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WEB SCIENCE INSTITUTE

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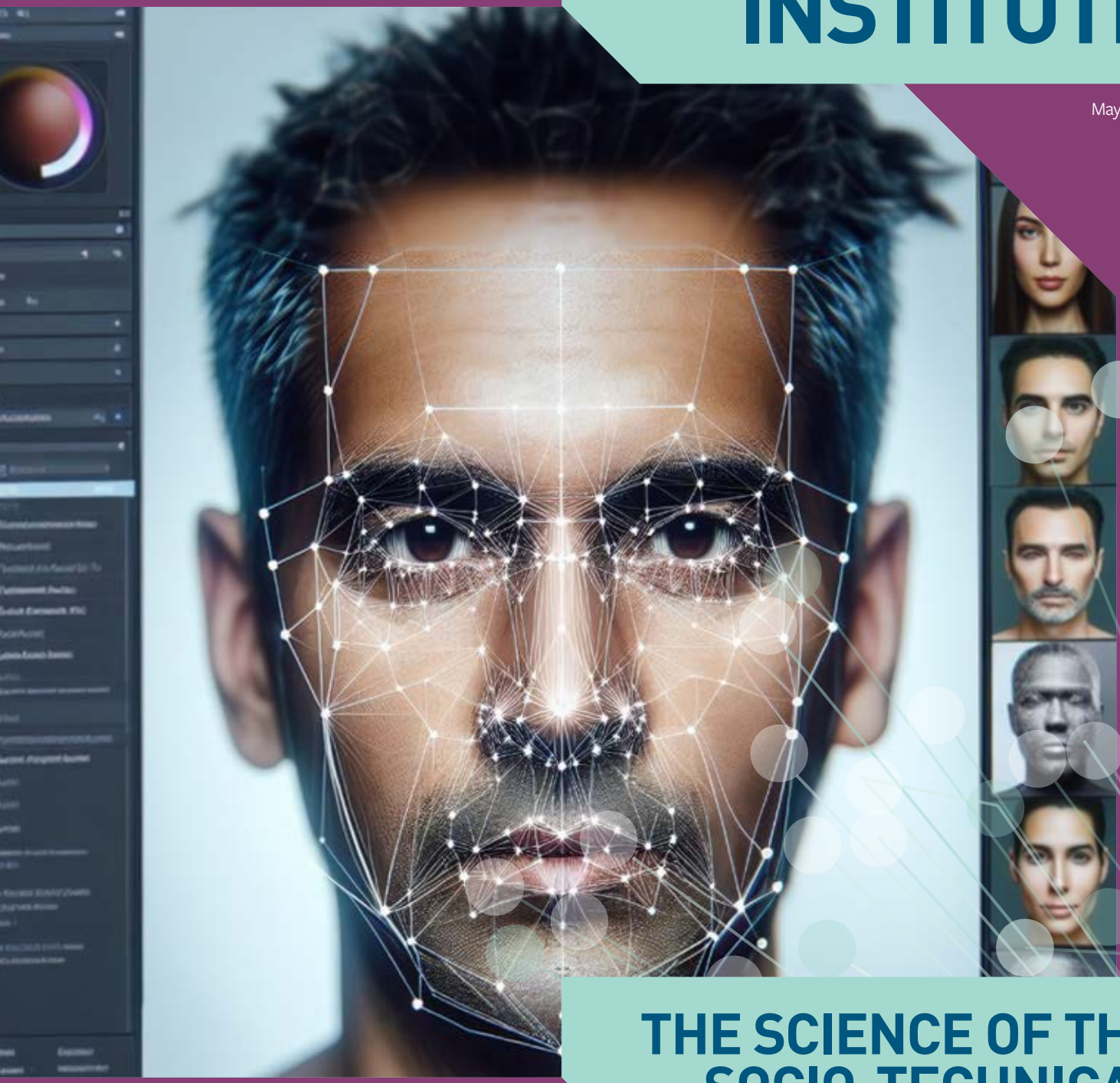


THE SCIENCE OF THE SOCIO-TECHNICAL

WELCOME

Professor Dame Wendy Hall
WSI Director

Professor Mark Spearing
Vice-President, Research and Enterprise

Welcome to the Web Science Institute (WSI) – we are at the forefront of Web Science research, training and enterprise and are based at the University of Southampton.

Over the last year, we have continued to strengthen the WSI as a world-leading interdisciplinary socio-technical research community through high-quality research-led activities and impact on policy.

With artificial intelligence (AI) playing an increasingly important role in our everyday lives, we are launching a new University of Southampton initiative AI@Southampton that is harnessing interdisciplinary AI expertise from across the University.

Find out later in this brochure how the WSI is coordinating and administering the development of AI@Southampton to build on the University's existing network of Turing Fellows and activities.

We have also launched the inaugural AI Arts Festival, in Winchester, showcasing how AI and the arts are coming together and featuring our very own Deputy Director and comedian Professor Les Carr.

I was privileged last October to be appointed to the UN Advisory Body on AI. We are working with the Government, private sector and civil society to analyse and advance recommendations for the international governance of AI.

We are also pleased to have recently appointed a new Collaboration Manager and look forward to working with her to support external partnership funding for research bids and increase capacity for co-developed research.

I hope you enjoy reading about what we have achieved over the last year and please get in touch if you would like to be involved in the future.

Artificial intelligence (AI) and data science have the potential to influence and enrich everything from digital healthcare and machine learning for scientific discovery, to cultural and creative practice and performance.

They span the full breadth of our future research at Southampton and are a key focus for us to build on our existing strengths, and to address the most complex societal and environmental challenges.

The Web Science Institute (WSI) plays a vital role in facilitating interdisciplinary research in this area across the University, and will coordinate AI@Southampton – a new initiative that will draw together the University's AI capability to accelerate our research position in AI.

I hope you enjoy discovering more in this publication and are as impressed as I have been with the strength and diversity of activities that the WSI is supporting. I have no doubt that the importance and impact of these activities will continue to grow over the coming years.

The WSI would like to thank its dedicated team of Associate Directors:

Professor Michael Boniface
Director of the IT Innovation Centre

Professor Thomas Irvine
Head of Music

Professor Larry Lynch
Head of Winchester School Art

Dr Matthew Ryan
Associate Professor of Governance and Public Policy

Professor Peter W F Smith
Professor in Social Statistics

Professor Mark Weal
Professor in the Digital Health and Biomedical Engineering Group

Find out more:
www.southampton.ac.uk/wsi

CONTENTS

WEB SCIENCE INSTITUTE

The Web Science Institute (WSI) brings together the University of Southampton's world-class, interdisciplinary, socio-technical expertise in web science, data science and artificial intelligence (AI) to leverage the unique role of online technologies in tackling global challenges.

We work to create collaborations within the University and with industry, governments and third sector organisations, that bring interdisciplinary socio-technical insights and impacts to the world's most pressing problems.

We have a key focus on interdisciplinary AI and are working with global partners in data, platform governance, social trust, democratic innovation and technological sustainability to create new knowledge that leads to new solutions.

Human-centred artificial intelligence (HCAI) is core to our research as well as continuing our position as global leaders in Web Science.

In pursuing a human-centred agenda, we address the social and ethical issues of technical systems, including the systematic disadvantages that women, ethnic minorities, people from the working classes and other under-represented and/or marginalised groups experience in the widescale adoption of technologies produced by powerful elites.

Find out more:
www.southampton.ac.uk/wsi

THE TWO FACES OF SOCIO-TECHNICAL

Here we talk to the two Web Science Institute (WSI) Deputy Directors and discover how their strengths and expertise reflect the two core elements of the WSI - social and technical.

Professor Pauline Leonard comes from a sociology background while Professor Leslie Carr was one of the first students on the University's Computer Studies degree.

Discover what led them to join the WSI, why Web Science is such an important discipline and what the future could hold.

PROFESSOR LESLIE CARR

WSI Deputy Director

Les is a Professor of Web Science and has been involved in the Web Science Institute since its beginning in 2014.

He first joined the University as an undergraduate on Southampton's Computer Studies course when it was launched in 1982, and as a researcher was involved in the early stages of Open Access and sharing information online.

Les was among a group of Southampton academics who acknowledged the global impact the Web was having and recognised that a discipline of Web Science needed to be developed at the University.

He said: "We were looking at how the Web was impacting the world and how the world was pushing back and impacting the Web.

"Web Science acknowledges the involvement that online technologies have in our lives. These technologies are huge and complex and they make us ask fundamental questions about intellectual property, privacy, law and rights, ethics, false information and the way that we live our lives.

"In the early days of the Web, social media was a new thing, companies were releasing all these fantastic products and the idea was that they would disrupt things and change the way they happened. But making beneficial changes to society and social institutions is really difficult, and Web platforms generate all sorts of unintended consequences but it's too late to put this cat back in the bag!

"So we need to train people, not only to understand the technology, but to understand the social, legal, psychological, political and economic issues of the technology that is being created."

Les' current research is focused on the impact of artificial intelligence (AI), its capability and the effects it is having on the world.

"I'm interested in the way that we integrate AI into society. A lot of people are concerned that their jobs are going to be taken or that AI will become too intelligent to be safe.

"So my research is looking at how we integrate these AIs into society, our social lives and our institutions.

Find out more:
www.southampton.ac.uk/wsi

Professor Leslie Carr

Professor Pauline Leonard

"We already have a very good infrastructure in place for accommodating new (human) intelligences into society and that is through our education and training system. People go through university, get an accredited degree, join a profession and professional society, get licensed, but while they are doing this they accept regulatory limits and constraints on the way they behave and what they are allowed to do.

"So could we use the same education and licensing system for AIs? Should we force ChatGPT to go to university?"

Les is also passionate about sharing Web Science to public audiences through stand up comedy. He and his daughter have appeared at the Edinburgh Fringe Festival and in towns around the south with their AI show Carr Crash, that explains how AI works and where the technology needs to become more aligned with humans. He runs training for researchers and students across the University to get experience in telling stories about their research through comedy, and runs the monthly Southampton Science Comedy night at October Books, in Portswood.

He added: "The future for the WSI is exciting. AI is the latest phenomenon to emerge from our increasing involvement with the online world, but it is so controversial that our Government recently convened an international summit to discuss its safety. There is a huge opportunity for academic insight and leadership, and the WSI's mission is to help bring researchers together so that the University can respond strongly to that challenge."

PROFESSOR PAULINE LEONARD

WSI Deputy Director

Pauline is a Professor of Sociology, specialising in the sociology of work, organisations and change, and, for much of her career, she has explored the impact of organisational changes on working lives, working identities and careers.

Ten years ago she started supervising WSI PhD students looking at the effect new technologies were having on work and life. It was this supervision, coupled with the rapid development of digital technologies in the workplace, that sparked an interest that has kept Pauline involved with the WSI.

It led to her developing a new research agenda looking at the various aspects of digital technological change on people and organisations. Her current projects include looking at the introduction of robots into the industrial cleaning industry and exploring issues of trust and trustworthiness in the defence and security sector in relation to autonomous systems.

She said: "I became absolutely fascinated by the impact of technological change on people's working lives. On the one hand it is seen as a utopian panacea to the multiple challenges facing industry and, on the other, it is greeted with deep suspicion and concern about technology taking over people's jobs.

"I am really interested in how this plays out at all levels of organisations, from managers to employees, as well as how social identities such as gender, ethnicity, age, educational background and qualifications might intersect with people's responses to and experiences of technology."

Five years ago Pauline became Deputy Director of the WSI with a particular focus on social sciences, and has been a key strength in marrying the two disciplines of social and technical within the WSI.

She added: "The WSI is a wonderful vehicle for opening up new research possibilities and opportunities for colleagues across Southampton. We aim to centralise this social, scientific study of technology into people's research agendas because increasingly digital technologies are impacting on us all.

"The Government and policymakers, both nationally and internationally, are very keen to benefit from digital technologies and to become leaders in the field. But frequently, the way that technology is framed and understood is overly technical, so they look at the technical capabilities without necessarily appreciating the social impact.

"Our aim at the WSI and at Southampton is to be the first port of call for developing how people think about technology and developing their appreciation of the social consequences of technological adoption.

"We work collaboratively with the Government, policymakers and businesses to understand how technology can be used for public and social good. Over the years, as digital technologies have developed and changed, artificial intelligence (AI), machine learning and robotics have become centre stage for business and society. The WSI is a leader in socio-technical approaches and has developed to enable research knowledge exchange activities in relation to AI.

"The future for the WSI is exciting. We are going to be coordinating AI@Southampton, which aims to foster and grow research capacity in interdisciplinary approaches to AI across the University and beyond."

THE MEETING OF MINDS: AI@SOUTHAMPTON

Artificial intelligence (AI) is a key priority of the Web Science Institute (WSI) and a strategic priority of the University. It is playing an increasingly important role in society and having a significant impact on our everyday lives. To ensure Southampton forges a reputation as a world expert in interdisciplinary socio-technical research and education, the University has launched a new initiative harnessing the interdisciplinary AI expertise from across the University.

"AI will change the way we live and work for the better – but an interdisciplinary approach to regulation and safe AI is vital."

Professor Dame Wendy Hall
Co-Investigator, RAi-UK

Find out more:
www.southampton.ac.uk/wsi

The AI@Southampton network will draw together the University's AI capability to accelerate our research position in AI and put us ahead of our competitors.

The WSI will coordinate and administer the development of AI@Southampton that will build on the University's existing network of Turing Fellows and activities.

WSI Deputy Director Professor Leslie Carr said: "The WSI will be the hub for discovering exactly where AI is happening across the University, and we're putting up signposts to help everyone discover this activity and connect with one another. We are not saying we're the place where the AI is happening – quite the reverse."

AI@Southampton will:

- extend the University's interdisciplinary network of world-leading AI researchers;
- enhance the University's capture of AI research and innovation funding;
- extend and deepen partnerships with policymakers, industry, business and third sector organisations;
- promote Southampton's external reputation as world experts in interdisciplinary AI research, enterprise, knowledge exchange and education.

The Turing University Network

Southampton is a member of the Turing University Network that provides universities with an interest in data science and AI the opportunity to engage and collaborate both with the Turing and its broader networks.

The WSI is responsible for coordinating the University's Turing-related activities including running engagement and cohort activities and sharing Turing opportunities and events.

AI@Southampton ECR network

One of the AI@Southampton-related activities are the AI@Southampton ECR networking events.

These are an opportunity for researchers across disciplines and faculties to get together and present, interact and learn about current and future research.

The network's ambition is to promote the cooperation and increase the internal and external visibility of University ECRs working in the areas of AI and data science. They also get the chance to find out about upcoming opportunities available through the Turing University Network and can introduce themselves and their work to other ECRs.

Organiser Dr Alexandra Karamitrou said: "The AI@Southampton ECR network is a great opportunity for ECRs who are interested in the application of data science or AI in their research to get to know each other and the amazing research carried out all over the University. We've had ECRs coming from virtually every school and faculty, which showcases the great amount of research involving data science and AI at the University and is not always easy to get to know what others are doing. Here they find a space for that."

To find out more or to join the AI@Southampton ECR network email wsi@soton.ac.uk

RESPONSIBLE AI UK (RAi-UK)

RAi-UK is a new consortium for the development of responsible artificial intelligence, led by the University of Southampton.

The £31m project is bringing together experts to create an international research and innovation institute to create trustworthy and secure AI that responds to the needs of society.

Southampton's Professor of Artificial Intelligence Gopal Ramchurn is RAi-UK's Principal Investigator, and WSI Director Professor Dame Wendy Hall is one of the Co-Investigators.

She said: "AI will change the way we live and work for the better – but an interdisciplinary approach to regulation and safe AI is vital.

"The UK can become the dominant force for responsible and trustworthy AI development and regulation with this investment. The work undertaken by the RAi-UK team at Southampton, together with our partners across the UK and internationally, will put the UK at the forefront of AI's future for the good of humanity."

SPOTLIGHT ON OUR TURING FELLOWS

The Web Science Institute (WSI) is continuing its collaboration with The Alan Turing Institute and coordinates the University's membership of the Turing University Network, a new strategy launched in 2023 to provide an opportunity for UK universities with an interest in data science and artificial intelligence (AI) to engage and collaborate with the Turing and its broader networks.

The Turing Fellowship Scheme aims to grow the data science and AI ecosystem in the UK by supporting, retaining and developing the careers of the next generation of world-leading researchers. Two new Southampton Turing Fellows have recently been appointed to join the existing three Fellows.

PROFESSOR TONY BAGNALL

Tony's Fellowship will use his key research interest of Time Series Machine Learning - learning predictive models from collections of ordered, real valued series – and apply it to biomedical signals in projects involving University College London and Great Ormond Street.

Machine learning is impacting all areas of science and algorithms tailored specifically for the features of time series offer the potential to improve predictive performance in many disciplines.

Tony said: "I have been working with the Turing since 2019 and am delighted to grow that work as a Southampton Turing Fellow. I will primarily help further their mission to build skills for the future by supporting their data study groups and Turing enrichment scheme at Southampton.

"I am keen to progress my research, engage and collaborate more with international colleagues, grow the connections of our Centres for Doctoral Training, and extend my current research network of collaborators from across the globe."

DR RAFAEL MESTRE

Rafael's interdisciplinary research lies at the interface of computer science and political science and responsible research on emerging technologies. He is focused on the development of different emerging technologies and their socio-technical evaluation and social, ethical and policy implications.

He said: "By studying emerging technologies early in the process, we could get ahead of their challenges in terms of ethical and social implications so that we're better prepared collectively to deal with them when they become a reality. This also gives the general public the opportunity to provide input and have their voices included in the development.

"Being awarded a Turing Fellowship is a great honour and recognition. I am excited about being able to extend my work further in and around responsible technologies. I have worked with the AI@Southampton ECR network and am keen to continue that.

"The Fellowship allows us to engage with research at the Turing and potentially shape their strategy going forward. It is a mark of prestige to the University that the research being carried out here is leading in terms of data science and AI and its applications in society."

PROFESSOR RUBEN SANCHEZ-GARCIA

Ruben's Fellowship will see him involved in the Structural Missingness theme within the Turing-Roche partnership with the pharmaceutical company Roche.

He said: "The amount of missing data in complex datasets, such as clinical or genomic datasets, is an increasing challenge in data analysis, including in statistical and machine learning.

"We are trying to detect and exploit the structure of the missing data by building mathematical representations of the missingness. This will allow us to improve the statistical analysis and increase the confidence of data-driven decisions such as drug trials success or medical treatment suggestions from a clinical dataset.

"We hope our research will raise awareness and encourage contributions from the scientific community to address this pressing challenge, which hasn't in our opinion had the attention we think it deserves.

"The Fellowship will allow me to keep in touch with other research opportunities within the Turing-Roche partnership, tap into the Turing network and contribute to the industry impact of academic research."

Find out more:
www.southampton.ac.uk/wsi

The Alan Turing Institute

PROFESSOR PAMELA UGWUDIKE

Pamela's Fellowship focuses on how to mitigate the risks and harms of AI technologies deployed by justice systems and social media platforms.

She has worked on projects that have explored where ethical issues arise including bias, privacy violations, and lack of transparency.

Pamela said: "Becoming a Turing Fellow has provided unparalleled opportunities to reach beyond the confines of my discipline and expand my research network. I have led and participated in several multidisciplinary projects that have explored the prospects and challenges of AI technologies, particularly in justice systems.

"As a Turing Fellow, I have had invaluable access to interdisciplinary research networks and opportunities to engage with key stakeholders including criminal justice policy makers, government bodies and third sector organisations.

"My Fellowship has strengthened my research proposals and contributed to successful grant applications, and I have been invited by a parliamentary body and third sector organisations to present my work or provide input on proposed AI governance strategies."

DR OWEN RACKHAM

As well as being a Turing Fellow, Owen is also seconded to the Turing as the Team Lead for Cellular and Molecular Medicine.

His research focuses on computational stem cell biology and how machine learning and artificial intelligence (AI) can be used to predict how cells will behave in situations such as if they are exposed to a drug, or if they age.

He said: "Prior to getting the Turing Fellowship, I had been working overseas so the network of people I knew in the UK working on AI and machine learning in health was quite small. The Turing provided a great opportunity to network and meet other people doing AI and data science in a similar space to me.

"I joined the omics group at the Turing and through that I have met lots of people who I have gone on to work with, collaborate with and write grants with. I have also been able to connect my colleagues at Southampton with people in the Turing network."

DR LOUISE COUTTS

Turing Secondment
Senior Research Fellow

Louise has just returned to the University of Southampton after spending two years employed by the Turing looking at the operation of large-scale clinical trials.

The project, in collaboration with the Clinical Trials Unit at University College London, involved building machine learning models to help with the monitoring of these large-scale trials.

She said: "These trials can have hundreds of sites taking part and the models were built to help the monitoring team discern whether sites were running the trials in a safe and robust manner or whether intervention, such as a site audit, was required.

"This was with a view to building a system that can be deployed for any large-scale trial, to aid a central monitoring team when running trials across multiple sites."

She added: "The key thing that I bring back is the strong Turing ethos of freedom of idea sharing without judgement, that arises from their codes of conduct. Along with fostering a greater freedom to share ideas, this also leads to participants feeling valued for the different perspective, creativity, experience and knowledge that they bring. I found this vastly helped improve my confidence in large group settings."

MORE THAN FLIGHTS OF FANCY

The digital revolutions of the past 40 years have profoundly impacted how we express ourselves as humans in the world, and the arts offer crucial tools for understanding changes to our ideas about what being human even means in light of new technologies such as generative artificial intelligence (AI).

Two of the Web Science Institute's (WSI) Associate Directors are Professor Thomas Irvine, Head of Music, and Professor Larry Lynch, Head of the Winchester School of Art.

"Working at the WSI has made a massive difference to my career. With the support of colleagues in the WSI I've been fortunate to learn about the AI revolution 'from the inside' as an Alan Turing Fellow, and now I'm having a great time working with my fellow directors Professors Larry Lynch and Leslie Carr on the University's first AI Arts Festival."

Professor Thomas Irvine
WSI Associate Director

Find out more:
www.southampton.ac.uk/wsi

AI IN THE SKY

The race is on to find a female partner of one of the rarest male plants in the world – the *Encephalartos woodii* – a cycad believed to be extinct in the wild.

Winchester School of Art Research Fellow Dr Laura Cinti is using drone technology and artificial intelligence (AI) to try and track down a female in the Ngoye Forest, South Africa, before it is too late.

She said: "My work is anchored in the story and hope of finding a female specimen and asks the question: Could there still be a female in the forest? Our search uses drones, equipped with multispectral sensors, capturing images that unveil hidden ecological details of the forest. We've taken over 20,000 photos and stitched these into large mosaic maps used in the search process.

"To help, we trained an AI model using both real and synthetic images of cycads, enhancing our ability to detect these 'extinct in the wild' plants in diverse contexts.

"The final artwork is an entanglement of storytelling, technology and conversation. The journey starts with the drone taking off - revealing the natural landscape below, and then switches to how landscape becomes data that is processed by algorithms in an artistic interpretation through the 'eye of the AI' - stitching tiles, analysing and processing spectral layers to see beyond the naked eye."

AI in the Sky was exhibited at the Centre Wallonie-Bruxelles, Paris, and has been shown at the EXPOSED Torino Foto Festival.

Laura is also showing the work at the AI Arts Festival.

MUSIC AND AI COMBINE FOR QUIRKY PERFORMANCE

Artificial intelligence (AI) is being used to write love letters that are then set to music, using a text generator that was developed with WSI funding.

Dr Benjamin Oliver, an Associate Professor in Composition, and Professor Will May, Professor of Modern and Contemporary Literature, gathered a large body of love poetry and song lyrics. This was then fed into the text generator called LoveLaceGPT that was built by student intern Yaseen Mohammed Osman, mentored by Lecturer in Computer Science Dr Shoaib Jameel.

The resulting music compilation, Love Letters, has been performed in London and Southampton by British soul sensation Hannah Williams, accompanied by the contemporary classical group Riot Ensemble. A recording of the song cycle has also been released as part of Benjamin's portrait album Too Many Sweets.

Benjamin said: "LoveLaceGPT produces some really bizarre things that humans wouldn't easily come up with. It also doesn't care in the way collaborators might if you undertake brutal edits, and it never runs out of steam!"

Dr Benjamin Oliver and Hannah Williams

RE-IMAGINING THE GALLERY GUIDE WITH AI

The future of art gallery and museum audio-guides is being reimagined by a WSI-supported project led by Associate Professor of Digital Culture and Design Dr Seth Giddings.

Seth is aiming to make the devices more sophisticated, fun and engaging through his research background in video games.

He said: "Since the 70s, games have featured nonplayer characters powered by AI. They would guide you, but they wouldn't just dispense information, they had their own motives and personalities, so they might conceal things or even lie."

Working with Professor of Literature and Visual Culture Dr Sarah Hayden, he ran a workshop for PhD students from Winchester School of Art, Humanities and Computing to playfully imagine how an AI gallery device could look and behave.

Seth is seeking to develop the project further and envisions future applications, not only in the arts but in the therapeutic space too, such as improving chatbots for mental health and mindfulness.

Image: © C-LAB

GENERATING FASHION: TOWARDS DIGITAL FUTURES

Winchester School of Art (WSA) Lecturer in Fashion Marketing and Management Alice Janssens is exploring how fashion, digital technology and generative AI can foster creativity and drive in the future of fashion.

The project is looking at how generative AI can impact the fashion industry by investigating its development across the supply chain from production to marketing. It is also impacting education and teaching programmes at the WSA.

The work plays a part in Alice's new research project in digital fashion called Digital Fashion in Practice: Applications and Longevity.

She is showing members of the public at the AI Arts Festival examples of how AI and digital tools are driving fashion forward, including an augmented reality integrated garment by digital artist Stephen Vineburg, and some digital examples of generative AI integration in fashion by Olska Green of brand Ecoolska.

Find out more:
www.southampton.ac.uk/wsi

TELLING THE STORY OF AI THROUGH COMEDY

WSI Deputy Director Professor Leslie Carr is passionate about sharing the area of Web Science through stand up comedy.

He and his daughter have appeared at the Edinburgh Fringe Festival and in towns around the south with their show Carr Crash, and he has recently restarted an initiative called Bright Club where experienced comedians help researchers engage with the public by creating research-inspired comedy material.

He said: "The aim is to get people to tell engaging stories about research and science through comedy. We've had more than 50 people apply to be trained in comedy and they've ranged across all areas, from professors to PhD students to staff.

"As well as training, we also provide performance opportunities. We run a monthly science comedy night in the city, and we also perfomed a show called 'Rejected Ted Talks' at the Brighton Fringe Festival.

Les is also joining other AI researchers from the University and comedians from across the country entertaining visitors at the AI Arts Festival.

An afternoon stand up show with six comedians is being MC'd by Dr Steve Cross, the founder of the chaotic science cabaret show Science Showoff.

In the evening ChatGPT takes over the microphone under the experienced guidance of professional comedian Ted Hill. A version of ChatGPT, trained by University researchers, is taking to the stage to help find the funny with audience members.

Also Oxford science comedian Alex Farrow will help the audience understand the philosophy behind AI.

TAKING AI AND THE ARTS INTO THE COMMUNITY

The WSI is bringing together artists and musicians from the University of Southampton and around the world by hosting the inaugural AI Arts Festival in Winchester.

Members of the public are able to discover how AI and the arts are coming together in media from photography, fashion and literature to comedy and jazz, in a festival of installations, demonstrations, comedy sets, readings and discussions.

The free, interactive, all-day event is showcasing the ways in which the University is using the convergence of AI and the arts to explore crucial questions about living responsibly and in harmony with powerful machines unleashed by revolutions in computing power and machine learning.

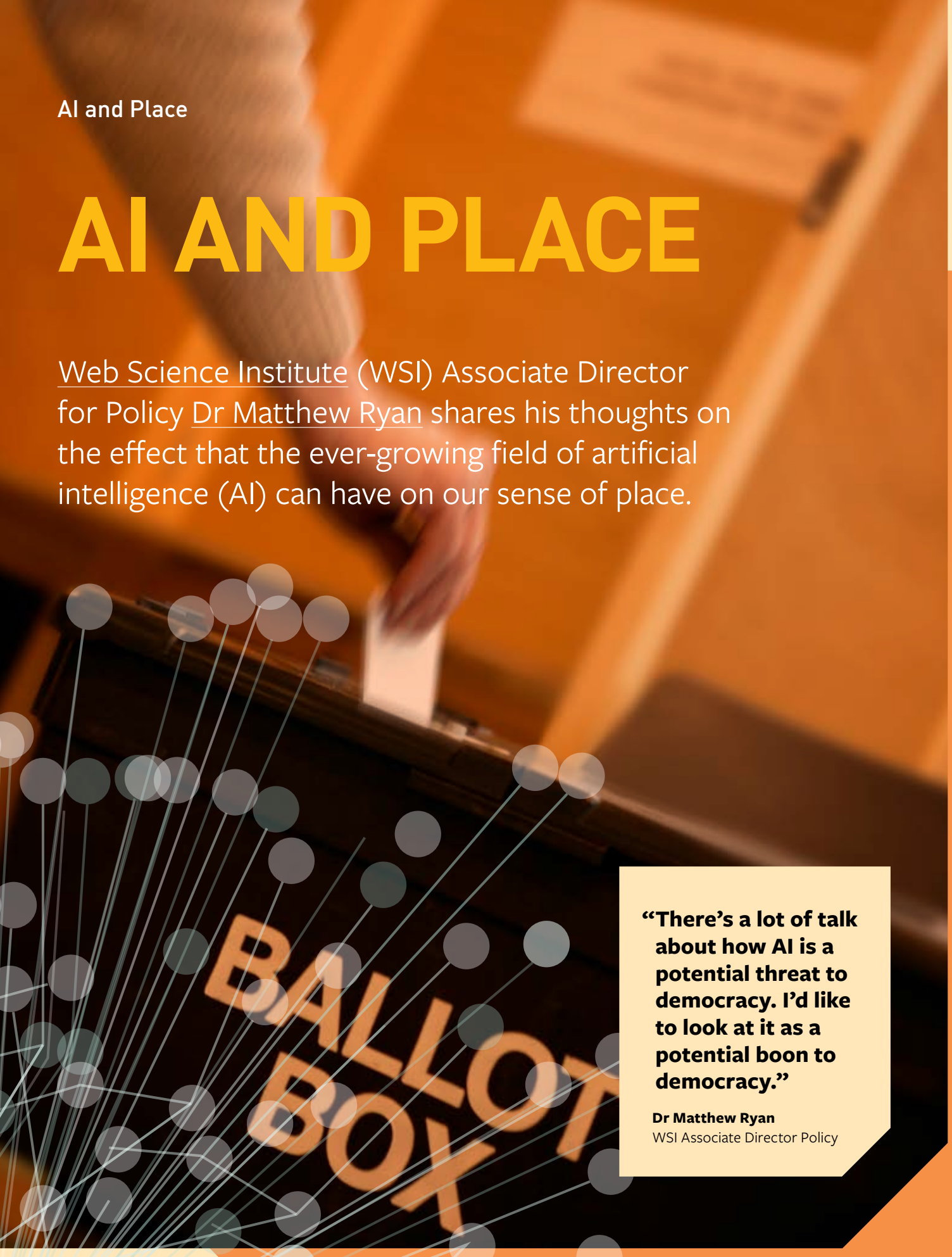
Special guests the Orchestre National de Jazz is performing an exploration of improvisations between instrumentalists and a machine within a large jazz orchestra.

The cultural celebration is culminating in a lively panel discussion featuring WSI Director Professor Dame Wendy Hall, BBC technology journalist Bill Thompson and other special guests, before a late-night stand up comedy set facilitated by ChatGPT and WSI Deputy Director Professor Leslie Carr.

The Festival is being organised in collaboration with the Winchester School of Art and the Southampton Institute for Arts and Humanities.

AI AND PLACE

Web Science Institute (WSI) Associate Director for Policy Dr Matthew Ryan shares his thoughts on the effect that the ever-growing field of artificial intelligence (AI) can have on our sense of place.



"There's a lot of talk about how AI is a potential threat to democracy. I'd like to look at it as a potential boon to democracy."

Dr Matthew Ryan
WSI Associate Director Policy

Dr Matthew Ryan

Find out more:
www.southampton.ac.uk/wsi

"AI is changing the everyday interactions citizens have with public services at local levels, influencing sectors like education, transport, and social care.

"By refining operational processes and introducing tools like Chatbots, AI enhances how services cater to residents.

"Yet, the technology also risks perpetuating existing injustices if mismanaged or poorly understood. AI applications need to be equitable and transparent.

"Effective AI implementation in the public sector will require an approach that is sensitive to regional disparities. This is a challenge if technologies are to scale efficiently but also adapt to unique local needs and constraints.

"Adaptation will need substantial investment in technical skills and resources, which many places currently lack. Furthermore, the governance of AI must prioritise democratic values and public welfare, ensuring that advancements in AI do not compromise but rather enrich the democratic engagement between the state and its citizens.

"The goal is for a civic AI that respects local demographics and accountability, creating AI solutions that are not only innovative but also inclusive and respectful of citizen rights.

"We want to develop a future where AI empowers public service delivery, aligning technical progress with societal and democratic imperatives."

CAN AI BE USED TO UNDERMINE ELECTIONS?

Online political disinformation and voter profiling during recent UK and US elections raises the fear of AI destabilising society by undermining democracy.

Matt recently published a position paper with WSI Director and Regius Professor of Computer Science Dame Wendy Hall and Researcher Dr Ben Hawes, tackling this very question.

In the paper they explain that AI can create and spread misinformation, manipulate public opinion, use data profiling to target voters, hack online voting systems and enable cyber-attacks on critical infrastructure before or during an election.

While none of these tactics are new, AI can vastly increase the effectiveness, volume and frequency of threats; generative AI technologies are a particular worry.

There are steps that government, law enforcement, media, civil society organisations and the tech industry need to take to counter these threats.

But Matt, whose research underpins the social science aspects of the paper, believes we can do more than just conserve democracy: we can use AI technology to help understand and improve it.

He said: "There's a lot of talk about how AI is a potential threat to democracy. I'd like to look at it as a potential boon to democracy.

The Rebooting Democracy project looks at how to regulate AI for inclusion in political speech, and how machines can track and predict behaviour, classify political communication, and foster political participation.

Designing for democracy

Popular online spaces don't lend themselves to productive or inclusive conversations.

"Social media platforms are designed to sell us products and give us a dopamine hit, not for a rational intellectual debate," said Matt.

"The opportunities technology gives to take actions such as liking or retweeting a post are not always used in the way designers intended and these affordances can themselves shape user behaviour, with unintended consequences."

Matt, together with Dr Selin Zileli and Dr Richard Gomer, has run workshops for practitioners working in the democracy sector to understand what they and their end users really need from software.

USING DEMOCRACY AND AI TO FOSTER SOCIAL CHANGE

A project led by Matt and Turing Fellow Dr Rafael Mestre is exploring how democracy and AI can foster knowledge exchange for social change.

They are partnering with the Democracy Network to ensure that research, thinking and those working on AI in the academic space, can better connect and share their learning with democracy and AI practitioners.

This will place the WSI at the forefront of facilitating engagement with novel AI for social good in the democracy domain and provide Southampton academics with immediate and priority access to practitioners.

It will also provide the critical feedback that is necessary to ensure ethical socio-technical development of novel AI.

Southampton and the Democracy Network have already developed a guide for collaboration for social and democratic change, addressing the challenge of creating effective collaboration for the realisation of democratic and broader social change.

AI AND HEALTH

The Web Science Institute (WSI) is involved with a number of projects in the area of health, including:

IMPROVING MUSIC ENJOYMENT FOR USERS OF COCHLEAR IMPLANTS

This project aims to improve music enjoyment for cochlear implants users.

Cochlear implants allow roughly 100,000 global users with severe to profound hearing impairment to access speech and communicate verbally, but their music perception and enjoyment can be limited.

This interdisciplinary research project, led by Dr Kate Hough and Professor Mark Weal, aims to gain access to unprecedented volumes of subjective cochlear implant user data to learn more about the function of the auditory brain when using an implant and to optimise the signal processing of music.

Find out more:
www.southampton.ac.uk/wsi

LIFEGUIDE

This multidisciplinary project has developed LifeGuide Plus, following on from the successful LifeGuide software platform.

The LifeGuide programme, led by Professor Lucy Yardley, Professor Mark Weal and Dr Leanne Morrison, is a unique set of software tools that allows intervention designers with no experience of programming to create interactive web-based interventions to support healthy behaviours and illness management.

It has generated huge success attracting more than £50m in funding, the website has over 3,000 members worldwide, interventions are being disseminated in the UK and globally, and more than 50 tutorial papers, development papers and reports of feasibility and full trials have been produced.

SUPPORTING BLOOD DONATION IN GHANA

A team of academics from the University of Health and Allied Sciences (Ghana) and the University of Southampton are exploring the challenges of the Ghana Health Service that is overseen by the National Blood Service (NBS).

Current challenges experienced in rural Ghana include settings in which hospitals are long distances away from the nearest blood bank, the unwillingness of community members to donate blood, lack of incentives for donors, lack of donation equipment, and lack of funding for blood donation promotion leading to blood shortages in the blood bank.

The research, led by Dr Markus Brede, aims to explore the use of disruptive digital innovation to support blood donation programmes in the Ghana Health Service, through the creation of an app that would provide a system running alongside the routine donation programme.

TRUST IN DIGITAL HEALTHCARE FOR MENTAL HEALTH

This research is exploring the use of mobile and digital technology (e-health) by individuals with serious mental health problems for healthcare purposes.

The study, led by Dr Emma Palmer-Cooper, combines reviews of existing research, alongside both large scale quantitative and in-depth qualitative research studies to understand how levels of trust relate to current and future use of e-health for mental health support.

Results highlight that ethical and responsible development and prescription of e-health is required to promote trust and appropriate use of these systems in the future.

IMPROVING HEALTH AND RESILIENCE THROUGH AI

AI and insights into health data are being used to support healthcare decision making, as part of the NIHR Southampton Biomedical Research Centre (BRC) Data, Health and Society theme.

Led by WSI Director Professor Dame Wendy Hall, the project aims to create a learning healthcare system, providing data insights that can be used by healthcare professionals to improve the health and resilience of individuals and populations.

They are investigating how technology impacts personal and society's health, and how people impact the technology, allowing them to realise the major health and social care potential that AI can deliver, in a scalable, iterative, responsive and accountable manner.

HELPING PEOPLE LIVING WITH MULTIPLE LONG-TERM HEALTH CONDITIONS

The WSI is working on two NIHR-funded interdisciplinary projects that are using AI to explore the challenges related to the growing number of people living with multiple long-term health conditions such as diabetes, heart disease or dementia.

MELD-B is analysing large datasets to understand how factors in people's lives can influence their chances of developing multiple burdensome conditions. The information will help identify the best way to accurately estimate the risk at different life stages and identify key time points for targeted public health interventions.

Cluster-AIM is developing and validating population clusters of people who have similarities in their medical and social care needs. Using data-driven AI methods will help deliver more personalised care.

WSI Associate Director Professor Michael Boniface said: "Understanding how burden changes in relation to the development of conditions over the lifecourse is important to identify preventative interventions but also ensure people are cared for appropriately, considering a broad range of socio-economic concerns."

WHERE SOCIETY AND TECHNOLOGY MEET

The Web Science Institute (WSI) has created valuable opportunities for world-class interdisciplinary research collaborations by bringing together multidisciplinary partnerships across institutional boundaries.

We will continue to generate exciting ideas to solve real-world problems leading to increased interdisciplinary research collaborations and more high-value research bids.

RESEARCH AREAS

We investigate how digital transformations may shape the future, and how we might best use new technologies to get the future ready. We work to better understand digital inequalities and learn how to effectively support digital inclusion, democratic innovation and civic participation that is inclusive, productive and forward looking.

We examine developments in AI, online interaction and data sharing, that affect how public spaces are used for work, play and learning. We want to help safeguard humanity by considering ways to ensure they remain free and equal.

Our research explores the ethics and practice of online privacy, security and data trusts. We examine opportunities to better govern the use of healthcare data and to understand new forms of data and their role in health interventions. We're working to decode the future by interrogating emerging socio-technical issues related to trust and trustworthiness of digital systems.

Where society and technology collide is a focus of our research in anticipating and understanding the adaptations humanity will need to make to work and live with AI. We're having to redefine research due to the rapid development and increasing adoption of digital technologies and the resulting societal impact.

We look at society and human creativity through an interdisciplinary lens which involves science, technology, the arts, humanities, social sciences, engineering and mathematics. We aim to push boundaries and create novel solutions where the future of society is imagined.

Find out more:
www.southampton.ac.uk/wsi

GIVING PROJECTS A HEAD START

The Web Science Institute (WSI) Pilot Project Fund aims to stimulate and pump-prime interdisciplinary research activity that will lead to collaborations and the development of full research grant proposals.

Here we look at some projects that have already received funding:

Distinguishing between real and fake images

Artificial intelligence (AI) systems can now produce images of faces that are so realistic that humans can't distinguish them from real human faces.

Known as hyperrealism, these AI-generated images have the potential to mislead the public and distort the truth by contributing to the spread of political misinformation, increasing cybersecurity risks, and facilitating fraudulent attacks.

Dr Tina Seabrooke, from Psychology, is leading this project to develop an innovative intervention that helps people accurately discriminate between real and AI-generated images of faces.

Participants will be trained to detect features that are often indicative of AI-generated images of faces. They will also be trained to avoid using features that people often rely on, but are not useful for distinguishing between AI-generated and real images of faces.

The intervention will have several phases, with each phase focusing on different features that participants use incorrectly.

Participants will be shown images that are strongly representative of a given category, such as face proportionality, and will receive clear instructions on how to discriminate the images using this feature. Their ability to distinguish AI-generated facial images from real human faces will be measured before and after the intervention, and relative to other control tasks.

Preliminary results suggest that the intervention is highly effective for improving people's ability to distinguish between AI-generated images and images of real human faces.

Enhancing the effectiveness of virtual communication

With the rise of remote work due to COVID-19, digital communication platforms like Teams, Skype, and Zoom have become widespread tools for collaboration.

The significant socio-technical transformation in work is taking its toll through longer working hours, Zoom fatigue, increased experiences of isolation, impacts on team trust and efficiency, and effects on people's sense of social cohesion.

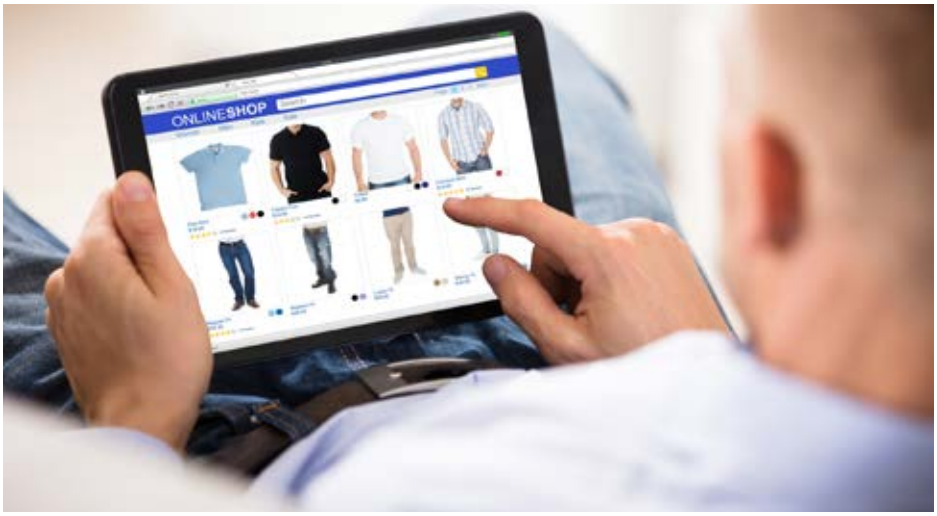
However, the more fundamental physiological and neurological differences between face-to-face and digital interactions have not been considered and, as a result, strategies to effectively address these challenges remain uncertain.

Dr Christoph Tremmel, from the School of Electronics and Computer Science, is leading this study as part of the Synthesizing Co-Presence Project, under the WellthLab's (wellthlab.ac.uk) mission to help 'makeNormalBetter, for all, at scale' to better understand these interactions.

Collaborating with WellthLab director professor m.c. schraefel, Dr Nathan Huneke, from Clinical Neurosciences, and PhD student Daniel Hobson, Christoph is investigating a range of physiological responses, such as brain activity, respiration rate and eye movements, during virtually mediated versus in-person communication.

This interdisciplinary research combines biosignal processing, psychology and human-systems interaction.

Preliminary findings have already shown fundamental physiological differences between in-person and virtual interactions such as an increase in heart rate, heart rate variability, and increased head movements during in-person interactions.



Alleviating the environmental impact from the rise in home shopping

Home shopping has risen exponentially in recent years partly due to the increasing availability of fast same-day delivery options.

In the UK in 2022-23, parcel volume rose to 3.6 billion items, compared to 2.8 billion in 2019-20. This increased the amount of last-mile delivery operations - the last leg of the journey that products take before reaching the consumer's home.

In cities, a large proportion of these deliveries are carried out by vans, which significantly contributes to traffic congestion and air and noise pollution. In recent years, more sustainable and green delivery options have been explored including low emission vehicles or no emission alternatives, such as on-foot or bike delivery.

These and other initiatives have brought about new planning challenges, such as how to take into consideration riders' and porters' preferences for different routes. These preferences could include the reward they offer or the length and the location of the journey.

Professor Selin Ahipasaoglu is leading this project that is carrying out foundational work to combine operational decisions about vehicle routing with existing mathematical optimisation models to develop a prototype intelligent agent that can produce personalised routes which are cost-efficient, sustainable and attractive to delivery workers.

EXCHANGING KNOWLEDGE AND ENABLING ENTERPRISE

The Web Science Institute (WSI) Knowledge Exchange and Enterprise Fund provides funding for socio-technical projects.

It enables researchers and research users to engage in a two-way exchange of ideas, research evidence, experience and skills.

Here we look at some projects that have already received funding:

Making the world greener with maths

Green initiatives, such as decarbonisation and resource allocation models, are topics of debate and concern for young people across the globe.

However, the Key Stage 3 mathematics curriculum in England and Wales doesn't adequately provide the maths skills for students to engage in these topics in a practical way, leaving students ill-prepared to use artificial intelligence (AI) tools to address these concerns in the classroom.

Easily accessible AI models and frameworks are set to play a more important role in young people's lives, so it is vital that they can suitably engage with these tools in matters that concern them most.

Dr James Stallwood, from Maths, is leading this project that is creating an educational framework for the methodologies and techniques of strategic optimisation using AI for green initiatives as a supplement to the current curriculum offered.

Working with educational partners, they will translate the advanced mathematical techniques that are used when working with AI tools, so that they can be understood by young people aged 12 to 16. They will develop lesson plans, workshop materials and other activities that can be delivered by mathematics teachers.

Composing a multimedia live installation with AI

Generative AI and machine learning offer exciting possibilities for sound design and interaction, but they also raise important ethical concerns and reveal the limitations of comparing sophisticated algorithms and powerful computers to the human brain.


Image courtesy of Dr Pablo Galaz

Dr Pablo Galaz, from Music, is leading a project that explores the expressive capacities of recent AI technologies in the context of music performance, specifically multimedia installations and experimental musical theatre.

He said: "By harnessing the capabilities of AI, we aim to create an immersive artistic experience where human expression and algorithmic agency intertwine in an extended performative space. Building on cutting-edge research in AI, I am composing a new piece for musicians Ensemble Resilience and percussionist and multidisciplinary artist Angela Wai Nok Hui, in collaboration with Research Software Engineer Christopher Melen and AI researcher Tiarna Lee.

"Research in fields such as biolinguistics has shown that there is a blurry distinction between growing and learning in human beings. Our way of learning and growing differs fundamentally from the way AI models are trained. Using visual imagery from medical datasets and facial recognition to control sounds and images in real-time, this piece is inspired by the question: 'What would it mean for a machine (AI) to understand what it is like to be human?'"

Creating decolonial and feminist AI

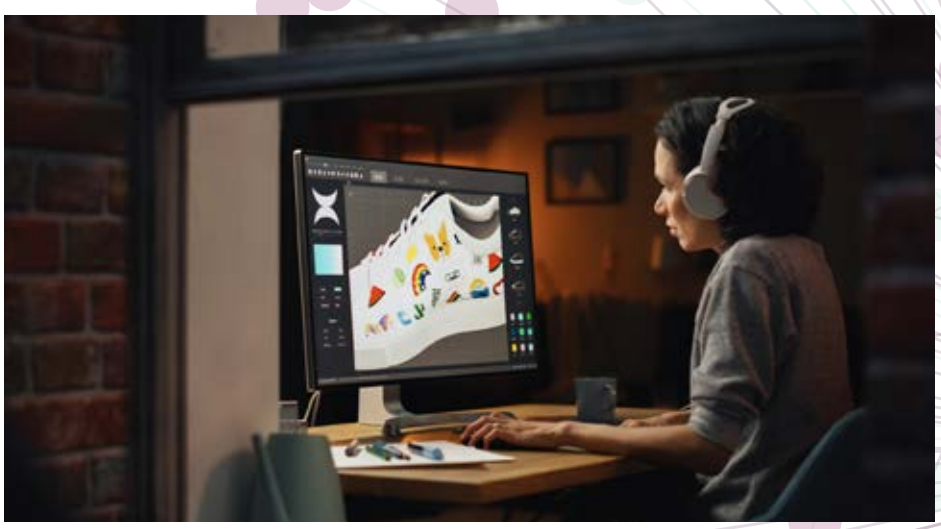
Dr Alexandra Anikina is leading this project that is bringing an urgently needed narrative change to the field of AI by using methodologies from artistic research, decolonial theory and feminist studies of science and technology, as well as creative methods from future studies and science fiction writing.

She is drawing on critical media studies, digital culture, arts and visual culture to build interdisciplinary guidelines and produce creative and critical implementations of alternative imaginaries that would create new directions for AI development.

Alexandra said: "Currently AI is concentrated in the hands of the big tech and is supposed to be neutral and objective. It is vital to call upon the under-explored potential of critical imagination of feminist and decolonial AI, underpinned by principles of inclusive and diverse ideas.

"The artistic imagination is also crucial for offering innovation and experimentation on a scale that goes beyond product or service development and is politically and socially oriented to the future."

The project is called, 'The Chronicles of Xenosocialist AI': researching decolonial and feminist AI with artistic research and science fiction methods.



> **"A key skill in this study has been adaptability in a fast-changing interdisciplinary environment."**
>
> **Kieron Owen**
> PhD in Web Science

SPOTLIGHT ON OUR STUDENTS

Find out more:
www.southampton.ac.uk/wsi

KIERON OWEN
PhD in Web Science

Kieron is in the third year of his PhD, examining how the impact of AI on work in the music industry is shaped by technological development and the conditions of its use.

He is doing this by studying creative AI for music, as human skills in the creative industries are often seen as safe from the impacts of AI. He is uncovering how the emergence of AI is affecting the conditions and experience of music work, while demonstrating the value of the social sciences within the development and study of AI impact.

He said: "A key skill in this study has been adaptability in a fast-changing interdisciplinary environment. I began the project with a fairly standard background in musicology, but with the guidance of my supervisors and available WSI training, I have learnt to conduct sociological research while engaging with unfamiliar technical areas and audiences.

"I hope to continue flying the flag in academia for non-STEM approaches to the benefits and risks of emerging technologies. The WSI at Southampton is a crucial leader in this area, and the opportunities it has given me to conduct interdisciplinary work are invaluable in this pursuit."

ERYN RIGLEY
PhD in Web Science

Eryn is in the final year of her PhD that is examining the ethical issues that arise when embodied AI systems such as robots interact with the natural environment around them.

She is developing a technique to train these systems to carry out tasks in such a way that there is minimal disturbance to the ecosystem they are deployed into.

She said: "I am absolutely loving doing this PhD project and am so grateful for the academic freedom it has given me and the research skills I have developed.

"I would consider myself to be a better academic researcher and writer, with a broader understanding of the academic landscape, and a much better knowledge of the area I am interested in. I have also discovered a love for teaching!"

After completing her PhD, Eryn is hoping to pursue a career in academia, particularly in the area of AI ethics. She said: "It's something I am passionate about, and I really enjoy both the research process and teaching."

RACHEL HAYWARD
PhD in Web Science

Rachel is studying a PhD in the cohort of Human-centred AI, investigating the different ways technology is able to support the safety of women while they are walking, cycling or scooting.

She is exploring whether technology developed to improve women's safety is useful in practice or if there are ways it could better serve women's needs.

She said: "I worked in industry for several years before I started this PhD. I have learned many new skills, both related to my research and about myself as a person. Being part of an interdisciplinary environment has been very rewarding, with the opportunity to discuss research with people from very different backgrounds.

"There is a need to understand how technology and artificial intelligence in particular will impact society. In the future I would like to contribute to that research area to mitigate any harmful effects as well as finding opportunities.

"The PhD has helped me gain a wide variety of skills to put me in a good position to contribute to this area."

HARRY NELSON
PhD in Web Science

Harry is studying a PhD across the disciplines of computer science, sociology and education exploring ways to make Large Language Models (LLM) applications more reliable and explore the trust between humans and AI tools.

One project he has carried out is to connect an AI Chatbot to the University's ePrints repository to help explore the research output of the University.

He said: "I've already learnt a lot about how to create and use LLM technologies, and understand how they are employed in both academia and real business situations.

"I've been able to use those skills in my research and do work for other people throughout the University. Being able to try and help people solve problems using AI definitely makes the work feel like it has an impact.

"In the future, I'd like to help contribute to a safe AI ecosystem. LLM tech is being rushed ahead without regard for a lot of legal or ethical issues that I think need to be addressed. Helping with research to ensure LLM use is responsible and safe, or to protect or aid those who are being displaced or whose work is being used by AI, would be fulfilling."

DR GEMMA FITZSIMMONS

PhD in Web Science 2016

Gemma has gone on to secure a role in the University's Research and Innovation Services Team (RIS) since completing her MSc and PhD in Web Science.

She initially joined RIS as an analyst using the data skills she had learnt during her PhD, but has now been promoted to become Head of Research Information and Systems, overseeing the team managing research information systems and delivering data-driven insights on the University's performance and benchmarks within the sector.

She also leads the management of strategic plans and processes for the Research Excellence Framework (REF) 2029, including supporting impact creation.

Gemma's PhD was an interdisciplinary project in Psychology and Computer Science focused on understanding the cognitive processes involved in online reading by analysing eye movements.

Her research has been used extensively to help understand the cognitive processing that occurs during reading and how online content punctuated with things like hyperlinks can affect a reader's comprehension.

Gemma said of her time with the WSI: "The WSI PhD community was fantastic! Although we were all studying different research areas, we formed a friendly and supportive cohort. We both challenged and supported each other's research and improved it for the better.

"A key skill I gained was the ability to communicate complex concepts to a diverse audience. This skill is transferable across all future roles. Being able to explain complex issues in a way someone from any background can understand is invaluable.

"My experience at WSI equipped me with interdisciplinary perspectives and collaborative skills that are invaluable in my current role, where I engage with every department of the University.

"During my studies I also became proficient with data analysis, a key skill required In my current role. I am able to extract actionable insights from complex datasets, providing strategic guidance and facilitating evidence-based decision-making, translating complex data into meaningful narratives."

DR ASHTON KINGDON

PhD in Web Science and combined Criminology, History and Computer Science 2022

Ashton's ground-breaking and world-leading research into the ways in which technology and imagery act as accelerators of radicalisation and the socio-technical components of extremism, has seen her become a global influence on dealing with the risks posed by extremists operating online.

During her PhD, she spent four years undercover online as a white supremacist, joining groups such as the Ku Klux Klan, neo-Nazi organisations, eco-fascists, radical right populist parties, QAnon conspiratorial networks, Tradwives, Identitarians, and satanic occult groups. The work from this is due to be published in a monograph in 2024.

Ashton, who is a Lecturer in Criminology at the University of Southampton, is also an Advisory Board Member at the Accelerationism Research Consortium, a research fellow at VOX-Pol, a core member of the Extremism and Gaming Research Network (EGRN), a member of the steering committee for the British Society of Criminology's Hate Crime Network and former head of Technology and Research Ethics at the Centre for Analysis of the Radical Right.

She has advised governments, military, civil society organisations, and tech companies across the world about the risks posed by extremists operating online. Her research into militant accelerationism has contributed to European and global policy and made national and international contributions to measures disrupting this form of extremist activity. She was appointed an expert witness for the US House of Representatives Select Committee to investigate the role Alt-Tech played in the January 6 attack on the United States Capitol.

Her combined work has contributed to international and national legislation and regulations, in Canada, the UK, the US and New Zealand and informed the work of international bodies including Tech against Terrorism, and the Global Internet Forum for Counter Terrorism GIFCT. She has also been a keynote speaker at the Counterterrorism Programme for 5eye law enforcement - widely regarded as the world's most significant intelligence alliance.

She said: "The thing I gained most from studying Web Science was the power of diverse thinking and working in interdisciplinary ways. Complex global problems such as online radicalisation need perspectives and knowledge that may be different from what we are comfortable with or trained in.

"It was incredibly difficult to learn new disciplines but it was the best thing I ever did in terms of improving my ability to research such sensitive and timely issues."

Find out more:
www.southampton.ac.uk/wsi

LEADING LIGHTS

Southampton academics have played a pivotal role in the development of the Web over the last 30 years, including being at the forefront of the development of the innovative discipline of Web Science.

With the growth of AI, they are expanding their education provision to incorporate the impact of AI and the challenges that it brings.

Developing an innovative online master's degree

The Web Science Institute (WSI) has been facilitating the drive to develop an innovative interdisciplinary master's degree in artificial intelligence (AI) for non-STEM students.

WSI Deputy Director Professor Leslie Carr said: "We have been bringing everyone together to discuss how we can develop this online provision.

"Drawing on this cross-faculty expertise, the new programme will look at what's under the hood of AI. So it won't just be exploring the technological side, but will incorporate all the other issues involved with creating and adopting AI technologies, such as the social, political, legal, economic and psychological implications."

The MSc will be aimed at managers and leaders of companies who need to be on top of how their products are built, tested and evaluated, so that they understand that they are safe, fair and unbiased and able to be deployed in the real world in industry, government and the third sector.

A commitment to education

The WSI is committed to continuing and expanding its education provision in the future.

It aims to:

- increase its Doctoral Training activities;
- develop modules and continuing professional development programmes that take advantage of new online markets;
- recruit at least one new PhD student per year;
- grow the cohort of Human-centred AI students.

It is also hoped to create an AI@Southampton education network to bring together everyone involved in the areas of AI and education across the University.

Human-centred AI interdisciplinary studentships

PhD studentships are being offered to postgraduates whose research focuses on human-centred AI. Research should be on a topic such as online health, social and embodied AI, democratic futures and trustworthy AI.

SHAPING POLICY

ALISTAIR SACKLEY
Specialist Policy Officer for the Web Science Institute (WSI)

Ali became the WSI's Specialist Policy Officer last year but had already been involved in Web Science at Southampton for 12 years.

He said: "My Web Science journey started when the WSI reached out to me to become a partner on a project that brought together three leading UK universities to produce the first major interdisciplinary research insights into the realm of social machines.

"At that time my team had responsibility for neighbourhood policing, integrated offender management, partnerships, data and information, so it was natural to become involved.

"I was also engaged by the Home Office on an initial piece of work related to technology policy and serious organised crime.

"Fast forward 12 years and I continue to advocate for Professor Sir Tim Berners-Lee's 'Two Magics' of Web Science in the spheres of criminology, philosophy, policing, crime and technology policy, as well as economics, law and ethics."

The importance of influencing policy

Ali's current role ensures that WSI research influences policy and policymakers regionally, nationally, and internationally.

He said: "It is important we are involved in policy as we live in a period of profound systemic change with considerable instability and uncertainty. Therefore, we must identify actions that will shape change for the better and help to build resilience to the inevitable shocks inherent in, and generated by, the complex system of systems constituted by the economy, technology, society, and the environment.

"These challenges require updating the way policies are devised and implemented and developing more realistic tools and techniques to design those policies based on appropriate data.

People at the WSI pool their expertise and experience to propose new approaches to analysing the interconnected trends and issues shaping today's and tomorrow's world. They tend to be effective systems thinkers and problem-solvers."

The future of Web Science

Ali said: "There is infinitely more homework to do to understand the Web's impact on society. The interdisciplinary nature of its research, pathways, breakthroughs and effects is a constant source of inspiration.

"Revisiting the 'Two Magics' of Web Science a decade on is a necessity to explore the relationship between the web's technical protocols and its social conventions.

"The micro interaction between two people on the web scales to produce a new macro phenomenon, and the creative magic required to identify new micro designs that could have positive macro effects, is still as relevant today, especially with the advent of artificial intelligence and all the challenges and opportunities that that presents."

DR MATTHEW RYAN
Web Science Institute (WSI) Associate Director Policy

Matt is the WSI's Associate Director for Policy, responsible for developing better knowledge exchange between Web Science research and relevant policy decisions.

Once a self-confessed 'luddite', Matt joined the WSI when he realised that he was using technologies more and more often and became more accepting that there was an inevitability about some aspects of life online. He also became aware that colleagues in the University were working on interdisciplinary projects to understand the consequences of these technological changes.

He said: "I started working with doctoral students in the WSI exploring political participation and how it related to elements of Web Science and, gradually, I became more fascinated and motivated to understand and engineer the changes we want to see for collective flourishing.

"I've spent most of my career working with civil servants and politicians, NGOs and others in the policy world. They are often generalists who are juggling very difficult competing interests, and are time or resource poor.

"It is important we can help them understand developments in technologies and society and help them anticipate issues. These new technologies affect people's lives, and they affect them in ways that are really impacting on how they exercise their fundamental political and social rights.

"So it's crucial that the people in the WSI who have the privilege and time to think these things through and understand them at a deep level, are able to communicate their insights to policymakers.

"We are learning what works best, and we will keep engaging and working out how we can help those who make decisions for the collective with our expertise and vision."

Matt's research aims to transform research and innovation to focus on reinforcing democratic norms and empowering citizens.

He has developed transdisciplinary expertise, advancing agendas at the intersection of AI, co-design, and social science. He tries to bridge knowledges of data science, design thinking and participatory methods to unite research and practitioners to create human-centred technologies, and transparent democratic processes.

He said: "The emergence of generative AI combines a low technical barrier to adoption with a high capacity for disruption of existing democratic processes. Ignored, technology-driven degradation of democratic processes in the UK could wreak havoc. Instead, we try to increase confidence regarding technology-driven interventions that improve democratic norms."

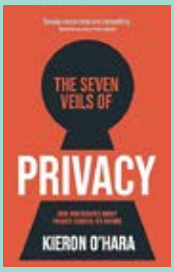
Find out more:
www.southampton.ac.uk/wsi

INFLUENCING POLICY

Members of the Web Science Institute (WSI) have published a number of policy papers and books that address developments in web science, data science and artificial intelligence (AI).

Here are the most recent books and publications:

MAKING AI WORK FOR EVERYONE: JOIN THE GLOBAL CONVERSATION
Professor Dame Wendy Hall and Researcher Dr Ben Hawes
Encouraging responses to the United Nations Artificial Intelligence Advisory Body's report Governing AI for Humanity.

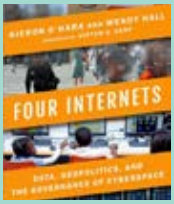


THE SEVEN VEILS OF PRIVACY
Emeritus Fellow Dr Kieron O'Hara
Kieron recently published a magisterial summation of 20 years of research on the topic of privacy, countering the common claim that privacy studies are in a state of crisis. A paperback edition was published in March 2024.

AFTER THE SUMMIT: PROGRESS IN PUBLIC POLICY ON AI
Professor Dame Wendy Hall and Researcher Dr Ben Hawes
Reflecting on the UK's international Artificial Intelligence Safety Summit.

CAN ARTIFICIAL INTELLIGENCE BE USED TO UNDERMINE ELECTIONS?
Professor Dame Wendy Hall, Dr Matthew Ryan and Researcher Dr Ben Hawes
Examining the potential threats AI poses to elections around the world and exploring what can be done to protect the integrity of the most fundamental of democratic processes.

WEB3: THE PROMISE AND THE REALITY
Professor Dame Wendy Hall, Emeritus Fellow Dr Kieron O'Hara, Researcher Dr Ben Hawes and Visiting Professor Bill Thompson
Providing a current overview of the functions of Web3 technologies, the major application areas and the kinds of challenges the technologies are intended to resolve.



FOUR INTERNETS: DATA, GEOPOLITICS, AND THE GOVERNANCE OF CYBERSPACE
Emeritus Fellow Dr Kieron O'Hara and Professor Dame Wendy Hall
Four Internets offers a new approach for understanding the Internet's socio-technical nature, and the rival values that have driven its governance and stability.

It unravels how tensions between the models play out across the geopolitical, economic, and technological spheres, and argues that its essential connectedness requires commitments to openness and compromise. Kieron and Dame Wendy are currently working on the application of the framework to the no less pressing question of the regulation of artificial intelligence.

APP INSIGHT

Nucleolus, a Web Science Institute-supported initiative, has launched a smartphone app that is helping improve vital treatment for children with amblyopia, known as 'lazy eye'.

Eye specialists, mathematicians and games designers teamed up to launch spinout company Nucleolus Software and develop the phone app using new AI-based technology.

Amblyopia causes sight loss in young children and occurs when the eye doesn't develop a strong enough link to the brain. It can usually be treated simply by covering the unaffected eye for several months forcing the 'lazy' eye to work.

The success rate for occlusion therapy is only 50 per cent and experts say busy households 'giving up', due to the time and effort involved, is a leading cause of failure.

The full version of the app will consist of several different computer games that use the smart phone's camera to check if the person is wearing their patch correctly and encourages them to do so within the game.

Nucleolus initially received WSI Z21 funding and has since gone on to gain further funding from Innovate UK, the WSI Stimulus Fund, and the Gift of Sight charity.

Mathematician Professor Joerg Fliege said: "By harnessing novel approaches from computational mathematics and artificial intelligence we have enabled the app to sense if the user's eye patch is being worn properly. If it isn't, the game prompts them to correct this by sending them encouraging messages. If they wear their patch properly the game responds by unlocking different levels, or can give rewards.

"We think motivating children in this way will help them to form a more positive association with their patch and ultimately, increase the effectiveness of their treatment."

The companion app for parents is due to be launched very soon.

Image courtesy of Nucleolus Software

Find out more:
www.southampton.ac.uk/wsi

COURTNEY LEE
Web Science Institute (WSI) Collaboration Manager

Courtney has recently joined the WSI in the new role of Collaboration Manager to support external partnership funding for research bids and increase capacity for co-developed research.

She is thrilled to be joining the WSI at such an exciting time and looking forward to helping to showcase the work that is driving progress.

She said: "It's impossible to escape the prevalence of Web Science in everyday life. It has always been an incredibly exciting subject area and the pace of change and progress is breath-taking.

"The momentum and demand we are currently seeing for Web Science-powered tech products and services from both industry and consumers has placed a renewed spotlight on the subject area and this is only going to grow and pick up pace as we look into the future.

"The WSI is in a prime position to lead the national and global conversation. The potential to bring about positive change has never been more real."

Courtney comes from a background in consumer travel tech products, fintech, banking and mortgages and has worked with stakeholders from across media, regulators and policymakers to tell stories, bring attention to causes and push for change.

She added: "Coming from a non-technical background, I've repeated the phrase 'explain it to me like you would to a five-year-old' more times than I can remember. It took me a while to realise this wasn't something to be embarrassed about but a question that helped developers, engineers and product managers to step outside of the silos they are used to operating in and think about how they can tell the story of their work to an external audience.

"I am looking forward to progressing the aims and goals of the WSI through engagement and collaboration with industry partners, and working with external stakeholders to highlight the exciting work going on at Southampton."

GLOBAL INFLUENCE

The Web Science Institute (WSI) is a truly global organisation. Our academics are spreading the message about the WSI and its research to all corners of the globe through a broad range of activities, including delivering keynote talks and lectures at various events around the world.

UN ADVISORY BODY APPOINTMENT

WSI Director Professor Dame Wendy Hall has been appointed to the United Nations (UN) high-level advisory body on Artificial Intelligence (AI).

Dame Wendy, who was selected from more than 1,800 nominees across 128 countries, joins 31 experts from around the world to analyse and advance recommendations for the international governance of AI. They have recently published their first report.

She said: "I feel very privileged to have been appointed by the United Nations to be on this new AI advisory body.

"As new AI technologies and capabilities emerge, it is so important that we harness them for good, while ensuring they don't evolve in ways that would be harmful to society. It is very exciting to be part of the global discussions on the best way to manage this."

Her role in the UN advisory body will see Dame Wendy work with experts from Government, private sector and civil society to provide insights from the breadth of her research at Southampton.

- Dame Wendy also attended the first AI safety summit held at Bletchley Park that brought together international governments, leading AI companies, civil society groups and experts in research to consider the risks of AI, especially at the frontier of development. They agreed The Bletchley Declaration on AI Safety.
- The 15th ACM Web Science Conference, held in Austin, Texas, USA, was co-chaired by Dame Wendy. The theme of the conference was Inequalities in the Face of Concurrent Crises.

Find out more:
www.southampton.ac.uk/wsi

WSI MEMBERS ATTEND SINGAPORE WORKSHOP ON AI

Members of the WSI leadership team represented the University at a collaborative workshop organised by Nanyang Technological University Singapore, Institute of Science and Technology for Humanity (NISTH) and supported by the British High Commission in Singapore.

Professor Dame Wendy Hall, Professor Pauline Leonard, Professor Les Carr and Dr Matt Ryan attended the workshop that explored the results of a survey on social trust in artificial intelligence (AI) rolled out in South Korea, Taiwan, Japan, and Singapore by NISTH.

Pauline said: "Our colleagues in Singapore are at the forefront of work on trustworthy AI, so this collaborative workshop was a great opportunity to showcase the advances in, and conscious implementation of, socially relevant and impactful AI technologies from both institutions.

CELEBRATING 50 YEARS OF THE INTERNET

The 50th anniversary of the Internet is being celebrated at a special event at The Royal Society in London.

Organised by the Web Science Institute, in collaboration with the Web Science Trust, the People-Centered Internet, the Digital Enlightenment Forum, The Digital Humanism Initiative and the Association for Computing Machinery (ACM), the event will feature a talk by Internet inventor Dr Vinton Cerf.

There will also be a workshop where participants will predict what the Internet will look like in the future, followed by a series of panels that will look back at what the Internet has achieved in the last 50 years, as well as focussing on the next generation of the Internet and AI.

WEB SCIENCE TRUST

The Web Science Trust (WST) is a registered charity hosted by the University of Southampton that aims to support the global development of Web Science. WST established the annual Web Science Conference in 2009.

The WSI was a founder member of the International Web Science Trust Network of Laboratories (WSTNet).

WST has recently formed collaborations with the People-Centered Internet, The Digital Enlightenment Forum and The Digital Humanism Initiative.

This alliance will work to strengthen their relations in areas of common interest, regularly exchange views on their respective activities, and prepare and implement common strategies and programmes for the priorities and areas of shared interest.

Find out more:
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https://x.com/sotonWSI

www.linkedin.com/in/web-science-institute

https://www.youtube.com/@WebScienceInstitute