IAS Institute of Advanced Studies

UNIVERSITY OF SURREY

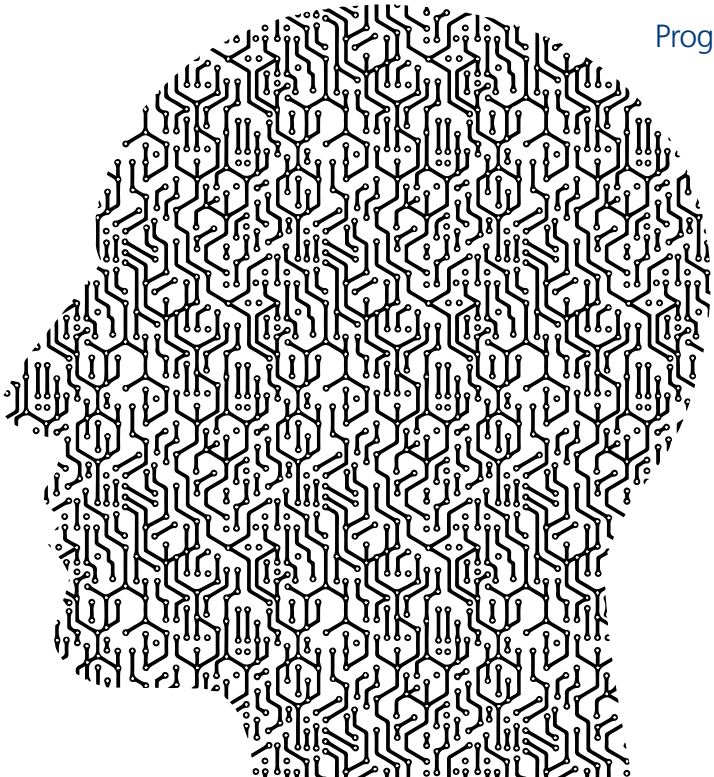
HHMC 2017

(2017 Workshop on Hybrid Human-Machine Computing)

20 & 21 September 2017

Treetops, Wates House, University of Surrey
Guildford, Surrey, UK

Programme



INTRODUCTION

The 2017 Workshop on Hybrid Human-Machine Computing (HHMC 2017) is 2-day workshop, to be held at the University of Surrey, Guildford, UK, on 20 and 21 September, 2017. It is a workshop co-funded by University of Surrey's Institute for Advanced Studies (IAS), a number of other organizations and related research projects.

When we talk about "computing" we often mean computers do something (for humans), but due to the more and more blurred boundary between humans and computers, this old paradigm of "computing" has changed drastically, e.g., in human computation humans do all or part of the computing (for machines), in computer-supported cooperative work (CSCW) humans are working together with assistance from computers to conduct cooperative work, in social computing and computer-mediated communication people's social behaviors are intermingled with computer systems so computing happens with humans and computers at the same time while humans are using computers to live their lives, and for cyborgs we are talking about human-robot hybrids or robot-human hybrids where the boundary between humans and machines becomes even more blurred. To some extent we see more and more a hybrid human-machine computing (HHMC) world where both humans and machines are working with and for each other.

The main goals of the workshop include 1) to bring researchers working in different disciplines but with common research interests on HHMC together for exchanging research ideas, and 2) to promote interdisciplinary collaborations and experience sharing between different subjects.

The workshop will also be used as an event to discuss medium- and long-term activities in the UK and internationally on HHMC related research, such as the possibility to set up a UK- and/or a European-wide research network funded by UK and/or EU funders. If successful, the workshop may be continued in future years as a pan-Europe or an international event.

At the workshop participants will be able to present their research work and ideas as oral presentations and posters. To encourage participations, the workshop called for extended abstracts rather than full papers, and there was a light-weighted peer review process conducted by the technical program committee to ensure quality of presented work while encouraging less mature work to be discussed among participants. Different types of work will be presented: original research, work in progress, research projects and networks, etc. Some work already published elsewhere will also be presented.

The workshop will also include three invited keynote talks given by renowned UK and international researchers working on different topics of HHMC. There will also be a panel discussion focusing on how to develop the HHMC research community further after the workshop ends.

A post-workshop journal special issue will be organized for selected work presented at the workshop. The post-workshop special issue will be published at the journal of Human Computation. Some selected work may also be invited for chapters of a book to be co-edited by Gerrit van der Veer, Achim Ebert, Nahum Gershon and Peter Dannenmann of IFIP WG 13.7 – Human-Computer Interaction & Visualization and to be published by Springer.

KEYNOTE 1

Title: **Password Generation, an Example of Human Computation**

Abstract:

A password schema is an algorithm for humans - working in their heads - without paper and pencil - to transform challenges (typically website names) into responses (passwords).

To start this talk, the speaker will ask for 2 or 3 volunteers, whisper instructions in their ears, then have them transform audience-proposed challenges (like AMAZON and FACEBOOK) into passwords.

The passwords will look random. The audience will be challenged to guess properties of the passwords but even the simple schema the speaker whispered to the volunteers will produce passwords that look random. These passwords can be easily made so strong that they pass virtually all password tests, like passwordmeter.com, with 100% strength.

Finally, the speaker will discuss human computation in general and the theory behind it.

This is joint work with Santosh Vempala and Jeremiah Blocki.

Speaker: Professor Manuel Blum

1995 ACM Turing Award
Member, National Academy of Sciences (NAS), USA
Member, National Academy of Engineering (NAE), USA
Fellow, American Academy of Arts & Sciences
Fellow, American Association for the Advancement of Science (AAAS)
Fellow, Institute of Electrical and Electronics Engineers (IEEE)
Bruce Nelson University Professor of Computer Science
Carnegie Mellon University, USA

Manuel Blum is a pioneer in the field of theoretical computer science and the winner of the 1995 Turing Award in recognition of his contributions to the foundations of computational complexity theory and its applications to cryptography and program checking, a mathematical approach to writing programs that check their work.

He was born in Caracas, Venezuela, where his parents settled after fleeing Europe in the 1930s, and came to the United States in the mid-1950s to study at the Massachusetts Institute of Technology. While studying electrical engineering, he pursued his desire to understand thinking and brains by working in the neurophysiology laboratory of Dr. Warren S. McCulloch and Walter Pitts, then concentrated on mathematical logic and recursion theory for the insight it gave him on brains and thinking. He did his doctoral work under the supervision of Artificial Intelligence pioneer Marvin Minsky, and earned a Ph.D. from MIT in mathematics in 1964.

Blum began his teaching career at MIT as an assistant professor of mathematics and, in 1968, joined the faculty of the University of California at Berkeley. He accepted his present position at Carnegie Mellon in 2001. Blum has supervised the theses of 35 doctoral students who now pepper almost every major computer science department in the country. The many ground-breaking areas of theoretical computer science chartered by his academic descendants are legend.

The problems he has tackled in his long career include, among others, methods for measuring the intrinsic complexity of problems. Among many of his key contributions to the Computer Science research community,

KEYNOTE 1

Blum is also well known as one of the poineers studying CAPTCHA (Completely Automated Public Turing test to tell Computers and Humans Apart) and as the co-inventor of the term CAPTCHA itself in the early 2000s. Blum has proposed a broader term Human Interactive Proofs (HIPs) to cover CAPTCHA and many other systems where humans are in the loop of some computational tasks to be done properly, which later inspired other researchers in different disciplines to propose the concept of human computation.

KEYNOTE 2

Title: **Simulating Societies – The Challenges and Benefits of Modelling Social Processes**

Abstract:

While the idea of computer simulation has had enormous influence on most areas of science, and even on the public imagination through its use in computer games, it has only recently had a significant impact in the social sciences. The breakthrough came when it was realised that computer programs offer the possibility of creating 'artificial' societies in which individuals and collective actors such as organisations could be directly represented and the effect of their interactions observed. This provided for the first time the possibility of using experimental methods with social phenomena, or at least with their computer representations; of directly studying the emergence of social institutions from individual interaction; and of using computer code as a way of formalising dynamic social theories. In this talk, these advances in the application of computer simulation to the social sciences will be illustrated with a number of examples of recent work, showing how this methodology is appropriate for analysing social phenomena that are inherently complex.

Speaker: Professor Nigel Gilbert

CBE (Commander of the Order of the British Empire), 2016
Fellow, Royal Academy of Engineering, UK
Fellow, Academy of Social Sciences, UK
Fellow, Royal Society of Arts, UK
Fellow, BCS - The Chartered Institute for IT, UK
Chartered Engineer
Director, Institute of Advanced Studies (IAS) and Centre for Research in Social Simulation (CRESS), University of Surrey, UK

Nigel Gilbert read for a first degree in Engineering, initially intending to go into the computer industry. However, he was attracted into sociology and obtained his doctorate on the sociology of scientific knowledge from the University of Cambridge, under the supervision of Michael Mulkay. His research and teaching interests have reflected his continuing interest in both sociology and computer science (and engineering more widely).

His main research interests are processual theories of social phenomena, the development of computational sociology and the methodology of computer simulation, especially agent-based modelling. He is Director of the Centre for Research in Social Simulation (CRESS).

He is also Director of the University's Institute of Advanced Studies (IAS) and responsible for its development as a centre for intellectual interchange.

He is the author or editor of several textbooks on sociological methods of research and statistics and was the founding editor of the Journal of Artificial Societies and Social Simulation.

KEYNOTE 3

Title: **Alan Turing and the Other Theory of Computation**

Abstract:

Most logicians and theoretical computer scientists are familiar with Alan Turing's 1936 seminal paper setting the stage for the foundational (discrete) theory of computation. Most however remain unaware of Turing's 1948 seminal paper which introduces the notion of condition, setting the stage for a natural theory of complexity for the "other theory of computation."

Computational mathematics, the "other theory of computation," emanates from the classical tradition of numerical analysis, equation solving and the continuous mathematics of calculus.

This talk will recognize Alan Turing's work in the foundations of numerical computation (in particular, his 1948 paper "Rounding-Off Errors in Matrix Processes"), its influence in complexity theory today, and how it provides a unifying concept for the two major traditions of the Theory of Computation.

It is based on a plenary talk given on the eve of Turing's 100th birthday in June 2012 at the Turing Centenary Conference at the University of Cambridge, UK.

Speaker: Professor Lenore Blum

Fellow, American Association for the Advancement of Science (AAAS)

Inaugural Fellow, American Mathematical Society (AMS)
Distinguished Career Professor of Computer Science
Founding Director, Project Olympus
Founding co-Director, Swartz Center for Entrepreneurship
Carnegie Mellon University, USA

Lenore Blum (PhD, MIT) is Distinguished Career Professor of Computer Science at Carnegie Mellon University and Founding Director of Project Olympus, an innovation center that works with faculty and students to bridge the gap between cutting-edge university research/innovation and economy-promoting commercialization for the benefit of our communities. Project Olympus is a good example of Blum's determination to make a real difference in the academic community and the world beyond.

Lenore is internationally recognized for her work in increasing the participation of girls and women in Science, Technology, Engineering, and Math (STEM) fields. She was a founder of the Association for Women in Mathematics and served as its third president. She was founding co-Director of the Math/Science Network and its Expanding Your Horizons conferences for middle and high school girls. At Carnegie Mellon, Lenore founded the Women@SCS program and CS4HS, the latter program now sponsored world-wide by Google. In 2004 she received the US Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring. In 2009 she received the Carnegie Science Catalyst Award recognizing her work targeting high-tech talent to promote economic growth in the Pittsburgh region and for increasing the participation of women in computer science. In 2016 women comprised over 48% of new majors in computer science at Carnegie Mellon.

KEYNOTE 3

Lenore's research, from her early work in model theory and differential fields (logic and algebra) to her more recent work in developing a theory of computation and complexity over the real numbers (mathematics and computer science), has focused on merging seemingly unrelated areas. The latter work, founding a theory of computation and complexity over continuous domains, forms a theoretical basis for scientific computation. On the eve of Alan Turing's 100th birthday in June 2012, she was plenary speaker at the Turing Centenary Celebration at the University of Cambridge, England, showing how a little known (to logicians!) paper of Turing's is fundamental to this theory.

DAY 1: Wednesday 20 2017

All sessions will take place in Treetops, Wates House, University of Surrey

08:00 – 09:00 Registration and Coffee/Tea

09:00 – 09:05 Welcome (Professor GQ Max Lu, President and Vice-Chancellor of the University of Surrey)

09:05-10:05 **Keynote 1: Chair: Shujun Li**

Title: **Password Generation, an Example of Human Computation**

Speaker: **Professor Manuel Blum**, Carnegie Mellon University, USA

Abstract:

A password schema is an algorithm for humans - working in their heads - without paper and pencil - to transform challenges (typically website names) into responses (passwords).

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10:05 – 10:25 **Introduction to HHMC 2017** (Shujun Li, General Chair of HHMC 2017)

10:25 – 10:45 Coffee Break

10:45 – 12:30 **Session 1: Human Computation & Crowdsourcing** (Chair: Elena Simperl)

Lora Aroyo* (Vrije Universiteit Amsterdam, The Netherlands), **[Invited Talk]** Data Science with Human-in-the-Loop: The Smart Cultural Heritage Use Case (20 mins)

Rafael Zequeira Jiménez*, Laura Fernández Gallardo and Sebastian Möller (TU Berlin, Germany), Collecting Subjective Ratings of Voice Likability: Laboratory vs. Crowdsourcing (20 mins)

Matthias Hirth* (University of Würzburg, Germany), Crowdsourcing-based QoE Assessment of Digitalized Remote Working (20 mins)

Alessandro Checco* (University of Sheffield, UK) and Gianluca Demartini (University of Queensland, Australia), Para Bellum -- Breaking Gold Questions Quality Assurance Systems in Paid Micro-task Crowdsourcing (20 mins)

Vlad Hosu* and Dietmar Saupe (University of Konstanz, Germany), Performance of Induced Degradations for Crowd-Worker Reliability in IQA (5-10 mins)

Qiong Bu* and Elena Simperl (University of Southampton, UK), Quality Assessment in Complex Classification Workflow (5-10 mins)

14:30 – 13:30 Buffet Lunch

13:30 – 14:30 **Keynote 2** (Chair: Corinna Elsenbroich)

Title: **Simulating Societies – The Challenges and Benefits of Modelling Social Processes**

Speaker: **Professor Nigel Gilbert,** University of Surrey, UK

Abstract:
While the idea of computer simulation has had enormous influence on most areas of science, and even on the public imagination through its use in computer games, it has only recently had a significant impact in the social sciences. The breakthrough came when it was realised that computer programs offer the possibility of creating 'artificial' societies in which individuals and collective actors such as organisations could be directly represented and the effect of their interactions observed. This provided for the first time the possibility of using experimental methods with social phenomena, or at least with their computer representations; of directly studying the emergence of social institutions from individual interaction; and of using computer code as a way of formalising dynamic social theories. In this talk, these advances in the application of computer simulation to the social sciences will be illustrated with a number of examples of recent work, showing how this methodology is appropriate for analysing social phenomena that are inherently complex.

14:30 – 16:00 **Session 2: HHMC Meets Social Sciences - Long Talks** (Chair: Pete Burnap)

Qingpeng Zhang*, Ronghua Xu and Jiaqi Zhou (City University of Hong Kong, China), Social media analytics of depression-focused online health communities: Social networking and linguistic analysis (20 mins)

Claudia Müller-Birn* (Freie Universität Berlin, Germany), Socio-Semantic Patterns of Cooperation (20 mins)

Joseph Corneli* (University of Edinburgh, UK) and Lorenzo Lane (University of Oxford, UK), Socializing mathematical social machines (20 mins)

Ryan Abbott* (University of Surrey, UK), I Think, Therefore I Invent: Creative Computers and the Future of Patent Law (20 mins)

16:00 – 16:30 Coffee Break

14:30 – 16:00 **Session 3: HHMC Meets Social Sciences - Short Talks** (Chair: Xingjie Wei)

Jon Machtynger* (IBM UK and University of Surrey, UK), Critiquing the human impact of Artificial Intelligence (5-10 mins)

Charlene Jennett* (UCL, UK), Creativity in Citizen Cyberscience (5-10 mins)

Meredydd Williams* and Jason Nurse (University of Oxford, UK), Social and privacy implications of novel computing systems (5-10 mins)

Giannis Haralabopoulos* and Elena Simperl (University of Southampton, UK), A pure emotion lexicon for beyond polarity sentiment analysis (5-10 mins)

Fabio Fasoli* (University of Surrey, UK), Being threaten and being threatening: The role of anthropomorphism in human-computer interactions (5-10 mins)

Amira Ahmed* and Frances Johnson (Manchester Metropolitan University, UK), Gamified Emotion Management in Shaping Doctoral Student Information Search Behavior (5-10 mins)

Bethany Styles* and Mark Elshaw (Coventry University, UK), Sentiment Analysis Algorithms to Predict Mood Trends in Depression Diaries (5-10 mins)

Social event (only for participants who registered for the workshop dinner)

18:00 Meet in front of the University Library's main entraince for rented buses to the Shere Village

18:30 – 19:30 Drink at a local pub and walk around the Shere Village

19:30 – 22:00 Dinner at Kinghams Restaurant

22:00 Buses back to Guildford main Bus Station

DAY 2: Thursday 21 September 2017

All sessions will take place in Treetops, Wates House, University of Surrey

09:00 – 10:00 Registration and Coffee/Tea

10:00 – 11:00 **Keynote 3** (Chair: Anna Cinzia Squicciarini)

Title: **Alan Turing and the Other Theory of Computation**

Speaker: **Professor Lenore Blum**, Carnegie Mellon University, USA

Abstract:
Most logicians and theoretical computer scientists are familiar with Alan Turing's 1936 seminal paper setting the stage for the foundational (discrete) theory of computation. Most however remain unaware of Turing's 1948 seminal paper which introduces the notion of condition, setting the stage for a natural theory of complexity for the "other theory of computation."

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It is based on a plenary talk given on the eve of Turing's 100th birthday in June 2012 at the Turing Centenary Conference at the University of Cambridge, UK.

10:00 – 10:15 Coffee Break

10:15 – 12:30 **Session 4: HHMC Meets Cyber Security** (Chair: Thanassis Giannetsos)

Awais Rashid* (University of Lancaster, UK), **[Invited Talk]** Why Johnny doesn't write secure software? Secure software development by the masses (20 mins)

Anna Cinzia Squicciarini* (Pennsylvania State University, USA), Online Image Privacy (20 mins)

Amir Javed*, Pete Burnap and Omer Rana (Cardiff University, UK), Scalable Real Time Prediction Algorithm for Drive by Download Attack on Twitter (5-10 mins)

Amir Javed, Eirini Anthi*, George Theodorakopoulos and Pete Burnap (Cardiff University, UK), Pulse: An adaptive Intrusion Detection System for the Internet of Things (5-10 mins)

Nouf Aljaffan* (University of Surrey, UK; King Saud University, Saudi Arabia) and Shujun Li (University of Surrey, UK), Human-in-the-loop Proactive Password Checkers (5-10 mins)

KEYNOTE SPEAKERS

12:30 – 13:30 Buffet Lunch.

13:30 – 14:45 **Session 5: HHMC and Beyond (1)** (Chair: Michael Rovatsos)

Stephen Muggleton (Imperial College London, UK) and Alireza Tamaddoni-Nezhad* (University of Surrey, UK), **[Invited Talk]** Human-Like Computing: Human-Machine Learning (20 mins)

Geeth De Mel, Dave Braines*, Anna Thomas, Tien Pham and Will Dron (IBM UK), Cognitively Mediated Research Discovery – A context-aware rich visualized knowledge graph co-created by humans and machines using a common language (20 mins)

Paolo Pareti* (University of Edinburgh, UK), Decentralised Human-Machine Collaboration by Sharing Web Data (20 mins)

14:45 – 15:00 Coffee Break

15:00 – 16:00 **Session 6: HHMC and Beyond (2)** (Chair: Long Tran-Thanh)

Petros Papapanagiotou*, Dave Murray-Rust (University of Edinburgh, UK), Max Van Kleek (University of Oxford, UK), Alan Davoust, Areti Manataki and David Robertson (University of Edinburgh, UK), Rapid Assembly of Social Machines with the Lightweight Social Calculus (20 mins)

Sarvapali Ramchurn* (University of Southampton, UK), Joel Fischer (University of Nottingham, UK), Enrico Costanza (UCL, UK) and Tom Rodden (University of Nottingham, UK), Towards Design Patterns for Human-Agent Collectives (20 mins)

Fabio Roli*, Alessandro Carcangiu, Battista Biggio and Giorgio Fumera (University of Cagliari, Italy), Hybrid Human-Machine Computer Vision for Intelligent Video-surveillance (5-10 mins)

Haiyue Yuan*, Shujun Li and Patrice Rusconi (University of Surrey, UK), Human-assisted Cognitive Modelling (5-10 mins)

16:00 – 16:15 Coffee Break

16:15 – 17:00 **Panel Discussion: Future of HHMC** (Chair: Shujun Li)

Panelists: Lora Aroyo, Jon Machtynger, Klaus Moessner, Anna Cinzia Squicciarini, Alireza Tamaddoni-Nezhad

17:00 – 17:15 Closing Remarks (Shujun Li, General Chair of HHMC 2017)

17:15 – 18:00 Networking / Depature

ORGANIZERS

General Chair: Shujun Li

Department of Computer Science and Surrey Centre for Cyber Security (SCCS), University of Surrey, UK

Publication Chair: Elena Simperl
Electronics and Computer Science, University of Southampton, UK

Publicity Co-Chairs: Pete Burnap
School of Computer Science & Informatics, Cardiff University, UK

Michael Rovatsos
School of Informatics, The University of Edinburgh, UK

Long Tran-Thanh
Electronics and Computer Science, University of Southampton, UK

International Liaison Co-Chairs

Dietmar Saupe (Europe)
Department of Computer and Information Science, University of Konstanz, Germany

Anna Cinzia Squicciarini (America)
College of Information Sciences and Technology, Pennsylvania State University, United States

Qingpeng Zhang (Asia-Pacific)
Department of Systems Engineering and Engineering Management, City University of Hong Kong, China

External Liaison Chair

Gianluca Demartini
Information School, University of Sheffield, UK

External Co-Sponsors/Stakeholders Liaison

John Breslin, National University of Ireland Galway, Ireland (IFIP WG 12.7, Chair)
Caroline GL Cao, Wright State University, USA (IEEE SMC Society TC on Human-Computer Interaction, Co-Chair)
Anna Cox, University College London, UK (ACM SIGCHI)
Peter Dannenmann, RheinMain University of Applied Sciences, Germany (IFIP WG 13.7, Chair)
Ulrich Furbach, Universität Koblenz-Landau, Germany (IFIP TC12, Chair)
Philip Hall, University of Melbourne, Australia (IEEE SSIT, Chair of Conference & Events Program)
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Pietro Michelucci, Human Computation Institute, US (Executive Director)
Greg Newman, Colorado State University, US (Citizen Science Association, Member of Board of Directors)
Symeon Papadopoulos, CERTH, Greece (IEEE Computer Society STC on Social Networking, Chair)

ORGANIZERS

Michael Rovatsos, University of Edinburgh, UK (ACM SIGAI, Conference Coordination Officer)
John Vines, Northumbria University, UK (ACM SIGCHI UK Chapter, Vice-Chair)
Tao Wang, SAS, USA (IEEE SMC Society TC on Human Perception in Multimedia Computing, Co-Chair)
Marco Winckler, University Paul Sabatier (Toulouse 3), France (IFIP WG 13.2, Chair)
Yicong Zhou, University of Macau, China (IEEE SMC Society TC on Cognitive Computing, Co-Chair)

Local Arrangement Team

Haiyue Yuan (Chair), Saeed Ibrahim Saeed Alqahtani, Nouf Aljaffan and Stylianos Savvopoulos, Department of Computer Science and Surrey Centre for Cyber Security (SCCS), University of Surrey, UK

Technical Program Committee

Charith Abhayaratne, University of Sheffield, UK
Budi Arief, University of Kent, UK
Kalina Bontcheva, University of Sheffield, UK
Richard Bowden, University of Surrey, UK
Pete Burnap, Cardiff University, UK
Anna Cox, University College London, UK
Gianluca Demartini, University of Sheffield, UK
Corinna Elsenbroich, University of Surrey, UK
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Kati Kuusinen, University of Southern Denmark, Denmark
Marta Kristín Lárusdóttir, Reykjavik University, Iceland
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Jon Machtynger, IBM UK and University of Surrey, UK
Roger Maull, University of Surrey, UK
Klaus Mößner, University of Surrey, UK
Michael Rovatsos, University of Edinburgh, UK
Patrice Rusconi, University of Surrey, UK
Dietmar Saupe, University of Konstanz, Germany
Elena Simperl, University of Southampton, UK (Co-Chair)
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David Stillwell, University of Cambridge, UK
Gianluca Stringhini, University College London, UK
Long Tran-Thanh, University of Southampton, UK
Xingjie Wei, University of Bath, UK
Matthew Williams, Cardiff University, UK
Marco Winckler, University Paul Sabatier (Toulouse 3), France
Qingpeng Zhang, City University of Hong Kong, China

FINANCIAL CO–SPONSORS

The Institute of Advanced Studies (IAS) at the University of Surrey hosts small-scale, scientific and scholarly meetings of leading academics from all over the world to discuss specialist topics away from the pressure of everyday work. The events are multidisciplinary, bringing together scholars from different disciplines to share alternative perspectives on common problems.

ias.surrey.ac.uk

Surrey Centre for Cyber Security (SCCS), University of Surrey, UK

Surrey Centre for Cyber Security (SCCS) was established in 2014 by the University of Surrey to consolidate and organise its Cyber Security activities across the University. Since 2015, it has been a UK government (GCHQ/NCSC) recognised Academic Centre of Excellence in Cyber Security Research (ACE-CSR). It brings together a group of cyber security researchers and over 20 associates to focus on the technical, human and interdisciplinary aspects of cyber security research. The Centre also runs Surrey's Information Security MSc programme, which has received GCHQ certification. surrey.ac.uk/sccs

School of Computer Science and Informatics Cardiff University, UK

Cardiff University (Welsh: Prifysgol Caerdydd) is a public research university in Cardiff, Wales, United Kingdom. Founded in 1883 as the University College of South Wales and Monmouthshire, it became one of the founding colleges of the University of Wales in 1893, and in 1997 received (but held in abeyance) its own degree-awarding powers. It adapted the public name of Cardiff University in 1999, and in 2005 this became its legal name as it left the University of Wales to become an independent University awarding its own degrees. It is the third oldest university institution in Wales and is the only Welsh member of the Russell Group of research-intensive British universities. cardiff.ac.uk/computer-science

EU FP7 Marie Curie Initial Training Network ESSENCE

ESSENCE (Evolution of Shared SEmaNtics in Computational Environments) is a 4-year, €4 million Marie Curie Initial Training Network (FP7-PEOPLE-2013-ITN) funded by the European Commission (grant agreement no. 607062). Since late 2013, it has supported the work of 15 early-career researchers, the ESSENCE Fellows, on topics that investigate semantic technologies, language games, multiagent communication, ontology learning, and human dialogue, and which all contribute to a broader research vision of diversity-aware AI. This vision emphasises creating next-generation AI technologies that can be used to bridge the gap between heterogeneous agents by exploring how representation, reasoning, and interaction can be used to allow diverse collectives of agents to share information and knowledge, coordinate their activities, and combine their individual capabilities. ESSENCE aims to build a community around this vision and to promote diversity-awareness as an important challenge for AI. essence-network.com

FINANCIAL CO–SPONSORS

Singapore-UK project STRICT

STRICT (Cyber security solutions for smart traffic control systems) is a 25-month research project jointly funded by the UK EPSRC (Engineering and Physical Science Research Council) and Singapore's National Research Foundation (NRF). It is a collaboration between the University of Southampton and Nanyang Technological University, focusing on developing a solution framework that can efficiently tackle the cyber security vulnerabilities of smart traffic control systems. gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/N02026X/1

ACM SIGIR

SIGIR is the Special Interest Group on Information Retrieval of the Association for Computing Machinery (ACM), the largest international learned society for computing founded. Since 1963, SIGIR has promoted research, development and education in the area of search and other information access technologies. More information about its work can be found at sigir.org/general-information. SIGIR provided 1000 USD funding to fund travel costs of some student presenters to attend the HHMC 2017 workshop. sigir.org

IBM UK

We are still in the process of getting their approval of using their logo. Before that happens, we can use their name.

IBM is a global cloud platform and cognitive solutions company, which has continually evolved over the past century to remain at the forefront of technological innovation. Its capabilities in data and analytics, cloud, mobile, social and security have helped the UK evolve to become one of the world's most digitally advanced nations. This digital revolution empowers us and our clients to gather and analyse data in ways that have never been possible before—helping UK organisations unlock new insights and usher in a new era of cognitive business. www.ibm.com/uk-en

FINANCIAL CO–SPONSORS

EU H2020 project QROWD

QROWD (Because Big Data Integration is Humanly Possible) is a 3-year, €4 million Industrial Leadership research project funded by the European Union's Horizon 2020 research and innovation programme (grant agreement no. 723088). It offers local government and transportation businesses innovative solutions to improve mobility, reduce traffic congestion and make navigation safer and more efficient. qrowd-project.eu

EU H2020 project Stars4All

STARS4ALL (A Collective Awareness Platform for Promoting Dark Skies in Europe) is a project funded by the European Union's Horizon 2020 research and innovation programme (grant agreement no. 688135). This is part of the larger CAPSSI (Collective Awareness Platforms for Sustainability and Social Innovation) initiative, aiming at designing and piloting online platforms creating awareness of sustainability problems and offering collaborative solutions based on innovative networks of people, ideas, services and technologies enabling new forms of social innovation. stars4all.eu

EU H2020 project LETS CROWD

LETSCROWD (Law Enforcement agencies human factor methods and Toolkit for the Security and protection of CROWDs in mass gatherings) is a 30-month, €3 million research project funded by the European Union's Horizon 2020 research and innovation programme (grant agreement no. 740466). It will overcome challenges preventing the effective implementation of the European Security Model with regards to mass gatherings. letscrowd.eu

Singapore-UK project COMMANDO-HUMANS

COMMANDO-HUMANS (COMputational Modelling and Automatic Non-intrusive Detection Of HUMan behAviour based iNSecurity) is a 25-month research project jointly funded by the UK EPSRC (Engineering and Physical Science Research Council) and Singapore's National Research Foundation (NRF). It is a collaboration between the University of Surrey and Singapore Management University, focusing on developing software tools to support cognitive models of humans for evaluating human-related security risks in cyber security systems. It involves CISRO, Australia and the University of Split, Croatia as unfunded partners. More information about its work can be found at commando-humans.net

TECHNICAL CO–SPONSORS

Citizen Science Association

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IFIP WG 13.2 Methodology for User-Centred System Design

IFIP WG 13.7 HCI & Visualization

IEEE Society on Social Implications of Technology (SSIT);

IEEE Systems, Man and Cybernetics (SMC) Society Technical Committee on Cognitive Computing

IEEE Systems, Man and Cybernetics (SMC) Society Technical Committee on Human-Computer Interaction

IEEE Systems, Man and Cybernetics (SMC) Society Technical Committee on Human Perception in Multimedia Computing

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