

DECODING THE WORLD WIDE WEB

Web Science Institute

WELCOME



Welcome to the [Web Science Institute \(WSI\)](#) – a world leader in Web Science research, training and enterprise, based at the [University of Southampton](#).

This is an exciting time for the WSI, as the University joins [The Alan Turing Institute](#) - the UK's national institute for data science and artificial intelligence. The University is honoured to have become a member of such a prestigious organisation and the WSI will be responsible for co-ordinating all of the University's Turing-related activities. We look forward to Southampton's research expertise contributing to help solve the key challenges and problems facing the world.

The University has just announced its first round of Turing Fellows and Pilot Projects and we are excited to see how their research will develop as they benefit from the links that the Turing Institute brings.

Elsewhere in this publication, you can find out more about the breadth of our research and the impact we are having both locally and around the globe, how we are helping boost entrepreneurship and fledgling business ideas, and how you can benefit from our education and training expertise.

Professor Dame Wendy Hall

WSI Executive Director



Technology and the digital economy are a central part of the University of Southampton's innovation strategy. The Web Science Institute (WSI) plays a vital role in facilitating interdisciplinary research across the University, bringing together world-leading academics from a range of subjects to drive forward research into all areas of Web Science.

I am delighted that the impact of this pioneering research has been recognised with the recent invitation for the University to become a member of The Alan Turing Institute. This is a reflection of the excellence of our research here at Southampton, and the potential our academics offer to bring new expertise and opportunities to the Turing Institute. The WSI will be pivotal in co-ordinating all of these activities.

I hope you enjoy discovering more in this publication about the many other exciting things that the WSI are involved in at the moment.

Professor Mark Spearing

Vice-President, Research and Enterprise



Find out more:

www.southampton.ac.uk/wsi

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WEB SCIENCE INSTITUTE

The [Web Science Institute](#) (WSI) co-ordinates Southampton's world-leading, interdisciplinary expertise in Web Science research, training and enterprise, to tackle the most pressing global challenges facing the World Wide Web and wider society today.



Find out more:

www.southampton.ac.uk/wsi

The World Wide Web

The World Wide Web is the largest information system in history and so much more. It is transforming the world and affecting the everyday lives of billions of people across the planet, shaping how they do business, conduct their social lives and co-operate to achieve their goals.

The scale of its impact and the rate of its adoption are unparalleled, providing a great opportunity as well as an obligation. To ensure the Web benefits the human race we need to do our best to understand it.

Web Science has an ambitious agenda: to focus the analytical power of researchers from diverse disciplines to explore the social and organisational behaviour of the Web, as well as its underpinning technology.

Web Science at Southampton

At Southampton, our world-leading academics have played a pivotal role in both the creation and on-going development of the Web. They were instrumental in the foundation of the discipline of Web Science that sits at the intersection of technology and society.

The Web Science Institute brings together globally recognised researchers to pursue interdisciplinary research challenges that span social and computational sciences, humanities, medicine, health sciences, business, law and natural sciences. We run major international research programmes funded by UK Research Councils, the EU, Government and industrial partners, and work with external partners in industry, government and the third sector to shape the future of the Web and digital society.

SHOWCASING OUR EXPERTISE

The [Web Science Institute](#) (WSI) brings together world-leading interdisciplinary expertise. Here are the people that are driving the WSI forward.



Professor Leslie Carr
Executive Director

Leslie's research focuses on the impact of the Web on society and the way in which the global communications infrastructure changes our personal, social and economic landscape. He is exploring how data and AI will shape new industries and future society. As part of the WSI he is working with partners from industry and government to identify the future opportunities of the digital economy whilst maximising the social and economic benefit the online world offers.



Professor Dame Wendy Hall
Executive Director

Dame Wendy was Co-Chair of the UK government's AI Review, which was published in October 2017, and has recently been announced by the UK government as the first Skills Champion for AI in the UK. She is Regius Professor of Computer Science, Pro Vice-Chancellor (International Engagement), and is the Executive Director of the Web Science Institute. With Sir Tim Berners-Lee and Sir Nigel Shadbolt she co-founded the Web Science Research Initiative and is the Executive Director of the Web Science Trust.



Find out more:

www.southampton.ac.uk/wsi

Dr Thomas Irvine

Director

Tom is an Associate Professor and Doctoral Programme Director in Music. He is an intellectual historian with a strong interest in how music interacts with science and technology. This informs his teaching at all levels, from working with undergraduates to exploring the musical histories we all carry around with us on our smartphones, to teaching and supervising MSc and PhD students in the CDT.



Dr Kieron O'Hara

Director

Kieron had a central role in the development of the discipline of Web Science and his research interests are the philosophy and politics of digital modernity, particularly the World Wide Web. He focuses on the key themes of trust, openness, ethics and privacy and has published several books looking at the trade-offs between open data, anonymising data, and privacy online. His work stretches across philosophy, computing, politics and security, and he is also a visiting professor of law at the University of Winchester.



Professor Elena Simperl

Director

Elena is Director of the Southampton Data Science Academy that offers professional training in digital transformation technologies such as AI and data science. Her research is at the intersection of AI and crowd computing helping understand how to build socio-technical systems that combine machine algorithms with human and social capabilities. She has worked on more than 20 European and national research projects including RENDER, ODINE, Data Pitch and Data Stories.



Our people

Professor Sophie Stalla-Bourdillon Director

Sophie is a Professor in Information Technology Law and Data Governance. She is Director of the Institute for Law and the Web (ILAWs), a member of the Southampton Cybersecurity Centre of Excellence, and a Senior Privacy Counsel at Immuta. Her research interests are in Information Technology law, particularly data protection, privacy, information security, anonymisation, intermediary liability and the impact of traditional bodies of law and fundamental rights and liberties upon Internet regulation.



Dr Mark Weal Director

Mark is Director of the CDT in Web Science Innovation and technical lead for the LifeGuide programme of research - a multimillion pound, multidisciplinary initiative to research and develop online digital public health interventions such as weight management, stroke rehabilitation and cochlear implant home care. His research interests also include new methodological approaches for emerging forms of data, and their application in areas as diverse as disaster management and food provenance.



Visiting Professors and Fellows

Honorary Professor

Sir Tim Berners-Lee
Inventor of the World Wide Web

Visiting Professors

Dr Vinton G Cerf
Internet Pioneer

Liam Maxwell
Director
Government Transformation
at Amazon Web Services

Professor George Metakides
Professor of Logic
University of Patras

JP Rangaswami
Trustee
Web Science Trust

Professor Sir Nigel Shadbolt
Principal
Jesus College, Oxford

Dr Phil Tetlow
Chief Architect
IBM Software Group

Visiting Fellows

Tom Barnett
Chronotis Ltd

Katharina Kinder-Kurlanda
Leibniz Institute for Social Sciences

Bill Thompson
Journalist and Broadcaster

Dr Tom Wainwright
Royal Holloway
University of London



Find out more:

www.southampton.ac.uk/wsi

Advisory Board

Tom Barnett, Founder and CEO, Chronotis Ltd – Chair of Advisory Board

Liz Brandt – CEO, Ctrl-Shift

Jonnie Goodwin – Founder, Lepe Partners, LLP

Professor Yi-Ke Guo – Data Science Institute, Imperial College London

Professor Susan Halford – University of Bristol

Professor Keith Jeffery – Keith G Jeffery Consultants

Matt McNeill – Head of Google Cloud Platform, UK and Ireland

Lohan Presencer – Chairman, Ministry of Sound Group

Professor Sir Nigel Shadbolt – Principal of Jesus College, University of Oxford

Bill Thompson – Journalist and Broadcaster

Kim Walker – Partner, Irwin Mitchell Solicitors

Academic Advisory Board

The WSI Academic Advisory Board brings together expertise from across the University to establish interdisciplinary approaches to pressing socio-technical challenges that support industry, government and the third sector.

Strategy Board

The WSI Strategy Board provides advice and guidance to the WSI on setting and achieving its strategic goals. It is chaired by the University's Vice-President (Research and Enterprise) and contains senior representatives from the University's five faculties, the Director of Research and Innovation Services and WSI Executive Directors.

Student Digital Champions (Digichamps)

The Digichamps are a group of student champions drawn from across the University who have professional experience, skills and expertise in the educational applications of digital and social tools. They promote the WSI and wider University events through social media channels, news and blog reports.

Our Partners include:

BBC

British Library

Cabinet Office

Cambridge Education Group

Chronotis Ltd

Ctrl-Shift

Data Science Institute, Imperial College

DSTL

Deutsche Bank

Digital Catapult

Elsevier

Fawley Waterside

Google

IBM

Irwin Mitchell

Ministry of Sound

Microsoft Research

National University of Singapore

Office for National Statistics

Open Data Institute

Ordnance Survey

Roke Manor Research

Solent Local Enterprise Partnership

Southampton City Council

Tsinghua University

Web Science Trust

Professor Susan Halford

Outgoing WSI Executive Director

Web Science is more important now than ever. In 2008, when we began, we knew already that the Web was deeply socio-technical, started by technical possibilities intended for researchers and driven by take up across a range of other users, that in turn has shaped the technical evolution of the Web. The Web was changing the world and the world was changing the Web. That was before social media took hold, before 'big data', the emergence of data science and the resurgence of Artificial Intelligence! We will only make the most of these opportunities - for research, education and society - and effectively face the challenges that they pose by building on the deep integration of expertise across disciplinary borders that we have achieved in Web Science. This is now much in demand, from government, industry and civil society. Working together we can shape the future of the Web.



UNIVERSITY OF SOUTHAMPTON JOINS THE ALAN TURING INSTITUTE

[The Alan Turing Institute](#) is the UK's national institute for data science and artificial intelligence. The Institute is named in honour of Alan Turing, whose pioneering work in theoretical and applied mathematics, engineering and computing is considered to have laid the foundations for modern-day data science and artificial intelligence. The Institute's goals are to undertake world-class research in data science and artificial intelligence, apply its research to real-world problems, drive economic impact and societal good, lead the training of a new generation of scientists, and shape the public conversation around data.



The Alan Turing Institute



Find out more:

www.southampton.ac.uk/wsi

Joining the Institute

The University of Southampton has recently become a member of The Alan Turing Institute, due to the excellence of its research, its alignment with the Institute's research interests, and its ability to bring new expertise and opportunities that add to the core strengths of the Institute and its existing partners.

Southampton researchers have joined academics from the other 12 partner universities to work alongside the Institute's industry, government and third sector partners to spearhead cutting-edge research and apply this research to real-world problems creating lasting effects for science, society and the world we live in.

All of the University's Turing-related activities are co-ordinated by the Web Science Institute (WSI). Executive Director Professor Dame Wendy Hall represents the University on the Turing University Partners' Board, and Professor Elena Simperl and Professor Peter WF Smith are the Turing University Leads. Susan Davies is the University Liaison Manager.

Celebrating our University partnership

The first Southampton Turing Fellows and Pilot Projects have recently been announced and a special event, hosted by the University's President and Vice-Chancellor Sir Christopher Snowden, will mark the occasion.

Turing Fellowships – awarded to academics with a proven track record in scholarly research in fields that are in the remit of The Alan Turing Institute, and whose development would be significantly enhanced through stronger ties to the Turing Institute network.

Pilot Projects – provide opportunities for academics to develop new research ideas aligned with the Institute's priorities, paving the way to substantial, interdisciplinary and inter-institutional programmes.

The successful applicants were:

Turing Fellows

- Dr Cristián Bravo
Decision Analytics and Risk
- Dr Nicholas Fuggle
MRC Lifecourse Epidemiology Unit
- Dr Philip Greulich
Mathematical Sciences
- Dr George Konstantinidis
Electronics and Computer Science
- Professor Ben MacArthur
Human Development and Health,
and Mathematical Sciences
- Dr Thomas Monks
Health Sciences
- Dr Helen Ogden
Mathematical Sciences and S3RI
- Professor Hou-Duo Qi
Mathematical Sciences
- Dr Faisal Rezwan
Human Development and Health
- Professor Elena Simperl
Electronics and Computer Science
- Professor Peter WF Smith
Social Statistics and Demography
- Professor Marika Taylor
Mathematical Sciences
- Professor David Woods
Mathematical Sciences and S3RI
- Dr Alain Zemkoho
Mathematical Sciences

Turing Fellows with a sponsored pilot project

Topological complexity of neural networks
Professor Jacek Brodzki, Mathematical Sciences

Machine learning of seismicity induced by hydraulic fracturing
Dr Thomas Gernon, Ocean and Earth Science

Machine learning algorithms for automated event detection in space physics
Dr Caitriona Jackman, Physics and Astronomy

Towards flexible autonomy for swarms in dynamic and uncertain environments
Professor Sarvapali Ramchurn,
Electronics and Computer Science

AI and inclusion
Professor Mike Wald, Electronics and Computer Science

“The Turing's university network represents a powerful coalition of research excellence in data science and artificial intelligence in the UK. It is with real pleasure that we welcomed Southampton into the Turing network this year, adding its substantial expertise to the Institute's already formidable network of academic talent.”

Adrian Smith

Director of The Alan Turing Institute

AT THE HEART OF THE MATTER

Research lies at the heart of the [Web Science Institute's](#) (WSI) success, positioning it as a world leader in Web Science knowledge and innovation and fuelling our extensive education, training, enterprise and impact activities.

We effectively draw together global expertise from across a range of disciplines at the University of Southampton including social and computational sciences, the humanities, medicine, health sciences, business and law, and natural sciences.

This distinctive interdisciplinarity allows us to establish novel socio-technical approaches to tackle the major challenges facing society and support industry, government and the third sector.

We also head major international research programmes that are funded by UK Research Councils, the EU, government and industrial partners.



We have research expertise in:

Digital Economy – we explore how the Web and Web data can be used to support growth and innovation across the economy. We work closely with a range of partners, from the local to the global, across sectors from the creative industries to retail, the public sector to cutting edge digital start-ups, with particular attention to data integration, real time analytics, digital marketing, and growing the creative industries. We continually consider implications for skills, careers and the labour market.

Digital Futures – our research focuses on how the digital transformations of today are shaping the future, and how we might intervene in these processes to support an inclusive and productive outlook for all. Our work contributes directly to understanding digital inequalities and to supporting the processes of digital inclusion, democratic innovation, and civic participation, and explores how new combinations of humans and machines might contribute to this, using examples such as Wikipedia.

Education – our researchers examine how the Web can be harnessed to improve access to education and develop new pedagogical approaches, including intelligent tutoring. We started the first free Massive Open Online Course (MOOC) in Web Science and lead a suite of online courses in Data Science, as part of the Southampton Data Science Academy.

Ethics, Privacy and Security –

we investigate the issues arising from protecting people's privacy and security in an online environment, including the principles and practice of data protection law and innovative approaches to understanding cybercrime and supporting cybersecurity. We are exploring fair and trustworthy means of data sharing, ethical questions relating to the development and deployment of autonomous weapons systems, understanding algorithmic bias and accountability and the broader ethical and epistemological questions of digital data, algorithmic decision making and artificial intelligence.

Health and Well-being – we research how the Web shapes health and well-being both positively – such as extending the information available and improving access to services – and negatively - such as online harassment and privacy breaches. Our researchers explore the opportunities for interventions in human behaviour through the development of mobile and social networking technologies for health interventions, including weight management, stroke rehabilitation and cochlear implant home care.

Intelligence – WSI Executive Director, Professor Dame Wendy Hall, co-led the UK Government's recent Artificial Intelligence review, which now underpins strategic interventions to support skills development and economic growth in this area.

[The Centre for Machine Intelligence](#) is developing a coherent approach to research and technology transfer in artificial intelligence, machine learning, and autonomous systems, bringing together researchers to work with policy makers and experts from social sciences and law to ensure that the development of machine intelligence benefits all.

New Forms of Knowledge – we examine how new forms of data and computational systems can be combined with theories and methods from across disciplines to create new forms of knowledge. We take an interdisciplinary approach to working with digital data, developing robust methodologies to make this useful and actionable for researchers, government, industry and civil society. We are at the forefront of research on 'social machines' and are pioneering methods to capture, store, manage, analyse and visualise large-scale, complex and diverse data from multiple sources in the Southampton Web Observatory.

ON THE ROAD TO SUCCESS

We are kick-starting innovative research ideas across the University through our Research Collaboration Stimulus Fund. The Fund provides £100,000 a year to stimulate and pump-prime research leading to collaborations and the development of full research grant or contracts proposals with non-academic partners.



The funding allocation comes from the Higher Education Innovation Fund (HEIF) and helps facilitate interactions between the successful projects and other University research, business, government and industry. Here we look at some of the ways the Stimulus Fund is helping get research projects off the ground:

Helping optimise UK freight delivery

Every day couriers across the UK make hundreds of parcel deliveries generating significant traffic, congestion, noise and pollution. The planning of these deliveries is often done manually by individual drivers - yielding inefficient schedules, particularly for drivers unfamiliar with the environment that result in half-empty vans, increased amounts of driving, and traffic congestion. Funding from the WSI Research Collaboration Stimulus Fund is supporting the development of a Web-based prototype tool by Southampton academics using real data from several parcel couriers in London. The tool will enable drivers to optimise their delivery schedules, will be accessible to all users remotely and will react to any changes by operating in real time, reducing delivery times, traffic, and energy and fuel requirements.

Obesity and health over social networks

Obesity has become an epidemic over the past 30 years and is now a major contributor to the global burden of disease, according to the World Health Organization. However, there is limited information about the spread patterns of the condition, although past studies have highlighted the role of peers and social networks in influencing the spread. A Stimulus Fund allocation has enabled Southampton researchers to explore whether patterns can be identified through Web-based social media like Facebook or Twitter to characterise the way eating disorders (particularly anorexia and bulimia) spread over the network. They established connections with national and international experts on public health and social network data, and are now bidding for further major research council funding to expand their research into the influence of social media on obesity as a whole.

Exploring the impact of the digital workplace

The role of online marketplaces has dramatically increased in importance with the rise of platforms such as Amazon Mechanical Turk, Clickwork, Freelance.com and Upwork. Funding from the WSI Stimulus Fund has enabled research to be carried out into revealing new ways of working and collaborating between enterprises and individuals, encouraging innovation and participation building towards a new vision for 'Factories of the Future'. The Digital Workplace for Innovation and Participation (DigiWIP) project explored whether these digital platforms of work allow skilled workers and investors to exchange ideas, develop opportunities and innovative products, creating both wealth and greater individual and social satisfaction, and what prevents collaboration and innovation on these digital platforms.



SHAPING THE FUTURE OF WEB SCIENCE

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.

As the Web continues to evolve, so do the opportunities to help shape its future. The [Web Science Institute](#) (WSI) has vast experience in education and training, and here are just some of the ways you can benefit from our expertise:

Centre for Doctoral Training (CDT) in Web Science Innovation

Southampton's CDT in Web Science Innovation is training nearly 170 students on its rigorous four-year iPhD programme, preparing them to become agents of change in the digital economy.

The programme combines academic and training opportunities to enhance the students' socio-technical skills, facilitate their collaboration with industry and external partners, and help raise the profile of their individual research activities.

The CDT also fosters global academic and industrial connections with research laboratories, external partner organisations and other Digital Economy CDTs, and its alumni are already helping shape the future of the Web and society in a range of prestigious roles across the globe.

Masters in Web Science

Southampton's one-year MSc in Web Science uses multidisciplinary techniques to explore the impact of the Web on society. Students develop the skills to analyse the impact of the Web on business, government, law and science, by exploring: Web technologies such as data and knowledge representations; e-business; agents and information system design; economic theory; legal practice; linguistic analysis; and sociological evaluation.

Southampton Data Science Academy (SDSA)

Data is of huge importance in today's society, forming an integral element of the information age. It is already considered by many to be the next global currency. The Web Science Institute offers a range of continuing professional development (CPD) online short courses in Data Science that are primarily targeted at professionals who require general, as well as sector-related, skills. The courses are certified by the University of Southampton and run in collaboration with Cambridge Education Group.

Courses include:

AI and Machine Learning for Business

Fundamentals of Data Science (Technical)

Fundamentals of Data Science (Non-Technical)

Data Security (Technical)

Data Security (Non-Technical)

Data Science for Digital Marketing

MAKING A DIFFERENCE

At the [Web Science Institute \(WSI\)](#) we are committed to making a real impact on society through our research, education and training. We are continually striving to increase income, grow capacity and extend our reputation through our impact and enterprise. Here we showcase some of the ways we are making a difference:

Z21 Innovation Fund – accelerating university start-ups

We are driving innovation into the real world through the Z21 Innovation Fund that is helping accelerate University start-ups.

In collaboration with the [Solent Local Enterprise Partnership \(LEP\)](#), the Z21 initiative is investing £1m into start-ups, giving them a boost towards investment, rapid growth and creating high-tech jobs in the Solent region.

Z21 Innovation Fund grants are available for Minimum Viable Products (MVPs) and Pre-Seed Funding.

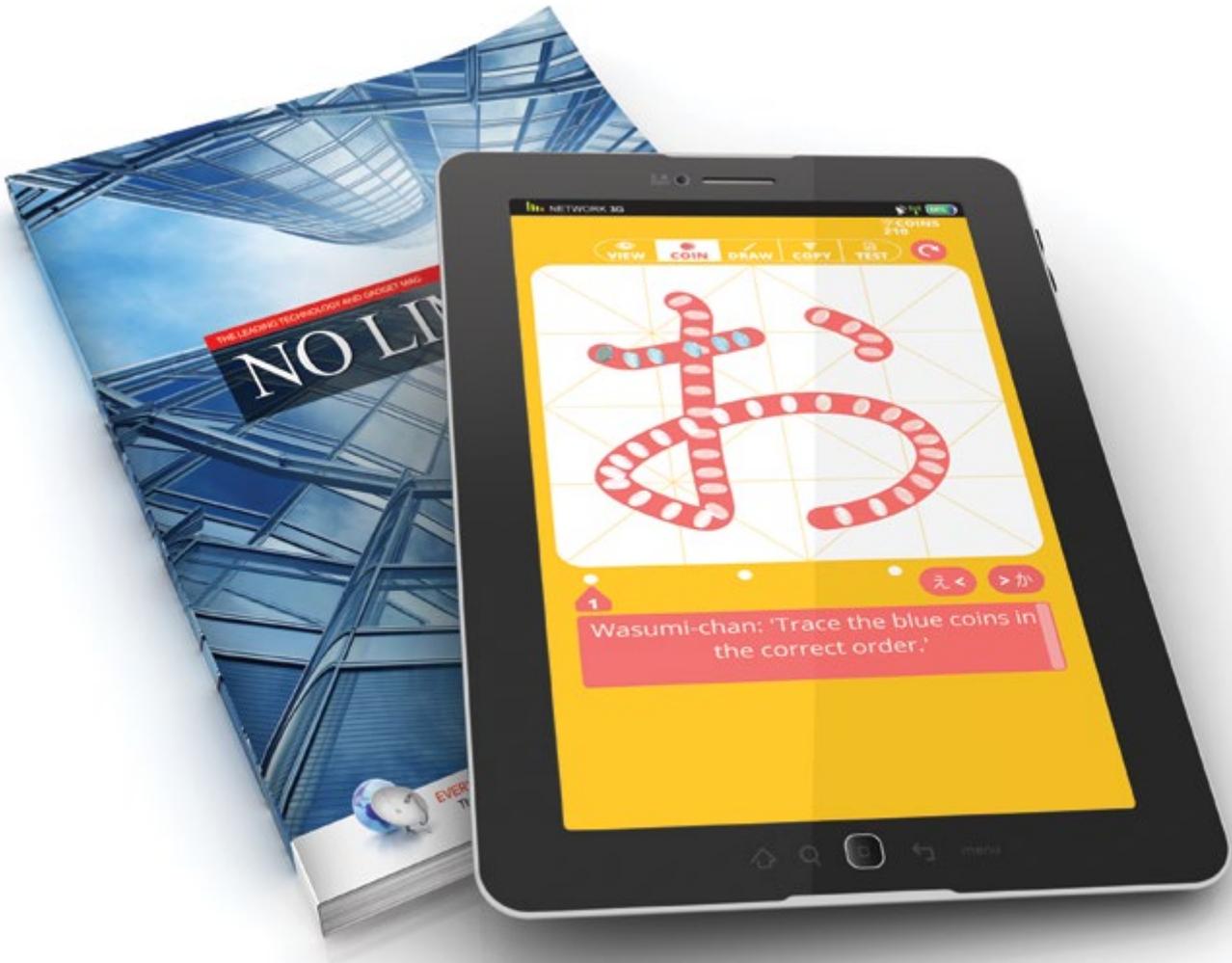
MVPs – applicants can apply for up to £6,300 for three months to achieve a product that is market fit and to gain traction with users.

Pre-Seed Funding – successful MVP projects can apply for Pre-Seed Funding of up to £31,500 for a further six months to become ready to raise Seed Investment. All successful projects will receive support from [Future Worlds](#), Southampton’s on-campus start-up incubator, which has a valuable external network of mentors, investors and experts. Projects will be invited pitch to investors at a Demo Day at the end of the six-month period.

Successful projects include:

BOON – is a Web-based AI assistant that helps struggling gift buyers find inspiring products from across all their favourite stores. Developed by Southampton graduates Dylan Grey and Mike Oakley, it is an online search tool that offers each customer a completely personalised set of 50 gift recommendations in just two minutes. Using cutting-edge machine learning algorithms, the tool generates a set of dynamically generated questions to understand the likes, dislikes and personality of the person each customer is buying for. Dylan said: “The funding has been invaluable at this stage; we’ve expanded our team, allowing us to rapidly develop. The investment supported us in the lead up to our launch.”

boon.gifts



Aura Vision – is a video AI platform that measures and improves shopping experiences producing valuable insights into customer behaviour to help boost sales and marketing performance. Developed by machine learning experts at Southampton, the deep learning technology uses CCTV cameras to capture shopper information, without accessing sensitive personal information. The data helps retailers understand how shoppers move around and experience their stores. The company recently joined the Collider accelerator, one of Europe’s leading hubs for the marketing, advertising and technology (MadTech) industry. CEO Dr Daniel Martinho-Corbishley said: “The Z21 fund provided us with a really valuable opportunity to get our idea off the ground in the first few months.”

auravisionlabs.com

Perfect Score – is an EdTech start-up that helps users to learn Japanese using advanced AI technology in an intuitive, gamified environment. An AI tutor gives insightful real-time feedback as you write, encouraging players to battle with friends to achieve the elusive perfect score. The free downloadable drawing app uses a bespoke handwriting recognition algorithm. The company aims to set up a solid distribution network across East Asia and deploy Chinese and Korean language versions of the language learning app. Travis Ralph-Donaldson, creator of Perfect Score, said “Z21 has given us a fantastic opportunity to grow and develop our product into world leading software, which is already receiving high investment interest for further seed funding.”

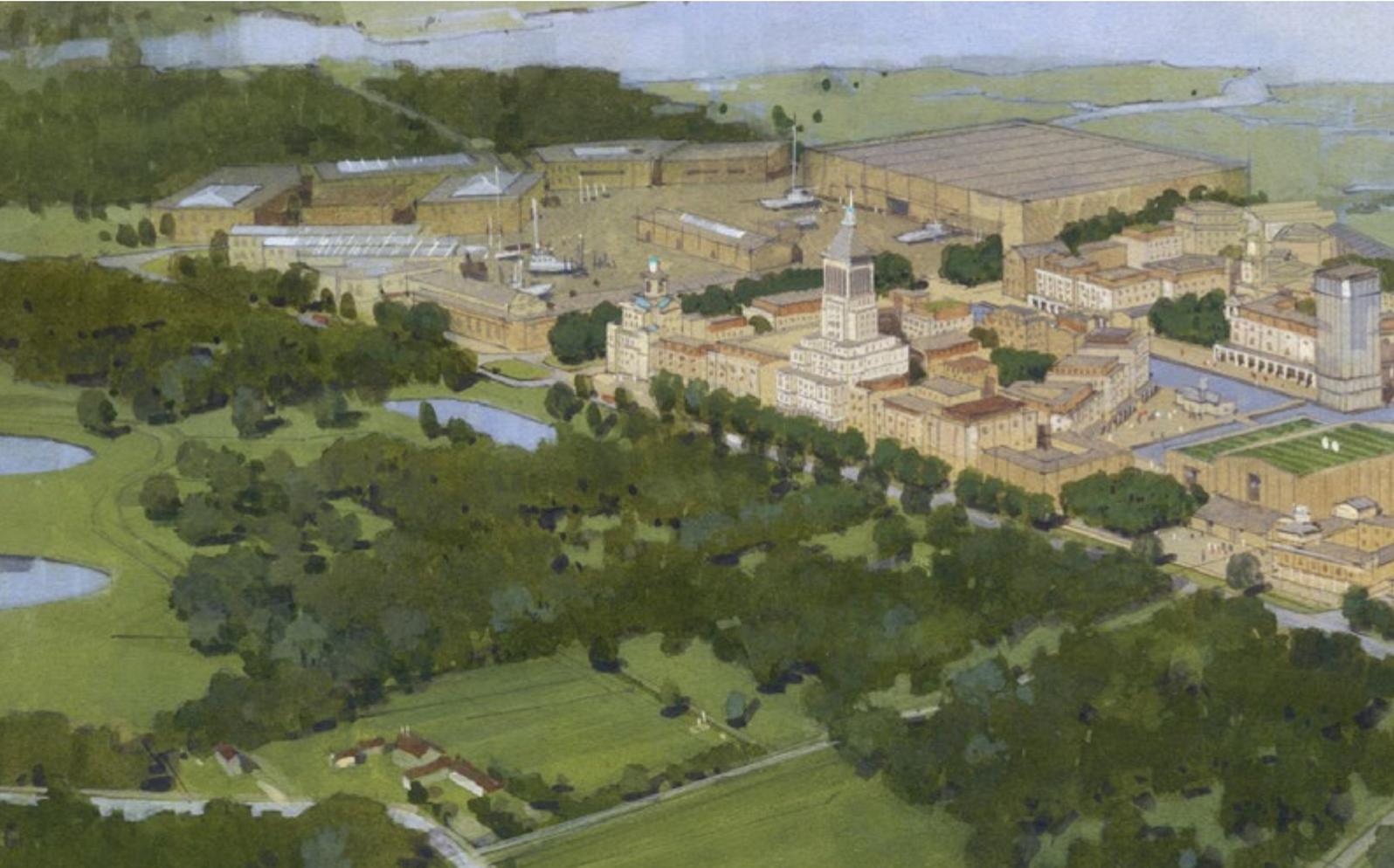
perfectscore.app

Encouraging small businesses

The University’s [Small Business Clinic](http://www.southampton.ac.uk/law/undergraduate/study/pro_bono/small-business-clinic.page) provides free practical advice to students and staff who are interested in setting up or running a small business in the UK. The Clinic is run by Southampton Law School in collaboration with experienced entrepreneur and investor Renold Tang and local law firm Coffin Mew. They have also recently put on a series of seminars exploring some of the key challenges in setting up your own business.

www.southampton.ac.uk/law/undergraduate/study/pro_bono/small-business-clinic.page

Enterprise and impact



Creating an 'intelligent' town

The Web Science Institute (WSI) has partnered with [Fawley Waterside Limited](#) to embark on building a new 'intelligent' town on the outskirts of Southampton.

The new habitation is being built on the former site of the UK's largest oil-fired power station, and will be built from the 'Internet up' fully considering what is required to create a successful and happy community.

The WSI is part of the Core Technical Group that is charged with ensuring the town has 'intelligent' infrastructure. Other members of the Group include Cisco, IBM, Siemens and Vodafone.

Aldred Drummond, Chief Executive of Fawley Waterside Ltd, said: "We have the opportunity to create a place that will be enormously beneficial to both new and existing communities and be the spearhead for showing how the UK has a new blueprint for successful town building."

Fawley Waterside will occupy Hampshire's most extensive brownfield site and will be set between the exceptional natural landscape of the New Forest National Park and the active waterways of the Solent.

WSI Executive Director Professor Dame Wendy Hall said: "We are delighted to be part of this group and to help balance the social and the technical aspects of such an ambitious and brave project."

Connected Southampton

The Web Science Institute (WSI) is collaborating with Southampton Connect – a group of senior representatives from key organisations across the city who meet to drive change and address the major challenges facing Southampton.

Connected Southampton is a project that brings together WSI academics who have research expertise in data, web observatories, ethics, management, social machines and Web Science, to work with senior city

representatives to help develop a virtual infrastructure that will aim to boost the city's economy and improve residents' quality of life.

Southampton currently has an established social and economic framework, but, like almost all other major cities in the UK, it lacks the virtual infrastructure that can be used as a base to grow the economy, help its people prosper, and improve the support available for small and medium enterprises (SMEs).

Developing this vital complementary infrastructure to enhance prosperity will ensure the city is in prime position to exploit its full potential and play an increasingly active part in shaping its future.

The city will harness the pioneering research that has come out of the University over the last decade, to build a socio-technical framework that will have the potential to deliver significant impact across Southampton, including increasing the numbers of tourists visiting the city and attracting more businesses to start up in the area.



The vision for an 'intelligent' town.
Image courtesy of Fawley Waterside Ltd

Tom Barnett, Chair of the WSI Advisory Board, said: "There is a long-term vision for the future of Southampton and we will be using the expertise generated at the University to make sure the underlying virtual infrastructure is in place for the city to embrace the potential of the network age and ensure a 'Smart Future'."

The project team hope that their prototype framework will be piloted at a regional and national level and ultimately used as a demonstrator for implementing virtual infrastructure in cities around the world.

Influencing policy

The Web Science Institute (WSI) is working with Public Policy Southampton to encourage Southampton's Web and Internet research to inform policy in innovative and impactful ways.

Some of the projects that are already having an impact include:

AI Review – WSI Executive Director Professor Dame Wendy Hall co-lead a major review for the

government of the UK's AI industry, setting out proposals for how Government, academia and industry can work together and increase the use of AI across the economy.

Southampton City Council – A WSI team including Dr Matt Ryan, Professor Susan Halford, and Professor Les Carr have supported Southampton City Council to develop the Southampton People's Panel - a citizen's panel that has played an important role in bridging knowledge gaps between Southampton residents and government. This has been followed up with two citizen social science projects recruited from the panel aimed at improving recycling rates in the city.

eIDAS – Southampton researchers are publishing a paper on why and how the Interoperability Framework set up by the EU eIDAS Regulation for electronic identification should be adapted to enhance the level of data protection. Their work was carried out for the Horizon2020 FutureTrust project and they recently presented the outcome to the European Commission.

Four internets – WSI Executive Director, Professor Dame Wendy Hall, and Director Dr Kieron O'Hara have published a policy paper - Four Internets: The Geopolitics of Digital Governance - that describes four emerging views of how best to govern the internet, exploring how each plays a geopolitical role and is championed at the national level. They argue that we need to be prepared for the internet that we know to evolve unpredictably, and work to ensure that it remains beneficial for humankind.

"We feel strongly that WSI researchers can and should make a difference, and we particularly encourage our students to address real-world problems, reaching out to policymakers, NGOs and business leaders, to build the research networks of the future."

Dr Kieron O'Hara
WSI Director

REACHING OUT

The [Web Science Institute \(WSI\)](#) is a truly global organisation. Our academics are taking the message about the WSI and our research to all corners of the globe through a broad range of international visits and activities.

Spreading the word

The WSI Directors deliver keynote talks and lectures about Web Science and Artificial Intelligence at numerous locations around the world, and our Web Science students take part in research partnerships to build links with other organisations. Recent locations have included Hong Kong, Taiwan, Amsterdam, Paris, Naples, Singapore, China, Malaysia, USA and Australia.

Professor Susan Halford co-organised a prestigious Dagstuhl Workshop, with colleagues from the US and Germany, inviting several WSI Directors and 20 other leading Web Scientists from around the world to reflect on 10 Years of Web Science. This will inform a new manifesto for Web Science that will be published in 2019.

W3C UK and Ireland Office

We are home to the World Wide Web Consortium (W3C) UK and Ireland Office - an international community that develops open standards to ensure the long-term growth of the Web. We help the W3C achieve its mission to broaden participation in W3C activities of more diverse stakeholders from the UK and Ireland. At the WSI we are fostering relationships with UK technology and policy leaders and helping to promote the adoption and implementation of W3C standards in the UK.

Web Science Trust

The Web Science Trust (WST) is a registered charity that is hosted by the University of Southampton. It aims to support the global development of Web Science. The WSI was a founder member of the International Web Science Trust Network of Laboratories, which brings together world-class research laboratories to support Web Science research and education. The network now has 20 international research groups. The WST has founded an annual Web Science Conference and a Summer School.

Distinguished Lectures

We run a series of distinguished lectures and seminars from leading experts around the globe offering opportunities for our staff and students to benefit from wide-ranging academic and industry expertise. Speakers have included:

- **Professor Mireille Hildebrandt (2017)**
Vrije Universiteit, Brussel/Radboud University, Netherlands
- **Professor Jeanette Hoffman (2016)**
Social Science Research Centre, Berlin
- **Professor Rob Kitchin (2018)**
Maynooth University Social Science Institute
- **Professor Chris Lintott (2015)**
University of Oxford/Zooniverse
- **Paul Maltby (2017)**
Department of Communities and Local Government
- **JP Rangaswami (2015)**
Deutsche Bank
- **Professor Alex Rehdig (2018)**
Harvard University
- **Professor Richard Rogers (2018)**
University of Amsterdam
- **Tom Steinberg (2016)**
mySociety
- **Professor Barry Wellman (2014)**
NetLab, University of Toronto



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