



2006-2016

A celebration of **10 Years** of the Science of the Web

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We also wish to acknowledge the contribution of colleagues who acted as supporters and research fellows for the forerunner to the Web Science Trust, the Web Science Research Initiative (WSRI).

# CELEBRATING 10 YEARS OF WEB SCIENCE

**2016 marks the tenth anniversary of the academic discipline of Web Science. It was in 2006 that the paper ‘Creating a Science of the Web’ appeared in the journal *Science*. The paper’s authors: Tim Berners-Lee, Wendy Hall, James Hendler, Nigel Shadbolt, and Daniel Weitzner, set out their concerns about the future direction of the Web, and emphasized the need to establish a clear research agenda ‘aimed at understanding the current, evolving, and potential Web’:**

*“If we want to model the Web; if we want to understand the architectural principles that have provided for its growth; and if we want to be sure that it supports the basic social values of trustworthiness, privacy, and respect for social boundaries, then we must chart out a research agenda that targets the Web as a primary focus of attention.”*

The authors called for the new discipline of Web Science to be inherently interdisciplinary, to tackle research challenges around ownership and access to data, and to provide better understanding of the social and public-policy challenges that can determine the transformative value of the information available on the Web.

“The Web needs to be studied and understood as a phenomenon, but also as something to be engineered for future growth and capabilities,” they wrote. “Web Science is about making powerful new tools for humanity, and doing it with our eyes open.”

The Web Science Trust was established in 2009 to raise awareness of Web Science and to build the foundations and framework for the new discipline. The Trust has promoted and encouraged multidisciplinary and collaborative research, supported curriculum development in universities and research institutions to train future generations of Web Scientists, and provided thought leadership through a global forum of interested individuals, companies and institutions – led by WSTNet, the global community of Web Science Trust labs.

In their 2011 Review, the Directors wrote: “We want to show how our understanding of Web Science will promote growth and innovation in our economies. We must nurture the next generation of entrepreneurs who will build the Web companies of the future. The business of Web Science needs our attention too.”

Ten years later, as can be seen in the pages of this report, much has been achieved in establishing Web Science as an academic discipline in the world’s universities and research centres, in creating a growing and active community that brings together knowledge and insights from multiple directions, and in promoting and sharing a body of knowledge and research that can play a central

role in shaping appropriate policy directives, as well as enabling a better understanding of the central importance of the Web in all our lives.

This volume celebrates Web Science in all its manifestation and the many directions in which it has developed over the 10 years of its existence. It highlights the events and institutions which continue to support its future development and, most importantly, the people of Web Science – from leading researchers to students around the world, with their hopes for the future. It celebrates the global network of WSTNet labs whose support has enabled Web Science to promote distinctive agendas – from Tsinghua in China to the Annenberg Network in California. It charts some of the key landmarks achieved in research, education, and thought leadership, and looks forward to what can be expected in the future from Web Science and its growing community.



*Professor Rodney Brooks welcomes the press at the initial launch of the Web Science Research Initiative at MIT in 2006, with Tim Berners-Lee, Wendy Hall, Daniel Weitzner and Nigel Shadbolt.*

# WEB SCIENCE TIMELINE 2006-2016

## 2006



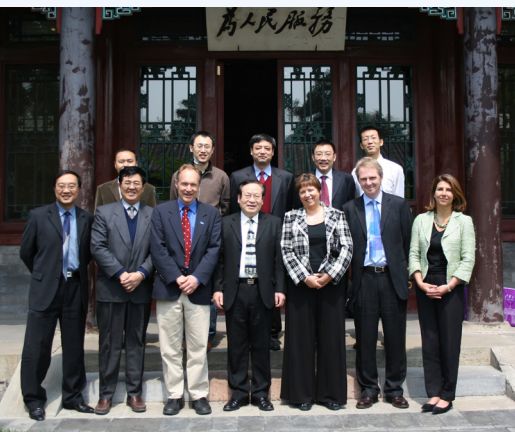
The Web Science Research Initiative is launched at MIT, a joint initiative between the University of Southampton and Massachusetts Institute of Technology, under the direction of Professor Tim Berners-Lee, Professor Wendy Hall, Professor Nigel Shadbolt, and Daniel J. Weitzner. WSRI is intended to generate for the first time a research agenda for understanding the scientific, technical and social challenges underlying the growth of the Web. 'A framework for Web Science' is published in *Foundations and Trends in Web Science*.

## 2007

Professor Sir Tim Berners-Lee introduces Web Science to the world in his testimony on the future of the Web at the US House of Representatives:

*"As the Web passes through its first decade of widespread use, we still know surprisingly little about these complex technical and social mechanisms. We have only scratched the surface of what could be realized with deeper scientific investigation into its design, operation and impact on society. Robust technical design, innovative business decisions and sound public policy judgement all require that we are aware of the complex interactions between technology and society. We call this awareness Web Science: the science and engineering of this massive system for the common good."*

## 2008



Professors Dame Wendy Hall, Sir Tim Berners-Lee, and Sir Nigel Shadbolt address the Royal Society of Arts, London, on the new discipline of Web Science.

The Graduate School at Shenzhen, Tsinghua University, in China, and the University of Southampton agree to set up a joint laboratory focused on Web Science: The Tsinghua-Southampton Web Science Laboratory at Shenzhen.

The University of Southampton wins funding for a new Centre for Doctoral Training in Web Science, directed by Professor Dame Wendy Hall, and involving interdisciplinary doctoral research and training in Web Science in collaboration with Health Sciences, Law, Economics, Sociology, Mathematics, Psychology, and the Humanities.

## 2009



The first Web Science conference takes place in Athens with the theme 'Society on the Web', and is opened by the President of the Greek Republic. It is the first conference to bring computer scientists together with social scientists to explore the human behaviour and technological design that shape the Web and its use.



The Web Science Trust, established in 2009 by the Founding Directors of WSRI, is granted charitable status, in a move which will enable greater focused, global development of the discipline:

**2010**

*'The establishment of the Web Science Trust and the granting of charitable status marks a significant stage in the global development of the discipline,' said Professor Wendy Hall. 'It is a hugely important development for the community - in fact it feels like Web Science is "coming of age".'*

Professors Noshir Contractor, Helen Margetts, Sir Tim Berners-Lee, and Sir Nigel Shadbolt are joined by JP Rangaswami and Dr Aleks Krotoski in a discussion on 'Why Study the Web?' held at the Royal Society in London. Professors Bill Dutton of Oxford University and Jim Hendler of Rensselaer Polytechnic Institute also take part.

The annual Web Science Conference is held at Raleigh, Durham, hosted by North Carolina State University and the University of North Carolina, Chapel Hill, and coincides with the World Wide Web Conference (WWW2010).

'Web Science: A New Frontier' takes place in London. The event organizers are Nigel Shadbolt, Wendy Hall, and James Hendler. Speakers include Albert-Laszlo Barabasi, Jennifer Chayes, Jon Kleinberg, Jianping Wu, Manuel Castells, Helen Margetts, Luis von Ahn, Ramesh Jain, Noshir Contractor, Jonathan Zittrain, and Tim Berners-Lee.

The first Web Science Doctoral Summer School is held at Rensselaer Polytechnic Institute.



**2011**

'Profiting from the New Web' is the title of a one-day conference held in London, with an audience drawn largely from the technology sector. The day's agenda addresses new ways of doing business enabled by the Web, with particular focus on open data, new platforms, social analytics and the pervasiveness of new media in business communications.

The annual Web Science conference takes place in Koblenz, Germany, the first conference in the series to be designated an ACM (Association of Computing Machinery) Conference. It is also supported by the International Communication Association (ICA), and by the ACM Special Interest Group on Hypertext, Hypermedia and the Web (SIGWEB). The conference attracts 198 submissions from 30 countries.

The Trust's Review lists the expanding Network of Web Science Trust Labs: Annenberg Networks Network, University of Southern California; Decentralised Information Group, Massachusetts Institute of Technology, Department of Computer Science, VU Amsterdam; Digital Enterprise Research Institute, NUI Galway; Institute for Web Science and Technologies, University of Koblenz-Landau; Oxford Internet Institute, University of Oxford; SONIC Lab, Northwestern University; Tsinghua-Southampton Web Science Laboratory at Shenzhen; Web Science Research Centre, Rensselaer Polytechnic Institute; Web Science Research Group, University of Southampton.



## 2012



WebSci'12 – the ACM Web Science Conference 2012 is held at Evanston, Illinois. The first Chinese Web Science Conference is held at Shenzhen.

Professor Sir Tim Berners-Lee, creator of the World Wide Web, has a special role at the spectacular opening ceremony of the Olympic Games in London. In the part of the show that paid homage to the UK's role in industrial innovation, Sir Tim is seen sitting at a computer screen, as the World Wide Web is acknowledged to have brought people together and provided unimagined opportunities for the world's communications and creative industries. Sir Tim's live tweet: 'This is for everyone', appears around the stadium as members of the audience display the words on pixelated light pads.

## 2013



WebSci'13 – the ACM Web Science Conference 2013 is held in Paris at the Palais des Congrès and includes a Fringe programme for the first time.

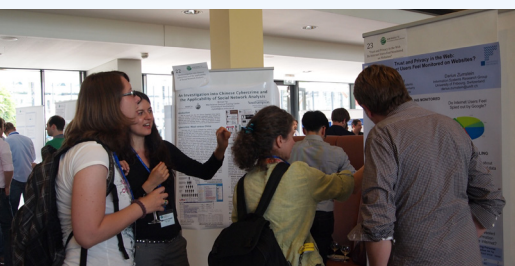
The University of Southampton launches the UK's first multidisciplinary Web Science degree for undergraduate students. At the same time it launches a pioneering free Massive Open Online Course (MOOC) on Web Science, in partnership with FutureLearn (part of the Open University).

The University of Southampton launches its new Web Science Institute, directed by Professor Dame Wendy Hall and Professor Sir Nigel Shadbolt along with Professor Les Carr and Professor Susan Halford, to investigate how the World Wide Web is changing the world and the world is changing the Web.

## 2014

*"Web Science offers the insights necessary to understand the flow of data and knowledge around the globe, and the social and technical processes that can turn gigabytes and terabytes of raw data into valuable new applications or evidence-based policy. It also helps us appreciate the threats to our online identities but also the opportunities of allowing our personal digital avatars to participate in new kinds of online businesses, online politics and online social engagements."*  
Professor Les Carr, Director, CDT for Web Science Innovation

The UK Government makes another investment in doctoral training in Web Science with the award of further funding for the Centre for Doctoral Training in Web Science Innovation, which will train 65 students over the course of five years:



For the first time Web Science has its own research track in the International World Wide Web Conference at WWW14.

WebSci'14 is held at Indiana University. The Web Science and Big Data Analytics Summer School takes place at the National University of Singapore. The *Journal of Web Science* is launched. An updated version of 'A Framework for Web Science' is published.

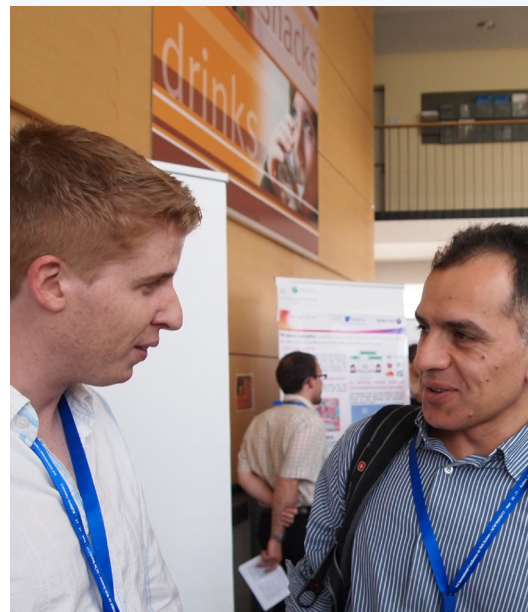
# 2015

India's first Web Observatory is launched by Professor Dame Wendy Hall and Professor Sowmyanarayanan Sadagopan at the International Institute of Information Technology, Bangalore (IIIT-B).

In collaboration with ANZOG and the University of South Australia (UNSA), a Web Observatory is installed to help local/regional government understand the issues and opportunities around an ageing population.

The Web Science Institute (WSI) celebrates its first anniversary at a special event in London, showcasing interdisciplinary Web Science research, with a panel discussion on 'Privacy and Trust in the Era of Big Data Analytics'. Professor Les Carr, WSI Director, says: "The Institute leverages its expertise in computational, social science and humanities research to provide Masters and interdisciplinary doctoral training that examines the disruptive effect of the Web's data and social media technologies on our personal and professional lives."

WebSci'15 is held at Oxford University's Keble College.



# 2016

The ACM Web Science 2016 Conference takes place in Hannover, Germany, organized by L3S Research Center. Panels cover 'Computational Social Sciences', 'Privacy and Internet Governance', and '10 Years of Web Science'. Keynotes speakers are Daniel Miller, Andrew Tomkins, Daniel Olmedilla, Ricardo Baeza-Yates, Jure Leskovec, and Helen Margetts.

Celebrating **10 Years** of the Science of the Web

## WST-10



As we celebrate the tenth anniversary of Web Science, I am excited about the aspirations to engineer a "Web We Want" – to design an information space that is open and inclusive of diverse, global populations.



**Lindsay Poirier, Rensselaer Polytechnic Institute**



I'm extremely excited about the existence of Web Science and its tenth anniversary. To my way of thinking, the field of Web Science plays a crucial role in a modern scientific community, since it addresses well-defined and newly emerged research problems from multiple views.



**Aleksandr Farseev, NUS Singapore**





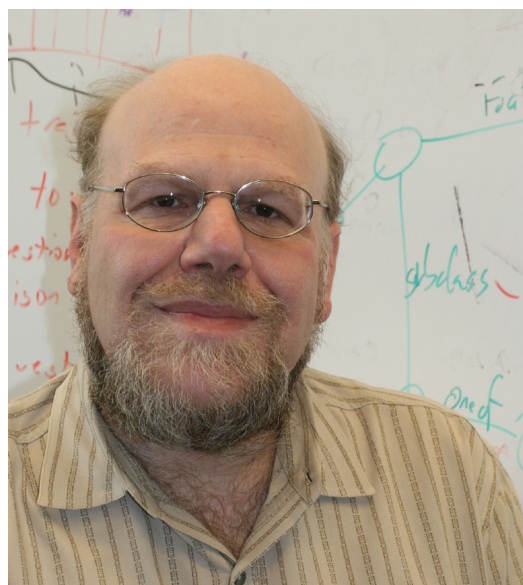
# HOW THE WEB HAS CHANGED

## JAMES HENDLER

**It is often said that the expression “May you live in interesting times!” is an ancient Chinese curse. In reality this story is probably apocryphal, but the notion behind it is not – times of great change can produce great opportunities, but also significant personal stress or major societal upheaval.**

Many things can cause change, but technological innovation is often a facilitator. And one challenge for people during times of change is understanding the realities of these technologies. It is a tough challenge to separate out the hype generated by those who stand to gain financially and otherwise from the truth of what is actually being achieved. News media and social networking sites offer little help – the reporters are often no more versed in the technologies than the people they are writing for. The optimists among them see reason for hope; the pessimists, reasons for fear. And the truth, when it is finally found, usually lies in a far more complex and nuanced space, somewhere between the two.

The Web is a constantly changing place of technological and social innovation. The first decade of the current century is often called the age of “Web 2.0.” This was a marketing term primarily developed to capture the idea of making the Web a two-way interconnection media (read and write, as opposed to just a passive amusement space like television).



*Professor James Hendler*

In reality, this was part of the original proposal for the Web as envisioned in Tim Berners-Lee's now famous design document, but it really took off in blogging, tagging, social networking and microblogging. Entire fields of study grew around these areas, including the field of Web Science which both serves as a place to bring together people studying these individual effects, as well as being an exciting interdisciplinary research field in its own right.

In the past few years, we've been seeing other changes taking us way beyond Web 2.0. Some of these raise questions about the very definitions of what the Web is and how it can be used. With the increasing penetration of smart-phones, with their application-based approach to functionality, the nature of people's uses of the Web is changing, or perhaps, to put it more correctly, evolving. The essential nature of the Web remains unchanged, but the way it is changing how people interact is beginning to look new and different.

Whereas many people think of the Web as “that thing behind the browser,” to the Web Scientist it is so much more. These mobile applications run on top of the Web architecture, meaning that as well as being the infrastructure that permits you to use a browser or search for a file, the Web is now a full-fledged development platform in its own right. To a user invoking an application, say Facebook or Whats App, on their phone, it seems like the Web has disappeared. They interact with each other through an interface that feels more like messaging and less like browsing and search. However, every time that user clicks on a photo or video, posts an update, or exchanges messages with friends, the architectures that support the Web are very much in play. To the Web Scientist the metaphorical atoms and molecules that make up the physical parts of the Web are URLs, protocols, Web languages, and “rest” interfaces that bind them together. Mobile apps are made up of those same things, generally configured in the same way, so the challenges of supporting and modeling the new Web are not too different from the old.



On the other hand, to a Web Scientist the metaphorical laws of physics that describe the macro-level interaction of those components are very different. Rather than principled laws like those of the physical universe, it is the actions of humans that make the Web what it is -- whether they are the people sending out tweets, writing articles in Wikipedia, passing pointers to videos on YouTube, or using any of the myriad of other services and applications that make up the modern Web. And as the nature of those interactions grows and changes with new devices, new applications, and new ways of communicating, studying the network of people supported by the Web-based

network of machines gets continually more challenging. Because of all this, as our knowledge of the properties of the Web infrastructure itself becomes increasingly clear, the new ways people are engaging with it make our field a continually changing universe requiring new ways to be observed and studied. And as the Web grows and evolves, whether one is an engineer working to keep the Web growing and thriving, a scientist trying to understand its basic properties, or a social scientist trying to understand the ways the Web is changing society itself, there is really only one way to describe the thrill of our endeavour: We are truly living in interesting times!

***James Hendler is Tetherless World Professor of Computer, Web and Cognitive Sciences, and Director, Rensselaer Institute for Data Exploration and Applications; he has been Chair of the Web Science Trust Board since 2014.***



# THE WEB OBSERVATORIES

## THANASSIS TIROPANIS

**The Web Observatory Project is a global effort led by the Web Science Trust, its network of WSTNet laboratories, and the wider Web Science community.**

The goal of the project is to create a global distributed infrastructure that will foster communities exchanging and using each other's Web-related datasets as well as sharing analytic applications for research and business Web applications. It will provide the means to observe the digital planet, explore its processes, and understand their impact on different sectors of human activity.

The project is creating a network of separate Web observatories, collections of datasets and tools for analysing data about the Web and its use, each with their own use community. This allows researchers across the world to develop and share data, analytic approaches, publications related to their datasets, and tools. The network of Web observatories aims to bridge the gap that currently exists between big data analytics and the rapidly growing Web of 'broad data', making it difficult for a large number of people to engage with them.

As a global project to develop an open and decentralized space for Web Scientists to share and discover these Web data, methods and tools, the Observatory has helped create new open metadata standards. There are currently 11 linked Web Observatories around the world, with more coming online in the future. Users of a Web Observatory node can publish metadata about resources (e.g. datasets or applications). Further, they can ask a WO node to enforce access control on data they catalogued or resources that they wish to share

with specific individuals instead of the general public. These nodes couple datasets with analytical and visual tools and are intended to provide insight for researchers through hindcasting of longitudinal data and streaming of real-time data to develop and evaluate theories of social interactions (social machines) on the Web. Such heterogeneous, distributed ('broad') data is a *sine qua non* of social machines research, yet its collection and aggregation can be ethically challenging. A few current examples of Web Observatory nodes include:

- **The Southampton Web Observatory (SUWO) focusing on Web Science, social machines and interdisciplinary research.**
- **The University of South Australia WO focusing on health and care for the elderly.**
- **The Korean Advanced Institute of Science and Technology focusing on disaster management.**
- **The Rensselaer Polytechnic Institute WO focusing on Web Science, and Health.**
- **The NeXT Social Observatory (National University of Singapore) focusing on brands and social graphs and social impact measurement**
- **The Truthy Observatory (University of Indiana) focusing on political opinion, information diffusion and the identification of organic user-generated content vs. "Astroturf" (content automatically-generated by bots)**

The Web Observatory passively monitors open streams of Web data, but it still raises important questions on the responsibilities and ethical obligations of observers and data holders. This passive observation covers the letter of the principles enshrined by the legal and ethics boards in our research organizations, but we must still question if it is inconsistent with their spirit.

Observatory interactions currently take place on the tacit assumption that all data postings, which may or may not be actually hosted by the organisation that manages the Observatory node, have been through the ethical validation process of the hosting organisation. Whether this is tenable in the long term, at scale, is an open question. At its current state of development, the Web Observatory needs a light touch ethical regime premised on good faith participation, and as it matures, the infrastructure is likely to incorporate techniques or formalisms to negotiate and verify the ethical commitments of participating data controllers.

The Web Observatory also raises questions on the responsibility of action/inaction on what we observe. What responsibility do we have in reporting abuse or a crime? What responsibility do we have in reporting or turning over our collections to third parties or governments? What if a government requests our data collections for political pur-

poses we don't agree with, or against recognized human rights? Due to the global nature of the data collected, these questions cross international and intercultural boundaries. The mere act of collecting and archiving these data creates legal and ethical risks that are often unforeseen.

Further work in the area of legal and ethical frameworks is needed to help researchers navigate these challenges. Indeed, the Web Observatory, as a global resource, is a work in progress, and will need to respond quickly to issues as they arise. Furthermore, it is a decentralised network of autonomous nodes, whose governance is distributed (institutionally, but also geographically), so that jurisdictions and cultural assumptions will vary across nodes. Centralisation of the ethical discourse will always be inappropriate; the question will be how easy it will be to manage ethical data exchange in such an environment.

*Dr Thanassis Tiropanis*  
*Director, Web Observatory Project*  
*University of Southampton*



Celebrating **10 Years** of the Science of the Web

**WST-10**



I consider it a privilege to be a part of the Web Science community and be involved with the celebrations of its tenth anniversary.



***Sophie Parsons, University of Southampton***



On the tenth anniversary of Web Science, I'm looking forward to realizing the dream of a constellation of Web Observatories all working together.



***Clayton Davis, The Indiana University Network Science Institute***



The tenth anniversary emphasizes the need for our continued attention and responsibility to study the ever-evolving nature of the Web. As a part of the Web Science community, I am excited to explore the new changes and challenges facing us in the next decade.



***Jaimie Y Park, KAIST***



# WST: NETWORK OF RESEARCH LABS

## STEFFEN STAAB



Professor Steffen Staab  
WSTNet Labs Chair

The Web Science Trust Network of research labs ([wstnet.webscience.org](http://wstnet.webscience.org)) has the mission to perform, support and disseminate the study and engineering of the Web in ethical manners benefitting the development of society. Towards this objective, WSTNet is designed to further activities that advance global research, education, outreach to industry, and the exchange of ideas.

**Global Networking in Research:** WSTNet brings together eminent institutions worldwide from Korea, China and Australia in the East, through Europe, and into the Americas. The network is open to well-qualified laboratories in any country.

**Global Exchange of Researchers:** WSTNet promotes and performs the exchange of researchers in Web Science, as a means for supporting interdisciplinary and multicultural research activities.

**Global Projects:** WSTNet promotes and performs key projects that cannot be developed by individual institutions but that are enhanced by the powerful global network.

**Global Education:** WSTNet aims to oversee international graduate schools, such as the WSTNet Web Science Summer School series ([wwsss.webscience.org](http://wwsss.webscience.org)) to further the interdisciplinary education of Web Science scholars. It helps to organize the yearly Web Science conference, and runs workshops, webinars and symposia at venues around the world.

**Outreach to Industry:** WSTNet has strong ties with participants from industry who acknowledge the need for understanding the Web and contributing to its continued sound operation. We involve these participants in discussions and events that help them to develop strategic agendas for shaping companies of the future that benefit society.

Thus, WSTNet stands for the academic and practical diversity that an interdisciplinary and broad field like Web Science requires. We are happy to introduce you to a few of our many highly gifted researchers from WSTNet labs all over the globe in the pages of this celebration.

Celebrating **10 Years** of the Science of the Web

**WST-10**



Enrolling in a Master's programme one year after it began was full of uncertainties. At that time, knowing that WSTNet brought together Web Science-related labs around the world really helped me with taking this step. Looking back I couldn't be happier with my decision.

**Martin Körner, WeST Koblenz**







ANNENBERG NETWORKS NETWORK

BONN-AACHEN INTERNATIONAL CENTRE FOR INFORMATION TECHNOLOGY (B-IT)

BRAZILIAN INSTITUTE OF WEB SCIENCE

CARDIFF UNIVERSITY

FRAUNHOFER-INSTITUTE FOR OPEN COMMUNICATIONS SYSTEMS (FOKUS)

IU NETWORK SCIENCE INSTITUTE

KOREA ADVANCED INSTITUTE OF SCIENCE AND TECHNOLOGY (KAIST)

L<sub>3</sub>S RESEARCH CENTER, LEIBNIZ UNIVERSITY

MIT CSAIL DIG

MIT HUMAN DYNAMICS LAB

NUS SINGAPORE

OXFORD E-RESEARCH CENTRE

OXFORD INTERNET INSTITUTE

SONIC LAB NORTHWESTERN UNIVERSITY

TETHERLESS WORLD CONSTELLATION, RPI

THE NETWORK INSTITUTE VU UNIVERSITY AMSTERDAM

THE WEB SCIENCE INSTITUTE, SOUTHAMPTON

TSINGHUA-SOUTHAMPTON WEB SCIENCE LABORATORY – SHENZHEN

WeST KOBLENZ

# PEOPLE OF WEB SCIENCE



**David De Roure**  
Oxford e-Research Centre

**David De Roure** is Director of the Oxford e-Research Centre, a multidisciplinary applied research department in Oxford which innovates in digital research methods. The research simultaneously embraces distributed computing and the crowd, anticipating a world of computation and citizens - social machines - at scale. This leads to a distinctive perspective on Web Science research characterised by a combination of new and pervasive technology, such as Internet of Things, coupled with social processes at scale - all with a backdrop of increasing automation. The rich intersection of disciplines in the Centre has led to methodological innovation in the Web Science area; for example, turning Web Observatories into Web Laboratories by instrumenting social machines in-the-wild, and using a humanities research method, prosopography, to study the social machines ecosystem. David is particularly interested in emergent behaviours in sociotechnical systems with the adoption of automation and machine intelligence, in all aspects of life including the knowledge infrastructures of scholarship. As host of Web Science 2015 he encouraged debate on the Internet of Things and on the ethics of Web Science. As well as promoting the important role of Web Science in understanding our co-created future, he supports training in Web Science methods and has introduced a Social Humanities workshop at the Digital Humanities Oxford Summer School.



**Helen Margetts**  
Oxford Internet Institute

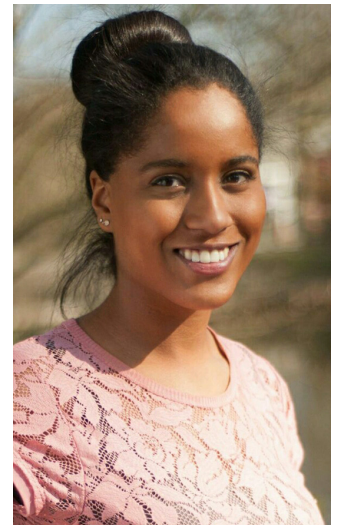
**Helen Margetts** is Professor of Society and the Internet and the Director of the Oxford Internet Institute, a multidisciplinary department of the University of Oxford. While located in the social sciences division, the Institute's mission to understand life online requires the full gamut of disciplinary perspectives. So the OII is one of the few departments in a world-leading university that you will find philosophers, psychologists, a physicist and political scientists. Using tools from all these fields, the OII pioneers the methodological and theoretical development needed to underpin Web Science and the growing field of social data science. Helen is a political scientist, investigating political behaviour, digital government and public policy in the age of the Internet, social media and big data. She is excited by the potential of new forms of data and methodological tools to transform the way we understand and explain political systems, and has helped the OII's involvement in the founding of the Alan Turing Institute for Data Science, ensuring that ethics and social data science are on the agenda.

## Gossa Lô

Network Institute, VU Amsterdam

I am a Masters student of Artificial Intelligence working on ICT for Development (ICT4D) research. Together with an interdisciplinary team of dedicated researchers, we focus on developing and deploying innovative ICT applications that enable rural communities in remote regions in West Africa (semi-arid countries and Sahellian regions such as (northern) Ghana, Mali, Burkina Faso, parts of Senegal) to share and gain access to information and knowledge. These applications link radio, mobile phones and the (offline) Web and integrate them with voice-based applications that meet the information needs and bridge the digital gap and long distances that are a daily reality for the rural communities.

The Internet and the World Wide Web as we know them in the West give us easy access to a vast amount of information, whereas such tools are inaccessible to the illiterate in most rural communities in the world. The limited number of supported languages on the Web as well as the fact that its use depends on a steady Internet connection show that the Web is still far from being accessible to everyone.



## Ruqin Ren

Annenberg Networks Network

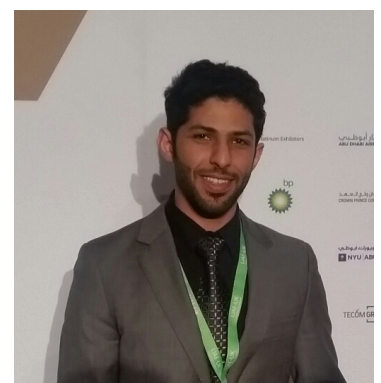


A PhD student at Annenberg School for Communication, University of Southern California, Ruqin is interested in studying online collective knowledge production, group informational behaviours, using social network analysis, semantic analysis and other computational techniques. She believes the study of social group dynamics on the Web could reveal interesting patterns about human behaviours, so we can better understand how to facilitate large-scale collaboration and learning.

## Nasser Alsaedi

Cardiff University

I am a PhD researcher at the School of Computer Science and Informatics at Cardiff University, working within the WST Social Data Science Lab. My current research focuses on data mining, information retrieval, and computational social science. I am interested in understanding the role of social media and the World Wide Web as a conduit for interaction within modern society. My aim is to detect real world events - particularly events that could lead to increased risk to public safety and security - by using data published and disseminated via online communities (specifically the Social Web), and to understand the diffusion and propagation of information in such networks. Automated classification and summarisation of text from massive datasets is at the heart of my research, which has applications in computer science, social sciences, modern policing, and healthcare.





## Clayton Davis

The Indiana University Network Science Institute



My research is centred on building and using Web Observatories for online social networks: our tools allow researchers to see what people are saying, who is saying it, where they are from, and how these ideas are spreading. A problem researchers face with social media is that it is often difficult to search and inspect historical trends. So in addition to observing the current state of the social network, our work enables exploration of how ideas and conversations have evolved over time -- adding the when to the analysis. Right now, I'm excited about using these tools to assist public health professionals in targeting their efforts.

## Louay Bassbouss

Fraunhofer – FOKUS

Louay Bassbouss is a senior research engineer in the Business Unit Future Applications and Media (FAME) of the Fraunhofer Institute for Open Communications Systems (FOKUS) in Berlin. His main research focuses on developing future Web technologies in the fields of cross-device and cross-platform applications and Web of Things. Louay has actively participated in many standardization activities by W3C and HbbTV in these research areas. He is one of the active contributors in the W3C Web of Things (WoT) group. He believes in the true potential of the Web to unlock the product silos in a highly fragmented IoT landscape.



## Jaimie Y Park

KAIST



I am a fourth-year PhD student at the Graduate School of Web Science Technology, KAIST, Korea. Coming from a computer science and business background, my research focuses primarily on understanding consumer behaviour through the lens of social media data. The Web has transformed the way consumers discover, research, and share information about brands and products, and it is now the primary marketing medium in terms of both reach and engagement. Currently, I am interested in analysing how consumers perceive, value, and react to different advertising strategies available on today's online social networking services. Furthermore, I care about understanding what drives users to voluntarily engage in word-of-mouth marketing on the Web and its impact. I hope to provide key insights for businesses and service providers to consider when formulating social marketing strategies that benefit both businesses and consumers on the Web.



## Jaspreet Singh

L3S Research Center

Studying the Web of today, we can gain invaluable insights into various facets of human society, politics, education and fashion to name a few. To contextualise such insights however, we must study the past of the Web. Web archives are a rich source of study for Web scientists, historians and social scientists are being collected by governments and organisations across the world and are growing rapidly in scale. To enable scholars and general users to tap into this valuable resource, we need to build better tools and algorithms to help them. My colleagues and I are exploring new methods of exploring and searching these archives in the context of the ALEXANDRIA project. We aim to build a search engine with novel ranking models, visualizations and user interfaces to make access to Web archives easier and better suited to Web scientists and other scholars. We hope that, as a result of our work, future generations will be able to leverage Web archives to produce more significant analyses about the Web and its past.



## Yves-Alexandre de Montjoye

MIT Human Dynamics Lab



I am a research scientist at the MIT Media Lab and a postdoctoral researcher at Harvard. I recently received my PhD from MIT (Human Dynamics group) under the supervision of Professor Alex Pentland and my BSc and MSc from Louvain. My research focuses on developing technical solutions for using large-scale behavioral data in privacy-conscious ways. I quantify the risks of re-identification in large-scale behavioral datasets and develop privacy-through-security solutions for the safe use of this data. I am currently very excited by our OPAL (Open Algorithms) project. Developed in collaboration with several carriers and foundations, OPAL will allow large-scale mobile phone and location data to be used for humanitarian purposes in low to middle income countries in privacy-conscious ways through question-and-answers systems.

Celebrating **10 Years** of the Science of the Web

**WST-10**



I am excited about the tenth Web Science anniversary and believe that through the collaborative work between scientists, organizations and local communities we will eventually succeed in overcoming barriers and can speak effectively of a World Wide Web.

**Gossa Lô, Network Institute, VU Amsterdam**



## Aleksandr Farseev

NUS Singapore



Aleksandr Farseev is a PhD Candidate at the School of Computing, National University of Singapore. His main research interest is in Social Media Analysis for Web Science. In particular, his research focuses on the multi-source user profile learning arising from the Web and social networks at both group and individual levels. Specifically, it enriches the Social Science research with the solid Computer Science knowledge, and brings more comprehensive analysis into Computer Science works by leveraging on Social Science experience. The multi-source user community detection and mobility analysis helps to extract meaningful user communities from multiple social media venues, which helps to dig deeper into Big Multimedia Data and, thus, understand the Web more. The individual user profile learning, in turn, enriches the above application by providing comprehensive description of the detected user communities. Altogether, it offers a powerful tool to uncover previously unknown and, extremely interesting relations from Big Social Multimedia Data.

## Lindsay Poirier

Rensselaer Polytechnic Institute (RPI)

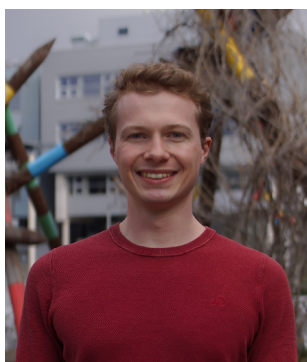
I am an anthropologist, a feminist scholar, and a Web scientist, but I do not study culture and gender on the Web. My research analyses how the Web's architecture – from the hypertext transfer protocol to the linked data formats that enable a Semantic Web – structures Web data, how users engage with it, and how machines interpret it. I question the types and forms of knowledge that can be produced with Web infrastructure and the limitations its architecture poses to fairly representing the world's knowledge.

I hope that in studying Web technologies from a critical social perspective, my research can help advocate for a Web that equitably organizes information.



## Martin Körner

WeST Koblenz



I'm studying Web Science at WeST and currently working on my Master's thesis. During my study I profited a lot from the interdisciplinary of Web Science. I was lucky enough to spend a semester at the Institute for Artificial Intelligence at the University of Georgia, followed by a three-month internship at Roche in Basel, Switzerland, where I used Semantic Web technologies to support terminology services for Pharma research. My current research is about extracting citation information from German social science publications using conditional random fields. After my Masters I will continue working with information scientists with the goal of supporting sociologists in their research.

## Sophie Parsons

Web Science Centre for Doctoral Training, University of Southampton

My PhD is a delicate but fascinating topic that I am incredibly passionate about. Social media is reshaping Emergency Management practices. Emergency Responders are embracing social media as a means of communication during an Emergency - as witnessed during events such as the UK Floods. However, it is unclear as to whether it is a useful tool for resilience-building. Resilience here being a somewhat ambiguous term, used by UK Emergency Management as the perceived goal of protecting against natural disasters. Through a mix of quantitative and qualitative methods, I am conducting an in-depth investigation into how and why Emergency Responders use social media for Emergency Management. I aim to determine if the use of social media for Emergency Management has an impact on community resilience-building. I hope this research will enrich our understanding of how and why the Web is manipulated to suit people's needs in times of extreme events.

The Web Science Centre for Doctoral Training at the University of Southampton provides me with the opportunity to research this topic through the interdisciplinary lens of Web Science, enabling me to integrate crucial social theories and frameworks with the technical understanding I gained through my previous degree. Ultimately, it is broadening my research skillset and encouraging me to grow as a person.



## Jacqueline Ng

Northwestern University



In my research, I aim to deepen and advance our understanding of how the Web changes the nature of student interactions and collaborative learning. In addition, I investigate how online discussion boards can be utilized more effectively to provide students with interactive opportunities in Web-based education platforms.

My interest in online and digital education stems from my diverse and interdisciplinary background. After graduating from Princeton University in 2006 with a Bachelor's degree in Operations Research and Financial Engineering, I became a US Government Bond trader at Morgan Stanley. A few years later, the firm sponsored me for an executive MBA at Columbia University. During my MBA studies, I transitioned functions to perform strategic analyses and develop investor presentations for the Co-President of the Company. In this role, I grew increasingly aware of the transformative nature of the Web, which continues to change the way that companies, including financial firms, conduct business with their clients. To play a more central role in this change, I transitioned to Microsoft to become an operations and finance manager in their online and physical store retail services team. While at Microsoft, I became aware of the complexities involved with running a global software company, and the importance of not only developing innovative products but also training and educating staff to adopt the latest technologies. This realization led me to pursue graduate work focusing on improving Web-based education.

This is truly an exciting period of human history, as the Web is rapidly transforming society and disrupting the way we think about our socio-technical interactions with each other. And, in turn, our interactions are shaping the future Web.

# A celebration of **10 Years** of the Science of the Web

## Web Science Trust

The Web Science Trust (WST) is a charitable body with the aim of supporting the global development of Web Science. It is hosted by the University of Southampton. The Web Science Trust is a private company limited by guarantee, registered in England and Wales with company number 06634408. The registered office address of the Web Science Trust is c/o Skadden, Arps, Slate, Meagher & Flom (UK) LLP, 40 Bank Street, Canary Wharf, London E14 5DS, United Kingdom.

[www.webscience.org](http://www.webscience.org)