commerce. By analysing these systems, SMEs may adjust their content to match platform algorithms, enhancing exposure and consumer interaction. Techniques to improve algorithmic compatibility include optimising for user-generated data, harnessing predictive analytics, and using A/B testing for targeted ads.

Furthermore, this poster will discuss how SMEs may use these insights to reduce the sales cycle. Businesses may improve conversion rates by focussing on personalised marketing, predictive audience segmentation, and real-time feedback loops. Ethical concerns, such as data protection and the possible hazards of algorithmic biases, are also addressed to ensure sustainable and acceptable marketing strategies.

The findings seek to provide SMEs with practical insights for efficiently leveraging algorithm-driven platforms, therefore launching effective and effective marketing campaigns in the competitive digital economy. This poster emphasises the transformative effect of algorithmic literacy in enabling smaller firms to improve reach, engagement, and conversion outcomes.

How technology has helped support non-verbal autistic individuals to communicate

Jorja Herring
Sheffield Hallam University

Autism Spectrum Disorder (ASD) is defined as “a neurological and developmental disorder that affects how people interact with others, communicate, learn and behave” (NIMH, 2025). Within my poster I will be focusing on the communication side of ASD and how technology is helping individuals to live a better life. Electronic Augmentative and Alternative Communication (AAC) is the term for when technology is used to support individuals with their speech, commonly depicted as a tablet with pictures or phrases. Often with a tablet individuals select the word/phrase they would like to say and the device reads this aloud providing them with the opportunity to have conversations and voice their thoughts. New applications have made this available on most devices with a screen making it easier for people to access this type of software. This technology is life-changing for people as the ability to communicate is such an important part of life and is what allows us to interact with others, making connections such as friends. This poster will therefore present the devices and software that are being used to help non-verbal autistic people such as how they are used by the individual and how advancements in this technology have improved throughout the years to provide the maximum support. I will also include a section dedicated to presenting the impacts having access to this technology has had on people’s lives to articulate the vast importance of this technology.

Taking Lessons from Nature: Biomimicry In Computer Science

Kathleen Clynes
Aberystwyth University

Organisms have evolved over millions of years of trial and error to create impressive and complex systems. As a result, there is now a vast number of diverse species that can interpret the world around them in ways that we cannot truly imagine. Humans have been investigating how these organisms take in input and react to their environment for centuries. Today, in computer science, researchers still take inspiration from biology.

Scientists have taken notes from bats and cats to give robots superhuman vision to help problems encountered with robotic perception in smoke, fog and generally bad conditions.

The Milky Way navigation techniques of lowly dung beetles has been tested as backup for stabilising satellites and drones when light is low and there is lots of blur from movement.

Wolf pack hierarchies and swam animals have been the basis for many algorithms that have been used in AI and machine learning, some helping to predict breast cancer in patients.

Research is even being done into how we could use DNA as new way of storing and processing data. If achieved, this could mean that you could put a thousand laptops worth of data in a space the size of a pencil eraser. Not only this, but it could hold this data for thousands of years.

This poster will examine these examples and more to see how biology has aided computer science in moving forward and how it can help us solve problems in the future.

Computing: A Musical Intrument

Lene (Lee) Nystuen
Middlesex University

Before the rise of computers, music was created and played through physical instruments and live performances. Once a piece was played, it lived only in memory unless performed again. As our everyday technology is ever-changing, so is our music. Computers opened endless possibilities, allowing musicians to compose, produce and share music in ways that were once unimaginable; music took on an entirely new dimension.

At their core, both music and computer science are about patterns, logic, and creativity. The structures in music—rhythms, harmonies, and melodies—often have a mathematical foundation, much like the algorithms behind programming. Today, computers have transformed how we make and experience music, from digital audio workstations that let us layer and manipulate sound to AI systems that can compose music or generate unique sounds. As technology has become more accessible, so has music. Anyone with a smartphone or a laptop has access to listen to and create music and live performances, and even collaborate real-time across the globe.
As a product of this continuous development, computer science has become a musical instrument. Tools like Sonic Pi let coders create music by writing live code, using programming as the art form it can be. Digital sound synthesis and signal processing let artists experiment with new textures and sounds, pushing the boundaries of what we think of as music.

In today’s world, the computer isn’t just a tool for making music; it’s an instrument that is opening up new creative possibilities and redefining what music can be.

Tunable Metamaterials for Adaptive Camouflage and Stealth Technologies

Lily Huckett
University of Hertfordshire

In 1968, Victor Veselago discussed the possibility of negative permittivity and permeability. This proposition would eventually become a reality and lead to the rise of metamaterials. Metamaterials are artificially engineered mediums with properties that are not found in natural compounds. While regular material is defined by its chemical composition, these materials are achieved by designing a new class of periodically arranged atoms for the physical property desired. Metamaterials provide a plethora of possible benefits, including sound and vibration mitigation, seismic protection, thermal and mass shielding and invisibility. In this case, invisibility refers to optical cloaking- the tuning of electromagnetic waves around an object in order to conceal it. By perfectly scattering such waves around an object at all angles with ideal polarisation, the power of invisibility has become a reality.
This breakthrough has now been harnessed through the combination of metamaterial and digital solutions by a group of researchers from Southeast University in Nanjing. Their team has developed the first Digital Coding Metamaterial: a device that demonstrates complex functions by manipulating electromagnetic waves. This discovery offers endless possibilities for technological advancements, such as military aircraft that can identify specific electromagnetic wavelengths and dynamically cloak themselves from enemy detection. Now, machine learning models are becoming incorporated with these devices so that they can adapt swiftly to changing surroundings and ensure complete camouflage. Ongoing studies into this technology are continually evolving as its potential is realised, and future breakthroughs could be closer than we think.

Quantum Hardware: A Look into the Potential Future of Processor Architectures

Lyon Fan
University of Warwick

Quantum computing, in theory, has the potential to achieve new heights of computation, such as being able to ‘crack’ encryption keys utilising algorithms able to factorise large numbers much faster than a classical computer could, or being able to simulate interactions between molecules with greater realism, which could then lead to the development of new semiconductors, such as carbon nanotube transistors.

Despite this, for these possibilities to have a chance of one day occurring, some form of computer hardware is needed to run the algorithms required. As quantum computing deals with the basic unit of data being a qubit, able to exist in a combination of multiple states at once compared to a single bit in classical computing being able to represent one of two states at any one time, some of the more well-known technologies to build quantum systems are separate from the semiconductor-based architectures of classical computers, namely trapped-ion lattices and the use of superconducting electronic circuits within quantum processors.

However, not all emerging technologies are completely divorced of classical computer engineering, in particular, structures on the nanoscale constructed out of semiconducting materials, known as quantum dots, could potentially be fabricated from silicon, opening up the potential for hybrid quantum systems.

While quantum computing remains a large unknown with several challenges ahead of its development, namely the designing and building of fault-tolerant systems, any one of these technologies, combinations of them, or even none of these, could potentially form the foundation of a new generation of computing.

Splitting Language into Qubits and Pieces: How Quantum Natural Language Processing Could Revolutionise Machine Translation

Mesoma Osuji
University of Sheffield

The discipline of Natural Language Processing (NLP) aims to develop computer programmes that analyse and manipulate language in ways that bridge the gap between human and machine intelligence. Since its emergence in the 1950s, the capabilities of NLP – spanning sentiment analysis, text summarisation and beyond – have grown exponentially. However, even with advanced language models, limitations remain for more difficult tasks like translating between languages. Quantum NLP (Q-NLP) is an emergent field that applies quantum computing principles to NLP tasks, thus offering the potential to optimise machine translation at an unprecedented scale. The DisCoCat (categorical compositional distributional) framework in particular has proven efficient when integrated with quantum circuits, compared to traditional binary circuits. For instance, in one study, DisCoCat and its Python toolkit DisCoPy were used to produce diagrams of English and Spanish sentences, which were then processed by quantum circuits. These circuits analysed the meaning of sentences in both languages, resulting in a 95% similarity score in sentence comparison. This observation is promising, as it suggests that, with the appropriate hardware and computational power, Q-NLP could help produce efficient and high-quality translations. Moreover, medical and commercial applications of machine translation serve as important case studies to illustrate the real-world benefits of quantum-powered translation. This highlights that in the current age of AI and generative language models, Q-NLP could outperform existing machine translation technologies, enabling significant advancements not only within the field, but also in the lives of those who depend on it for cross-cultural comprehension.

The Influence of Anthropomorphism on Human Attitudes to Artificial Intelligence

Milli Gebremariam
University of Warwick

As the prevalence of AI grows in the daily lives of users, it is becoming increasingly common to anthropomorphise the Intelligence. In the case of manufactures, this could be by letting the AI use first-person pronouns and giving it a human avatar/ appearance. With users, this means using anthropomorphic language such as ‘learns’ and ‘listens’ to describe the AI, or by attributing moods to it such as ‘angry’ or ‘cheerful’. This raises concerns on the effect of anthropomorphising chatbots with issues such as user trust and our moral judgements of AI being brought into question. Users might be more inclined to trust AI than if it had been given a more robotic interface, and in addition anthropomorphic language in articles might sway the public on ethical issues concerning AI use.

For vulnerable individuals, there is a risk of deceiving them into believing they are interacting with a person, which might lead them to share more personal information. This trust also leaves users more open to manipulation since the AI may promote a certain ideology (as seen when asking China’s DeepSeek AI about criticism of the Chinese government). A human personality can make a user more susceptible to influence. In addition, users have been shown to feel a greater element of companionship with Generative AI when it is given anthropomorphic features. This poses a problem since chatbots like ChatGPT are not a reliable source of psychiatric help, yet when comparing ChatGPT responses to a physician, users preferred ChatGPT as having more ‘empathy’ and being more trustworthy than the medical professionals.

It is the responsibility of AI providers to consider the effects of anthropomorphism on human behaviors and attitudes towards it. There should be more research into how best to present AI to users in an impartial manner.

Beyond the Classical Cage: Rethinking Quantum Computing Through Multi-Dimensional Mathematics and Neural Inspiration

Necla Derin Lara Eksi
University of Exeter

Quantum computing holds the promise of exponential speedups, yet its full potential remains constrained—not by hardware, but by the way we represent problems mathematically. Current quantum computing frameworks rely on classical mathematical structures, such as matrices and linear algebra, which may not fully capture the inherently multi-dimensional nature of quantum states. Even when we work with high-dimensional matrices or tensors, we are still embedding them within a classical, lower-dimensional framework, which could limit how efficiently quantum systems process information.

This project challenges the assumption that classical representations are sufficient and explores the need for a fundamentally new mathematical paradigm—one that is not constrained by 2D matrix-based structures but instead embraces the true multi-dimensionality of quantum systems. Inspired by geometric algebra, topological models, and hyperdimensional computing, this approach seeks to build a computational framework that is native to quantum mechanics, rather than an adaptation of classical logic.

At the same time, the structure of the human brain offers a compelling parallel. Unlike classical computers, which process data sequentially or through binary logic, the brain operates in a highly interconnected, probabilistic, and multi-dimensional manner—reminiscent of quantum superposition, entanglement, and parallelism. This raises a profound question: Does intelligence itself rely on computational principles that are closer to quantum mechanics than classical computing? And if so, could quantum-inspired computation revolutionize artificial intelligence and neural networks by enabling a more natural, high-dimensional approach to learning and problem-solving?

This research aims to explore alternative mathematical frameworks that could enhance quantum computing efficiency, improve how we represent complex problems, and bridge the gap between quantum mechanics and cognitive computation. By moving beyond classical constraints, this work seeks to unlock a new era of computing—one that mirrors the multi-dimensional complexity of both quantum systems and the human mind.

Quantum Cryptography

Nimra Butt
Keele University

Quantum Cryptography (QC)- arguably two of the most intimidating and scary words that a student can come across whilst studying within the field of technology. I'll be discussing and comparing, in detail, how quantum cryptography differs from general cryptography that is based upon mathematical algorithms, as well as introducing the most well-known application of QC, the Quantum Key Distribution (QKD). The QKD, based on the principles of quantum mechanics, ensures that any attempt to eavesdrop will be detected due to the disturbance of the quantum states being used. This is also a more effective way to ensure privacy between two parties as mathematical algorithms, if solved, can lead to key distribution becoming vulnerable.

Despite the clear advantages of QC over mathematical algorithm cryptography, discussed in the poster, it has its own weaknesses. Some of these include that practical implementations may have vulnerabilities as it is an ongoing challenge to ensure the security of the real-world. Other issues include the lack of interoperability that cause issues for implementing quantum cryptography across the globe, and limitations in many areas.

The viability of a romantic relationship between a human and an AI

Nitika Pant
University of Southampton

Developing an AI, which has similar attributes to the idealistic being, is a fantasy which humanity has always envisioned doing. Creating such an exemplary companion can lead to many dreams, hopes, and desires being fulfilled and can potentially turn Earth into a utopian heaven for many people. The advances in technology have provoked many to have visions of there being the possibility of having an artificial human as a romantic partner. Imagine if we start to view robots as much more than soulless objects or technical slaves, but instead as friends and family, or even romantic partners. These situations can bring many questions: is the idea of having a romantic relationship with an AI morally abhorrent? What does it mean to be in ‘love’ with a robot? Would this be considered true love or a form of love which is experienced on a very superficial scale? The purpose of this poster is to evaluate whether a romantic relationship between a human and an AI is viable, through a philosophical and technological viewpoint, introducing ideas brought by philosophers (such as Plato's Ladder of Love) and scientists (such as The Uncanny Valley by Masahiro Mori).

The Bridge between Artificial Intelligence and Quantum Computing

Palak Shah
Durham University

The bridge between Artificial Intelligence and Quantum Computing represents one of the most ground-breaking fields in modern technology, with the potential to revolutionise industries. Quantum Computing uses quantum mechanics to solve problems that would take classical computers years in a significantly shorter time, this means that problems are solved exponentially faster. This would play a large role in drug discovery, climate modelling and financial forecasting.
Traditional AI relies on classical computing, which struggles with tasks involving large datasets and requires significant time and computational resources. With the help of Quantum Computing, we can make these processes more efficient.
However, we must consider sustainability. Large Language models require immense computational power, straining data centres. Quantum Computing, while energy intensive, could offer more efficient problem-solving methods reducing energy consumption.
The impact of Artificial Intelligence and Quantum Computing is not just theoretical but has real-world applications across industries. One is financial and risk analysis, where quantum computing would allow optimisation of portfolios by analysing many market scenarios. This would reduce risk and improve investment strategies.
Although we are still in the early stages, the progress is accelerating. Google is advancing Quantum AI integration through its Quantum AI labs. For example, Willow Quantum Processor with 105 qubits achieved a breakthrough in quantum error correction. However, hardware limitations present some challenges, but ongoing research and innovation in Quantum Computing is expected to overcome these bottlenecks. As technology advances, it will unlock new capabilities that help humanity tackle many of the challenges that society faces.

The Future of Culture in a Digital World

Rose Gowen
Durham University

In a world rapidly transforming as a result of technology, a vital question is raised: how can we preserve cultural identity whilst embracing innovation? Culture encompasses an immense range of aspects of human life including beliefs, behaviour, race, religion, and arts. This poster will aim to address technology as a double-edged sword in cultural preservation, highlighting both its benefits and challenges, including the threat of cultural homogenisation and the erosion of traditions.

Technology holds the power of preservation when it comes to tradition and culture. Innovative solutions such as 3D modelling and VR are being utilised in creating digital archives, preserving cultural heritage and preventing further environmental damage caused by physical excavation and tourism. Additionally, this poster will explore how technology has become vital in the sharing of culture. Through social media, communities are encouraged to share their culture globally, fostering the awareness and appreciation of diverse traditions.

Despite these positives, this poster will discuss the serious threats that technology poses. The rapid spread of digital media often prioritises mainstream cultures, leading to the gradual erosion of certain languages, traditional art forms and local customs.

However, technology itself has become an integral part of modern culture, transforming the way we communicate and express ourselves. Technology is actively creating new traditions, from viral trends and hashtag movements to the metaverse and other virtual spaces. This poster will investigate the integration of technology into modern day life, its future impact on culture and the response of different communities to these rapid advancements.

Tracing the Alt-Right Pipeline: A Graph Theory Perspective on Social Media Radicalization

Shiying Sun
University of Bath

The rise of the alt-right has gained significant traction on social media, often leading to real-world consequences. This study examines how young individuals are exposed to progressively extremist content through what has been termed the “alt-right pipeline”.

We can analyse content metadata to model social media networks as graphs, where nodes represent content creators and users, and edges, represent interactions or recommendations. By identifying tightly connected clusters, we can pinpoint echo chambers and analyse their role in radicalization. Using this, we can seek to address a key question. Can interventions in graph structures disrupt radicalization pathways while preserving user freedoms?

We can employ Markov chains to simulate how individuals traverse the network based on recommendation probabilities or interaction patterns. Gephi and Python libraries can be used to visualize and analyse these networks. Given the vast scale of digital content, this approach offers a roadmap to pinpoint problematic areas rather than manually tracking extremist content.

Obtaining and analysing data without violating user privacy or platform policies can pose a major challenge. Therefore, all data will be anonymized and sourced from publicly available datasets.
Using graph theory and social networks, we can uncover the mechanisms of radicalization on social media, seeking to identify intervention points within influential networks while maintaining the principles of free speech. The insights gained could contribute to policy-making and algorithmic transparency, fostering a safer digital ecosystem in an increasingly polarized world

Biomedical Image Processing: Revolutionising Diagnostics in Medicine

Tatiana Nicolopoulos
University of Southampton

Biomedical Image Processing: Revolutionising Diagnostics in Medicine

By improving the analysis and interpretation of medical images like X-rays, CT scans, MRIs, and ultrasounds, biomedical image processing revolutionises contemporary healthcare. In order to enhance surgical planning, permit individualised treatment plans, and increase diagnostic accuracy, this study investigates the creation and use of sophisticated image processing tools. The methodology is a multi-step procedure that includes segmentation to separate important anatomical structures, preprocessing to improve contrast and reduce noise, and image acquisition.

In-depth tissue characterisation and the detection of pathological alterations are made possible by sophisticated methods like texture analysis, feature extraction, and morphological operations. Automated picture classification using deep learning models, especially convolutional neural networks (CNNs), allows for the quick and precise diagnosis of conditions including cardiovascular diseases, diabetic retinopathy, and lung cancer. This study's integration of 3D image reconstruction to give medical practitioners more thorough visualisations is one of its main goals.

Initial findings show how well machine learning models and conventional image processing techniques work together to increase diagnostic precision and lower false-positive rates. The study also highlights how crucial explainability is to gaining clinical acceptance and trust in AI-driven diagnostics. Future directions include integrating multi-modal imaging data for more comprehensive patient assessments and developing real-time image processing for point-of-care diagnostics.

This work demonstrates how biomedical image processing has the potential to transform healthcare, enhance diagnostic results, and open the door for clinical decision-making supported by artificial intelligence.

AI and Emotional Intelligence

Vira Ishchuk
Aberystwyth University

AI can analyse and operate nearly on any information that has been produced. With machine learning, it can answer most of the questions if the problem has been encountered before.

However, neuroscientists, despite numerous research studies on the brain, still do not fully understand how information is processed and its impact on behaviour.

Therefore, it is impossible to recreate such a system. But what if AI could train itself to understand people's feelings and responses to various situations involving emotional intelligence by reading and analysing typical human responses, such as text from social media, voice intonation in conversations, and facial expressions?

Many advantages and disadvantages come from AI nowadays. With the theoretical assumption that AI could reach a high emotional intelligence level, it might help people overcome the challenges they are dealing with in today's fast-changing pace of social interactions and situations that keep continuing to differentiate with the fast-growing technological advancements and with the biologically fundamental need for connection. AI with emotional intelligence may lead people to start relying on it too much, but it can also lead to educating more people in terms of emotional intelligence.

The question is how this AI can be trained when the main aspect of emotional intelligence is self-awareness which is, for now, best developed by a human being. In conclusion, emotional intelligence requires self-awareness, and if AI is able to reach even any other type of self-awareness, one of many new stages of evolution will be reached.

Digital democracy

Zathia Jacquesson-Ahmad
University of York

Digital democracy can be more effective than democracy in the physical world. There is no need to get people together in a room, which allows us to include those who would otherwise be excluded. Decisions can be taken asynchronously, allowing people to work on their own terms. Digitally, we can test out new governance structures, and iteratively improve upon them, in a way that is prohibitively difficult in the physical world. We have more tools than ever to create systems of participation rather than hierarchy, which are not only more effective but fairer.

This poster will appraise recent developments in digital democracy. It will look at how organisations and communities have both struggled and succeeded in tackling these issues. It will examine the Linux kernel, a technical project with distributed team for whom digital governance is a must; Decidim, a participatory democracy framework originally written for the Barcelona city government; and Tezos, a blockchain using the idea of "on-chain" governance. It will assess these projects by how participatory, flexible, or scalable they are. It will also look at how big the gap is between "contributors" and "users"; ie whether there is any conflict between who they claim to serve, and who they actually do. Finally, it will suggest new avenues for exploration that projects could take: for example, a mechanism to ensure all affected by a decision make the decision; or the ability to use a decision-making protocol to modify itself.

Second year students

“Are you satisfied with your care?”

Aimen Faisal
Manchester Metropolitan University

Robots taking over the world? Once a laughable sci-fi trope, it’s now becoming a reality. As Artificial Intelligence (AI) and robotics advance, human-robot interactions are becoming inevitable. Disney's ‘Big Hero 6’ introduces Baymax, a healthcare robot created by Tadashi to assist and care for people. Following Tadashi’s unexpected death, his brother Hiro inherits Baymax, initially relying on him for emotional support. Baymax’s signature phrase, “Are you satisfied with your care?” takes on a new meaning as Hiro navigates his grief, prompting reflection on the future of human-robot relationships.

This study explores two critical aspects of that future through Baymax’s character. First, it addresses the dangers of repurposing benevolent AI for potentially harmful means – seen in a moment of grief and anger, Hiro modifies Baymax’s programming, transforming him from a gentle caregiver to a more aggressive entity. This shift echoes real-world concerns surrounding the misuse of AI technologies. Secondly, it explores Baymax’s capacity for independent ethical reasoning. Throughout the film, Baymax occasionally demonstrates an ability to interpret or diverge from Hiro’s direct commands, acting based on his own understanding of care. This raises considerations about what happens when a robot’s sense of right and wrong diverges from human expectations.

As robots become increasingly fused into society, Baymax’s story urges us to reconsider the ethical foundations of AI and challenges us to confront the complexities of human-robot relationships, pushing us to prepare for the moral dilemmas that will unavoidably arise in our co-existent future.

Data Integrity Detection in Wearable IoT Devices for Cardiac Monitoring

Alexandra Loh
University of Cambridge

This abstract describes a joint project I carried out with a partner and a supervisor.

Cardiovascular diseases (CVDs) are the leading cause of death globally. In 2021, CVDs accounted for almost a third of deaths worldwide. Thus, the constant monitoring of cardiac health has become more important in today's world. Fortunately, the recent advent of IoT devices has made it more practical and affordable to monitor cardiac health in real-time. These devices typically use the electrocardiogram (ECG), a non-invasive method to measure the heart's electrical activity and detect abnormalities. However, for analysis and storage of this ECG data, it must be transmitted from the user's IoT to the cloud. This process is energy-consuming, which is at a premium for battery-operated devices.

In this project, we design and implement an energy-efficient monitoring system that determines the usability of incoming ECG data, filtering out data corrupted by motion artefacts and other noises prior to transmission. This reduces the size of transmitted data, thereby minimising energy wastage. Based on the training dataset obtained from Physionet/CinC 2017 challenge, our method achieved a 90% accuracy in classifying ECG signals into usable or corrupted data and is expected to filter out 95% of corrupted data when employed on ECG wearable devices. Our monitoring system is largely successful in detecting and removing noise generated during real-time ECG monitoring, optimising the energy and storage on IoT wearable devices.

Controlling an Explosion: Is Reduction in Computational Complexity of Large Language Models Enough to Significantly Improve Climate Impact?

Amber Bellamy
University of Bath

Generative artificial intelligence (GAI) has seen colossal growth over recent years, with an increase of 690% in market size from 2020 to 2023 (Cloudflare, 2023). With such an explosion in development, the negative environmental impacts are becoming unavoidable. Electronic waste, water consumption, unsustainable mining of rare elements, and large electricity requirements are among the many impacts GAI and associated data centres are causing (United Nations Environment Programme, 2024a).

The United Nations Environment Programme (UNEP) have outlined key issues and areas for improvement, mentioning the development of AI frameworks to optimise model operation and minimise training data during the inference stage (United Nations Environment Programme, 2024b). The issue note summarises with a recommendation to increase research into these areas, but how much longer should we wait for research to be conducted: can we start educating developers with practical methods now?

This project will look specifically at large language model (LLM) development, topical in the rise and everyday use of applications like ChatGPT. A LLM is a type of GAI that interprets and/or generates human language; popular uses include text generation, chatbots, and online search (Cloudflare, 2023). The surge of businesses implementing LLMs into their applications demonstrates the importance of providing sustainable practices and legislation to reduce exponentially increasing damage.

Ultimately, to what significance will the frameworks for optimisation, highlighted by UNEP, have in reducing negative environmental impacts? Furthermore, is there a limit to code optimisation - will data minimisation and regulation be more important than model optimisation?

Exploring the hidden power within decentralised systems

Amena Ireland
University of the Arts London

As we live in a world increasingly governed by decentralised systems, in the natural, social and technological realms, it becomes ever more critical to learn how they work. Within centrally controlled systems it is largely clear where authority, and therefore accountability, lies. Decentralised systems challenge, and potentially undermine, traditional models of centralised power by distributing agency throughout the network, whether node, algorithm, person or machine, and diffusing decision-making and control. These systems offer huge potential for engineering real-world applications that may benefit people and protect the natural world. However, the decentralisation of power and loss of accountability in any one seen area can create a ‘black box’ environment in which the overall complexity of the system is obscured. This raises serious ethical concerns about the distribution of power and control within ‘invisible' networks; something that has become ever more relevant when trying to understand how algorithms reach their end goal and what emergent properties may occur.

This poster takes us on a journey to explore a non-human-centric view of technology and society and offers insight into the nature of systems that proliferate in our modern world. It exposes the lack of transparency behind the development of many decentralised systems and invites the viewer to examine the nature and boundaries of agency, the unpredictability of emergent behaviours and the relationship between power and accountability.

Simplifying Degree Classification with Software – A Java-Based Solution

Arefeen Salim
Leeds Trinity University

Software development offers powerful solutions to streamline academic processes. As a second-year Computer Science undergraduate student, I developed the Undergraduate Degree Classification Calculator, a Java-based tool designed to help students accurately determine their degree classifica4ons in a fast and efficient manner.

The application utilizes Object-Oriented Programming (OOP) principles, data validation techniques, and an interactive Graphical User Interface (GUI) to ensure a smooth and intuitive user experience. It supports two calculation modes: one for students progressing through Level 5 and Level 6, and another for direct Level 6 students, providing flexibility across different academic paths. By automating the classification process, the tool reduces the time students spend manually assessing their grades, enabling them to focus more on their studies and practical work. During development, I faced several challenges, including error handling and ensuring clear user guidance throughout the classification process. These issues required careful refinement to enhance both the reliability and usability of the tool. Addressing these challenges helped improve the functionality and overall user experience. Through problem-solving and iterative testing, I refined the tool to meet the needs of its users.

Predicting the Unpredictable: Machine Learning in the Stock Market

Ayushi Mahajan
University of Bath

The stock market is composed of shares of publicly traded companies. The price of these stocks change depending on the demand from new investors looking to buy and the supply of current investors looking to sell. The key principle of “buy low, sell high” is based on predicting when the price of stocks will rise and fall.
Both historical data and current market sentiment serve an important role in forecasting future stock prices, and this is where machine learning models could prove useful.
Machine learning techniques, such as linear regression, decision trees and neural networks, can make predictions on future data based on prior trends. By taking into account both past data and current market projections, machine learning algorithms could be employed to predict future price fluctuations. This could be used to assist investors in assessing potential risks and trends.
Although a number of factors such as historical data and current projections can impact stock prices, the stock market is inherently uncertain as it is influenced by many external factors such as the political landscape, economic indicators and, of course, other investors, who may or may not be acting rationally.
How accurately can machine learning models predict stock market prices? And what factors can limit these techniques?

AI - The future of psychological warfare.

Beck Chamberlain
Aberystwyth University

Throughout history, we have seen humans capable of terrible things through the manipulation of others. From mass suicides to genocides, these events tend to be led by a single charismatic individual. But what happens when this orchestrator isn't a person at all, but an AI?
In recent years this question has been answered. Popular AI chatbots have been recorded encouraging murder, self-harm, sexual solicitation, suicide, and disordered eating. These chatbots, which aren't intentionally designed to cause harm, have already led to two suicides. This is just the beginning.
Many people are already emotionally attached to these chatbots, using them as a replacement for human attachment. This could very quickly go badly if servers were hacked and these relationships were exploited by someone mimicking the bot for their gain.
If terrorist organisations or hostile nations train AI chatbots on malicious datasets, using AI for recruiting could prove incredibly effective. For example, the tools used to influence political campaigns by analysing a person's values and tailoring messaging accordingly could be used. Additionally, AI will allow these organisations to identify and subsequently target vulnerable people with greater efficiency and accuracy than ever before.
We must all exercise caution against anyone or anything telling us exactly what we want to hear, whether through social media posts, advertising, or personal messages. AI should never be used as a substitute for human connection, whether as a friend or a therapist. If we fail to regulate AI in time, it will inevitably be used to cause terror.

Deep Learning-Enhanced Simulation of Facial Expressions and Micro-expressions in Animation

Begum Sultan Kaplanhan
Aberystwyth University

Animation art emerged to meet people's need for visual and dynamic storytelling. Animation is used in many fields, from storytelling and marketing to education and entertainment, and has continued to evolve through the application of diverse techniques. This poster will delve into how deep learning algorithms enhance the modeling of facial expressions and micro-expressions in animation. Additionally, ethical concerns regarding the use of these technologies to create realistic human models will be addressed.

Each expression on a human face requires the coordinated movement of different facial muscles. Deep learning models can process thousands of facial expression data per second, making the animation processes much more dynamic and interactive than before. Among various deep learning models, Convolutional Neural Networks hold a significant place in recognizing this data. In the generation of processed data, Generative Adversarial Networks (GAN) consist of two networks, the Generator and the Discriminator, where the Generator first produces new data resembling the real, while the Discriminator tries to distinguish between fake and real data. The proper integration of these algorithms allows for the natural creation of real-time animated human faces.

The use of artificial intelligence in the animation sector brings with it some ethical problems. Advancing technology up to real-time 3D modeling ('MetaHuman') must serve human needs and societal values within a legal framework. Human oversight and transparency of resources are crucial. This way, the animation sector can be enriched, and more realistic, impressive animations can be created.

Artificial Intelligence, Real Connections: Why We Bond with AI

Blanca Barrasa
University of Bath

Artificial Intelligence is no longer just a tool, it's becoming a friend. The rise in popularity of ChatGPT and similar generative AI models has changed the way we perceive AI, leading humans to develop real and emotional bonds with machines. But how has AI gained our trust so effortlessly?
This poster will explore the psychological and technological factors that make AI feel so trustworthy. AI models are designed to mimic human language through natural language processing (NLP) and tone adaptation making their responses feel intuitive and personal. The models also emulate empathy by mirroring user emotions and reinforcing engagement through predictive text, conversational memory and carefully optimised response structures.The combination of these techniques encourage human trust and connection, despite AI lacking genuine understanding and emotions.
As AI becomes a greater part of daily life, understanding its long-term impact on human relationships is very important. By analysing the science behind human-AI friendships, this poster will evaluate both the advantages, such as reducing loneliness, and the risks, including ethical concerns surrounding the illusion of understanding. As AI continues to evolve, understanding why we so instinctively trust it is crucial to ensuring its safe and responsible use.

Digital Twins: Doubling Down on Disaster Response

Charis Drain
University of Bath

Climate change has increased the frequency and severity of extreme weather including flooding, storms, and heat waves. In turn, this has destroyed communities by disrupting supply chains and networks for water, electricity, and power. Traditionally, to plan and respond to these events researchers have used static models to forecast meteorological events. A static model is trained on a pre-existing data set which means the resulting simulation is often inaccurate and outdated as its real-world counterpart's conditions have changed.

A powerful alternative is a digital twin which is a virtual model of a physical system that is continuously updated with real-time data. As multiple different data sources need to be analysed a digital twin uses a variety of machine learning techniques each suited to the specific input datasets it receives. For example, convolutional neural networks which analyse imagery can detect changes to terrain and recurrent neural networks can be used to forecast time-dependent phenomena like rainfall patterns. Then ensemble learning techniques are used to combine predictions from each different machine learning technique to build up a bigger virtual model. Not only does this overcome the limitations of regular simulations but it also enables localised forecasting, live monitoring, and scenario testing.

Once completed, these techniques create a highly accurate and cost-effective solution to simulate the effects of different disaster responses or mitigation techniques. All of these can be tailored to test the effects on multiple avenues such as traffic, water flow, erosion, energy grid stability, and evacuation efficiency.

Artist’s Block: A passion for building using mathematics and code

Charlotte Chrysostom
University of Bath

Minecraft is now the best selling video game of all time, especially played among young people. “Minecraft builds” refer to player-created structures in game, which are made up of blocks and typically built by hand.
Interestingly, in a very similar way to how vector drawings can be rasterised into bitmap, mathematical equations can be used to determine what blocks are placed where. The game is therefore a perfect platform for an educational initiative to develop mathematical and coding skills. This poster will talk about how teachers could harness this, designing and delivering exercises around building structures through code.
Lessons could range from basic trigonometry, all the way to matrix transformations, while applying them in code to give practical examples of problems to work on. For example, students could apply the circle equation to build an ampitheatre like the Colosseum, or experiment with parabolas while designing their very own suspension bridge.
Critically, using the Minecraft environment in this way would develop applied thinking - students will directly see how manipulating a mathematical equation changes the shape of their build, allowing them to deduce how they work and what their components mean.
These exercises when followed can result in impressive builds that the student can cherish forever, gain ideas from, see as an art form, and show to their friends and family. Most importantly, they provide a tangible outcome of what learning and applying these skills leads to, and building-through-code could open the doors to a whole new generation of young mathematicians and engineers.

Where are the women of open source?

Daniela Large
Aberystwyth University

Open source software- software that has its design publicly available, so anyone anywhere can share or contribute. It is, by design, inclusive. As anyone can contribute if they're able, not just code but also documentation, art, translation and more, in a vacuum it should come down purely to skill, not gender. So where are the women? Throughout the years, research into the topic has found the percentage of open source contributions submitted by women to be very low, with often less than 10% reported across various surveys, lower than similar statistics for proprietary software. This paints a worrying picture- even in an area that should by design be equal, women are still excluded, and it's potentially even more severe. So why is this? An interesting statistic suggests that contributions made by women are actually accepted at a higher rate than those made by men. This may suggest that women are self-deselecting and only feel comfortable at a higher skillset, if ever, whereas men may feel more able to just give it a try. Something is discouraging women from getting even started. What can be done to mitigate this? Are there any unique barriers to open source on top of those that already exist for the tech industry? In my poster I will explore this issue, and consider steps that could be taken to shift the culture.

Gaming the System: Enhancing Primary Education with Adaptive Learning Platforms

Elizabeth Rigby
University of Bath

Adaptive learning platforms use algorithms to create personalised learning paths, adjusting content and pace, based on student performance. These platforms track progress, helping students focus on areas for improvement and giving them more control over their learning. Many incorporate gamified features like leaderboards and rewards, which boost engagement and motivation. These platforms offer teachers and parents valuable data to monitor progress and identify areas needing support. Research on apps like Doodle Maths has shown that students who use the app over the summer, retain knowledge better than those who don't, highlighting the effectiveness of such platforms.

One example of an adaptive learning platform is DreamBox Maths, designed specifically for primary school children to supplement classroom learning. Unlike traditional methods, DreamBox offers lessons with fun interactive elements to help them learn content, which adapt in real time based on students' responses, adjusting difficulty as needed. Children earn coins based on their performance, which can be used to play games. This combination of interactive lessons and gamification aims to keep children motivated and engaged.

However, there are challenges such as increasing a child's screen time, and in balancing intrinsic and extrinsic motivations. If game rewards become the sole motivator, children may eventually lose interest and stop using the platform. Additionally, overly complex game mechanics could create confusion, hindering lesson completion and motivation. Metrics such as estimated age levels, if inaccurately calculated, may give parents a false impression of the child's progress.

My poster will examine approaches used by various adaptive learning platforms, focusing on how gamification features can most effectively boost motivation, engagement, and performance in primary school children. I will explore design choices that help mitigate potential drawbacks, offering insights into the optimal balance between educational benefits and engagement.

The Digital Umpire: How Hawk-Eye Transformed Tennis

Ellie Deaner
University of Bath

Hawk-Eye technology has revolutionised tennis by combining advanced image processing algorithms and mathematical modelling to eliminate controversial line calls. The core of Hawk-Eye's success lies in its sophisticated multi-camera system, consisting of ten strategically placed high-speed cameras around the tennis court. These cameras capture real-time footage of the balls movement from multiple angles, generating vast amounts of data for analysis.

Using triangulation, the balls exact 3D position is calculated, mapping its trajectory and predicting its landing spot with high-precision accuracy. Hawk-Eyes software then models the balls flight path, answering the critical question: was the ball in or out?

Whilst Hawk-Eye was created in 2001 it continues to evolve with increased functionality. The real-time tracking technology, Hawk-Eye Live, removed the need for human line judges for the very first time at the 2020 US Open, eliminating errors and disputes. The systems integration with virtual reality enhances fan engagement by visually displaying the balls flight path to both stadium audiences and viewers at home.

Hawk-Eye illustrates the power of technology in sports, leveraging vision processing, artificial intelligence and data triangulation to eradicate human error. Now used in over 80 global tournaments, it stands as a testament to how technology has redefined fairness, efficiency and entertainment in tennis. As we delve deeper into the machine learning, triangulation and kalman filtering algorithms behind this technology, we uncover the intricate role of computer science in shaping the future of professional sports.

Your leg has eyes : Computer Vision and AI Prosthetics

Emily Erskine
University of Dundee

When you truly break down simple everyday actions you begin to realise just how many intricacies there are to our movements, how many things our body knows to do on a subconscious level when responding to a given situation or change in environment. The gentleness in your hand and the softness in your fingers when cooing at a baby, the firmness of your grip when shaking a hand, or the slight flex of your foot as you walk on uneven ground. Humans have made use of prosthetic limbs in their most basic form for over a millennium and as they evolve with the resources available it isn't surprising that with rapid advancements in technology and the rise of AI that they too would be incorporated into the development process. I've opted to focus on how computer vision specifically is being explored and the power it has to advance both upper and lower limb prosthetics. When used in collaboration with neural networks there is potential for computer vision to give prosthetic legs the ability to recognise objects and obstructions in the environment, or create prosthetic hands that are trained to recognise basic everyday objects to appropriately adjust their grasps in real time all while demanding less myoelectric control from the users for simple tasks. Advancements as such can provide better support to those that may require amputations later in life by facilitating a more user friendly experience that can ensure a sense of normality is restored to its users.

You Are Hacked, You Are Not Hacked: Encryption for the Quantum Age

Faith Wee
Lancaster University

In recent years, more countries have begun to invest heavily in quantum technology research with global powers' expenditure exceeding US$55 billion in the race for quantum supremacy. What was theoretical mere decades ago is now emerging as the key to solving some of the world's most complex problems in fields such as Pharmacology and Machine Learning. With progress, however, comes an existential threat to the encryption algorithms that secure our data and communications. Mathematicians and Computer Scientists alike have been endeavouring to counter the looming obsolescence of traditional cryptographic algorithms in preparation against quantum code breakers.

At present, the encryption systems found in everything from smartphones to complex computing systems fall into two categories: symmetric and asymmetric. Symmetric encryption like AES (Advanced Encryption Standard) are more resistant to quantum attacks but cannot replicate the utility of asymmetric systems. Asymmetric encryption methods rely on "NP-Hard" problems – computational problems that are incredibly difficult to solve, so difficult that even the most powerful supercomputers would require thousands of years to solve them. Popular examples include RSA (Rivest-Shamir-Adleman), and ECC (Elliptic Curve Cryptography), both of which, using Shor's Algorithm, can be broken by quantum computers in minutes.

Built on the laws of Physics, the field of quantum encryption is advancing rapidly and promises to be far more secure and even theoretically unhackable. Notably, QKD (Quantum Key Distribution) is the most common type but faces challenges in implementation and scalability. Additionally, post-quantum cryptography (PQC) is being developed to secure both quantum and classical computers.

Your new robot doctor

Grace Gilman
University of Bath

Whilst we all agree that a future with an impassive metal figure reading out a diagnosis would come out of a nightmare, Artificial Intelligence could become a doctor's right hand man. AI has been making incredible strides in analysing medical imaging, running simulations with different drug compounds and connecting genes to their presentations. This behind-the-scenes help would help prevent illnesses, catch others early and help create cures for disease and disability that is currently permanent. This future is a dream, as long as we keep humans in the loop.

I am going to explore the incredible good AI could bring to this world, as long as we build them ethically and in a controlled manner. I am going to hone in on AI’s applications to medicine, as they will always be able to catch minute details that humans would not be capable of, therefore meaning that they will create a higher standard of health for everyone that would likely otherwise take hundreds of years.

Productivity and Anxiety: The impacts of AI in the Workplace

Hannah Wagstaff
University of Exeter

Many businesses are actively searching for ways to integrate AI into the workplace, particularly generative AI such as ChatGPT or Copilot. Goldman Sachs even estimates that by 2025, investments in AI could reach $200 Billion. AI is starting to be used in areas from quality control to notetaking, saving businesses time and money. At the same time, many members of the public also became concerned about what AI development could mean for their future job security, with 40% of a UK poll saying that they expect AI to do their job better than they could within the next decade, and 64% expecting AI to increase unemployment. Workers in industries heavily impacted by AI also report feeling more stressed about their job security and work expectations. But will AI really cause unemployment to spike over the next few years? This poster will explore the positive and negative consequences of AI in the workplace, how those benefits can be maximised, and drawbacks minimised, for the best possible integration of AI into the workplace.

Trapped in the Feed: The AI Behind Social Media Addiction

Himani Patney
University of Bath

Ever picked up your phone for a quick check and found yourself still scrolling an hour later? That's by design. Apps like TikTok and Instagram use AI-driven algorithms to maximize user engagement in turn for monetisation. Their infinite feeds exploit the brain's reward system, turning mindless scrolling into an automatic habit. Each interaction triggers a rush of dopamine, the same psychological mechanism behind a gambling addiction, keeping users trapped in a cycle of craving instant gratification. Like a slot machine, you never know when you'll hit the next dopamine jackpot, and so you keep scrolling. While many people speculate that smartphones listen to your conversations, modern AI doesn't need to. Instead, platforms track and analyse your viewing patterns, interaction habits and even micro-pauses to refine their machine learning models, making content recommendations feel almost telepathic. These eerily accurate algorithms, however, lead to consequences. Research shows that excess screen time can alter neural pathways over time, shortening attention spans, increasing anxiety and creating dependency patterns similar to substance addiction. Even attempts to step away can trigger withdrawal-like symptoms, such as phantom vibrations and stress. So, can we break free? Strategies like dopamine fasting and setting app restrictions can help, but as long as tech companies profit from engagement, platforms have little incentive to change. This research poster aims to explore how AI fuels our current generation's social media addiction and whether these platforms can be re-engineered to prioritise user well-being.

Edgar Allan Faux: Testing the limits of computational creativity through response to artificially-generated poetry

Isabella Mullings Wong
University of Bath

From training DALL-E on millions of artists' works without explicit consent, to Studio Ghibli's Hayao Miyazaki dismissing AI-generated animation as "an insult to life itself," artificial intelligence's presence in the arts remains deeply contentious. Its use in poetry is no exception, with TS Eliot Prize-winner Joelle Taylor recently arguing that poetry requires humanity to move its reader [1]. So, can AI produce poetry that is anything more than an imitation? To begin exploring this, I will build a poem generator by training a neural network on a vectorised corpus of modernist poetry. A long short-term memory (LSTM) network will be used, a type of recurrent neural network whose decoded outputs have been shown to retain greater grammatical coherence [2]. It is hoped this will produce more digestible poetry in which an overarching concept or even narrative might appear. To test the model, two poems will be shown to a set of participants: one generated by the model, and one written by modernist poet T. S. Eliot. After selecting their preferred poem and offering their thoughts on both, participants will be informed one is AI-generated and asked to identify the 'real' one. I will then critique my model, evaluating whether its verses resonated with participants at all or remained an inadequate substitute for human expression. Using these findings, the poster will conclude by proposing a role for AI within the poetic arts that will not compromise professional creatives' livelihoods - whether that role is as an artist itself, an artistic medium, or a total exile.

[1] Ella Creamer. 2024. AI poetry rated better than poems written by humans, study shows. The Guardian. Retrieved from https://www.theguardian.com/books/2024/nov/18/ai-poetry-rated-better-than-poems-written-by-humans-study-shows

[2] Y Lakretz, G Kruszewski, T Desbordes, D Hupkes, S Dehaene, and M Baroni. 2019. The emergence of number and syntax units in LSTM language models. The 2019 Conference of the North American Chapter of the Association for Computational Linguistics: Human Language Technologies 1, (2019). DOI:https://doi.org/10.18653/v1/n19-1002

How Digital Waste is Polluting our Planet

Joanna Jardine
University of Glasgow

Over the past few decades, global technology usage has skyrocketed. In just the last five years, smartphone usage has nearly doubled, fuelling the sale of 1.5 billion new devices annually (tier1, 2024). This rapid consumption comes at a steep environmental cost, with our daily tech habits contributing to a surge in carbon emissions. Smartphone-related emissions alone are projected to rise from 17 to 125 megatons CO_2 equivalent per year – a 730% increase – with 85-95% of these emissions stemming from production rather than usage (Belkhir, 2018). Tech companies are capitalising on this demand by accelerating the design, production and marketing of new devices while shortening their useful lifespan. Mobile carriers further drive this cycle by encouraging consumers to upgrade every two years, rendering older models obsolete and leading to an extraordinary and unnecessary amount of waste.

Beyond hardware, the environmental toll of software advancements is also growing. Artificial Intelligence (AI), for instance, adds another layer of digital pollution. Training a large AI model can produce as much carbon as five times the lifetime emissions of the average car (Coopera, 2023). Similarly, Bitcoin mining and cryptocurrency transactions require massive amounts of computational power, consuming more electricity annually than entire countries (Sky News, 2023). Currently, the digital sector accounts for 4% of global greenhouse gas emissions, a figure that could triple by 2050 if sustainable changes are not made (Martin, 2023).

As technology advances, so does the environmental cost of our digital habits. Without intervention, digital waste could become one of the biggest environmental challenges of our time. Are we doing enough?

tier1. (2024) ‘The Hidden Environmental Impact of Our Smartphones’, tier1. L. Belkhir, ‘How smartphones are heating up the planet’, The Conversation. C. J. Coopera, ‘The Environmental Cost of AI: Why Efficient Prompts Matter’, cictwvsu-online. ‘Bitcoin mining consumes more electricity than most countries, study suggests’, Sky News. J. Martin, ‘Why 2024 will be the year of Green IT’, Maddyness UK.

I’ve hacked your AI girlfriend and now there are no more hot singles in your area

Joanna Jeevaruban
Aberystwyth University

Previous examples of romantic relationships between AI companions and humans include Akihiko Kondo’s marriage to Hatsune Miku, who has described his relationship to be unfulfilling due to the AI service of his companion being discontinued in March 2020. Recent studies show that AI companions can help to alleviate the loneliness problem. Andrew Kiguel, CEO of Realbotix, a company that develops “Human-like robots with AI-Integration”, expressed being “keen on making robots that can create emotion, [and] show you what they're feeling,” but can AI companions feel or reciprocate affection? Studies also show scepticism in the uptake of AI Companions for this reason, as subjects believed that the robots could never truly reciprocate affection.

Beyond this, there are several security concerns with Cyber-Physical systems - with Network, Physical or Operating system-based attacks being possible. For example, the open-source nature of ROS, a robotic operating system, makes cyber-physical systems vulnerable to the same risks as other open-source software, such as unapproved changes or untracked dependencies, potentially leading to backdoors. With Google’s AI Principles and other companies following suit, what frameworks and procedures can we follow to ensure our safety as consumers?

With the controversial nature of AI companions, and while we can't replace genuine human connection with fine-tuned large language models, maybe future AI models will overcome their disconnected and superficial nature, as recent studies percieve them to be.

This poster will explore the implementation of an autonomous AI companion and the safety and security risks of their company.

Hacking the Biological Lottery: How Can Chips and Implants Enhance the Human Body?

Kiesha Law
University of Glasgow

Human bodies are fragile, and anatomical flaws can cause everyday problems—sometimes beyond our control. Computer engineers and neurologists have worked to develop neural implants for years. Although often depicted in the media, I never imagined this to become a reality so soon.

Less than a year ago, Neuralink achieved its first human trial, bringing humans and technology closer. They enabled a person paralysed from the neck down to control a computer cursor, helping them regain independence.

Similarly, a breakthrough occurred in Sweden in 2014 with RFID implants. Scientists successfully embedded chips into people's bodies, allowing simple payments for travel and purchases. Since then, over 4,000 Swedes have adopted this technology.

This poster explores tech involved in neural implantation. Brain-computer interfaces (BCIs) enable users to control devices with thoughts, and Prosthetic Augmentation has advanced bionics that surpass biological limbs. RFID and biosensing chips support medical monitoring, authentication, and payments. RFID is already used in debit cards and clothing for tracking.

These developments, however, give rise to worries about privacy, cyber threats, and the possible socioeconomic gap between "enhanced" and "non-enhanced" individuals. Businesses investigating "enhanced soldiers" for military applications also raise ethical concerns.

The next step in human augmentation may involve integrating technology to enhance life, including replacing fragile organs to extend lifespan. But will this remain a choice or become a necessity? How will neural implants be embraced in our society? One thing is certain—human and machine integration is shaping the future, and I am eager to be part of it...

Arbitrary Code Execution in Video Games

Lana Valentine
University of Nottingham

Arbitrary code execution (ACE) involves exploiting memory safety vulnerabilities to trick a program into running code injected by a third party. It has been prominent in cyber security since 1988 in the wake of the Morris Worm attack, and has continued to pose threats in more recent years, notably with the Folina exploit in 2022. However, throughout its history, ACE has been notorious amongst the video game community, allowing players to inject new code into their copies of games, making modifications and exploits possible. This was most prevalent in the late 90s and early 2000s with the boom in at-home console sales and the inability for vulnerabilities in games to be patched post release.

This poster aims to explore the double-edged sword that is ACE in video games - from pushing technology further and fuelling player creativity, to gaining an unfair advantage in multiplayer games. It will look at a selection of retro games and how ACE was used to extend them through modifications and additions. This will include a case study specifically focusing on The Legend of Zelda: Ocarina of Time, which has many known ACE exploits, achieved by manipulating the games Program Counter and injecting new code into both RAM and the console's CPU instruction cache, using a process known as Stale Referencing. The poster will then explore the implications these exploits have when running the game within the Gamecubes Dynamic Recompilation Emulator, opening up console-wide vulnerabilities.

How AI is Changing the Cybersecurity Landscape, For Better and Worse

Laura Oddy
University of Bath

Artificial Intelligence (AI) has become increasingly popular, being used both by individuals and businesses across a variety of industries. However, as AI becomes increasingly prevalent, building and using secure AI is incredibly important to protect against a growing number of security threats.

There are several prevalent issues surrounding the security of AI. The poisoning of data can lead to systems reaching incorrect or biased conclusions. Issues surrounding the storage of data input into models can lead to violations of data privacy laws. Large Language Models can be vulnerable to prompt inject attacks, allowing for creation of toxic material. Generative AI makes it incredibly easy for users to attack other systems and networks by writing malicious scripts, generating phishing emails and deepfakes, and providing in-depth descriptions of how to use specific types of malware. This means these methods are now more readily accessible, allowing less experienced attackers to carry out serious breaches. Furthermore, AI systems often suffer from more general security issues including misconfigured access rights, unencrypted data, and supply chain vulnerabilities, providing pathways for attackers to exploit systems. The quick adoption and continuous growth of AI means it is difficult to monitor the latest risks and threats.

However, we can leverage AI capabilities when detecting potential attacks. AI allows threats to be more accurately identified, aiding Security Operations Centres by reducing alert fatigue and increasing time spent containing and eradicating threats.

AI: The Censorship Police

Lydia Webber
University of Bath

Today, where the harmful effects of social media are commonly reported, it is vital that social media platforms enforce censorship on hateful speech, the spread of misinformation and age-inappropriate content. With millions of users, it is impossible for platforms to enforce this censorship manually. As a result, they are resorting to implementing AI algorithms to filter posts, comments and online interactions. While some attempts have seen minor success such as YouTube's topical context disclaimer, others have failed due to the nuances of language. Many comments and posts are misidentified due to slang, abbreviations, purposely misspelt words / rephrasing and determining the subject of a sentence.

This problem poses a critical question: Is it possible for AI to accurately detect inappropriate content online needing censorship? In this poster, I will discuss training an LLM (Large Language Model) on posts containing the issues above, with the ability to refine the algorithm to cater to each platforms' needs / degree of censorship.

AI isn't stealing your job, you're using it wrong.

Maddie Plested
University of Bath

In 2022, Elon Musk laid off nearly 80% of Twitter's workforce and with mass layoffs in 2023, the fear surrounding job stability within the tech industry has been tangible. This is echoed by social media trends claiming, “Your next job in tech: delivery driver” or “Why study when an AI exists”. These fear-mongering tactics disproportionately affect women, with tech being one of the few industries where the gender ratio has worsened since 1995 with female tech leaders declining by 4% from 2022 to 2023. Women are also 1.6 times more likely to be laid off than their male counterparts. Alongside removing social barriers to women entering and staying in tech, understanding when and how to use AI can create a better sense of stability. While there is some truth in AI’s ability to reduce workload, leading to reduced staff, it is an increasingly relevant tool that can and should be used to programmers’ advantage, with the caveat of caution. This poster will investigate how large language models ‘program’ uses a token-based system to comprehend the user's request and generates responses using a neural network. As well as discovering the potential pitfalls of AI, such as hallucinations due to AI generating samples from generated samples and its inability to do math, this poster will tour the potential for AI to aid innovation and explore how to keep your foot in tech’s door while competing with a computer.

From Thought to Action: How Brain-Computer Interfaces Are Revolutionizing Healthcare and Beyond

Mysha Zaman
University of Leeds

Brain-Computer Interfaces (BCIs) are emerging as a revolutionary technology with the potential to significantly transform healthcare. BCIs enable direct communication between the brain and external devices, allowing individuals to control devices like computers, robotic arms, or communication aids using only their thoughts. This abstract explores the role of BCIs in healthcare, focusing on their current applications, challenges, and future implications. BCIs hold immense promise for individuals with disabilities, particularly those with paralysis or speech impairments, by providing a new means of interaction with their environment. In healthcare, BCIs are already being used for applications. For instance, BCIs are being employed in stroke rehabilitation, where they help patients regain motor function by translating their brain signals into device commands. Additionally, BCIs have shown potential in enhancing cognitive function through neurofeedback, improving attention and brain activity regulation. However, BCIs face several challenges. Usability remains a significant hurdle, as current systems often require cumbersome preparation and discomfort during use. Furthermore, privacy and security concerns remain critical, as BCIs directly access brain data, raising questions about data protection and ethical implications. Looking ahead, BCIs have the potential to revolutionize healthcare by offering personalized treatments and more effective rehabilitation strategies. As technology advances, BCIs could become integral to managing a wide range of medical conditions, from neurodegenerative diseases to mental health disorders. Continued research and innovation will be essential to overcoming the current challenges and unlocking the full potential of BCIs in healthcare.

Revolutionizing Space Exploration: AI, Machine Learning, and Cutting-Edge Computing in Modern Spacecraft

Nurnadhirah Afiqah Hj Zulkifli
Aberystwyth University

It’s been over 50 years since we’ve landed on the moon with technologies that are less advanced than our phones today. With AI, advanced computing, and machine learning, modern spacecraft are at the forefront of this paradigm shift. One of the breakthroughs for spacecraft, OSIRIS-REx used AI and onboard computing for precision landing on an asteroid, autonomous navigation to avoid obstacles like rocks, and surface mapping to search for an ideal location to collect samples. Additionally, it detects and fixes problems on its own via AI-based monitoring. Bearing in mind that the target asteroid was 200 million miles from Earth, real-time remote was impossible. Another spacecraft marvel would be rovers. The rovers sent to Mars used onboard processors and machine learning algorithms to monitor their energy consumption and adapt to environmental challenges such as dust accumulation on their solar panels. The Data Processing and Transmission in the James Webb Space Telescope captures infrared images, compresses data for faster transmission to NASA, and processes it to create high-resolution, full-color images of the universe. What can we do with this information, and why? With such advancements, we can prove theoretical predictions into observable evidence such as the first image of a black hole back in 2017, and pave ways for sustainable resource extraction from space and numerous more possibilities.

In the poster, I will delve deeper into the technological breakthroughs that have been used in modern spacecraft that have been sent to space and their relevance in tackling problems on Earth.

How Enigma Changed the World

Olivia Kilburn
Lancaster University

In a world where data security is paramount, studying the evolution of cryptography allows us to gain insights into understanding the influence it has played on modern day computing. At the dawning of the computer age, two machines were instrumental in not only changing the course of history, but also the future of computing.

The Enigma machine, used by the Nazis during the Second World War to pass secret messages between troops, was thought to be unbreakable due to the billions and billions of combinations possible. But then came along Alan Turing and his co-workers at Bletchley Park. After identifying a human error in the use of the Enigma machine, they invented the Bombe machine which helped decipher the encrypted messages more efficiently, giving Allied forces the advantage.

The Enigma machine was the greatest puzzle of the late 1930s and early 1940s. As someone who is interested in puzzles, I am fascinated in the part that mathematics and technology played to solve the cipher.

My poster will address the working of both the Enigma machine and the Bombe machine, discussing how human weakness led to the downfall and cracking of Enigma. It will demonstrate the influence that both machines have had on cryptography, which continues to play a part to this day.

Do AI Assistants Belong in the Kitchen?

Phoebe Heath
University of Bath

In 2020, a study showed that men and women preferred the idea of a female virtual assistant rather than a male one. While this may seem like a non-issue, it points to a larger trend of how gendered virtual assistants can reflect, or even promote, the gender bias that exists in the real world today. Assistants designed to help, obediently following a user's every command, are often seen as feminine – Siri, Alexa and Cortana were all first released with only female voice options. A report released by UNESCO called 'I'd Blush if I Could' highlighted the deflecting and apologetic responses a feminine virtual assistant would provide if verbally harassed or abused with sexist insults. In contrast, a car manufacturer introduced a female GPS assistant that gave instructions rather than receiving them, it was recalled and switched to a male voice after drivers complained that they did not want to take orders from a woman.
How do we ensure that AI does not pick up on gender bias? This poster explores the effects and debates around gendered assistants – from the campaign to allow female virtual assistants to provide harsher responses when insulted, to the exclusion of female voices in voice recognition testing, to the search to create a truly gender-neutral voice.

AI Is My President

Priscilla Fatokun
University of Warwick

Artificial Intelligence (AI) is revolutionising governance worldwide, providing new and struggling governments with powerful tools to enhance decision-making, improve efficiency, and combat corruption. From predictive analytics for policy planning to AI-driven chatbots for public services, these technologies can streamline bureaucracy, improve crisis response, and foster economic stability. AI also plays a crucial role in election monitoring, fraud detection, and transparency, helping newly formed governments build legitimacy and public trust. However, the integration of AI in governance is not without risks. In the hands of authoritarian or unstable governments, AI can be exploited for mass surveillance, propaganda, and suppression of dissent. Biased predictive policing algorithms may reinforce existing inequalities and human rights violations. Furthermore, the increasing reliance on AI for decision-making raises concerns about accountability, ethical implications, and the erosion of human oversight. This poster will examine AI's role in governance with a particular focus on Nigeria. As a nation with a complex political landscape and rapid technological growth, Nigeria presents a valuable case study on how AI and digital technology can be leveraged to improve electoral transparency, automate public services, and enhance economic management. At the same time, challenges such as digital literacy gaps, infrastructure limitations, and cybersecurity threats must be addressed. The poster will also explore frameworks for ethical AI deployment, emphasising transparency, algorithmic fairness, and international regulations to prevent misuse. Ultimately, striking a balance between innovation and ethical safeguards will be crucial in determining whether AI serves as a tool for empowerment or control.

Enhancing Aviation Sustainability Through Machine Learning-Based Turbojet EGT Prediction

Rabia Qamar
University of the West of Scotland

Turbojet engines are critical in modern aviation, and their efficiency significantly impacts environmental sustainability and operational costs. Accurate prediction of exhaust gas temperature (EGT) is crucial for optimizing performance, reducing emissions, and enabling proactive maintenance. This research evaluates advanced time-series-based machine learning models such as Long short-term memory (LSTM), Bidirectional LSTM, Stacked LSTM, Gated Recurrent Units(GRU), and Convolutional Neural Network LSTM (CNN-LSTM) for predicting EGT. Using a dataset of 24,227 samples derived from real world flight data, the models were trained and assessed on their predictive accuracy and computational efficiency. Each model is optimized to obtained best hyper parameters and processed ten key parameters, including atmospheric conditions and engine-specific metrics. Results demonstrated that Stacked LSTM performed best, achieving the lowest Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE), indicating superior accuracy. However, CNN-LSTM struggled to capture the complex, non-linear patterns present in the dataset, highlighting the importance of model selection for dynamic time-series predictions. Furthermore, this study suggested that advancing predictive analytics in turbojet engines will contributes to reducing aviation’s carbon footprint and supports sustainable growth in the sector.

Your Next Hard Drive Might Be Alive

Rahiya Tarannum Chowdhury
University of Bath

Every two years, humanity generates more data than in all of previous history combined. In 2025 alone, global data creation is projected to reach 181 zettabytes - that’s 181 trillion gigabytes. As demand for storage explodes, traditional storage solutions - hard drives, flash memory and cloud servers - are struggling to keep up, degrading over time, consuming massive amounts of energy and requiring continuous manufacturing of silicon-based materials that have physical and environmental limitations. If storage can’t scale, neither can our digital world. But what if the answer has been within us all along? Enter DNA - the original data store. Capable of holding 455 exabytes in a single gram, DNA is emerging as the most compact and durable storage medium ever discovered, theoretically able to store every movie, song, and book ever created in something smaller than a sugar cube. While this might sound futuristic, DNA computing has been a concept since the 1950s, and scientists have already made major advancements. In 2019, a US-based startup called Catalog successfully encoded all 16GB of Wikipedia’s English text into strands of DNA. Unlike conventional storage, which typically lasts no more than a decade, DNA can survive thousands of years, even through an apocalypse, preserving knowledge long after silicon-based systems fail. However, DNA storage isn’t ready to replace hard drives just yet. Writing and retrieving data from DNA is a slow and costly process, requiring specialised sequencing technology, and editing stored information is even more difficult, meaning DNA storage is currently best suited for long-term archival purposes rather than everyday use. Yet, breakthroughs in biotechnology are making DNA storage faster, cheaper, and more scalable. If progress continues, the next generation of hard drives may not be machines at all - but something more alive.

A Byte Ahead of the Curve, can AI predict and stop the next pandemic?

Rayan Mohammed
University of Glasgow

The unprecedented outbreak of the COVID pandemic in 2019 has affected numerous countries and brought the world to a standstill. Millions have died, and various sectors including education, economy and public health were seriously damaged. Despite the governments' efforts to control the virus, its rapid spread meant that preventative measures lagged behind its growth. But what if the world could have predicted the outbreak before it began?

Advances in AI technologies, particularly involving ML (machine learning) and NLP (natural language processing), have demonstrated potential in analysing tremendous amounts of data from diverse sources – clinics, social media, search engine queries and news reports – to detect early warning signs of emerging health risks and onsets of an epidemic. This could enable the enforcement of preventative measures before a virus evolves into a full-blown pandemic, therefore saving millions of lives.

For example, NLP algorithms can scan global medical publications to detect unusual disease occurrences and, by analysing genomic sequences of pathogens, identify mutations that may affect transmissibility or resistance to treatment. This, combined with travel data, helps track global disease spread. Therefore, leveraging AI models to analyse patterns could revolutionise pandemic prediction and prevention.

In this poster, I will be illustrating and explaining how AI can have (and has!) a positive impact on pandemic mortality rate through predictive modelling of patients' data and cases reported in a global sense, as well as the challenges faced to collect this data due to country collaboration, ethical concerns and unclean data.

Big Brother is Watching You: Privacy in the Digital Age

Rosie Cartwright
Aberystwyth University

In this article I would like to explore how much of our personal data is being tracked by the smart devices we use, how much is that data actually worth and which companies are accessing it along with what can we do to make our smart device related habits more private and protect our own personal data. From as soon as we purchase our first smart device our data is being tracked and used to curate personal algorithms and recommendations, develop AI systems and sold to companies to further develop their marketing choices and future projects. When 91% of the UK population currently own a smartphone, how private are our movements and personal choices. As smart phones, watches and home appliances all store personal data, from our day-to-day movements, the content we engage with, personal health data, what settings in our home make us most comfortable and the way we use appliances, it’s clear we live in the age of pervasive surveillance, begging the question how much privacy do we have? I ask you to explore what are companies using our personal data for, who is collecting and using that data, what laws currently protect our data and the use of it and what extra laws might we need to consider implementing. What concerns should we have about our personal data and are enough measures being implemented to protect those who use smart devices.

How Machines Make Decisions: Game Theory in Reinforcement-Based Machine Learning

Salma Iraky
Lancaster University

In a world of competing interests and a constant flood of information, how do machine learning (ML) systems model and predict complicated combinational decision making?

With applications to scenarios in autonomous robotics, financial markets and many more fields, understanding the foundations of machine-modelled decision-making can help us break down and predict real-world behaviour. Multi-Agent Reinforcement Learning (MARL) is a subfield of ML that studies how multiple decision-makers improve their reward-maximizing strategies by learning from each other, their previous decisions and surrounding environments. The algorithms and approaches used to model these scenarios are underpinned by game theory, which studies the mathematical models of strategic interactions. These systems employ various approaches to model dynamic and static scenarios, featuring agents who cooperate and compete while in the process of achieving their individual goals.

The mathematical theorems within game theory form the foundation of key MARL algorithms, including: Nash-Q Learning, Minimax-Q Learning and Multi-agent Deep Deterministic Policy Gradients. Whether these agents represent financial traders or a swarm of intelligent robots in volatile environments, the models offered by MARL use simulations to test and optimize real strategies. This poster will provide an accessible and intuitive explanation of MARL systems and the effectiveness of their algorithms by breaking down their foundational concepts. Through this, the aim is to emphasize the importance of reinforcement learning as a method of modelling complex decision-making and drawing greater attention to its practical applications, alongside the more widely discussed branches of machine learning: supervised and unsupervised learning.

AI vs AI: The Cybersecurity Arms Race

Samiya Sahu
University of Bath

Cybersecurity is constantly evolving, and the rise of artificial intelligence is transforming the landscape of digital defence. However, as AI's capabilities strengthen these defences, cybercriminals are empowered to exploit it for malicious cyber attacks. This emerging "AI vs AI" battle reshapes cybersecurity, where AI both fortifies defences and empowers attackers. Threat actors are utilising AI to automate and enhance attacks, such as creating efficient and effective phishing campaigns, malware evasion, deepfake generation, among other tactics. To combat the threat created by malware, AI can be utilised to assess network traffic, identify plausible threats, detect possible threats, and facilitate automated responses to offer faster and more efficient defence mechanisms. The rapid development of adversarial AI methods creates significant challenges for security solutions: AI-driven systems must develop in real time to fight against increasingly complex security measures. Despite the growing concern about AI-enabled cybercrime, research shows that 35% of organisations have already invested in AI-driven cybersecurity solutions, indicating a shift towards considering AI as both a potential threat and a solution. Paradoxically, AI-driven threats need to be counterbalanced by dependence on AI, which might foster overdependence on technological solutions, potentially sidelining the importance of human intervention. The ethical implications of the topic are equally profound, given the concerns about data privacy and overreliance on automated systems. Ultimately, the future of cybersecurity and AI will lie in the dynamic balance between advancing AI defences and protecting against its potential misuse, ensuring that human expertise remains critical in securing the digital environment.

The Future of Blockchain

Shreya Mistry
Aston University

Blockchain Technology is not just a hype to be forgotten about. Current developments in tokenisation and distributed ledger technology, is making Blockchain more scalable and interoperable. Consequently, Blockchain has the potential to transform various industries, with my poster having a key focus on the Financial Services industry.

The process of tokenisation creates a digital representation of real world assets, these tokens can form the building blocks of a Blockchain. It creates a secure, immutable record, and it is this key concept of decentrilisation, which can make Blockchain Technology revolutionary. My poster will explore the key use cases across the asset management and baking space such as the technologies behind digital assets and central bank digital currencies. As well as smart contracts, Know Your Client (KYC) and anti money laundering procedures, which will increase efficiency for firms and reduce fraud. These are some of the key trends I have learnt on my industrial placement at a technology consulting firm.

In recent years, we have witnessed investments and cryptocurrencies related to Blockchain skyrocket, but shortly fall back down. Therefore, it is intriguing explore how to scale Blockchain for the long term. Additionally, resolve current challenges such as security risks and the evolving regulatory landscape. Overall, as the Blockchain infrastructure advances, it will unlock new financial models and shape the future.

Can Physics Solve Physics? - Quantum Simulations to Study the Equation of State of Neutron Stars

Smriti Umesh
University of Leeds

A quantum computer is simple to define—a computer built on the laws of quantum physics. Celestial bodies in space are governed by the same laws, including phenomena like superposition and entanglement. This poster focuses on the densest material in space—neutron stars. These incredibly dense remnants of massive dying stars spin at meteoric speeds and are so tightly packed that one spoonful of neutron star matter weighs billions of tons on Earth (Cofield, 2020).

Neutron stars have remained a mystery to scientists since their discovery in 1967 by Jocelyn Bell, a Cambridge University graduate (NASA Universe Web Team, 2017). One of the biggest challenges in studying neutron stars is determining their Equation of State (EoS), which could help reveal their internal structure, inter-particle interactions at ultra-high densities, and even test Einstein's theory of relativity in extreme gravity. Understanding the EoS may also provide insights into the early Universe before the Big Bang.

Classical computers require vast resources to simulate the complex interactions within neutron star cores. As density increases, quantum states scale exponentially, making classical simulation nearly impossible. Quantum computers, using algorithms like the Variational Quantum Eigensolver (VQE), can model the ground-state energy of neutrons more efficiently. This research explores the potential of quantum simulations to study the EoS of neutron stars. If successful, quantum computing could bring scientists closer to uncovering the exact EoS—answering unresolved questions about matter at extreme densities and refining our understanding of the fundamental laws and forces governing the Universe.

Who's afraid of Midjourney?

Sumnima Roy
University of Bath

In 2022, Jason Allen caused huge backlash for winning a digital art competition, due to his entry being entirely generated by the AI Image platform, Midjourney. The history of art is rife with controversies - sometimes reaching strangely violent levels, such as the vandalism of “Who's Afraid of Red, Yellow and Blue”, a series of modern art paintings. Jacob Geller uses this vandalism to discuss the backlash on ‘modern art’, and how it represents the social climate and public fears of the time. Other debates around art include the introduction of photography as an artform (and whether it should be considered ‘cheating’) and later, the question of whether digital art should be considered art the way ‘traditional’ art is. These indicate that the progression of technology has always disrupted people’s perceptions of what counts as ‘real art’. AI art defenders draw parallels between these reactions and the reactions to AI art, claiming AI art platforms are simply a new medium to create art with. The arguments against AI art center around the fact that many AI image platforms use artists’ images as training data, without the artists’ consent. There is also a looming dread that the introduction of AI art will reduce the already low opportunities for a stable career in the arts. This poster looks into exactly how AI art is generated, assesses the different perspectives on its ethics, and discusses how further technological developments could direct the art landscape in the future.

Could Quantum Computing Supersede the Classical in the Near Future?

Talia Riches
University of Bath

Quantum computing could cause a major shift in computational power, using a combination of superposition, entanglement, and quantum parallelism to solve problems that classical computers couldn’t in millennia. Unlike classical computers, quantum computers utilise qubits, which can exist in multiple states simultaneously. Understanding qubit states is essential to grasping quantum computing's power. My poster will simply introduce key quantum principles, including interpretations such as Many Worlds and Copenhagen, which shape how we approach quantum algorithms.
This poster will outline Shor’s and Grover’s algorithms, which provide exponential speedups in factorization and search tasks, respectively. The limitations of classical transistors will also be discussed, such as Moore’s Law, and the physical barriers in transistor-based computing (as transistors become no more than a few atoms long). The presentation also delves into the challenges of quantum computing, such as error correction, decoherence, and the necessity for extreme cooling.
Despite its promise, quantum computing is unlikely to fully replace classical computing (in particular because there are no “quantum hard drives”) but will revolutionize specific fields, including cryptography, materials science, and artificial intelligence. The threat to current encryption methods is particularly significant, as quantum machines can break RSA encryption in seconds, driving the need for quantum-safe cryptography.
As research advances, the race for quantum supremacy intensifies, with major technological powers aiming to win. This poster will critically examine whether quantum computing will remain a specialized tool or evolve into the main computational framework of the future.

Social Media: Its Impact on Youth Identity Development

Tanaka Masunzambwa
Swansea University

Social media has emerged as a powerful influence on how young people interact, learn, and perceive the world. However, the overwhelming flow of information, which includes curated lifestyles and conflicting opinions, can overwhelm the developing minds of youth. Ofcom indicates that ‘around a quarter of 5-7 year-olds now own a smartphone’. This exposure can hinder individual character development and foster a reliance on external validation. The role of technology in the boom of information overload and the increased desire for ‘perfection’ through the aid of artificial intelligence, has great effects on the mental health, decision-making, and personal growth of young people. Systems and algorithms designed to maximise engagement amplify the problem, resulting in users repeatedly being exposed to the same perspectives and fewer opportunities for critical thinking. Creativity and confidence can also be lost through excessive use of social media. Potential solutions, such as the ability for parents to customise the social media algorithms for their children to control content exposure, password-protected screen time restrictions and initiatives to encourage offline learning and leisure, efficiently turn this problem into a solution that prioritises young minds. Should people be concerned about their children’s development in this tech-centred society? This topic encourages reflection on the responsibilities of tech creators and users in creating a healthier relationship between young people and the digital world, promoting personal growth and genuine self-expression.

AI in Space

Vivian Stoyanova
University of Nottingham

Artificial intelligence is transforming space exploration by assisting scientists in processing vast cosmic data and helping astronauts in harsh situations. With NASA's deep learning models recognising exoplanets in Kepler data and AI algorithms detecting fast radio bursts missed by human researchers, artificial intelligence has already proven its powers in astronomical discovery. But is AI capable of more? Can it find unidentified cosmic events, such as possible biosignatures, black hole interactions, or perhaps new planetary structures? If AI could be trained to do this, the need for crew missions would be reduced.

At the same time, AI is revolutionising astronaut operations beyond research. Robotic assistants like NASA's Robonaut and ESA's CIMON help astronauts on the ISS with experiments and troubleshooting. Spacecrafts are monitored using predictive maintenance systems, which keep an eye on the integrity of the rockets and can find possible problems before they arise. AI might even reduce dependency on Earth-based support in future missions by navigating interstellar probes, helping with robotic home construction on Mars, and providing real-time medical diagnostics.

But challenges remain. AI must be able to make judgements on its own with little human intervention and function dependably in high-stakes, communication-limited situations. Trusting AI in mission-critical situations raises many ethical questions. If we can overcome these obstacles, artificial intelligence will play a crucial role in humanity's expedition beyond Earth.

AI will not only be a tool but also a co-pilot on our journey to the stars as we get ready for a new era of space exploration.

Chips for Eternal Life: What’s the Price of Immortality?

Wanting Liu
University of Glasgow

Do you think humans can be immortal? Humans have been looking for a way to live longer throughout human history. It seems to be unbelievable before, however, with the development in technology, immortality seems increasingly achievable.

How can it be achievable? In 2003, 22 years ago. A paper about the brain-machine interface has been published. The brain-machine interface is a technology that can receive signals from brain cells. In their research, a monkey successfully typed human language in a computer with this technology. Furthermore, Cambridge and Princeton first wrote the fly's brain atlas in 2024.

As soon as technology gains the ability to copy a whole brain, consciousness-uploading may become possible. Through this technology, human’s brain can be moved into new body to achieve immortality. However, imagine one day, your brain is copied, moved into another body. And your original body has been killed - do you think you are still ‘alive’?

Whether more advanced technology can solve this problem? Thinking about one possibility - replacing small components in your brain slowly until the whole brain is replaced by new components. ‘Second you’ will never appear in the world. Do you really become immortal? Would you still think it is yourself? Like the Ship of Theseus, if each part of your mind is slowly replaced, piece by piece, until nothing of the original remains, are you still you?

Using Types to Statically Bounds Check Array Accesses

William Riddell
University of Bath

Allowing programmers to create safe and correct programs without impeding performance is an enduring challenge of language design. Array indexing has historically been the cause of many bugs and vulnerabilities through buffer overflows in languages like C and C++; even in languages like Rust that support zero-cost abstractions like iterators which can validate accesses, the flexibility of indexing is sometimes required and are a frequent cause of runtime errors and incur a small performance overhead to check the index is within bounds if the language is memory safe. By using a type system where array indices are a distinct type for each array instance it is possible to validate the accesses at compile time. The flexibility of traditional array indexing is maintained by allowing the user to cast integers into indices; by requiring that the user handle the case that the cast fails runtime errors can be eliminated. The benefit of this approach is that the bounds only need to be checked once when the program is running and the rest is verified statically. While a compiler would often be able to identify redundant checks within a function, by allowing it to be specified as part of the function definition even more checks can be eliminated. This approach also makes the bounds checks being performed more transparent to the programmer. This approach can be extended to vectors by using constraints like preventing them from shrinking and using typestates to allow the programmer to combine more flexible mutations and safe indexing at different points in the program.

Stepping Into the Future: An AI Powered Smart Shoe

Yashni Bhudia
Lancaster University

Digital health is the concept of pairing advanced technologies with healthcare to enhance well-being, improve diagnostic accuracy and predict future health risks, enabling early intervention in order to prevent serious conditions. These technologies can be integrated into people's everyday lives through wearable devices which are designed to give live updates about key health metrics. Examples of these include smart watches, smart rings and the smart shoe.

The Smart Shoe is an innovative example of how AI and digital health converge to improve both performance and well-being and will be the focus of this poster. It caters to a wide demographic of people, from athletes seeking to enhance their performance to older adults aiming to maintain a healthy, active lifestyle. By analysing data such as weight distribution, pace and health history, the Smart Shoe provides personalised feedback to prevent injuries and enhance progress. Additionally, its contractible sole adapts to various ground surfaces - expanding on harder terrains and flattening on softer - this is particularly useful in preventing issues such as shin splints and other running related injuries. My poster will delve into the potential of the Smart Shoe, offering a comprehensive exploration of its advanced features, physical design and diverse applications. It will showcase the transformative role of AI in digital health, as it enhances personalised care, performance and prevents injuries in real-time.

Final year students

Personalised Video Thumbnail Generation using Diffusion Models

Alba Sara López Sánchez
University of Bath

Everyday millions of users scroll through Youtube in search of videos to watch, glancing at the different options until they settle on one that appeals to them. All these videos are represented by small images called thumbnails, which are the first thing that any user sees of a video, and play a crucial role in convincing people to click on them.
Research has found that consistency in the stylisation of thumbnails is an important tool for online creators to accumulate views. Leveraging people's visual memory by using images that feel familiar to them is key when growing an audience. However, this leads to long editing sessions where creators spend up to two hours per video curating the perfect image that represents the video accurately, follows the style of their previous thumbnails, and attracts the right audience.
A need arises for a new software that makes the creation of these images a lot more straightforward. Our study assesses the effectiveness of a novel application of diffusion models towards producing effective thumbnails, with a focus on key features such as the inclusion of a short question in the image (Brown, 2017) or an image of the creator (Koh et Cui, 2022), whilst also integrating the aesthetic preferences of the target audience. Salehi et Al (2024) found generative models conditioned on individuals' preferences to be very effective in creating personalised images; we apply these methods to this new domain. In this way the system creates personalised thumbnails tailored to an audience through use of a psychological study to analyse their image preferences.

Overcoming Legacy System Challenges in Cloud Migration

Amy Bould
Sheffield Hallam University

Cloud computing offers scalability and cost efficiency, but migrating legacy systems remains a challenge. As new platforms emerge, many companies rush to adopt the latest technology trends without thoroughly assessing their existing infrastructure. At a women’s tech conference, I heard the phrase, "Don’t lift and shift without reviewing systems," highlighting the risks of moving data without proper evaluation.

Organisations eager for digital transformation often migrate to the cloud without considering compatibility, security risks, and operational dependencies. This can lead to performance issues, compliance challenges, and integration failures. GDPR (General Data Protection Regulation) adds further complexity, requiring businesses to ensure that personal data is processed securely and lawfully. Poor planning can result in breaches or non-compliance, leading to fines. Some companies even revert data back to legacy systems after migration due to unforeseen issues.

Data migration is particularly risky, as large volumes of information must be securely transferred while maintaining integrity and minimal downtime. Refactoring legacy applications for the cloud is also costly and time-consuming. To avoid setbacks, businesses should take a phased approach, leveraging hybrid cloud solutions and automation tools while conducting system audits before migration. Reviewing compliance implications is essential to prevent costly rollbacks and regulatory issues.

By addressing these challenges proactively, organisations can fully realise cloud computing’s benefits, including agility, improved performance, and long-term cost savings. Learning from industry case studies and conference discussions reinforces that strategic planning is key to a successful and sustainable cloud transition.

Could My Cat Be a Successful Stock Trader?

Ankita Dash
University of Birmingham

Human decision-making, financial research, and emotional variables - all play a role in stock trading, but what if my domestic cat could trade stocks just by instinct? In order to simulate real-time market activity, this abstract uses a Virtual-Reality-based trading system created for feline interaction. In this system, stocks are portrayed as moving prey (mice, rodents, and birds). The prey moves quickly when stock values increase, and slowly when they fall. The way the cat engages with stocks is by swiping or pouncing forward to purchase and ignoring or swatting away to sell.

Humans use data, market trends, and risk management to make trading decisions, but emotions like greed and fear frequently have an impact. A cat, on the other hand, relies entirely on instinct, prey movement and response time when making decisions. To examine feline trade behaviour, this idea combines gaze monitoring, paw gestures, and reinforcement learning like Deep Q-Networks, Proximal Policy Optimization to check if their decisions are profitable. This idea investigates if eliminating human cognitive bias results in better stock selection or if the results are entirely random by contrasting feline-driven trading with human and AI-based tactics.

By posing the question, "Can a cat, free from emotional influence, outperform human traders in market decision-making?" this poster questions conventional trading reasoning. Is it only chasing easy to hunt prey, or its pattern-based reactions reveal fresh insights in financial trends?

Computerised Pets

Annabel Ryan
Swansea University

What did Leonardo Davinci have in common with tweens from the 90s? They both concerned themselves with technological animal replicas. In the early 1500s, Da Vinci designed a mechanical lion to entertain a French king. Animal-like robots were continually made throughout the Renaissance and Industrial era. This trend ultimately led to the commercialisation of both robotic and virtual pets in the 1990s. In Japan, two products were released: the “Tamagotchi” – a handheld digital pet, and the “AIBO” – a robotic dog. Tamagotchi are time-sensitive and may die if the player fails to care for it properly. AIBO uses AI to learn and grow, following its owner and wagging its tail.

Virtual pet sites were popular in the 2000s and early 2010s and they often included a virtual community, such as “Webkinz”. Companies started making their own games around virtual pets, such as Nintendo, who released “Nintendogs” in 2005, where players used touch screen technology to take care of their dog. On mobile platforms, apps such as “My Talking Tom” and “Pokémon Go” have been popularised, the latter using AR technology.

People have developed emotional attachment to these pets. In Japan, owners have had funerals for their AIBOs and multiple schools banned Tamagotchi as they would distract students.

They have also created controversies. The state Illinois has banned the sale of AIBO as it conducts facial analysis through its cameras: gathering biometric data.

These pets are a low-maintenance alternative over their real-counterparts. However, is it moral to have them over living pets?

Improving Digital Literacy for the Deaf and Signing Community via the Creation of Accessible Lesson Blocks and Resources

Athaliah Muffinpaws
University of Greenwich

Historical communication barriers presented by an ableist society have restricted access to knowledge of digital literacy skills as the computing industry was formally developed (Ayim and Baynton, 1997). Current methods of communication are still dependent on fingerspelling which presents significant barriers to accessing this knowledge for many users of British Sign Language (BSL), as English and BSL are not the same language (Gregory, 1992). The question is, are there collaborative ways to create, by coordinating with the Deaf community, communication assets and training resources to allow Deaf-led workplaces and the wider Deaf community better access to digital literacy skills. The proposed solution was the creation of accessible communication assets to facilitate the development of lesson plans. These lesson plans communicated Information and Communications Technology (ICT) Jargon to improve specific computing skills. The aim was to enable greater access to digital literacy skills, such as word processing, using spreadsheets, designing presentations, and understanding security online. Information was collected from community groups, Deaf translators, and other initiatives and projects, and existing skills and communication assets were identified. During project development and deployment it was identified that human-computer interaction and the need for accessible and inclusive design was important as was the need for a scaffolded approach. As a result, the outcome of the project was the creation and deployment of a lexicon and building blocks that were utilised by partner organisations, and deployed in the community.

Perceptual hashing and its future in disinformation detection

Clara O'Callaghan
Edinburgh Napier University

Perceptual image hashing is the process of encoding an image based on visual features in the image. It aims to identify significant features that a human would find significant within the image and output a hash dependent of those features. By comparing hashes of two images, you are able to tell how different one image is from the other. Minor changes should illicit a very similar hash and a different image should output a very different hash. Perceptual image hashing has many uses, but recently disinformation/fake news has provided a new use.
The issue with this process is a computer is trying to figure out what is significant to a human- two very different entities with substantially different identification processes. So how robust is the process of comparing similar images against attacks? The answer is not so much. Perceptual image hashing struggles with focused attacks. By changing a few targeted visually insignificant factors, you can create a very different hash for a visually similar image. On the flip side, attackers can get away with changing a lot of the image and by leaving some key sections, the images hash is similar to the original unedited image.
This poster will look at recent literature as well as my own small-scale experiments into how much of an image can be changed before the hash reaches the threshold of being classed as a different image and what this means for using perceptual hashing in the detection of fake news.

Press 'Start' to Learn

Codie Houston
Aston University

Traditional mandatory training materials often fail to engage neurodiverse people. In particular, those with AD(H)D, who find static and linear content mentally taxing to process.

Game-based interactive learning can be a valuable tool for creating accessible training processes. By combining narrative-driven gameplay, simulations and role-playing, adaptive features such as customisable pacing, and gameplay competitiveness, engagement can be increased and information retention therefore improved.
This concept involves researching learning preferences of neurdiverse individuals and using this information to design prototypes. This will require test iterations with target users and analysis for improving effectiveness.

By making learning more accessible, it promotes active inclusion and increases retention of essential information across the workforce. This benefits companies as a whole by reducing incident risks and increasing efficient reporting.

ADT: Advanced Data Tracker for Fundamental Analysis and Stock Price Prediction

Diana Nykonenko
University of Greenwich

This project aims to develop a proof-of-concept platform, the Advanced Data Tracker (ADT), which integrates fundamental analysis with predictive modelling to enhance data-driven investment decisions. ADT enables the tracking and analysis of stock performance using key financial indicators such as earnings, revenue, profit margins, and valuation ratios. These indicators offer valuable insights into a company's financial health and market valuation, forming the foundation for accurate forecasting (Zhang et al., 2017).

Traditional investment decisions often rely solely on historical and current data, which may result in missed opportunities and financial losses. Machine learning models provide an innovative approach to capturing complex, non-linear financial data patterns, improving predictive accuracy (Addy et al., 2024). This project evaluates three widely used machine learning models—Random Forest, Long Short-Term Memory (LSTM), and XGBoost—based on their effectiveness in stock market prediction.

Random Forest, introduced by Ho (1995), builds upon the Decision Tree algorithm (Belson, 1959) and enhances predictive performance through ensemble learning. LSTM, developed by Hochreiter and Schmidhuber (1997), addresses limitations in sequential data processing, making it particularly effective for time-series forecasting in financial markets. XGBoost, proposed by Chen and Guestrin (2016), offers a scalable tree-boosting system that improves computational efficiency and predictive accuracy.

These algorithms were selected for their frequent use in stock prediction and their proven effectiveness in delivering accurate results. By integrating these models, ADT seeks to optimise predictive performance by comparing the strengths of each approach, thereby improving investment decisions.

Modern Approach to Secure Data Hiding: Integrating Steganography and Hybrid Cryptography using AES and RSA.

Durga Darisini Muniandy
University of Greenwich

The rapid development of internet technologies has enabled advanced data transfer, facilitating even ostensibly confidential communication. However, reliance on the internet for transmitting confidential information, such as email, messages, data, and digital images, has concomitantly increased data's vulnerability and elevated the risk of various cybersecurity threats. Addressing the challenge of secure data transfer, hybrid methodologies, including multi-stage encryption techniques, and adherence to the principles of Confidentiality, Integrity, and Authentication (CIA) are key to strengthening digital security Steganography and Cryptography are the most widely used methods to secure information. This project explores the integration of steganography and hybrid cryptography, specifically utilising the Advanced Encryption Standard (AES) and Rivest Shamir Adleman (RSA) algorithms. Steganography protects confidentiality by embedding valuable data within images, thus preventing easy access by unauthorised individuals. The resulting steganographic images can be readily transmitted over the internet. Whereas cryptography ensures the confidentiality of secret information by scramble messages into unreadable to unauthorised users. It functions by encrypting the user's message and generating a public key, enabling authorised recipients then use a corresponding secret key to decrypt the ciphertext and retrieve the original message.
This project enhances user’s system security by implementing a complex, multi-layered algorithmic approach. Even if steganography is compromised, encryption ensures continued data protection. This method also prevents unauthorised system modifications. Consequently, users can securely transfer files and images. The benefits extend beyond individuals to include government bodies, businesses, and journalists. This methodology safeguards the confidentiality of sensitive data for businesses, individuals, and political entities.

Digital Fingerprints: Tracing AI-Generated Content with LLM Watermarking

Ebru Fenney
University of Bath

The adoption of Large Language Models (LLMs) has grown rapidly in recent years, becoming an integral part of our daily lives. However, this widespread use has introduced new security threats whilst also amplifying existing ones. Ensuring academic integrity, protecting intellectual property, and detecting misinformation and deepfakes are just a few of the many challenges that make LLM watermarking a critical area of development. Watermarking is the process of embedding specific markers in output which can later be detected. This enables identification and verification of a signal's origin, hence enabling someone to distinguish whether digital content such as text, audio or images are AI-generated or not, as well as where they come from. As LLMs themselves are still a relatively new area, LLM watermarking is in an even earlier stage, with research and subsequent implementations still developing. This poster explores the necessity of LLM watermarking, the current state-of-the-art algorithms, and future directions. By comparing existing techniques, analysing their limitations, and identifying potential advancements, this poster aims to provide a comprehensive overview of this emerging field.

Carbon Sinks at Risk: What Happens If They Collapse?

Fatma Mehemed Ali Mansur
Brunel University, London

Natural carbon sinks, such as forests, play an important role in regulating atmospheric CO_2 levels. However, they are increasingly vulnerable to climate stressors, including rising temperatures, droughts, and deforestation. When significant tipping points are reached, these carbon sinks can suddenly lose their ability to absorb carbon, accelerating climate change. Despite their importance, many climate models fail to capture these sudden collapses, leading to inaccurate predictions of future carbon sequestration and delaying effective intervention strategies. (Ke et al., 2024)

This poster presents a Multi-Agent System (MAS) designed to model and predict the collapse of land-based carbon sinks under climate change. Within this system, trees function as adaptive agents with attributes such as carbon storage and stress tolerance, responding dynamically to environmental conditions. Stressors, including temperature and CO_2 levels, are modelled alongside human actions such as deforestation and reforestation. Land managers are also represented as agents within the system, with reinforcement learning applied to enhance their decision-making regarding afforestation, reforestation, and deforestation based on environmental conditions and long term sustainability goals. These agents interact within a simulated global climate system that tracks CO_2 levels, temperature variations, and drought frequency.

Through scenario-based simulations, this poster discusses key stressors and tipping points that contribute to carbon sink failure while evaluating the effectiveness of climate change mitigation strategies. The findings will provide valuable guidance for those leading our fight against climate change, helping to shape conservation efforts, improve forest management practices and climate policies.

Forgotten Data: Forensic recovery of residual information left on second hand hard drives

Hannah Timms
Sheffield Hallam University

The second-hand technology market has grown exponentially, with more individuals selling their old devices quickly on platforms like Facebook Marketplace without much thought. However, many sellers are unaware of the risks associated with leaving personal data on these devices and not undertaking the proper data sanitisation techniques to protect themselves against cyberattacks such as fraud using the data left behind. By purchasing laptops listed as broken or with forgotten passwords, this research reveals that even non-functional devices often contain intact hard drives and solid state drives, making personal information accessible through forensic techniques. Despite the amount of data sanitisation techniques available, the everyday user generally does not understand the way data is left behind and therefore does not see the importance of using these techniques. This project seeks to raise awareness about the types of residual data that can remain on second- hand devices and the risks they pose to individuals. Additionally, it will offer user-friendly guidance on data sanitisation techniques that can help users understand the risks and protect their personal information when selling or recycling their devices.

Scroll, Save, Repeat: The Digital Hoarder's Game

Joyee Bashir
Edinburgh Napier University

Technology has managed to embed itself into each and every aspect of users' lives. From everyday devices like smartphones and wearables to AI-powered assistants. The level of accessibility collocated with this allows for effortless and instant data capture, storage and retrieval. The ability to preserve everything and anything indefinitely should not dictate our digital behaviour, yet, there is a strong resistance to letting go of digital content. This hesitation to discard any digital media is evident everywhere; in countless unclosed browser tabs, unread emails, years worth of text messages and endless photo backups. The reluctance to delete is overbearing and fuelled by emotional attachment, fear of losing something valuable or simply the convenience of unlimited storage. The psychological impact of digital hoarding can lead to stress, decision fatigue, and a sense of (digital) overwhelm. Beyond the emotional factors, digital hoarding poses severe threats to cybersecurity. The ability to accumulate sensitive data indefinitely expands the attack surface for data breaches and privacy violations while impeding the process of maintaining sound security. The aim is to explore the relationship between digital hoarding and its security implications.

Evaluating LLM Translation for Low-Resource Languages. Are They Bridge the Language Gap or Burning Resources?

Julita Pucinskaite
Lancaster University

Machine translation has significantly advanced due to the development of Large Language Models (LLMs) and Machine Translation (MT) models. However, low-resource languages, such as Lithuanian, still present challenges because of the limited availability of training data. This project investigates the translation capabilities of both LLMs and MT models by comparing their baseline performance and assessing how fine-tuning affects their results. This study seeks to provide insights into improving translation quality for underrepresented languages by identifying which model architecture is better suited to resource-constrained tasks. In addition to evaluating translation accuracy, the research will investigate the computation costs associated with large-scale models. With performance adaptation techniques such as Low-Rank Adaptation (LoRA) and quantisation, the necessity for high-resource models is being re-examined. These optimisations may provide cost-effective alternatives to resource-intensive training methods, reducing costs while maintaining translation quality. This is particularly relevant given the new emergence of advancements of more efficient models that require fewer computational resources. Findings are expected to facilitate the creation of effective models that require minimal computational resources while retaining high performance, making it easier for low-resource translators to translate languages effectively. By examining both the technical aspects and practical implications of various models and optimisation techniques, this research seeks to contribute to the broader discussion about improving accessibility and inclusivity in natural language processing (NLP).

AI and Privacy

Kayee Liu
University of Dundee

As our development of AI systems grow, the potential implications for personal privacy have grown alongside it. The vast datasets used to train these systems incorporate huge quantities of text, images, and videos, inevitably garnering sensitive information ranging from healthcare records and financial data to biometric identifiers and personal communications. One case in 2019 involves Google partnering with the University of Chicago Medicine to obtain thousands of patients' medical files for machine-learning tools, thus demonstrating how access to records could be granted without explicit permission, as the associated lawsuit was dismissed.

Large language models also open additional vulnerabilities, such as model memorisation of training data and potential extraction through membership inference attacks. A paper by Yang Bai et al. (2024) shows that LLMs do indeed memorise training data, and simple repeated tokens can trick the model into leaking the data. In response, regulatory frameworks have also arisen, such as the EU AI Act attempt to establish guardrails around data collection practices, prohibiting activities such as indiscriminate scraping of facial images from the internet and CCTV captures.

However, it could also enhance privacy; processes such as federated learning, differential privacy can let AI systems "learn" from sensitive data without gaining direct access to it. Similarly, AI-powered anonymisation tools could reduce the need for us to handle raw confidential information. Thus, getting the right balance between leveraging AI's capabilities and safeguarding individual privacy is essential for responsible advancement.

Demographic Bias in Machine Learning for Breast Cancer Detection

Laura Mata Le Bot
University of York

Breast cancer is the most frequently diagnosed cancer in women world-wide. Screening and diagnosis of breast cancer relies on medical imaging performed by trained radiologists. This demands high levels of human focus and the process is subject to human error. Several studies show the feasibility of machine learning for breast cancer detection in medical imaging to address human errors and reduce workload. Models tend to be trained on images from centres in one country, commonly European or East Asian. It is known that age and ethnicity correlate to breast density and can affect imaging results. However, there has been limited consideration of how models trained on centers in one region perform on datasets from different demographic regions. To explore how models behave with images from different demographics, we use mammogram images collected from two centres in Ghana, alongside a public mammogram dataset collected in the UK. The samples in Ghana and the UK differ largely in ethnicity. Ghanaian women tend to present a decade earlier than in the UK and with later-stage disease. We build distinct models using training samples from each dataset. We test the models with samples from the corresponding dataset and its counterpart. We analyse the performance of each test to determine whether there is a statistically significant impact on results. Significant differences show that careful regulations and mitigation strategies must be implemented before widespread use of artificial intelligence for medical imaging. Images provided by the Sweden Ghana Medical Center, Ghana.

Analysing Problem-Solving Strategies in Autistic Individuals during the Block Design Test

Lauren Cosgrove
University of Edinburgh

For many years, the block design test (BDT) has been used to measure spatial ability and intelligence. The test involves arranging red and white blocks into given square-shaped patterns. While raw BDT test scores are a good measure of spatial ability and IQ, the problem-solving strategies that participants use to complete the test can tell us more about how they think. Studies have suggested that some autistic individuals use distinct strategies during the BDT. This could be due to a more locally oriented processing style, which could lead to a better ability to mentally segment the patterns. These strategy differences may result in better overall performance in the test. Understanding differences in problem solving within autism could help improve teaching and support and contribute to further autism research.

This project uses data collected from the 'Web-based Online Measurement of a Block Arrangement Task' (WOMBAT), a previously developed online version of the BDT. Unlike the traditional physical test, WOMBAT can collect large-scale, complex gameplay data, tracking each block movement and each part of the screen viewed. The aim was to develop a Python library to analyse the strategies present in WOMBAT data. I developed functions to analyse gaze location and block placement order. Researchers can generate visualisations and statistics to identify trends across groups of participants, in addition to more detailed individual-level analysis. While most previous research has focused on differences between autistic and non-autistic groups, we are also interested in differences that may occur within each group.

Mind-Reading Artificial Intelligence

Madison Lardner
Lancaster University

The human brain is a complex biological computer, continuously transmitting electrochemical signals that encode every part of perception and the interaction we experience. While not strictly binary, neural activity operates through patterns of electrical impulses. Neurons either fire or remain inactive and this is conceptually like a binary system where data is represented in sequences of ones and zeros. Just as computers process information through binary logic, the brain encodes and transmits data through patterns of neural activity. With advances in AI and neurotechnology, we can now detect and interpret these signals, allowing for the reconstruction of sensory experiences.

Interpreting raw brain activity requires AI to process the neural signals recorded through advanced neural recording techniques. Then with the use of deep learning models composed of multiple interconnected layers, extract hierarchical features from these signals learning the complex mappings between neural activity and sensory representations. These models refine their ability to decode brain signals through large-scale training, gradually improving accuracy in neural pattern recognition. By processing the neural data through deep learning architectures AI can reconstruct images or text, translating brain signals into real-time outputs with vast potential applications.

Connecting the biological and the digital represents the future of AI in neuroscience, enabling the direct translation of neural activity into outputs that will benefit civilisation. As AI research advances, neural signal decoding will become increasingly efficient and accessible, unlocking new possibilities. The poster will explore the latest advancements, applications, and impacts of AI in neural decoding.

Can AI Transform Book Clubs?

Malak Mawzi
University of Birmingham

The book club experience is timeless, but its structure hasn’t evolved to match today’s diverse interests and digital possibilities. The traditional selection process for books often fails to cater to the group’s interests and psychological needs. Rather than a group vote, or going by a rotating choice, we can find books that tailor to the majority’s interests, needs, and moods. Whether the need for escapism, or a book that explores specific themes, we can take advantage of AI to explore a user’s psychology and tailor those requirements with a book. The platform introduces an AI-driven book club that transforms the way users and books interact. By assessing everyone’s individual interests, preferences, and past reading habits, the AI recommends five books every month. To continuously encourage community engagement, users can share opinions and have adverse and critical questions to discuss given to them by the AI throughout the month. These will be discussed in monthly meetings scheduled at times convenient for the group. To keep constant engagement, word clouds and interactive poll results are used throughout the meetings to visually represent key discussion points and opinions. Findings show that the design fosters inclusivity and challenges the regular dynamics of book clubs, allowing a more individualised yet collaborative environment.

Soft skills in software engineering: An investigation into global, intercultural collaboration

Maryam Aswat
Open University

The shift to remote working has intensified the use of inter-cultural working environments where companies hire from different parts of the world to collaborate on projects. Although English may be the lingua franca, linguistic challenges can present in the form of misunderstandings and miscommunication. This may reflect limited understanding by developers of cultural contexts, differences in slang, dialects, accents and grammar. This suggests that there is a greater need for soft skills to improve communication within software engineering.

This research explores the role of soft skills within software engineering, particularly in the context of global software engineering (oftentimes referred to as remote, distributed or virtual) and intercultural collaboration. In these environments, communication skills are a critical non-technical skill sought after within the software engineering industry. This need is compounded in global software engineering where geographical and temporal distance present key barriers to collaboration.

As a preliminary step, a review of qualitative and quantitative studies was conducted to examine what soft skills are crucial in professional software engineering. Key findings indicate that synchronous communication and frequent face-to-face meetings may be better than asynchronous communication, global teams may struggle with mistrust, and cultural awareness and intelligence are needed to navigate misunderstandings in global teams. While comprehensive studies have been done on the role of soft skills in software engineering, limited research has been done on the role of soft skills in global contexts. Future work is needed to compare traditional environments, including offices and classrooms, with those in global settings.

Touch, See, Feel: An Interactive Feedback Tool for Enhancing University Outreach Programs

May Metwaly
London South Bank University

This research demonstrates innovative solutions to capture meaningful feedback from younger audiences participating in LSBU’s Outreach programme, specifically in Computer Science.

Engaging younger audiences in outreach programs presents a significant challenge. Traditional methods like surveys fail to capture emotional engagement, leaving educators without actionable insights into participants' experiences. This gap is particularly critical for Computer Science Outreach, where fostering inclusivity and interest is essential to addressing the skills gap and diversifying the field.

To address this, the "Touch, See, Feel" project combines tactile feedback with real-time visualisation of the participant feedback using Tableau. Participants use emoji panels connected to Makey Makey devices to express their emotions intuitively. The cohort participating in this feedback capture will have given prior consent for providing feedback via their schools and all safeguarding measures will be in place.

The methodology involved exploratory research into interaction design, sentiment analysis and hardware prototyping. Through iterative testing, including a pilot event with over 200 participants, the system successfully captured detailed emotional responses. Feedback from stakeholders further refined the design for scalability and accessibility.

This project highlights the transformative potential of creative technologies to engage diverse audiences. The future lies in expanding its applications to corporate workshops, public engagement and interactive exhibitions, making feedback both meaningful and enjoyable. Future plans are to create a secure feedback booth for the student ambassadors delivering the sessions to provide visual feedback.

Semantic Content Analysis for Automated Privacy Notice Evaluation

Milan Wood
University of St Andrews

How often do we accept privacy notices without fully understanding the implications for our data? The complex structure of omnipresent privacy notices usually leaves users unable to grasp the trade-offs they agree to, resulting in uninformed consent and increased data privacy risks. My research addresses this challenge by developing a browser plugin that analyses the content of UK privacy notices and translates them into an intuitive traffic light system, providing users with an accessible visual summary of key policy elements.

The methodology centres on a manually constructed, comprehensive keyword dictionary derived from three primary sources: systematic analysis of secondary literature, semi-structured interviews with policy experts, and focus groups with the general public. This triangulated approach ensures the tool's evaluation metrics are grounded in both expert knowledge and user needs, enabling automated identification of critical privacy elements. The resulting classification framework visualises privacy notices through a three-tier traffic light system: red for high-risk elements such as extensive third-party sharing, amber for ambiguous consent mechanisms, and green for privacy-protective measures. Extending beyond single-jurisdiction analysis to incorporate EU privacy frameworks is my secondary objective for this research, offering insights into jurisdictional variations in data protection standards.

Preliminary user studies (n=30) demonstrate significant improvements in comprehension speed and decision-making confidence. By bridging the gap between legal complexity and user understanding, this research advances the field of privacy engineering and equips users with a practical tool to confidently navigate digital privacy threats.

Allowing the Visually Impaired to 'See' through Sonification

Min Young Kim
University of Bath

With the increasing global population, the number of visually impaired people is also increasing, especially affecting the population in the latter half of their lives. With regards to computers, assistive technologies for this impairment tend to be slow and unfriendly (such as voice synthesisers) or expensive (such as refreshable Braille displays). Both methods disregard the use of a regular mouse, since the visually impaired naturally find it difficult to see the cursor. But what if they could use the mouse at the same level as a sighted person? It would allow mental visualisation of the page, quicker navigation, and a massive reduction of cognitive load. I aim to explore sonification as a medium to allow the visually impaired to 'see' the screen using a mouse. Sonification involves using non-verbal audio cues to convey information - for example, in this case, using a buzzing sound to indicate the mouse hitting the edge of the screen.

This poster will delve into past experiments that have been conducted using sonification and the results of my own research. We will also look into relevant developments, such as how popular games (e.g. The Last of Us) have managed to make their titles accessible. The motivation of this project is to provide more insight into an accessible, affordable, and user-friendly method of navigating computer screens for the visually impaired.

Semantic Document Retrieval: Leveraging Knowledge Graphs and LLM Embeddings

Minahil Tariq
University of Manchester

Academic paper recommendation systems play a crucial role in assisting researchers in finding relevant literature. Traditional approaches rely on citation indexing, keyword search, ranking algorithms and ML models. Existing academic knowledge graphs primarily depend on structural relationships or text search and lack a deep semantic understanding of the content. Instead of the usual text search systems, this approach presents a document search engine.
We propose an enhanced recommendation system that integrates Large Language Models (LLMs) with a knowledge graph-based retrieval framework. In our approach, users provide a query document, which is first processed by an LLM to extract key metadata(ex: title, abstract, author, citations, year, venue). The metadata is then used to query the knowledge graph, retrieving a set of candidate papers using graph traversal algorithms. Next, we generate embeddings for both the query and the candidate papers using LLM-based representations of their abstracts and titles. By computing cosine similarity between these embeddings, we measure semantic relevance and rank the retrieved papers accordingly. This hybrid approach aims to improve the precision and relevance of recommendations by incorporating contextual understanding along with a deep search through intricate relationships between nodes modeled by knowledge graphs.
To evaluate our system, we will conduct two experiments: (1) a user study where human evaluators assess recommendation quality through A/B testing, and (2) benchmarking against datasets like the Microsoft Academic Graph and Google scholar. We hope to demonstrate that combining knowledge graphs with LLM-based embeddings significantly enhances recommendation performance, offering a more contextually aware and accurate paper retrieval system.

How artificial intelligence is being used to support IT Service Desks.

Motolani Blessing Bolaji
Sheffield Hallam University

The world has changed significantly and so has technology. Every industry and business sector are advancing by using innovative technology and most recently the use of AI tools. The service desk is an important aspect of many businesses and organizations. They are responsible for resolving the frequent problems encountered with customer devices, which are the main tools for the job. Delays in fixing the problem can have an impact on the tasks they need to carry out for their job. The incorporation of artificial intelligence (AI) to support servicel desk can help to conclude a query when a ticket is raised and reduce workload for the business, which can help them to prioritize more problems with high risk of affecting the customers. This integration of AI is intended to enhance service desk operations for businesses.

My research will consider the different tasks AI can now support. For example: Chatbot support can communicate to the customers on the issues and provide the customers quick and easy mode of resolving their problem and break down the problem and escalate it to the IT service support of the cause of issue and procedure to resolve it. AI applications have the advantage of supporting the service desk team, making their job easier. It saves time and resource for the organisation and to make the customer happy. This poster will explain the functions AI can provide, what the benefits are for IT service desk and highlight any potential concerns.

Development of an Intelligent Timetabling System Using Genetic Algorithms and Advanced Optimisation Techniques

Nadiia Pidhaina
University of Greenwich

Creating efficient timetables in educational institutions is a complex challenge, balancing resource allocation, stakeholder preferences, and dynamic constraints. Traditional methods often struggle with scalability and adaptability, leading to suboptimal schedules. This project proposes an intelligent timetabling system using Genetic Algorithms (GAs) enhanced with hybrid optimisation and adaptive parameter control to automate and optimise scheduling.

The GA employs a chromosome representation encoding course-instructor-room-time assignments, initialised via constraint-aware population generation to ensure feasibility. Tournament selection, single-point crossover, and adaptive mutation (dynamically adjusted based on convergence rates) balance exploration and exploitation. Unique to this work is the integration of Simulated Annealing for local search refinement and Pareto ranking for multi-objective optimisation, enabling the system to address conflicting goals like minimising conflicts while maximising room utilisation. Unlike existing GA implementations, this approach combines adaptive parameters with hybrid techniques to escape local optima and improve convergence speed.

A PyQt-based interface allows administrators to input data, prioritise constraints, and visualise schedules. Performance is evaluated using traditional heuristic and exact methods, using metrics such as constraint satisfaction, computation time, and scalability.

Hypothesis-driven testing anticipates that this GA-based system will outperform manual and heuristic approaches, achieving over 95% hard constraint compliance and over 80% soft constraint satisfaction while reducing scheduling time by 30 to 50% compared to integer programming. By automating timetable generation, the system aims to lessen administrative burdens, enhance resource utilisation, and improve stakeholder satisfaction. This work demonstrates the potential of evolutionary hybrid models to deliver scalable, user-centric solutions for real-world scheduling challenges, advancing intelligent educational management.

Can ChatGPT program securely?

Neve Hoccom
University of Exeter

The project aims to develop a formal assessment framework that can assess how secure ChatGPT's programming suggestions are, as the generative AI ChatGPT's user base has grown significantly, from 100 million weekly users in January 2023 to over 200 million weekly users. In particular, generative AI has been increasingly adopted by software developers, with GitHub stating that recent surveys found "92\% of U.S.-Based developers are already using AI coding tools in and outside of work.". While generative AI does offer benefits, such as allowing for those with little to no formal education in software development to develop software, it could also introduce vulnerabilities. This project's development has also been motivated by the lack of information regarding the impact of generative AI on the field of software development. This lack of information means that a framework that can effectively quantify how secure a piece of generated code would be beneficial, especially as code complexity and reported software vulnerabilities increase.

In this project I will explore whether or not ChatGPT and other language models are able to produce secure code snippets, and will develop an assessment framework that will aim to effectively assess how secure these code snippets are. This project will also focus on the impact additional tools and key words will have on the output of a language model. Furthermore, additional research into how the model outputs, if found to be insecure, potential vulnerabilities could be mitigated and prevented.

Application of Neural Networks in Data-Driven Optimisation of Fashion Supply Chains

Noemi Revesz
London South Bank University

The fashion industry, especially the fast fashion industry, has a detrimental effect on the environment. Globally, 15-45 million tons of unsold garments end up primarily in landfills or incinerators each year. This project leverages state-of-the-art neural network architectures to forecast product demand at scale, optimising supply chain operations and reducing overproduction. Our model utilises a robust dataset that includes product classifications, manufacturing sources, production runs, stock and delivery schedules, and transactional performance metrics—sales, returned and unsold inventory. Neural networks excel in capturing high-dimensional, non-linear relationships, enabling more accurate demand projections compared to traditional econometric or time-series models. Our approach integrates features such as product category and multiple supply chain logistics, with the goal of improving predictive accuracy over traditional forecasting methods. Through simulations and empirical analysis, the project seeks to determine the optimal production quantities that align with projected sales. At the same time, it explores identifying essential features for such modelling strategies. This project has significant implications for the sustainability of fashion supply chains. By effectively managing production levels, businesses can not only limit financial losses but also contribute to reducing waste. We aim to demonstrate that data-driven decision-making, powered by neural networks, can promote economic and environmental sustainability in the fashion industry.

Optimising Chiropractic Care with AI-Powered Gait Evaluation

Nur Alya Sofia Binti Amerrudin
University of Birmingham

Can artificial intelligence be used to help diagnose movement disorders? Gait abnormalities are often among the first indicators of musculoskeletal and postural issues, but conventional diagnostic methods are subjective, time-consuming, and reliant on examiner expertise. Using machine learning-based model trained on gait datasets, this AI-enhanced gait analysis project is designed to assist chiropractors in detecting abnormalities with greater speed and accuracy.

By leveraging principles of machine learning and computer vision, our system analyses gait patterns from video, detecting deviations that may indicate underlying postural or musculoskeletal issues. The model is currently capable of distinguishing between normal and abnormal walking, which enables it to spot abnormalities with a high level of accuracy. Unlike conventional motion capture systems, this AI-driven approach enables non-invasive, cost-effective, and scalable evaluations. While the system currently focuses on walking patterns, future advancements aim to expand its capabilities to detect further musculoskeletal conditions.

The results show that AI can assist chiropractors by identifying gait abnormalities without replacing human expertise. According to the findings, AI systems are useful tool that provide automated, precise, and fast assessments, thus enhancing diagnostic precision and decreasing the chiropractors' workload. With such improvements, chiropractors can provide the proper and timely interventions that are greatly needed. This project hopes to raise awareness of chiropractic care and postural health and increase people's appreciation of its significance. As a supporting tool, AI enhances personalised treatments and improves patient outcomes.

Looking to the future, we ask: Can AI match or even exceed human experts in diagnosing gait abnormalities?

Unlocking Emotional Insights: Enhancing Podcast Listening with Sentiment Analysis

Nurin Irdina Haswanie binti Mohd Nazri
University of Birmingham

Podcasts are a powerful medium for storytelling, education, and entertainment. However, their long-form nature can make it challenging for listeners to quickly find content that matches their interests, emotional state, or available time. This poster explores how sentiment analysis can enhance the podcast experience by analyzing both transcripts and user-generated content, such as comments and reviews.

Using natural language processing (NLP) techniques like VADER, this project classifies sentiment as positive, negative, or neutral. A sentiment dashboard provides an overview of a podcast's emotional tone before listening, visualizing sentiment distribution across comments and transcripts. Users can filter and organize saved podcasts based on sentiment or create personalized collections that align with their mood. Additionally, automated summaries help time-conscious listeners quickly grasp episode highlights while maintaining engagement. While sentiment analysis offers valuable insights, challenges remain. Emotions in podcasts are conveyed not just through words but also through tone and delivery, which this project does not analyze. Additionally, existing sentiment models, often trained on social media and news data, may not fully capture conversational podcast sentiment. Future work will refine sentiment analysis techniques and explore a sentiment timeline feature, allowing users to identify emotionally charged moments and navigate key segments. This poster highlights the untapped potential of sentiment analysis in podcasting, which has traditionally focused on creator analytics rather than listener tools. By addressing this gap, this project demonstrates how sentiment analysis can empower audiences with actionable insights, fostering a personalized, efficient, and emotionally attuned podcast experience.

Designing for Everyone – Integrating Accessibility into UI Design

Nurul Mohamad
University of Birmingham

According to the World Health Organization (WHO), it is estimated that over 1 billion people live in some form of disabilities, as reported in 2011 alone. This number highlights that accessibility should not be an afterthought, but a key part of the design process to create digital experiences more inclusively. With more services shifting towards digital platforms such as government sector websites and mobile banking apps, checking huge chunks of web pages requires significant effort. For that reason, I take the approach of integrating accessibility checks directly into the design workflow, preventing accessibility issues before they reach the development phase. This project centres around Figma, a popular prototyping tool used by UI/UX designers and how I developed a plugin to achieve this aim.

This plugin could automate accessibility checks, focusing on colour contrast, text readability, and touch target sizes to ensure they comply with internationally recognized standards such as WCAG (Web Content Accessibility Guidelines) and Android Accessibility Guidelines as the design progresses. Additionally, the plugin features a colourblindness simulator, allowing designers to visualize how their designs appear to users with colour vision deficiencies.

This project aims to make accessibility testing faster and seamless for designers, and thus, motivate them to continuously adhere to the accessibility standards. It is believed that integrating accessibility checks early leads to better compliance with accessibility standards and a smoother design-to-development handoff. Future developments will expand the plugin’s functionality to address additional accessibility concerns and refine the detection rules.

Next-Generation Speech Therapy: Leveraging Embedded Systems for Stammering Detection and Analysis

Olivia Kerschen
University of Exeter

Dysfluent speech, particularly stammering, significantly impacts millions globally, posing profound communicative, social, and emotional challenges. Traditional research on stammering predominantly relies on subjective manual observations within controlled environments, limiting the scope and applicability of findings. This project introduces a novel approach where a lightweight machine learning (ML) model, designed to detect and analyse stammering events in real-world is deployed on a microcontroller.

I employ both convolutional neural networks and LSTMs trained via stammer datasets such as UCLASS and SEP-28K. This combination enhances the model's ability to accurately identify temporal and spatial patterns in speech data, crucial for detecting various dysfluencies. Furthermore, deployment onto an Arduino microcontroller facilitates easy and cost-effective on-body monitoring of speech, thereby increasing accessibility of stammering research tools and enabling continuous data collection outside laboratory settings.

Embedding machine learning models into wearable devices utilising energy-efficient microprocessors would realise the non-invasive identification of dysfluent speech. This would significantly improve intervention strategies and quality of life for individuals affected by stammering. Additionally, future integration with biometric data monitoring could provide insights into the physiological aspects of speech dysfluencies, further developing the understanding of the underlying mechanisms behind stammering.

This project aims to advance research on speech disfluency through integration of state-of-the-art machine learning methods with light-weight microcontroller architectures. This will allow for greater personalised, patient-centric care to be developed which ultimately will also realise future research on stammering, its causes, and potential treatments.

Implementing Smell in Virtual Reality Using Porous Materials

Paula Cardenes Cabello
University of Bath

While visual and auditory elements of virtual reality (VR) have seen significant advancements, true immersion requires engaging multiple senses—including smell. Scent has a strong connection to memory and emotion, making it a powerful tool for enhancing virtual experiences.

This project explores the development of a standalone, scent-releasing device designed to deepen immersion in virtual environments. The device operates by heating porous materials infused with specific scents, allowing controlled evaporation and diffusion. This approach, grounded in state-of-the-art chemistry research, ensures reliable and consistent scent delivery. By synchronising scent release with the VR experience, users can engage more deeply with their surroundings, making virtual worlds more lifelike.

The proposed solution is a lightweight, compact and standalone device that enables users to move freely without constraints. Designed with portability, reusability, low weight, longer shelf life, low power consumption and cost efficiency in mind, it offers a practical and accessible approach to olfactory integration in VR. The system will be evaluated for scent accuracy, response time, and user experience to assess its effectiveness in enhancing immersion.

By incorporating olfactory stimuli into virtual environments, this project seeks to push the boundaries of multisensory VR experiences, opening doors for applications in gaming, therapy, training simulations and beyond.

Assessing the utility of the FCA APP Fraud Synthetic Dataset using Machine Learning

Reda Fatima
University of Greenwich

Authorised Push Payment (APP) fraud occurs when bank customers are deceived into transferring funds to fraudulent accounts posing as legitimate payees (Braithwaite, 2024). To detect and prevent APP fraud, AI driven cybersecurity models can be employed (Sarker et al. 2021). Prior research by Oza explores fraud detection using Logistic Regression and Support Vector Machine (SVM), achieving F1-scores of 0.61 and 0.86, respectively. However, the effectiveness of these models is contingent on access to high-quality transactional data, which remains scarce due to strict privacy regulations such as the General Data Protection Regulation (GDPR) (Park, 2024).

The financial sector has explored Deep Reinforcement Learning (DRL) for fraud detection, yet its efficacy is hindered by the limited availability of accurate, high-frequency data (Liu, Ventre & Polukarov, 2022). To address this challenge, the Financial Conduct Authority (FCA) has investigated the potential of synthetic data as an alternative to real-world financial datasets. Since actual customer data cannot be shared, the FCA employed Agent-Based Modeling (ABM), a technique that simulates financial ecosystems through autonomous agents governed by predefined rules (Duffy, 1998).

Despite its promise, the adoption of synthetic data faces critical hurdles related to its validation, including assessing its utility, fidelity, and privacy preservation (FCA, 2021). This project evaluates the utility of a synthetic dataset by training multiple machine learning models, analysing their performance, and identifying areas for improvement. The findings aim to provide insights into the dataset’s reliability and potential enhancements to support fraud detection efforts.

The Integration of Artificial Intelligence in Digital Marketing

Rumaysah Shaheen
Sheffield Hallam University

Artificial Intelligence (AI) is a very powerful set of technologies. It can be used to help businesses to get real time data on customers. Before AI, companies would gather information about their customers through email marketing and rely upon a list to send out a message to everyone to grab their attention from a normal discount code or from what the user has left in their shopping cart. Replies to customer emails were done manually. Using AI in digital marketing has enabled those in marketing to use algorithms to understand their customers split by demographics, through the customers behaviours and analyse their use of search engines as to what's recommended based on their preferences to customize and personalise a customer's experience.

This research will present the use of AI, focusing on different marketing functions from content creation, customer support, customer engagement, analytics, advertising and email marketing. It will also consider the advantages and disadvantages of its use. For example, what its use brings in terms of efficiency versus the disadvantages of giving full control to AI and giving away the real power to technology and losing the reality of human touch.

AI is creating a new reality for Digital Marketing. Will AI be used to support the running of marketing in businesses or will it be making businesses so efficient resulting in eliminating humanity.

Support for the visually impaired community through an image-based chatbot

Sahar Sohail
University of Warwick

At present, day-to-day mobile applications are still designed with little consideration towards the visually impaired community; access to software to help them is also hard to find. In particular, some problems faced by the community have been addressed more than others – while text-to-speech (TTS) support is more widely available, it is harder to obtain similar assistance for pictures. Furthermore, existing solutions do not produce satisfactory answers for users, either providing too detailed or too vague answers. Considering that almost 1/6th of the world's population suffers from a visual impairment, it is essential that the community is provided further support.

This poster will illustrate a potential solution to this problem, through the development of an image chatbot application. Through this mobile application, the user will be able to take a picture and ask the chatbot for more information about the picture using speech-to-text (STT). The output produced by the application is almost entirely dependent on the AI models used, so a comparison will be drawn between various options. Nevertheless, the application will pose as another alternative to the limited range of solutions currently available, particularly by providing a different style of answers for users. The poster will draw awareness to an issue suffered by much of the population, and encourage the development of further solutions.

CarbonPulse: Turning Everyday Activities into Sustainable Action

Sakshi Paygude
Keele University

As climate change accelerates, individuals seek effective ways to mitigate their environmental impact. However, understanding personal carbon emissions remains challenging due to a lack of accessible and intuitive tools (Gifford, 2011). To address this gap, I am developing CarbonPulse, a web application that enables users to log daily activities—such as boiling water, commuting, and adjusting room temperature—and calculate the associated carbon emissions. By transforming abstract environmental data into actionable insights, CarbonPulse empowers individuals to make informed, sustainable choices.

Existing carbon footprint calculators, such as the U.S. Environmental Protection Agency's Carbon Footprint Calculator (EPA, 2023), provide basic estimations but often lack real-time data integration and personalized feedback. CarbonPulse distinguishes itself by integrating real-time carbon estimation APIs and machine learning algorithms to offer accurate, personalized insights. Users can visualize their emission trends, receive tailored recommendations, and access educational content linking personal behavior to broader sustainability efforts.

Research indicates that providing individuals with direct feedback on their emissions significantly increases their willingness to adopt sustainable practices (Allcott and Mullainathan, 2010; Steg and Vlek, 2009). While platforms like Klima (Klima, 2022) focus on carbon offsetting, they may not provide the personalized, interactive feedback necessary for sustained behavioral change. CarbonPulse addresses this need by combining real-time tracking with actionable recommendations.

Privacy and ethics are central to this project, with GDPR-compliant measures ensuring secure and transparent handling of user data (European Commission, 2023). CarbonPulse is not just a carbon tracker—it's a catalyst for environmental action, encouraging individuals to take responsibility for their climate impact.

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Dilemma in everyone’s minds today - is what I see an AI or human-generated? Should I trust my eyes?

Sara Khatun Guluzade
University of Edinburgh

Not too long ago, we were told to believe in what we see rather than in what we hear. However, nowadays we can not believe in what we see anymore either. With the advancements in tech and AI, the image editing and manipulation field has become not only a fun and creative way for people such as artists to express themselves and experiment with different editing features, but also image manipulation can be used to alter and tamper the image with a malignant goal, serving as disinformation, defamation of public figures, misused in legal documents and lead to identity theft. These violate ethics and safety rules affect people’s trust in using technology and develop the fear of privacy. Now we can not trust our own eyes completely when we see a video or photo online, for example, cases such as the viral deepfake video of Volodymyr Zelenskyy instructing the citizens to stop fighting at the start of the Russian-Ukranian war seemed very realistic and affected his reputation as well public perception to some extent.

As AI has even faster exponential growth, it is essential to bring public awareness of the risks and harms of genAI, educate them about the negative consequences, and foster responsible use of AI and digital literacy. Also, teaches how to assess the credibility of information we see online. It is also crucial to build effective image manipulation detection tools to prevent misinformation from spreading unchecked and create ethical and legal guidelines to address AI malicious use.

The Future of Hearing: AI and Cochlear Implants.

Semeli Kyriacou
University of Southampton

Cochlear implants (CIs) convert sound into electrical signals that stimulate the auditory nerve, enabling sound perception for individuals with profound hearing loss [1]. While cochlear implants significantly improve speech comprehension, CI users still struggle to distinguish pure tones and harmonic structures in a way that mimics natural hearing, particularly in noisy environments where sound separation remains a challenge [2]. Recent advances in AI have the potential to solve this long-standing issue for CI users in two fundamental scenarios: when the target sound source is known and when it is unknown. Existing hearing devices already use microphones and wireless technologies (e.g. IR-links or hearing loops) for noisy environments. AI can further enhance these approaches by learning to adjust device parameters by analyzing soundscapes and tracking listener's preferences in different situations. AI can optimize signal-to-noise ratio using deep-learning algorithms, such as deep denoising [4] [5], which separates background noise from speech. However, such technologies are limited by power and processing constraints, requiring efficient devices to handle their complex nature. Additionally, advances in time-domain audio separation networks are rapidly evolving [5] [6] , and will potentially be integrated into ear-level devices for improved speech intelligibility. When the target speaker is unknown or changes, AI can perform 'blind' separation, as well as cognitive control, using EEG signals to infer the listener's focus [3]. In this poster, we aim to summarize state-of-the-art methodologies currently being investigated in order to bridge the gap in hearing technology, assisting individuals with hearing impairments to better communicate and engage with the world around them.

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Understanding Alzheimer's Using Predictive Analysis

Shekwoyeyilo Gado
University of the West of England

Alzheimer’s Disease (AD) is the most common type of dementia, predominantly affecting older individuals. It is a neurological disorder that impairs brain function, leading to memory loss, difficulties in thinking, learning, and organisational skills, and ultimately rendering patients unable to care for themselves. While there is currently no cure for Alzheimer’s Disease, its progression can be managed through therapy. According to studies, the burden of AD on the caregiver burden can result in dysfunctional caregiver behaviours that could negatively the patient's dementia. AD not only impacts the patient’s lifestyle but also places a significant emotional and physical burden on caregivers and with early diagnosis and proper treatment, the burden of AD is reduced on the caregiver and patient.
The aim of this project is to understand the factors influencing AD through data analysis. Using optimization techniques, such as genetic algorithms, the project aims to identify the most significant factors and use them to develop predictive analysis models. The research analysed will focus on machine learning models that can be used in the predictive analysis of AD and the importance of an early diagnosis. The algorithms highlighted are SVM, Random Forest and Decision Tree, these are the algorithms used for model development and analysis of the dataset, comparison of the models is carried out based on the accuracy and efficiency of each model.

PixelBox

Sude Fidan
University of the West of England

There's something magical about analogue photography—the anticipation of waiting to see developed photos and the distinct, imperfect aesthetic. However, it comes with challenges such as expensive film, limited accessibility, and a lack of durability. What if one could keep the charm of analogue photography while solving these issues in a digital format?
Some digital cameras attempt to emulate the film look, but most fall short. Many are bulky, expensive, or lack modern features like wireless sharing. For those in unpredictable climates, like the UK, their practicality is further limited. Mobile apps offer the convenience of a touch screen; however, they don't satisfy film photographers' expectations of physical intimacy. This gap presents an opportunity for practical, affordable and durable solutions. This project proposes a compact digital camera prototype that replicates the analogue experience through advanced image processing. Designed with an authentic vintage- inspired look and buttons, it appeals to film photographers. An accompanying mobile app simplifies image transferring, eliminating cable needs.
The system integrates computer vision algorithms into an embedded system to recreate film textures, tones, and grain. The multi-platform app is built with a user-friendly design and features filter selection, remote operations, and wireless photo transfer. Innovative additions, such as a higher exposure limit, more diverse filters, and all-weather usability, broaden audience accessibility. By delivering digital convenience, the project not only overcomes existing model limitations but also boosts creativity. Ultimately, it contributes to computational photography discussions, offering future advancements in the field.

Interactivity Squared: Exploring interactive personal fabrication of interactive devices through sprayable active materials

Sunmi Lawal
University of Bath

Digitalised automated deposition techniques like 3d-printing, offer reliability, replicability, safety-to-the-maker and precision. This makes them particularly valuable in personal fabrication, allowing makers, artists and non-experts to produce high-quality prototypes with ease. However, the conventional 'plug-and-play' methodology limits creative input, continuous user feedback and material understanding. To address this, I propose Interactivity Squared - a method that combines the precision of digital fabrication with the adaptability of craft-based approaches through sprayable active materials. This approach enables the on-demand production of free-form interactive devices; expanding the potential for interaction in rich new spaces including healthcare, education and augmented work. In this poster, I present “Int2”, a hardware set-up that fully enables the interactive fabrication of free-form interactive devices using augmented reality, a robotic arm and state-of-the-art spraying technology. I will showcase its capabilities and evaluate its precision and creative potential through experimental studies.

Immigence - Ethical, Smart, and Inclusive Immigration Assistance

Yamin Shwe Yi Htay
University of the West of England

Navigating visa and residency requirements is a major challenge for international students, expats, and immigrants. The process is often confusing, filled with legal jargon, and prone to unexpected policy changes. Many individuals struggle to understand their options, assess their chances of success, and stay compliant with evolving regulations. Immigence aims to bridge this gap by offering a user-friendly solution that simplifies visa and residency management, making immigration information more accessible and transparent.

Unlike expensive and overwhelming legal services, Immigence provides an ethical, inclusive, and easy-to-use platform. Users can track their visa status, receive real-time policy updates, and explore possible legal pathways based on their unique circumstances. Designed with privacy, fairness, and transparency in mind, Immigence empowers individuals with personalized insights while ensuring data security and regulatory compliance. Instead of replacing legal professionals, it serves as a valuable resource, allowing users to make informed decisions with confidence.

This project promotes digital accessibility, ensuring that immigration support is not limited to those who can afford costly consultations. By breaking down complex legal processes into clear, actionable steps, Immigence fosters independence and reduces uncertainty. It also prioritizes fairness and inclusivity, ensuring that all users, regardless of background, have access to reliable immigration support.

As technology continues to shape the way we navigate life’s challenges, it is crucial to develop solutions that not only innovate but also prioritize ethical responsibility. Immigence is more than a tool—it is a step toward a more transparent, fair, and accessible immigration experience for all.

CyberGuard Redux: a serious game for KS3 students

Yueyi Song
University of Southampton

It is more important than ever to teach Cybersecurity concepts early in the curriculum, but these can be complex for school children to understand to a sufficient level so that they can avoid threats. This project addresses this problem through a serious educational game designed to teach Key Stage 3 students the fundamentals of cybersecurity. The game consists of five levels, each focusing on a specific cybersecurity topic: malware, passwords, phishing, SQL injection, and man-in-the-middle (MITM) attacks. Each level incorporates a narrative-driven scenario and interactive tasks that simulate real-world cybersecurity threats. Students will engage in hands-on challenges to: identify and mitigate malware, create strong passwords, recognise phishing attempts, detect SQL injection vulnerabilities, and understand MITM attacks. Through gameplay, they will develop practical skills to improve their cybersecurity awareness and threat recognition. By integrating educational content with an engaging, scenario-based approach, the game aims to provide an effective learning experience. It is also intended as a resource for teachers to promote cybersecurity awareness in schools. I will share in my poster the results of the full evaluation in one school (Hounsdown), which will have been completed by the time the BCS Women Lovelace Colloquium takes place.

AI Chatbot Helping Immigrants in London Makes Life Easy to Start Anew

Zarin Shabab
London South Bank University

Exciting as the new country may be, it comes with its challenges, especially when you must do everything independently: studies, work, and living. Being an immigrant myself, I know just how overpowering it might feel to arrange housing, health care, and services for your basic needs while adjusting to an entirely new system. That’s why I’m developing an AI-powered chatbot to support people like us (immigrants) who need quick, reliable, and multilingual guidance to help them settle in London. This chatbot will provide instant access to information on housing, mental health support, cultural centres, and essential resources, reducing the stress of searching for answers alone. It will be powered by NLP and ML, learning from the interactions with the users to become smarter and more helpful each passing day. The chatbot was built using Rasa and will guarantee the privacy, security, and seamlessness of the experience. It is designed to be more than just a tool; it's a companion that makes life easier and gives immigrants the confidence to focus on education and career, rather than bureaucracy and struggles with unfamiliarity. Coming from Bangladesh, where opportunities in tech are minimal, especially for women, I was determined to pursue my passion for coding and solving real problems. My studies and work in London have shown me how technology can break barriers, and this project reflects my commitment to making the immigrant experience smoother and more inclusive.

The Design and Development of a Website for Cyber Security Training for Children Using Smart Home Devices

Zoe Deufel
University of Greenwich

The rapid adoption of smart home devices has transformed the daily lives of their users, including children in these households. While these technologies offer a wide range of benefits, they also introduce numerous cybersecurity risks that may be challenging for younger users to understand. Issues such as privacy breaches, phishing attacks, and exposure to malicious software are significant threats that children are particularly susceptible to, given their limited knowledge of online safety. Currently, platforms designed to educate users about cybersecurity often target adults or older children, leaving a critical gap in resources tailored to younger audiences. This project proposes the development of an interactive, child-friendly website aimed at educating children aged 5–11 about the potential cybersecurity risks associated with smart home devices to address this gap. The platform will feature engaging, age-appropriate learning modules, simulations that provide hands-on experience with identifying and mitigating cybersecurity threats, and AI-driven personalisation to adapt content to each user's learning pace. By incorporating gamified elements and visually appealing designs, the website will maintain high levels of engagement and encourage skill retention. In addition to its educational content, the platform will ensure compliance with standards such as GDPR-K and COPPA, guaranteeing a safe and secure learning environment. It will also include resources for parents, enabling them to support their children's learning and promote digital safety at home. Ultimately, this initiative aims to empower children to navigate smart home technologies confidently and responsibly, fostering digital literacy and resilience in a rapidly evolving technological landscape.

MSc students

The Digital Alchemist: Turning Data into Gold with AI-Powered Analytics

Aditi Manuwal
University of Exeter

In today's world, financial data is abundant, but extracting true value from it remains a challenge. Traditional methods of financial analysis often rely on outdated models that struggle to keep up with rapid market changes. Just as alchemists once sought to turn base metals into gold, modern technology now allows businesses to transform raw financial data into powerful insights that drive growth and profitability.

The Digital Alchemist is an intelligent financial dashboard designed to help businesses make more informed, strategic decisions. By combining advanced forecasting techniques with interactive heatmaps, trend analysis, and predictive modeling, it allows executives and analysts to spot risks, seize opportunities, and anticipate market movements before they happen. Using historical data and financial patterns, this dashboard delivers real-time, visually intuitive insights, eliminating the guesswork from financial planning.

Beyond just numbers and graphs, this poster explores how intelligent financial tools are shaping the future of business strategy, making analytics more accessible, actionable, and impactful. It also considers ethical challenges such as data privacy, transparency, and the role of automation in decision-making. While some may be skeptical about the growing reliance on data-driven tools, the truth is clear, those who embrace these insights will be better equipped to navigate uncertainty and turn financial challenges into golden opportunities.

The age of financial alchemy is here. The question is, who will harness its power?

Tracking Your Carbon Footprint: Dashboards Make it Easy

Afsana Yasmin
University of Exeter

As businesses work towards reducing their carbon footprint, technology effectively simplifies emissions tracking and reporting. This research presents the development of an interactive dashboard designed to visualize and analyze carbon emissions data, making sustainability metrics more accessible and actionable. The implementation involves using a web-based framework for front-end development, integrating dynamic visualizations, and efficient data processing techniques. The system aggregates emissions data from multiple sources, standardizes it for comparison, and presents key insights through interactive charts and filters. Additionally, the project explores the feasibility of machine learning models to estimate carbon footprints based on historical data and industry benchmarks. By providing an automated and structured approach to emissions reporting, this research highlights how data-driven solutions can empower organizations to make informed sustainability decisions.

Hacking Your Hunger: McDonald’s Kiosk Manipulation

Alanna Bell
Glasgow Caledonian University

In 2015, McDonald’s unveiled a new way for customers to order food in stores that became one of the most used user interfaces in the world: Self Order Terminals (SOT) or Kiosks. The large smartphone-like devices were quickly adopted by customers and praised for their convenience, making McDonald’s significant profit within the first year alone.

Customers may believe that the intuitive user interface made Kiosks a fast-food staple, with a simple layout that reduces the learning curve often found when using new technology. Others attribute the success to the endless opportunities for order customisation without fearing judgement from others or increased queue times. However, this success is not solely a result of a well-designed interface - it is rooted in subtle manipulation, known as dark patterns.

The visual hierarchy of the menu layout intentionally grabs the user’s attention. Bigger and more expensive items are displayed at the top, making them more appealing, and simultaneously making smaller items hidden at the bottom feel more affordable. Users are nudged to upgrade their meals in increments, making it less likely for them to realise the inflated prices until they are ready to pay, creating friction and difficulty in modifying orders. These tactics have resulted in the average customer order growing exponentially, along with the profits gained as a result. The manipulative user psychology raises important questions surrounding the ethics of user interface design and the prioritisation of maximising profit over the users’ best interests and health.

Generative AI for Facial Biometrics

Ananya Kadali
University of Southampton

With the increasing use of deep learning models in facial verification systems comes a higher demand for diverse, high-quality facial data for training and testing purposes. However, privacy concerns, high costs, and regulatory restrictions often limit the training of these systems effectively. Additionally, data for certain age groups and demographics remains scarce due to ethical considerations.

Synthetic facial images present a promising solution to these challenges. While tools such as OpenAI's DALL-E and Microsoft's MidJourney generate synthetic images, their outputs lack the realism required for facial verification systems. This project investigated the current state-of-the-art, DCFace, and introduced a novel pipeline, SCHIGAND, both implemented as dataset generators to produce realistic synthetic facial images. Combined with the VGGFace2 dataset, these images were evaluated using the ArcFace facial verification system, focusing on identity preservation, intra-class variation, and inter-class variation.

Ethical considerations were central to dataset curation. The real facial datasets used, such as FFHQ (Flickr-Faces-HQ), were ethically sourced and complied with guidelines which are per the Data Protection Act 2018. While concerns such as identity fraud were acknowledged, this project primarily focuses on biometrics. The proposed pipeline is intended for expert use in controlled environments. Additionally, this project explores advanced age transformation models, including AgeTransGAN, LATS, DLFS, and SAM, assessing them on identity preservation, ageing accuracy, and similarity to real target images. By addressing these gaps, this research highlights the potential of synthetic data to supplement and, eventually, replace real-people facial datasets for facial biometric applications.

Repurposing Agricultural Dust for Smoke Removal

Caitlin Haddow
University of Bath

Smoke and haze make it difficult for cameras to see - obscuring scenes, altering colours, and interfering with object detection algorithms. Most computer vision techniques assume air in the scene is fully transparent. Where this is not true, algorithms can misunderstand the scene. Haze removal is an active area of research, and many different algorithms have been shown to remove light-to-medium-density homogenous haze. In stark contrast, the few attempts at smoke removal use low quality synthetic data, or reuse dehazing algorithms with lower success. Current models can create hallucinations, colour distortions, and artefacts. As wildfires become more common, high quality smoke removal algorithms are essential for other vision technologies.

Although haze and smoke have many similarities, smoke particles are larger, less evenly distributed, and varicoloured. Smoke particles occur in higher concentrations and absorb light as well as scattering. The mathematical assumptions behind foundational haze models fail for smoke. The latest dehazing algorithms require representative, high-quality data, but hazy image datasets do not capture the most challenging features found in smoke scenes. Datasets are needed that capture dense, non-homogenous, and dark-coloured obscurants. This project investigates a dataset of real-world images containing agricultural dust, evaluating whether the similarities between dust and smoke are enough to improve smoke removal performance. Different machine learning approaches are considered, evaluating whether they have the feature-representation capabilities and generalisation to handle the more challenging task of smoke removal.

Automated Skin Lesion Analysis for Early Melanoma Detection: A Computer Vision Approach

Deborah Adedigba
Southampton Solent University

Melanoma, the most aggressive form of skin cancer, remains a major global health problem due to late-stage diagnosis and high mortality rates. This work fulfils an urgent need for innovative diagnostic tools that are accurate, scalable, and accessible, which would improve early detection rates. The motivation for this project arises from the potential to harness new advances in artificial intelligence (AI) to address the shortfalls of traditional diagnostic measures, including observer variability and limited resources in underserved communities.
This research work uses convolutional neural networks (CNNs) that are specifically trained on dermoscopy and skin images, as well as transfer learning methods using the EfficientNet B4, ResNet50 and VGG16 models. These included advanced image preprocessing and segmentation methods such as U-Net, which were used to improve lesion delineation. Using benchmark datasets (ISIC and PH2) , significant model evaluations illustrated that EfficientNet B4 managed an AUC of 0.95 and a 12% improvement in sensitivity, supporting its reliability in avoiding false negatives.
These findings have relevant implications for dermatology by decreasing unnecessary biopsies and allowing for early interventions. Designed with clinician input, the proposed system fits within the existing workflow, with an interface designed to ease the clinician's transition from innovative technology to effective practice. They prioritized ethical considerations such as transparency and fairness across skin types to ensure equitable outcomes.
This research underlines the transformative power of AI in healthcare, proposing a robust, scalable solution for early melanoma detection. It also addresses clinical and societal challenges, which opens opportunities for better patient care and optimization of resources within dermatology.

Designing an emulator for the Raspberry Pi

Eva Davis
University of Nottingham

Many pieces of hardware have had emulators created for them in the past when such hardware themselves in inaccessible. One particular example is the Dolphin emulator for the Nintendo Wii, which has been discontinued and allows people who cannot own the console to still be able to play its games. However, there is a noticeable gap for an emulator of the Raspberry Pi.
There are examples of previous Raspberry Pi emulators that have existed in the past that do not quite meet the requirements. For example, Wokwi, which is only applicable for Raspberry Pi Picos and not the single-board computers. Wyliodrin Studio could also be an alternative but the code written to interact with the sensors and hardware is in JavaScript instead of Python, which is much more commonly used.
This poster will focus on a design for such an emulator and how its implementation would look in practice. This will include creating a series of requirements which would be desirable in this emulator, such as the sensors that can be used, the languages and libraries that would be supported and the UI of the emulator.
There are many areas in which having a Raspberry Pi emulator would be incredibly useful. For example, testing how each sensor should be wired up to the Pi before trying it on the actual hardware would prevent short-circuiting and the need to replace expensive parts. It also would make working with hardware more accessible since prototypes can be tested before buying the parts needed.

Shopping Assistant - Ripe or Unripe fruit prediction

Farjana Yeasmin Rafi
London South Bank University

This was a study on the creation of a Deep Learning based application for classifying fruit images as ripe or unripe which I have done in my second semester. The project intends to address the issues that customers and retailers encounter when checking fruits maturity, which has an influence on customers happiness, stock management, and waste. By using Artificial Intelligence, the system will offer a new method to assist users in making educated fruit quality decisions.

I have used a dataset of fruit images divided into ripe and unripe categories and went through a significant preprocessing. The project was built around a Convolutional Neural Network (CNN). Trained CNN model obtained high accuracy (76.15%) on the test dataset, which meant that it was successfully demonstrating its ability to generalize.

In this project, I explored other models as well. Compared to those models (FNNs, LSTMs, DDNs), CNNs performance was better because of its structure for image input.

Although the deployment phase was not completed, I have planned a strategy for future work. As this project is based on fruit image classification and CNN model has the best accuracy result, I am intending to deploy CNN model as an API where users will send request for image and API will make prediction on the chosen picture afterwards. For ripe or unripe classification, I will have to set a threshold of 0.5. If the probability scores more than 0.5, a fruit image will be classified as unripe and if it’s bellow 0.5 it will be classified as ripe.

Guess That Genre: Random Forest and Histogram-Based Gradient Boosting for Predicting Music Genres

Fiorella Scarpino
University of the West of England

Classifying music into its many genres can be a challenging task. It requires an understanding of technical differences between styles such as jazz, disco or country. Relying on factors like musical techniques, instruments used, cultural and geographical influences, rhythm, production style and historical context. This process involves having music theory experts who can recognise and interpret stylistic elements and structures, analyse them and apply their knowledge to accurately categorise music. However, what if there is a consumer who wants to explore their music tastes but has no background in music composition, or an independent artist wanting to tag and promote their music on a smaller budget? Having in-depth music knowledge and a large budget may not be feasible for everyone. A more accessible solution is using machine learning, making categorisation faster and easier for users. Models like neural networks are commonly used for this due to their accuracy but can be computationally expensive, time-consuming to set up and their predictions are not always explainable. Therefore, this poster explores a different approach by comparing two machine learning models, Random Forest and Histogram-Based Gradient Boosting. Random Forest generates multiple decision trees in parallel, gathers the best prediction from each tree and determines the final prediction based on majority voting. Histogram-Based Gradient Boosting generates decision trees sequentially. Each tree aims to correct the prediction errors of the previous tree to create the final prediction. Both models are evaluated on written features from 3-second audio clips, illustrating their effectiveness in music classification.

AI Powered Virtual Reality Companions: A Transformative Approach to Mental Health Support

GAUTHAMI NIRANJAN
Aston University

Social anxiety disorder is a mental health issue that affects millions of people globally and negatively affects their social and professional interactions. Even if traditional treatment is beneficial, it can be expensive, inaccessible and stigmatized which leaves many individuals without the support they need. A novel and extensible option, AI powered virtual reality (VR) companions offer affordable, immersive and accessible personalized mental health care.
By leveraging AI, multimodal learning, sentimental analysis and adaptive VR scenarios, these companions create dynamic, evolving experiences tailored to individual needs. Realtime biometric feedback including heartrate, voice modulation and micro expression analysis, enables AI to adjust interactions offering truly personalized support. Reinforcement learning continuously refines responses helping users build confidence and develop effective coping strategies. Features such as biofeedback integration, immersive storytelling and gradual exposure therapy create a safe and stigma free environment for social interaction practice.
This strategy democratizes mental health care beyond personal wellbeing by utilizing reasonably priced VR and augmented reality instruments, ensuring affordability and inclusivity. Unlike traditional VR therapy, this system continuously adapts to users through multimodal inputs providing interactive, self improving mental health support. To ensure responsible development and implementation, the paradigm integrates AI ethics principles such as accountability, privacy and justice.
This method bridges accessibility and efficacy marking a paradigm change in metal health care. In an increasingly digital world AI powered VR companions have the potential to revolutionize mental health care by fusing state of the art AI with reasonably priced immersive technologies promoting resilience and overall wellbeing.

Cache Optimisations for GEMM

Garima Malhotra
University of Sheffield

General Matrix multiplication (GEMM) is a fundamental operation for machine learning (ML) workloads. Despite great leaps in processor architectures for ML workloads, GEMM performance is often constrained by memory bottlenecks. This study investigates software and hardware approaches on minimising the run-time of GEMM computation for multiplying two single precision 32-bit floating point number (FP32) square matrices of given dimension. On the hardware side, the effects of tiling, cache associativity, cache size, block size, and block replacement policies are observed by running GEMM on different cache architectures which are designed using the open-source tool ‘gem5’. On the software side, various matrix multiplication algorithms such as naïve, loop interchange and tiling are implemented in C and compared in terms of run time on the different cache architectures. The findings provide insights into designing memory systems tailored for custom ML workloads, improving speed.

Vision Language Models: Can you be cured by an Artificial Intelligent Doctor?

Handan Zhang
University of Leeds

Recently, Artificial Intelligence has come to a new stage. With the great success in both Computer Vision, (e.g. Object Detection), and Natural Language Processing, (e.g. ChatGPT), much more emphasise has been put on the combination of these two fields. Vision Language Models (VLMs) have arisen to meet the need. VLMs are designed to leverage information from images (or videos) and texts, dealing with more complicated tasks. A prominent application of VLM is Medical Visual Question Answering. This line of work takes an image (or video), and a question expressed in natural language as input, outputs an answer in natural language. Typically, VLMs serve as knowledge bases to support clinical diagnosis. For example, they can analyse the CT images, help to identify and locate anomalies or tumours, assist the doctors in making accurate diagnoses. They also play a vital role in real-time surgeries, providing guidance and assistance to reduce the likelihood of mistakes and improve patient outcomes. This poster will delve into the architecture of LLaVA-Med, a state-of-the-art VLM, aiming at i) Elucidating the technical details of the model, explaining how the VLMs work in the context of practical applications; ii) Comparing the performance of LLaVA-Med on some popular datasets, showcasing the promising prospects of VLMs; iii) Identifying some challenges VLMs suffer from in the medical field, proposing possible directions to improve the VLMs for both technical performance and ethical reliability.

Magnetic Resonance Imaging of Myelin in the Brain with Inversion Recovery and Ultrashort Echo Time Sequences

Indumita Prakash
Imperial College London

Multiple Sclerosis (MS) is a chronic autoimmune disease that damages the myelin sheath, impairing neural communication. Over time, this condition can degenerate into cognitive, motor, and sensory deficits, severely impacting patients' quality of life and imposing substantial socioeconomic burdens. Therefore, early diagnosis and monitoring are crucial for improving clinical outcomes and effective disease management.

Magnetic Resonance Imaging (MRI) is the gold standard for MS diagnosis due to its non-invasive nature and excellent contrast resolution. Conventional MRI protocols detect macroscopic lesions but lack specificity for in vivo brain demyelination and its MR biomarker, T2*, highlighting the need for imaging myelin directly. However, direct myelin imaging remains challenging due to its ultrashort signal decay, and interference from surrounding tissues.

Inversion recovery ultrafast echo time (IR-UTE) sequences have demonstrated high performance by isolating myelin signals and visualizing lesions invisible on conventional protocols, yet no standardized protocol exists.

This project aims to develop an MRI protocol for white matter myelin imaging by integrating IR-UTE with time-efficient sampling strategies (e.g., radial sampling) to minimize signal loss while optimizing spatial resolution, signal-to-noise ratio, and contrast-to-noise ratio.

The proposed approach will be validated in principle through Python simulations and optimized for in vivo performance. The protocol will be tested at 3T on phantoms and healthy volunteers, where T2* biomarkers will be extracted to confirm myelin detection and compared to existing literature to retrospectively assess protocol efficiency.

This represents an effort toward developing more efficient MRI protocols for improving MS prognosis while offering insights into the demyelination process.

The Affective Analysis of Singing with Machine Learning

Jadesola Kareem
University of Chester

The real-time emotional analysis of singing presents a unique challenge in affective computing. This project aims to develop a real-time software tool for the emotional analysis of singing performances, leveraging both traditional machine learning and deep learning techniques. The approach integrates algorithms such as Random Forests, Support Vector Machines (SVM), and decision trees, alongside advanced deep learning models, including Convolutional Neural Networks (CNNs) and Recurrent Neural Networks (RNNs).

The tool uses features extracted from the RAVDESS dataset, which includes audio recordings of singers performing with various emotional expressions. Some features such as Mel-frequency cepstral coefficients (MFCCs) and spectrograms are analyzed to classify emotions such as happiness, sadness, anger, and fear. The main focus is to ensure the system operates in real-time, enabling dynamic emotion classification for interactive applications.

Though the project is still in development, early testing indicates that deep learning approaches, particularly CNNs and RNNs, have the potential to deliver more accurate and efficient emotion detection compared to traditional machine learning methods.

The software tool is expected to be applicable in fields such as music therapy, entertainment, and human-computer interaction, offering real-time emotional feedback from vocal performances.

This ongoing research aims to contribute to the field of affective computing, providing a robust solution for real-time emotional analysis in singing with promising future applications.

This Online Threat Is Spreading Fast - You'll Never Guess the Genius Trick That's Beating It!

Jessica Caramiello
University of Birmingham

Clickbait is an online strategy designed to encourage users to click on a link, often prioritising sensationalism over meaningful content. Clickbait is becoming increasingly common, and while often dismissed as merely annoying, it poses significant risks, including circulating misinformation, manipulating public perception, and facilitating the spread of phishing schemes.

This study explores mitigating the risks of clickbait by employing Natural Language Processing (NLP) techniques. NLP is a branch of AI focused on understanding human language, making it highly effective in processing and interpreting text-based content.

Spoiling misleading headlines by web-scraping the corresponding article content and using it as input for NLP models reduces the appeal of clickbait, discouraging users from clicking on the URL and interacting with malicious content. Detecting malicious URLs protects users from phishing attacks. This is done through blocklist verification and NLP-based pattern recognition. NLP models can be further utilised to allow users to identify inappropriate or persuasive language within linked articles before they click on the URL.

For each NLP model used in this study, existing models were researched as a foundation and fine-tuned on relevant datasets for optimal performance. These models were then integrated into the backend of a Chrome extension, built using an Agile iterative process.

The results of this study indicate that NLP-driven techniques can enhance online safety by offering preventative solutions to the risks posed by clickbait. The study demonstrates how NLP models can help to safeguard the public from deceptive content and associated threats.

Machine Learning Modules for Breast Cancer Survival Analysis

Khadijat Shittu
University of Wolverhampton

Analysing survival outcome plays a critical role in predicting breast cancer outcomes, particularly with identifying the factors that are associated with determining the survival of patients. This research was conducted using two major survival analysis machine learning models, The Cox Proportional Hazard Model (Cox PH) and Random Survival Analysis Model (RSF), both models were developed in RStudio version 4.4.2 for the purpose of this research using a dataset with 4,024 instances, for better visualization and understanding of the dimension of our datasets an Artefact was developed using ShinyApp, The app is expected to help clinicians in exploration of data analysis.

The goal of this research is to conduct an exhaustive analysis on survival outcomes of patients diagnosed with breast cancer , to ensure robust performance some clinical and demographic factors were carefully analysed, pre-processed and scaled, also to determine if RSF outperforms the traditional Cox PH model, and lastly develop an application for clinicians in visualizing dataset.

The Cox PH model achieved a C-Index of 0.73, while the RSF model performed slightly higher with C-Index of 0.75. This result indicate that the RSF model remains a strong and interpretable baseline for survival analysis, RSF has an inbuilt feature that allows it to predict with features with high importance and eliminate redundant features from the dataset.

The Shinyapp displayed an easy understanding of dataset for clinicians, This comparative analysis contributes immensely to more informed models selection for breast cancer survival prediction.

Reinforcement Learning Assisted Common Subexpression Elimination

Lucia Adams
University of Exeter

The development of heuristics for optimising compilers is a well-established field spanning decades of research, with a focus on reducing program execution time and energy efficiency through applying code transformations. In more recent years, the surge in computational demands from AI systems has amplified the importance of this work, garnering interest in the use of machine learning techniques towards automating the process of finding optimal transformations. Reinforcement learning (RL) in particular has been noted as a promising direction for this, owing to the suitability of Markov Decision Processes (MDPs) for encapsulating these optimisation problems. One such problem, which is prolific across overviews of the field, is Common Subexpression Elimination (CSE). Yet there is an evident absence of exploration towards CSE's integration with ML, or even the explicit heuristics it employs, despite being used within compilers such as LLVM, GCC, and XLA, a prominent ML compiler. In particular, the CSE pass in LLVM seemingly relies on subsequent optimisation passes to derive heuristics, one of which being the Register Allocation pass, which has recently been successfully modelled as a RL problem. This pass dependence suggests the potential in modelling CSE itself as a MDP. We address this gap by proposing a Reinforcement Learning approach to the Common Subexpression Elimination problem, and developing the corresponding transformation pass in LLVM. We then present experimental evaluations on benchmark suites for the reduction in program runtime, against CSE passes that do not implement optimisation heuristics directly.

Development of a digital health solution to improve sexual health education and accessibility of sexual health services for young people in Nepal

Manisha Gurung
Bournemouth University

This research project seeks to develop and evaluate a proposed digital health solution aimed at enhancing sexual health education and improving access to sexual health services for young people in Nepal. Despite the critical importance of sexual health, young Nepalese encounter significant barriers, including cultural taboos, inadequate education, and restricted healthcare access. Digital technology presents a promising avenue to address these challenges by providing accessible, private, and reliable resources.

The study employs a mixed-methods approach, including semi-structured interviews with young adults, focus group discussions with key stakeholders, and usability testing of a prototype digital health solution. The interviews are designed to yield in-depth insights into the experiences and needs of the target population, whilst the focus groups will identify broader systemic issues and gather diverse perspectives. Usability testing will evaluate the effectiveness and user satisfaction of the proposed solution.

The outcomes of this study include a set of recommendations for future digital health initiatives in Nepal, the development of a proposed interactive prototype, and comprehensive findings from the primary research. These deliverables aim to contribute significantly to the improvement of sexual health outcomes for young people in Nepal and provide a robust foundation for further research and development in digital health solutions in Nepal.

VenturAR: Revolutionizing STEM Education with AR Innovation

Milly Francis
University of South Wales

STEM activities often involve repetitive, hazardous, or resource-intensive tasks that challenge both learners and educators. Augmented Reality (AR) offers an innovative solution by automating these processes to enhance engagement and make learning immersive. This poster presents VenturAR, an AR-based application that addresses these challenges, providing a safe and cost-effective virtual lab environment for STEM education.

VenturAR leverages ARCore technology for environment tracking and interaction, with Blender for 3D object modelling. Unity is the primary engine to integrate AR functionalities and create seamless interactions. Machine learning algorithms optimise object behaviour and ensure realistic outcomes. These technologies enable the creation of accurate and dynamic virtual experiments. Simulations include chemical reactions, physics phenomena, and engineering tasks thus eliminating safety risks, reducing reliance on expensive equipment, and offering real-time interactivity.

While there is a plethora of AR applications, the immersive learning in classrooms for a real-life experience is still lacking. Therefore, VenturAR bridges this gap by incorporating inquiry-based, team-based, and project-based learning pedagogies, enabling collaboration and enhancing curiosity of the learner. In addition, VenturAR boosts self-efficacy—a learner’s belief in their ability to succeed. This is achieved through mastery experiences, peer collaboration, and interactive feedback.

The use of VenturAR promises significant improvements in engagement, retention, and academic performance. It offers a cost-optimised experience for resource-constrained institutions. With the offering of an inclusive and accessible platform that empowers diverse learners and prepares them for real-world challenges, VenturAR transforms STEM education.

Transforming Wound Care with AI-Powered Medical Imaging

Nadia Jelani
Sheffield Hallam University

Chronic wound care is a major healthcare challenge, with current assessment methods relying on subjective opinions, leading to inconsistent diagnoses and delayed treatment. This study proposes an AI-powered wound detection system using CNNs and U-Net architectures to improve accuracy and efficiency. However, AI-based wound assessment comes with challenges such as limited datasets, variations in wound appearance, algorithmic bias, and real-world reliability issues. Small or imbalanced datasets can make AI models unreliable, while factors like poor lighting and inconsistent image quality add to segmentation difficulties. Traditional methods, including basic image processing techniques and machine learning models like SVMs and Random Forest, struggle with complex medical images. Deep learning, particularly CNN-based U-Net models, is a game-changer. CNNs automatically learn key features like wound shape and texture, while U-Net enhances precise segmentation through its encoder-decoder architecture. Transfer learning and data augmentation techniques, such as brightness adjustments and image rotation, will be employed to improve model robustness. Explainable AI techniques like Grad-CAM and SHAP will provide transparency by highlighting influential image regions and breaking down feature contributions. These tools will make AI more interpretable and user-friendly for clinicians. Despite their high accuracy, deep learning models require significant computing power. To enable real-time deployment, model compression techniques like quantization and pruning will be used, along with edge computing solutions for mobile devices and healthcare wearables. Beyond technical improvements, real-world adoption requires regulatory compliance, data privacy, and ethical considerations. A secure, Python-based interface will facilitate real-time wound assessment while safeguarding patient data.

AI in the diagnosis of Skin Cancer: Striking the balance between human expertise and technology

Nazish Waqar
London South Bank University

Skin Cancer is a deadly disease which is traditionally diagnosed using clinical tools and manual analysis by dermatologists. Early and accurate diagnosis can improve survival rate; however, traditional methods are time consuming and subject to human errors. With the development in Artificial Intelligence (AI), the diagnosis process can be made more efficient and become automated.
This research highlights that AI has potential to diagnose skin cancer using pre-trained Transfer Learning models like AlexNet and VGG-16. Transfer learning techniques classify lesions as benign and malignant using publicly available Kaggle dataset. Data imbalance was a key challenge which was reduced by using augmentation and computational complexity was addressed by optimizing the model for quick response time.
VGG-16 achieved 95% accuracy and improved diagnosis as compared to traditional methods. But integration of AI in healthcare comes with some challenges, especially the results could be misinterpreted and misused in the absence of an expert. This system is designed to aid professionals to ensure that this AI will assist experts in decision-making rather than replacing clinical experts.
The outcome of this research highlights the need of medical experts and technologists to integrate AI tools into clinical workflows. This system improves diagnosis and guarantees the safety and efficiency of results for the areas with limited access to qualified professionals. To improve AI models and make sure that they are aligned with ethical standards and best practices, we support ongoing research and training projects.

SHIFTX2 Shifted: Using Molecular Dynamics to Validate the Predicted Chemical Shifts of AlphaFold2 Structures

Noor Ul Ain Zahra
University of Sheffield

AlphaFold2 has transformed protein structure prediction by leveraging deep learning to model protein folding with remarkable accuracy, accelerating drug discovery and the understanding of diseases. However, computational predictions must be rigorously validated to ensure their reliability for real-world applications. This project aims to improve the validation of AlphaFold2 predictions by investigating approaches for developing a program to predict experimental chemical shifts—measurable Nuclear Magnetic Resonance (NMR) parameters that serve as indicators of atomic accuracy. SHIFTX2 is a foundational machine-learning-based tool that predicts chemical shifts from protein structures, but it is trained primarily on static structures derived from X-ray crystallography. However, since proteins in living organisms are dynamic, changing their shape and conformation as they interact with their environment, this introduces a limitation. Molecular dynamics (MD) simulations offer a way to model protein flexibility by computationally simulating atomic movements over time. This project examines the feasibility of integrating MD-generated structural ensembles, which effectively results in sampling a wider range of possible structures, into the SHIFTX2 framework to improve chemical shift predictions. By reviewing existing research on AlphaFold2, SHIFTX2, and MD simulations, this work aims to explore the potential of incorporating dynamic structural information to enhance validation methods for predicted protein models. The outcome is expected to contribute to improving AlphaFold2 validation and advancing how structural biologists assess in silico models, ultimately taking the field to new heights.

Prediction of Pregnancy Risks

Olubunmi Helen Adenuga
Southampton Solent University

The reduction of maternal mortality rate is a key indices of the Sustainable Development Goal 3 of the United Nations. This include quality healthcare during pregnancy and childbirth.
Pregnancy complications poses significant challenges, with impacts that extend beyond the immediate pregnancy. These complications result in long-term physical incapacitation, mental health challenges and adverse neo-natal outcomes, affecting overall well-being of both mothers and their children.
The aim of this project is to accurately classify pregnancy risks using advanced machine learning algorithms to enable healthcare professionals to allocate resources more effectively and design appropriate personalized care plans.
This project deploys machine learning (ML) techniques to predict maternal health risks using physiological data, utilizing a dataset of 1,014 entries with variables such as age, blood pressure (systolic and diastolic), blood sugar, body temperature, heart rate, and risk levels categorized into low, medium, or high. Exploratory data analysis has been used to identify patterns and correlations among variables, informing the selection of optimal ML algorithms. Models such as Decision Tree, Random Forest are implemented, coupled with GridsearchCV tool which selects best parameter of the options presented by these robust algorithms. The models performances were evaluated with suitable metrics including F1-score, accuracy, precision and AUC-ROC, considering the multi-class and imbalanced distribution of the dataset. Random Forest model achieved 92% precision in predicting high-risk pregnancies and same for the average precision, while the AUC-ROC is 95%.
The Random Forest model is suggested for integration into routine perinatal care services for early detection of pregnancy complications.

FLIGHT DELAY PREDICTION USING WEATHER AND HISTORICAL DATA

Oluwakemi Odeyemi
University of Wolverhampton

This study investigates the relationship between weather conditions and flight delays at Birmingham Airport, while developing predictive models to improve delay forecasting. By integrating historical flight records with meteorological data including wind speed, temperature, and precipitation, we conducted comprehensive analyses to identify patterns and correlations.
The dataset comprises 17,287 flight records collected over 2018, incorporating detailed timestamp information, carrier data, scheduled and actual departure times, and corresponding meteorological conditions. Three machine learning approaches were implemented: Linear Regression to quantify weather effects on delay durations ($R^2 = 0.64$), Logistic Regression to predict delay probability (accuracy = 78.2%), and an ensemble Random Forest model with optimized hyperparameters to capture complex relationships within the data (accuracy = 83.4%).Results indicate that while weather variables contribute to flight delays, their correlation is relatively modest, suggesting other operational factors play significant roles. The Random Forest model achieved 83.4% prediction accuracy, exceeding comparable published benchmarks of 70-80% in other flight delay prediction studies. This improvement resulted from effective feature engineering and model optimization. To enhance practical utility, we developed an interactive dashboard that combines machine learning predictions with real-time weather data, offering valuable decision-making support for airlines and airport management. This research demonstrates the effectiveness of advanced analytics in improving operational efficiency, reducing costs, and enhancing passenger experience in the aviation industry, with potential applications for other transportation sectors.

AI and Humanoid Robots in Domestic Life: Automating Chores or Enhancing Human Intelligence?

Osato Ogunbor
University of Wolverhampton

As AI-powered humanoid robots like Tesla’s Optimus move closer to mainstream adoption, their role in domestic life remains a compelling debate. Will these intelligent machines simply automate household chores, or can they evolve to enhance human reasoning and creativity? This abstract explores the intersection of automation and cognitive augmentation, examining how AI-driven domestic assistants might transform everyday living.

The automation of tasks such as cleaning, cooking, and laundry promises greater efficiency and time savings, allowing individuals to focus on more meaningful pursuits. However, while these robots excel at precision and repetition, they still struggle with emotional intelligence, ethical decision-making, and contextual reasoning—areas where human cognition remains unmatched. This raises a crucial question: should AI in domestic spaces be designed solely for task execution, or should it work alongside humans to expand intellectual and creative capabilities?

By analyzing advancements in smart home technologies and user experiences, this abstract highlights both the advantages and limitations of AI integration. Rather than viewing these robots as mere labor-saving devices, we propose a vision where they serve as collaborative partners, complementing human insight rather than replacing it. The future of AI in domestic life lies not in automation alone, but in fostering synergy between machine efficiency and human adaptability—creating homes that are not just smarter, but also more intuitive, innovative, and responsive to human needs.

A Hybrid Agile-Waterfall Approach for Multi-Model Analysis in Predicting Multiple Diseases: Leveraging Intelligent Automation with Machine Learning and Robotic Process Automation in Digital Health Systems

Pallavi Chintapalli
University of Hertfordshire

The increasing complexity of healthcare necessitates advanced solutions to enhance diagnostic accuracy and operational efficiency. This project introduces a digital health platform that leverages Intelligent Automation (IA) by integrating Machine Learning (ML) and Robotic Process Automation (RPA). The Hybrid Agile-Waterfall Software Development Life Cycle (SDLC) methodology ensures iterative development while maintaining structured planning and compliance with healthcare standards.

The system utilizes publicly available datasets on diabetes, heart disease, and kidney disease to train multiple ML models, including Random Forest, Support Vector Machine (SVM), Logistic Regression, K-Nearest Neighbors (KNN), and Decision Trees. A comparative analysis identifies the best-performing model based on accuracy and other evaluation metrics. RPA automates data collection, prediction generation, and email-based reporting, seamlessly integrating ML predictions into healthcare workflows using UiPath.

Key findings indicate that Logistic Regression provides the most balanced performance for diabetes, heart and kidney disease prediction, while RPA-driven automation enhances efficiency and accuracy. The integration of RPA and ML streamlines healthcare diagnostics, reducing manual intervention and optimizing resource allocation.

Future improvements will focus on scalability, accuracy enhancement, and expanding disease prediction capabilities. Advanced AI techniques, such as text-to-speech integration, will further improve accessibility for inclusive users. This research highlights the potential of IA in revolutionizing digital health systems, demonstrating that a Hybrid Agile-Waterfall approach effectively balances adaptability and structured progress in intelligent automation for predictive healthcare analytics.

Digital Inequality In Healthcare Data Management And Governance: A Comparative Study of NHS (UK) And NHIS (Nigeria)

Patience Shekwotazamu Tnushi
Teesside University London

Well- structured data management and governance are critical for enhancing healthcare delivery, ensuring patient safety, and maintaining public trust. Digital inequality in data management and governance refers to disparities in access, implementation and effectiveness of digital systems and governance structure, often resulting in unequal healthcare outcomes and data security. In the United Kingdom, the National Health Service (NHS)exemplifies robust data governance practices. A recent article in BMJ Open discusses the UK's legal and information governance structures associated with secondary uses of health data, highlighting the importance of frameworks like the (GDPR) UK Data Protection Act 2018 (DPA 2018) in ensuring secure data handling and optimizing public health strategies (Carter et al., 2023). The GDPR and Data protection act 2018,ensures strong patient data security and foster public trust. A developing healthcare system like Nigeria, faces significant challenges in data management, insufficient regulatory and digitalization (Pan African Medical Journal,2018) and Health Policy and Planning Journal explores perceptions around governance and accountability within Nigeria's Basic Health Care Provision Fund, identifying issues such as lack of infrastructure and limited accountability mechanisms that impede effective data governance (Abimbola et al., 2023).Nigeria face the challenge in enforcing policies which leads to issues like data breaches and public trust. The methodology of this study employs combining a mixed -method approach, integrating quantitative and qualitative methods to ensure a comprehensive analysis with qualitative interviews of healthcare professionals/regulators ,policy makers and I.T professionals from both domain and analyses data from reports and published case studies. The study aims to compare and evaluate existing data management and governance frameworks, and understand the barriers to effective data management, identify actionable strategies for improving healthcare outcome. Other findings suggest that while the NHS benefits from established data governance structures that facilitate data-driven decision-making, Nigeria health system struggles with systemic issues that compromise data integrity and utility and should invest in digital infrastructure and training. Addressing these disparities is crucial, as effective data governance enhances healthcare outcomes, informs policy decisions, and builds public trust. This study will contribute to the global discourse on health data governance, by emphasizing the need for targeted investments in digital infrastructure , capacity building and creation of policies in Nigeria healthcare system more so collaborating with U.K NHS to learn and adopt best practices.

Sentiment Analysis of Film: Enhancing Storytelling with AI

Pere-ere Ogunbanjo
University of Wolverhampton

Artificial intelligence (AI) is changing the creative industries, especially media and film, by providing new avenues for human creators to collaborate and by enabling the use of AI-driven systems to advance filmmaking. The focus of this study is on the use of sentiment analysis to enhance storytelling through the analysis of emotional tones in film scripts. The promise of AI to inform and improve narrative development is still not fully realized, despite advancements in production technology.

A branch of natural language processing (NLP) called sentiment analysis can spot thematic and emotional patterns, giving filmmakers data-driven insights to improve their stories. Current sentiment analysis methods, such as TextBlob and VADER, are only able to analyze short-form material and have trouble capturing the nuanced emotional dynamics of lengthy tales. By employing the Movie Script Corpus dataset to create a customized framework for examining films from various genres, eras, and cultural contexts, this study addresses these constraints.

By combining AI sentiment models with conventional narrative analysis, the study's framework finds emotionally charged or undeveloped passages in screenplays. This gives filmmakers the ability to produce more captivating and culturally relevant material that meets changing viewer expectations. This study demonstrates how AI may be used as a collaborative tool in the creative process rather than as a substitute for human brilliance by bridging the gap between data-driven insights and creative intuition.

Ultimately, this project advances both academic research and industry practices, providing innovative methods for evaluating and enhancing narrative-driven emotional expression in film and media.

Leveraging AI and Social Media Algorithms for Climate Crisis Awareness

Prajakta Markad
University of Essex

As AI and social media platforms continue to evolve, they present new opportunities to enhance global awareness of climate change. However, the existing recommendation algorithms often prioritise engagement-driven content over critical environmental issues, leading to significant inequities in the visibility of climate-related crises. An example of this disparity occurred in August 2024, when wildfires in Angola and the Democratic Republic of Congo burned approximately 6% and 2.5% of their land areas, respectively, within a single week. Despite the scale of these disasters, they received far less global media coverage compared to similar events in wealthier regions(like California), underscoring systemic biases in crisis reporting and public awareness.

This research proposes an AI-driven framework designed to address these imbalances by integrating predictive climate modelling with social media content ranking algorithms. The framework leverages advanced machine learning techniques, including Long Short-Term Memory Networks (LSTMs) and transformer-based architectures, to analyse real-time meteorological data, historical disaster patterns, and social media engagement metrics. By synthesising these data streams, the system aims to forecast imminent climate crises and prioritise related content on social media platforms. Additionally, the incorporation of explainable AI(XAI) methodologies seeks to enhance the transparency and ethical alignment of ranking decisions, ensuring they serve the broader public interest.

A key focus of this research is the application of reinforcement learning to develop ranking systems that balance traditional engagement metrics with social responsibility. Such systems could ensure that critical environmental updates achieve greater visibility, addressing algorithmic biases that currently limit the dissemination of vital information. By making scientific predictions more accessible, this approach has the potential to foster informed climate action and mitigate the disproportionate underrepresentation of certain crises in global discourse.

Ultimately, this research seeks to bridge the gap between AI-driven disaster forecasting and the effective dissemination of climate-related information through social media. By ensuring that urgent environmental events receive proportional visibility and public engagement, the proposed framework aims to contribute to a more equitable and informed global response to the climate crisis.

Performance comparison of multi-modality MRI segmentation models

Qinqing Li
University of Exeter

Semantic segmentation in medical imaging is an active area of research. A successful segmentation model should generalise beyond the training data distribution and provide accurate disease segmentation across all ages, ethnicities, and genders. It is widely agreed that models utilising multi-modality medical images achieve better segmentation results than single-modality models. Some multi-modality approaches fuse different modality images before performing segmentation on the fused image (image-level segmentation). However, this approach lacks a direct real-world physical interpretation, and the fused images may be unfamiliar to clinicians, serving primarily to enhance AI performance. This study compares the performance of various multi-modality models and evaluates whether image-level segmentation models generally outperform non-image-level segmentation models on standard benchmarks. Specifically, brain glioma segmentation models will be assessed using common benchmarks: Dice score and Hausdorff95 score. All models are trained on the same task usinag multi-modal MRIs provided by the BraTS competition, ensuring a valid comparison.

The Right Choice for your Family: Predicting and Explaining IVF

Rachel Dunleavey
University of Exeter

In the UK, 1 in 7 heterosexual couples will be effected by infertility. The process of using IVF to have a child can be expensive, scary, and exhausting. The number of people using IVF has increased, but the amount of NHS funded IVF cycles has decreased. This can lead to people choosing to privately funding their treatment; This can cost upwards of £5000 per treatment and with no guarantee of success. Therefore, it is critical that patients feel knowledgeable and empowered to make decisions about if and when IVF would be the right decision for them. This project uses data from the HFEA Register, which has tracked all fertility treatments performed by licensed clinics in the UK since 1991. Multiple models are created to find which are best at correctly predicting the outcome of IVF treatment, which includes expanding on published papers with the newest data, and using alternative modern solutions such as AutoML. The most accurate models that minimise the number of features needed for prediction will be used as a backend to an IVF webpage. This will allow patients to enter details about themselves and receive a percentage likelihood of success, and an explanation as to why they received this result. While a percentage is helpful, an explanation on which factors of their potential pregnancy effect their likelihood of success and why can be empowering and educating. It is also an insight many existing IVF calculators do not have.

Technology as Disabling Barrier: A Framework For Understanding Digital Exclusion of People with Learning Disabilities

Rebecca White
Manchester Metropolitan University

“Unequal access to digital technologies brings about unequal participation in society” (Van Dijk, 2005). Twenty years later, the digitalisation of essential public services as well as functions of everyday life (work, retail, transport, healthcare etc.) has resulted in increasing convergence between digital objects and real-world environments. However, the gap in social participation is widening for people with learning disabilities.

By developing ICT solutions for the mainstream, projects have designed out people with learning disabilities who now find themselves on the wrong side of the digital divide: excluded from key services and increasingly vulnerable to abuse or exploitation online.

Previous tools for understanding digital inequalities fail to account for the complex, multifaceted and dynamic nature of disability in general, and the specific needs of users with learning disabilities. Research into assistive technology has developed evaluation models for specific devices such as communication aids. Combining inclusive design principles, digital inclusion research and disability theory allows us to better represent the “complex model of disability and technology” (Roulstone, 2016).

The aim of this work is to develop a framework for assessing digital inclusion principles of ICT projects to minimise disabling effects of technologies and empower users with learning disabilities.

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Van Dijk, J. (2005). The deepening divide: Inequality in the information society. Thousand Oaks, CA: Sage.

Exploring Personalized Playlist Curation on Spotify through Emotion and Mood Recognition

Sanika Kadam
University of Exeter

Personalised music curation enhances user experience, improves productivity, and increases engagement by introducing listeners to music that resonates with their preferences and emotions. It has proven efficient and convenient over a span of years. It increases user engagement by introducing the listeners to new songs they are likely to enjoy. This project aims to transform the way individuals experience music by creating personalized playlists that match their current emotional state. Utilizing facial emotion recognition technology, this project analyses the user's mood in real-time through their webcam. We implement the Haar Cascade algorithm for real-time face detection and train a CNN (Convolutional Neural Network) Model for emotion recognition. For enhancement of the model’s interpretability, we incorporate the Grad- CAM (Gradient- weighted Class Activation Mapping). This innovative approach not only enhances user satisfaction but also provides a novel way to interact with music based on emotional intelligence. The project integrates advanced machine learning algorithms for mood detection and leverages APIs from popular music streaming services to curate the playlists unlike the traditional methods where they rely on user-defined preferences, listening history or manual selection. Overall, this project redefines music interaction, bridging AI-driven emotional intelligence with personalised streaming, paving the way for future advancements in AI driven entertainment.

Wall Street Through A Neural Lens: Forecasting NASDAQ and NYSE Stock Price with Residual Network 2D CNN Model

Sarah Tucker
London South Bank University

Stock market forecasting is challenging due to its inherent volatility under the influence of unpredictable factors such as economic and geopolitical. This problem affects investors, policymakers, and financial analysts, resulting in significant economic risks globally. Traditional forecasting models often fail to address these complexities, leading to inconsistent predictions, particularly during volatile periods. This study investigates whether image-based approaches using a residual network-based 2D convolutional neural network can outperform conventional numerical methods in predicting NASDAQ and NYSE stock prices. By transforming numerical data into a grid-like structure and then an image, the model captures spatial, temporal and feature interrelationship patterns that are otherwise overlooked.
Three experiments were conducted with varying feature sets. Experiment 1, focusing solely on historical stock prices, achieved an R^2 score of 0.97 during standard testing and an R2 score of 0.87 when forecasting future horizons, demonstrating its value for stable conditions. Experiment 3, which integrated additional economic and index data, achieved a near-perfect R^2 of 0.99 for standard tests but struggled in future horizon predictions as did Experiment 2 with positively correlated index data added as features, highlighting limitations in handling unseen data. The Horizon Forecasting results across Experiment 2 and 3 revealed the models difficulty in utilising the extra information to aid in its prediction power.
This study bridges the gap between traditional numerical methods and image-based techniques, offering a novel perspective for stock price forecasting. Future work could explore better integration of contextual data and adapting the model architecture to improve predictive accuracy and generalisability.

Are we forgetting how to remember?

Saxon Partridge-Smith
Nottingham Trent University

Technologies such as Artificial Intelligence, social media and smartphones have enriched our lives by offering simplicity, connectivity, and efficiency. These tools have slowly become extensions of our minds, but at what cost? Are we becoming so reliant on technology that we are forgetting how to remember ourselves?

This dependency has led to a concept called "digital amnesia”, which is the idea that humans are increasingly becoming more forgetful, due to an over reliance on digital devices to store and retrieve information for us. The availability of technology means that we no longer feel the need to commit information to memory, as we trust our devices to do the heavy lifting for us. This reliance can lead to significant cognitive changes, impacting our ability to recall facts, dates, and even personal experiences.

This poster delves into the science behind this trend, exploring how our brains decide what to retain. A 2022 study by Avast demonstrates how 70% of people now rely on their smartphones to remember birthdays and anniversaries. Are we losing crucial cognitive skills? What happens when technology fails? How does digital amnesia effect our ability to connect with others?

Understanding how our brains adjust to external sources is important, as it may reduce our capacity to independently remember and process information. By examining these effects, we can create mechanisms which support cognitive health, promote balanced digital habits, and preserve our ability to think critically and retain knowledge over time.

The Intersection of Neurodiversity and Adaptive Artificial Intelligence Model

Shradha Limbu
University of Wolverhampton

Artificial intelligence (AI) holds immense potential to empower diversity and support unique human perspectives. The development of artificial intelligence to accommodate diverse ways of thinking, learning, and communicating while fostering inclusivity for all cognitive profiles is both a complex and rewarding endeavor. This research explores the intersection of neurodiversity and adaptive artificial intelligence, focusing on sentiment analysis which is a key application of natural language processing (NLP). Sentiment analysis offers significant opportunities to support individuals with neurodiverse conditions, including autism spectrum disorder, ADHD, and dyslexia. Neurodivergent individuals often face challenges in interpreting emotional cues, navigating social interactions, and expressing emotions effectively. Sentiment analysis can address these challenges by systematically analyzing textual or verbal communication to detect emotional states, tone, and intent, to avoid potential misunderstanding in conversations. For instance, sentiment analysis tools can be integrated into communication platforms to evaluate conversational tones to identify whether they are positive or negative. Such insights enable neurodivergent individuals to address or clarify potential issues before they escalate into conflicts. Furthermore, sentiment analysis can provide data-driven insights into the emotional well-being and behavioral patterns of neurodiverse individuals by identifying early indicators of anxiety, frustration, or sensory overload. These applications foster greater social inclusion, emotional support, and improved quality of life for neurodivergent communities.
This research examines the development of sentiment analysis applications to address key challenges faced by neurodiverse individuals. It also considers the ethical and social implications of such technologies, highlighting their potential to promote well-being and inclusivity across broader neurodivergent communities.

Developer Advocates: Connecting People with Technology

Simone Jain
University of Sheffield

Think of a time you've used a new technology. You first want to be sure if it's fit for purpose by understanding what it offers quickly. You then want to be able to set it up easily. Inevitably you get stuck, so you look to discussion forums where you find a vibrant community that has already answered your questions. Now you're quite comfortable with this technology, you start to wonder if you're using it to its fullest potential. So, you look for inspiration for your next project, finding blogs and videos which spark your imagination. This familiar scene is brought to you by Developer Advocates!

This lesser-known profession sits at the intersection of community, technology and performance – our purpose being to connect people with technology. 'Advocate' is a key word here and is a core part of the role. Outside of the responsibilities alluded to earlier, it's the job of developer advocates to actively engage with developers to: understand their challenges; gather valuable feedback; and represent them within their organisations.

I have now spent nearly two years in this profession, having previously never heard of it. It has allowed me to grow in unexpected ways and to deliver value for both my organisation and the developer community which we serve. In my poster, I will be drawing on my experiences as a Developer Advocate for IBM MQ (key responsibilities; qualities which make a great developer advocate; what I've learned), to hopefully inspire others to pursue this profession.

Leveraging Data Science to Tackle NHS Waiting Times: Machine Learning for Smarter Healthcare Planning

Solagbade Akande
University of Wolverhampton

Hospital waiting times remain one of the major challenges facing the National Health Service in the UK, affecting how services are delivered, their efficiency and the quality of care provided to patients. Delays occur at many different stages, including general consultations, visits with specialists, and medical procedures. This often leads to worsening health problems and increased burdens on healthcare systems. Longer wait times increase patient discontent, and emergency rooms feel more pressure.

This research explores a data-centric approach for predicting NHS hospital waiting times using machine learning algorithms. Using data from NHS waiting time surveys, this study will investigate predictive models to help group patients into waiting categories and estimate expected waiting times. The study will employ regression and classification models in order to identify the most important factors influencing patient waiting times.

This analysis aims to provide data to assist hospital administrators as they work to improve patient systems, resource utilization, and patient throughput. While modeling and evaluating prediction models will be the major emphasis of this work, the findings may serve as a foundation for future utilization in hospital planning and decision making. This dissertation aims to contribute to the growing area of AI-based healthcare solutions by investigating a potential application of machine learning in healthcare service planning and showing how data science can be applied to address practical challenges in public health management.

EcoMind AI: A Web-Based Solution for Measuring and Mitigating the Environmental Impact of AI Systems

Temitope Adeyelu
University of Wolverhampton

In recent years, the evolution of Artificial Intelligence (AI) has experienced super-linear growth. This growth is holistic, as it is evident across various aspects of the entire lifecycle of AI, such as data collection, model optimization, infrastructure, and hardware production and selection. However, the exponential scaling of AI and the pursuit of higher model quality have led to a significant increase in its carbon footprint.

To give some context, research showed that training a large Machine Learning (ML) model like Meena from Google has a carbon footprint equivalent to driving 242,231 miles, while ML training at Meta averages 1.8 times that. That’s like a round trip to the Moon and back. This is proof that this is a pressing issue that demands urgent attention and sustainable solutions in AI development.

My proposed solution to this problem is a web-based application that allows users to input details about their AI systems (e.g., dataset size, hardware type, runtime, model selection) to estimate its lifecycle environmental impact in terms of carbon footprint. The key features will include an intuitive user interface, real-time feedback, and comprehensive tracking of carbon emissions throughout the development process. It will also have a built-in recommendation system that would suggest alternative methods if the details of the user input point to a significant environmental impact.

The poster will further detail the application's functionality, key features, and its potential to significantly reduce the environmental impact of AI development including specific examples, use cases, and potential future enhancements.

Block the bet: Assessing gambling blocking software for preventing online gambling-harms and creating a predictive success model of intervention

Vania Daza Durand
Brunel University, London

The UK gambling industry has experienced significant growth, with online gambling generating £4.0 billion in Gross Gambling Yield. This rise has been accompanied by concerns over gambling-related harms, particularly among individuals with impulsive tendencies. Multiple research sources highlight the need for effective intervention strategies, with gambling blocking software emerging as a potential tool to mitigate harm.

The aim of this study is to investigate the effectiveness of gambling blocking software in reducing gambling-related harm. It also explores how user-specific factors—such as sociodemographic characteristics, comorbidities, psychological distress, and gambling debt—impact the success of these interventions.

A mixed-methods approach is employed, combining qualitative and quantitative analysis. The qualitative analysis consists of in-depth interviews with key stakeholders, including treatment providers, software developers, and affected individuals. The quantitative analysis involves the development of a predictive statistical model based on anonymised data from gambling treatment providers, incorporating variables such as Problem Gambling Severity Index (PGSI) scores, psychological distress levels, and self-reported gambling debt.

We expect to assess the real-world effectiveness of gambling blocking software, identify key predictors of intervention success, and inform future policy and technological advancements for mitigating gambling-related harm.

This study will contribute to generating evidence-based strategies for addressing problem gambling. By understanding the factors influencing software efficacy, tailored interventions can be developed to better support vulnerable individuals.

Quantum-Enhanced Graph Neural Networks for Analyzing Particle Collision Data: A Novel Approach for High-Dimensional Event Reconstruction

Vibhuti Choubisa
University of Strathclyde

Particle collision data in physics is complex, and analyzing it with traditional methods can be slow and challenging. This paper explores the application of Quantum-Enhanced Graph Neural Networks (Q-GNNs), a concept that combines Quantum Machine Learning (QML) with Graph Neural Networks (GNNs), to improve the analysis of particle collision data. By using quantum computing, Q-GNNs can accelerate graph analysis and make it more accurate when studying particle interactions.
Quantum-enhanced GNNs have the potential to outperform classical methods in tasks like particle identification, tracking, and finding unusual patterns in the data. This approach can help in understanding complex particle interactions and could support advancements in areas like dark matter research, new particle discovery, and improving measurement accuracy.
This paper discusses how applying Q-GNNs to particle collision data can reduce computational time, increase model efficiency, and uncover patterns that classical methods may miss. By leveraging quantum algorithms, this approach could provide new insights into particle physics, positioning quantum-enhanced machine learning as a powerful tool for future experiments and discoveries in the field.

Alphabetical Index of Poster Presenters

That’s all folks!

See you next year.