

# 2019 IEEE Smart World Congress

August 19-23, 2019  
Leicester, United Kingdom



The 5<sup>th</sup> IEEE Smart World Congress (SmartWorld 2019)

The 16<sup>th</sup> IEEE Int'l Conf. on Ubiquitous Intelligence & Computing (UIC 2019)

The 16<sup>th</sup> IEEE Int'l Conf. on Advanced & Trusted Computing (ATC 2019)

The 19<sup>th</sup> IEEE Int'l Conf. on Scalable Computing & Communications (ScalCom 2019)

The 5<sup>th</sup> IEEE Int'l Conf. on Internet of People (IoP 2019)

The 3<sup>rd</sup> IEEE Int'l Conf. on Smart City Innovations (SCI 2019)

and

Symposia, Workshops, Special Sessions and Panels



## Final Program

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## **Conference Venue**

- Hugh Aston Building, De Montfort University, The Newarke, Leicester, LE2 7BY ([map](#))
- Room numbers: Room 0.08, 0.10 (Ground Floor); Room 2.06, 2.07, 2.08, 2.09, 2.10 (Second floor); Room 3.04, 3.05 (Third floor)

## **Registration**

Registration will take place on 19th, 20th and 21st August in the foyer of the above conference venue.

## **Internet Access**

WiFi Network: **DMU-Guest**, Username: **iswc2019**, Password: **uYjyxs6**

# IEEE SmartWorld/UIC/ATC/ScalCom/IoP/SCI 2019 Program at a Glance

**Monday, 19<sup>th</sup> August 2019**

Time/Room	HU 0.08	HU 0.10	HU 2.06	HU 2.07	HU 2.08	HU 2.09	HU 3.04	HU 3.05
09:00-09:40					EHR SIS			
09:40-10:40								
10:40-11:00	<b>Coffee/Tea Break</b>							
11:00-11:30	ACE-1	UIC- MWDA- 1 (10m)  SMCN-1		VPVC-1	EHR SIS	WSIWS C-1		DMTS-1
11:30-12:00								
12:00-12:30								
12:30-13:30	<b>Lunch</b>							
13:30-14:00	ACE-2	SMCN- 2	Smart-PDS-1 (15m)	VPVC-2 (30m)	EHR SIS	IoT5GB- 1		DMTS-2
14:00-14:45			SR4CSW-1				PER- HEALTH (15m)	
14:45-15:30							IOP-1 (30m)	
15:30-15:50	<b>Coffee/Tea Break</b>							
15:50-16:20	SUC-1 (25m)	ISRCPS	SSESS -1		EHR SIS	IoT5GB- 2		RTDPC C -1
16:20-16:50								
16:50-17:30								
18:30-20:30	<b>Reception</b>							

**Tuesday, 20<sup>th</sup> August 2019**

Time/Room	HU 0.10							
08:50-09:20	<b>Opening Ceremony</b>							
09:20-10:00	<b>Keynote 1:</b> Ambient Intelligence: Convergence Of Artificial Intelligence, Machine Learning, Biometrics, Cloud-Computing, And Internet-Of-Things <b>Speaker:</b> Prof. Vincenzo Piuri, University degli Studi di Milano, Italy Chair: TBA							
Time/Room	HU 0.10		HU 0.08			HU 2.06		
10:00-10:40	Keynote 5 (UIC)		Keynote 6 (IoP)			Keynote 7 (ScalCom)		
10:40-11:00	<b>Coffee/Tea Break</b>							
Time/Room	HU 0.10							
11:00-12:30	<b>Panel 1:</b> Future Computing in Smart World <b>Chair:</b> Stephen S. Yau, Arizona State University, USA							
12:30-13:30	<b>Lunch</b>							
Time/Room	HU 0.10							
13:30-14:15	<b>Keynote 2:</b> Enabling positioning and personalisation capabilities in the wild - challenges and opportunities <b>Speaker:</b> Niki Trigoni, University of Oxford, UK Chair: TBA							
Time/Room	HU 0.10		HU 0.08			HU 2.06		
14:15-15:00	Keynote 8 (SWC)		Keynote 9 (ATC)			Keynote 10 (SCI)		
15:00-15:20	<b>Coffee/Tea Break</b>							
Time/Room	HU 0.08	HU 0.10	HU 2.06	HU 2.07	HU 2.08	HU 2.09	HU 3.04	HU 3.05
15:20-15:50	SWC-1	UIC-T1-2	UIC-T1-1	UIC-T4-1	UIC-1	ScalCom-1	ATC-1	IOP-2
15:50-16:20					SCI-1			
16:20-17:30								

**Wednesday, 21<sup>st</sup> August 2019**

<b>Time/Room</b>	<b>HU 0.10</b>							
09:00-09:50	<b>Keynote 3:</b> Network Traffic Theory and Technologies: Practice, Challenges and Trends <b>Speaker:</b> Prof. Chengsheng Pan, Dalian University, China <b>Chair:</b> TBA							
<b>Time/Room</b>	<b>HU 0.10</b>			<b>HU 0.08</b>		<b>HU 2.08</b>		
09:50-10:40	Keynote 11 (invited)			Keynote 12 (invited)		Keynote 13 (invited)		
10:40-11:00	<b>Coffee/Tea Break</b>							
<b>Time/Room</b>	<b>HU 0.08</b>	<b>HU 0.10</b>	<b>HU 2.06</b>	<b>HU 2.07</b>	<b>HU 2.08</b>	<b>HU 2.09</b>	<b>HU 3.04</b>	<b>HU 3.05</b>
11:00-11:40	Panel 2	UIC-T2-1	UIC-T3-1	UIC-T4-2	SCI-2	ScalCom-2	ATC-2	IOP-3
11:40-12:30								
12:30-13:30	<b>Lunch</b>							
<b>Time/Room</b>	<b>HU 0.10</b>							
13:30-14:15	<b>Keynote 4:</b> Building Qualitative Models of Spatio-Temporal Behaviour <b>Speaker:</b> Tony Cohn, Leeds University, United Kingdom <b>Chair:</b> TBA							
14:15-15:30	SWC-2	UIC-T2-2	UIC-T3-2	UIC-T4-3	SCI-3	ScalCom-3	ATC-3	IOP-4
15:30-15:50	<b>Coffee/Tea Break</b>							
15:50-16:30	SWC-3	UIC-T2-3	UIC-T3-3	UIC-T4-4	Panel 3	SWTC/PhD	ATC-4 (20m)	IOP-5
16:30-17:30						Poster/ Demo		
18:30-20:30	<b>Banquet at Athena</b>							

**Thursday, 22<sup>nd</sup> August 2019**

<b>Time/Room</b>	<b>HU 0.08</b>	<b>HU 0.10</b>	<b>HU 2.06</b>	<b>HU 2.07</b>	<b>HU 2.08</b>	<b>HU 2.09</b>	<b>HU 3.04</b>	<b>HU 3.05</b>
09:00-09:50	SWC-4	UIC-T2-4	UIC-T3-4	UIC-T3-6	SCI-4		UIC-T3-8	Keynote 14
09:50-10:40					UIC-T2-6		IOP-6	Keynote 15
10:40-11:00	<b>Coffee/Tea Break</b>							
11:00-11:40	SWC-5	UIC-T2-5	UIC-T3-5	UIC-T3-7	UIC-T2-7		CESHAP	Smarter AAL-1
11:40-12:30							P-1	
12:30-13:30	<b>Lunch</b>							
13:30-17:30	Conference Sideline Meeting / SWTC Committee Meeting							

**Friday, 23<sup>rd</sup> August 2019**

No SWC2019 activities planned.

# IEEE SmartWorld/UIC/ATC/ScalCom/IoP/SCI 2019

## Program Preview

### Keynotes

- Keynote 1: Vincenzo Piuri**, Department of computer Science, University degli Studi di Milano, Italy  
*Ambient intelligence: convergence of artificial intelligence, machine learning, biometrics, cloud-computing, and internet-of-things*
- Keynote 2: Niki Trigoni**, University of Oxford, UK  
*Enabling Positioning And Personalisation Capabilities In The Wild - Challenges And Opportunities*
- Keynote 3: Chengsheng Pan**, Dalian University, China  
*Network Traffic Theory and Technologies: Practice, Challenges and Trends*
- Keynote 4: Tony Cohn**, Leeds University, UK  
*Building Qualitative Models of Spatio-Temporal Behaviour*
- Keynote 5: Anton Nijholt**, University of Twente, Netherlands (UIC 2019)  
*Turning Ubiquitous Smartness into Ubiquitous Playability*
- Keynote 6: Zhiwen Yu**, Northwestern Polytechnical University, China (IoP 2019)  
*Ten Scientific Problems in Human Behavior Understanding*
- Keynote 7: Geyong Min**, University of Exeter, UK (ScalCom 2019)  
*Autonomous Operation and Maintenance in Scalable Computing and Networking Systems*
- Keynote 8: Peter Eisert**, Humboldt University Berlin, Germany (SWC2019)  
*Visual Computing for Smart AR Assistance*
- Keynote 9: Pierangela Samarati**, Department of Computer Science of the Universita' degli Studi di Milano, Italy (ATC 2019)  
*Data Security and Privacy in Emerging Scenarios*
- Keynote 10: Reeba Korah**, Alliance College of Engineering and Design, Alliance University, Bangalore, India (SCI 2019)  
*IOT Enabled Smart Energy Management Systems for Smart City Applications-An Indian context*
- Keynote 11: Yasha Wang**, Peking University, China (invited talk)  
*Challenges and solutions for building a self-evolving smart city*
- Keynote 12: Omer F. Rana**, Cardiff University, UK (invited talk)  
*Vertical workflows: Service Orchestration Across Cloud & Edge Resources*
- Keynote 13: Yiqiang Chen**, Chinese Academy of Sciences, China (invited talk)  
*FedHealth: A Federated Transfer Learning Framework for Wearable Healthcare*
- Keynote 14: Wenbing Zhao**, Cleveland State University, USA (invited talk)  
*Developing Smart and Connected Solutions for Healthcare and Medicine*
- Keynote 15: Prof. Lu Liu**, Leicester University (invited talk)  
*Data-Driven Service Computing*

### Panels

**Panel-1: Future Computing in Smart World**

- Chairs:* Stephen S. Yau, Arizona State University, USA  
*Panelists:* Sumi Helal, Lancaster University, UK  
Julient Bourgeois, University of Bourgogne Franche-Comté, France  
Runhe, Hosei University, Tokyo, Japan  
Man Liu, St. Francis Xavier University, Canada

**Panel-2: Intelligence Analytics: The Confluence of Data Analytics and Artificial Intelligence**

*Chairs:* Sally McClean/Liming Chen, De Montfort University/Ulster University

*Panelists:* Sally McClean, Ulster University, UK  
Claudio Bettini, Università degli Studi di Milano, ITALY  
Hongji Yang, Leicester University, UK  
Alison B Lowndes, NVIDIA Ltd, UK  
Liming Chen, Ulster University, UK

**Panel-3: Urban Computing 2.0**

*Chairs:* Junfeng Zhao, Peking University, China

*Panelists:* Kieran O’Hea, Head of Smart Cities, Leicester City Council  
Bin Guo, Northwestern Polytechnical University, China  
Kevin I-Kai Wang, The University of Auckland, New Zealand  
Diego López-de-Ipiña González-de-Artaza, Universidad de Deusto, Spain

**Paper Sessions**

**1. ACE-1 ~ ACE-2**

The 3rd International Workshop on Applications of ICT, Cyber Security and Ecommerce Data Security

**2. ATC-1 ~ ATC-4**

The 5th IEEE International Conference on Advanced & Trusted Computing (ATC 2019)

**3. CESHAPP-1**

The 3rd China-Europe Innovation Forum on Smart Healthy and Privacy Protection (SmartHealth 2019)

**4. DMTS-1 ~ DMTS-2**

International Symposium on Data & Model-Driven Methods for Trustworthy Systems

**5. EHRSIS-1 ~ EHRSIS-2**

Forum on Ethics and Human Rights in Smart Information Systems

**6. IOP-1~ IOP-5**

The 5th IEEE International Conference on Internet of People (IoP 2019)

**7. IoT5GB-1 ~ IoT5GB-2**

International Workshop on IoT-related Technologies for 5G and Beyond

**8. ISRCPS-1**

The 1<sup>st</sup> Workshop on Intelligence, Security and Resilience in Cyber Physical Systems (ISRCPS 2019)

**9. Per-Health**

PER-HEALTH

**10. RTDPCC-1**

The 5th International Symposium on Real-time Data Processing for Cloud Computing (RTDPCC-2019)

**11. ScalCom-1 ~ ScalCom-3**

The 19th IEEE International Conference on Scalable Computing and Communications (ScalCom 2019)

**12. SCI-1 ~ SCI-4**

The 3rd IEEE International Conference on Smart City Innovations (SCI 2019)

**13. SmarterAAL-1**

The 2nd Workshop on advanced Technologies for Smarter Assisted Living solutions: Towards an open Smart Home infrastructure (SmarterAAL 2019)

**14. SMCN-1 ~ SMCN-2**

The 2019 International Workshop on Security Measurement of Cyber Networks

**15. Smart-PDS-1**

1st International Workshop on Personalisation and Decision Support for Citizen Service Enhancement at Scale – (Smart-PDS 2019)

**16. SR4CSW-1**

Workshop on smart robots to construct future smart worlds (SR4CSW 2019)

**17. SSESS-1**

The 3rd Symposium on Software Engineering for Smart Systems (SSESS 2019)

- 18. SUC-1**  
The 1st International Workshop on Security of Ubiquitous Computing
- 19. SWC-1 ~ SWC-5**  
The 5<sup>th</sup> IEEE Smart World Congress (SmartWorld 2019)
- 20. SWTC-1**  
IEEE CIS Smart World Technical Committee (SWTC) – PhD Forum
- 21. UIC-1**  
The 16<sup>th</sup> IEEE International Conference on Ubiquitous Intelligence & Computing (UIC 2019)
- 22. UIC-T1-1 ~ UIC-T1-2**  
UIC 2019: Track 1: Intelligent/Smart Object & Interaction
- 23. UIC-T2-1 ~ UIC-T2-6**  
UIC 2019: Track 2: Intelligent/Smart Environment & Application
- 24. UIC-T3-1 ~ UIC-T3-7**  
UIC 2019: Track 3: Intelligent/Smart Systems & Services
- 25. UIC-T4-1 ~ UIC-T4-4**  
UIC 2019: Track 4: Personalization and Social Aspects
- 26. UIC-MWDA-1**  
Workshop on Mobile Web Data Analytics (MWDA 2019)
- 27. VPVC-1 ~ VPVC-2**  
The 3<sup>rd</sup> symposium on Visual Perception and Visual Computing (VPVC 2019)
- 28. WSIWSC-1**  
The 1<sup>st</sup> Workshop on Security Issues in the World of Smart Cities (WSIWSC 2019)



## Welcome Message from the IEEE SmartWorld 2019 Steering Chairs

Our world is changing swiftly and has been becoming smarter and smarter. Smart world is composed of numerous “smart things” at different levels and scales, starting from smart objects, smart machines, smart buildings, smart transportations, smart manufactures, smart agricultures, smart cities, to smart anything. We are stepping into such a smart world, in which almost everything is able to sense, communicate, compute, think, and take actions smartly, as stated in the congress theme “Smart Things Everywhere”.

Smart world, as we first envisioned in 2004, is a natural result of the fundamental trend where communications, computations and artificial intelligence are distributed ubiquitously in various physical environments that change these environments and further the whole world. While exciting, as researchers we must examine and study a series of challenging issues in achieving a truly smart world to benefit the mankind and at the same time safeguarding the natural environment to ensure sustainable development.

Smart World Congress originates from the Workshop on Ubiquitous Smart Worlds (USW 2005) in Taipei on March, and the Symposium on Ubiquitous Intelligence and Smart Worlds (UISW 2005) in Nagasaki on December. Now it is a flagship congress of our IEEE Smart World TC, sponsored financially by IEEE Computational Intelligence Society and technically by IEEE Computer Society. We are very delighted to have the IEEE SmartWorld 2019 in Leicester, UK. We cordially welcome all of you.

SmartWorld 2019 gathers us here, which is mainly because of one special person – Prof. Liming Chen of De Montfort University, UK. We highly appreciate his excellence in leading SmartWorld 2019 as the general chair and coordinating the IEEE UIC/ATC/ScalCom/IoP/SCI. He has worked wholeheartedly to this large event for 10 months since October 2018.

The great success of SmartWorld 2019 is also contributed by the awesome organizing works done by all the congress/conference chairs, professional paper reviews from program committee members, and high-quality research papers from authors. Apart from the main conferences, there are panels and workshops/special sessions, which are focused on important aspects in smart world study. We are grateful for all organizers and authors of the congress, conferences, panels and workshops/special sessions.

Our sincere gratitude also goes to all distinguished keynote speakers, invited talk speakers and panelists, whose sharp insights can surely stimulate and inspire us to foresee the smart world and make it smarter. We express our great appreciations to local team members who have done a tremendous work to offer us wonderful services. Wish you an enjoyable participation in IEEE SmartWorld 2019 and a nice stay in Leicester, one of the beautiful cities in UK.



Dr. Jianhua Ma  
Professor, Hosei University, Japan  
Chair, IEEE CIS Smart World TC  
Chair, IEEE SMC TC on Cybermatics  
Chair, Smart World Congress Steering Committee



Dr. Laurence T. Yang, FCAE, FEIC  
Professor, St. Francis Xavier University, Canada  
Chair, IEEE CS TC on Scalable Computing  
Chair, IEEE SMC TC on Cybermatics  
Chair, Smart World Congress Steering Committee

# **Welcome Message from the IEEE SmartWorld 2019 General Chairs**

Welcome to the 5<sup>th</sup> 2019 IEEE Smart World Congress (SmartWorld 2019) which is hosted by De Montfort University in Leicester, UK, from 19<sup>th</sup> to 23<sup>rd</sup> August 2019.

As the General Chairs of SmartWorld 2019, on behalf of the organizing committee of the Congress, we would like to welcome all attendees and participants to this wonderful event, and express our gratitude for their involvement and contributions.

Smart World is a vision, and also a challenge, within which everyday things are enhanced with abilities of perception, communication, computation and intelligence so that real-world tasks could be undertaken easily, quicker, at low cost and in an enjoyable way. With the rapid prevalence of the Internet of Things, and the adoption of big data analytics and artificial intelligence techniques, the envisioned smart world and the new ways of life it will bring to us will arrive sooner than expected.

Research on Smart World is an emerging but well-established research field covering many inter-/multidisciplinary subject areas and applications of almost all aspects of our life. It will significantly impact the society and economy, and ultimately benefit humanity and improve quality of life, meanwhile safeguarding and maintaining sustainable development and evolution. Smart World Congress aims to provide a scholarly platform and offer opportunities for researchers, developers, engineers and practitioners worldwide to gather together to exchange views and insights, share state-of-the-art research results and findings, forge collaborations and links, and facilitate knowledge transfer, research translation and innovations.

SmartWorld 2019 is fully sponsored by IEEE Computational Intelligence Society and IEEE Computer Society. It consists of six co-located IEEE international conferences, i.e., SWC 2019, UIC 2019, ATC 2019, ScalCom 2019, IoP 2019, SCI 2019, associated workshops, panel sessions, forums, tutorials and keynotes, and numerous sideline networking meetings, for the dissemination and exchange of the latest research findings, ideas and future trends.

Many individuals have contributed to the success of SmartWorld 2019. In particular, we would like to express our special appreciation to the Congress' Steering committee chairs, Prof. Jianhua Ma, Prof. Laurence T. Yang, for their trust and guidance on organizing this Congress, the Congress' Program Chairs, led by Prof. Hui Yu, for their outstanding work on the technical program, and the Congress' local organizing team, led by Dr. Feng Chen, and the central support team, including Khawla AlHasan, Sarah Fallmann, Ismini Psychoula, Darpan Triboan, Ruijie Wang, Yumei Zheng. We would also like to thank all members of the Organizing Committee and Program Committee, workshop and tutorial organizers for their hard work and significant efforts, keynote speakers and panelists for offering insightful and enlightening talks. Last but not least, we would like to thank all authors and attendees for submitting, presenting and sharing your research which makes this wonderful event possible and exciting!

## **General Chair**

Professor Liming Chen, Ulster University, UK

## **General Co-Chairs**

Joel Rodrigues, National Institute of Telecom, Brazil

Alistair Duffy, De Montfort University, UK

# **Welcome Message from the IEEE SmartWorld 2019 Program Chairs**

On behalf of the Program Committee of the 5th IEEE Smart World Congress (SmartWorld 2019), we would like to welcome you to join the conference in Leicester, UK, 19-23 August 2019.

The smart world is set to enhance everyday things with abilities of sensation, communication, computation and intelligence, so that many tasks and processes could be simplified, more efficient and enjoyable. The IEEE SmartWorld 2019 has become a leading-edge forum for both researchers and practitioners to exchange on advances and innovations on smart world. The SmartWorld 2019 has attracted research papers on the related research issues from all around the world. We have received 112 submissions this year. All submissions have received at least three reviews following a high-quality review process. According to the review results, 22 regular papers and 49 workshop papers have been selected for oral presentation at the conference.

The success of SmartWorld 2019 is due to the effort of many people. We would like to take this opportunity to thank the program committee members and the referees for their time and effort, and for their well-constructed reviews given such a compressed schedule. We would also like to express our gratitude to Sumi Helal, Xin Yao and David Mba, our Honorary Chairs, Liming Chen, Joel Rodrigues and Alistair Duffy, our General Chairs, and Jianhua Ma and Laurance T. Yang, the Chairs of the Steering Committee, for their guidance and dedication to this conference. We are deeply in debt to their untiring efforts and assistance, without which it would be close to impossible to pull together this program at all.

We would like to thank all the authors and attendees for their contribution to the conference. Without their strong support and participation, the conference would not have been so successful.

We sincerely hope that the conference will provide an excellent opportunity for you to learn from each other. Enjoy the conference, both technically and socially!

## **Program Chair**

**Hui Yu**, University of Portsmouth, UK

## **Program Co-Chairs**

**Zumin Wang**, Dalian University, China

**Ronny Hänsch**, TU-Berlin, Germany

**Zhong Fan**, Keele University, UK

# Welcome Message from the ATC 2019 General Chairs

Welcome to the 16th IEEE International Conference on Advanced and Trusted Computing (ATC2019) sponsored by IEEE, IEEE Computer Society, IEEE Computational Intelligence Society, IEEE Technical Committee on Scalable Computing (TCSC), and Acrossing, held during August 19-23, 2019, in De Montfort University, Leicester, UK. On behalf of the Organizing Committee of ATC2019, we would like to express our sincere and warm welcome to all participants!

IEEE ATC2019 conference is the 16th edition of the highly successful International Conference on Advanced and Trusted Computing (ATC). ATC conferences have taken a leading role in addressing these challenges and achieving practical advanced computing systems with truly trustworthy services. Started in 2005, the series of ATC conferences have been held at Nagasaki (Japan), Vienna (Austria), Three Gorges (China), Hong Kong (China), Oslo (Norway), Brisbane (Australia), Xi'an (China), Banff (Canada), Fukuoka (Japan), Vietri sul Mare (Italy), Bali (Indonesia), Beijing (China), Toulouse (France), San Francisco Bay Area (USA) and Guangzhou (China).

It provides a forum for engineers and scientists in academia, industry, and government to address the resulting profound challenges and to present and discuss their new ideas, research results, applications and experiences on all aspects of advanced and trusted computing technology.

ATC2019 consists of the main conference, one workshop, one symposium and one special session with 17 main conference presentations, and 1 distinguished keynote speech. Specially, we have one panel that attracts many scholars around the world. For the successful organization of ATC2019, we counted on the great support of many people and organizations. First of all, we would like to sincerely thank Prof. Jianhua Ma, (Hosei University, Japan) and Prof. Laurence T. Yang (St. Francis Xavier University, Canada), the Steering Committee Chairs of ATC, for giving us the opportunity to organize the conference and for their support and guidance. We must express our deep thanks to Prof. Liming Chen (De Montfort University, Leicester, UK), the organization chair of ATC2019 for his local organization and conference coordination. We would like to express our appreciation to Prof. Pierangela Samarati (Universita' degli Studi di Milano, Italy) for accepting our invitation to be the keynote speaker of ATC2019.

We would like to give our special thanks to the Program Chairs Weizhi Meng (Technical Univ. of Denmark, Denmark), Valtteri Niemi (University of Helsinki, Finland), Liang Cheng (Lehigh University, USA), Shujun Li (Kent University, UK) for their excellent work and great efforts in organizing an outstanding program committee, conducting a rigorous reviewing process and selecting high quality papers from a large number of submissions, and for preparing an excellent conference program. We are grateful to the Workshop/Session Chairs Marinella Petrocchi (Institute of Informatics and Telematics, Italy), Pengfei Hu (China Mobile Research Institute, China), Yu Chen (San Jose State University, USA), Wenxiu Ding (Xidian University, China) as well as other chairs, advisory members, steering members, and PC members for their great supports. We would like to thank all reviewers for their hard work, for providing constructive feedback to authors and enabling an excellent selection of the papers. Most importantly, our great appreciation to all authors, for submitting their high-quality papers to ATC2019 main conference and its workshops/special sessions. Last but not the least, we would like to greatly thank the ATC2019 local organization team led by Prof. Liming Chen for the excellent local arrangement of the conference.

ATC2014 is hosted by De Montfort University, Leicester, UK. We would like to take this chance to express our sincere thanks to the host and foundations for their great supports. We thank all participants in ATC2019. We sincerely hope ATC2019 can stimulate innovation and future research and play as a platform for professional activities in the field of advanced and trusted computing.

## General Chairs of ATC2019

Zheng Yan, Xidian University, China & Aalto University, Finland

Vincenzo Piuri, Universita' degli Studi di Milano, Italy

Kim-Kwang Raymond Choo, University of Texas at San Antonio, USA

# Welcome Message from the ATC 2019 Program Chairs

It is our great pleasure to welcome you for the 16th IEEE International Conference on Advanced and Trusted Computing (IEEE ATC 2019) sponsored by IEEE and IEEE Computer Society, held on August 19-23, 2019, in Leicester, UK. Established as a premier venue in the area of advanced and trusted computing, IEEE ATC 2019 aims to offer a forum for researchers to exchange ideas and experiences in the most innovative research, development and applications related to Advanced Computing (AC) and Trusted Computing (TC).

This year, ATC 2019 accepted 9 full papers and 8 short papers selected from 34 submissions, giving an acceptance rate of 26.5% for full papers. We wish to thank the authors of all submitted papers for choosing ATC 2019 as the venue to present their high quality research.

A high quality review process was done by the highly qualified program committee members. Each paper was reviewed by at least three independent reviewers on average. We would like to extend our thanks to the program committee members and to additional reviewers who contributed their precious time and expertise to provide professional reviews and very interesting feedback to authors in a tight time schedule.

We are fortunate and delighted to work in coordination with the Steering Chairs Prof. Jianhua Ma (Hosei University, Japan) and Prof. Laurence T. Yang (St. Francis Xavier University, Canada), and the General Chairs Prof. Zheng Yan (Xidian University, China & Aalto University, Finland), Prof. Vincenzo Piuri (Universita' degli Studi di Milano, Italy), and Dr. Kim-Kwang Raymond Choo (University of Texas at San Antonio, USA), and the Honorary Chairs Prof. Qinghua Zheng (Xi'an Jiaotong University, China), Prof. Mohammed Atiqzaman (University of Oklahoma, USA), Prof. Hui Li (Xidian University, China) for a successful ATC 2019 and for the success of the final program. We sincerely appreciate their constant support and guidance. It was a great pleasure to work with such an excellent team. Also, we would like to express our gratitude to the local team for managing the program information in the conference website, and to Workshop Chairs Marinella Petrocchi (Institute of Informatics and Telematics, Italy), Pengfei Hu (China Mobile Research Institute, China), Yu Chen (San Jose State University, USA), and Wenxiu Ding (Xidian University, China) for their efficient assistances in managing the workshops.

We expect this conference to be a highly stimulating event to foster interesting discussions as well as useful interaction between researchers, and to provide an excellent forum for exchanging and developing new ideas in the field of Trust Computing.

## Program Chairs of ATC 2019

Weizhi Meng, Technical Univ. of Denmark, Denmark

Valtteri Niemi, University of Helsinki, Finland

Liang Cheng, Lehigh University, USA

Shujun Li, Kent University, UK

# Welcome Message from the IEEE IoP 2019 General Chairs

On behalf of IEEE IoP 2019 Chairs and Committees, we are very pleased to welcome you to the 5th IEEE International Conference on Internet of People, i.e. IoP 2019.

IoP is a forum for presenting leading work on “People-driven Internet for Smarter Hyper-Connected Societies”. IoP explores how a people-centred Internet can foster collaborative human and machine intelligence. During the conference, scientists and engineers in both academia and industry are invited to present their high-quality work in several tracks to push beyond the limits of existing technologies.

The Steering Committee and Advisory Board members have provided excellent guidance to our Organizing Committee and PC Committee. The PC Chairs, Dr. Javier Jaén, Dr. Diego Casado, Dr. Alessandro Bozzon, and Dr. Bo Yang, and the PC committee members have attracted, reviewed, and selected quality papers.

The successful conference program preparation and quality proceeding publication of the IEEE International Conference on Internet of People (IoP 2019) have been due to the incredible efforts of the PC committee members, conference organization chairs, including the Workshop Chairs: Dr. Yoram Chisik, Dr. Nervo Verdezoto and Aitor Urbieta, the Poster and Demo Chair: Dr. Mario Vega, the Publicity Chairs: Dr. Elena Navarro, Dr. Antonio Jara and Zhiyong Yu, the Steering Chairs: Dr. Jianhua Ma and Dr. Laurence T. Yang and the Advisory Chairman: Dr. Bin Guo. They have worked very hard to ensure the successful call for papers, review and quality production of the conference proceedings.

Besides, we would also like to give our thanks to Keynote Speakers, Prof. Xin Yao and Prof. Vincenzo Piuri. Last but not least, we would like to thank all the authors who submitted their papers to the conference, and we hope that you will be able to attend this wonderful event!

## Executive General Chair

- Liming Chen, De Montfort University, UK

## Honorary Chair

- Jiming Liu, Hong Kong Baptist University, Hong Kong

## General Chairs

- Diego López-de-Ipiña, University of Deusto, SPAIN
- Maurice Mulvenna, Ulster University, UK
- Jing Zhou, Communication University of China, China

# Welcome Message from the ScalCom-2019 General Chairs

On behalf of the Organizing Committee, we are honoured to welcome you to attend the 19th IEEE International Conference on Scalable Computing and Communications (ScalCom-2019) held in Leicester, UK, 19-23 August 2019. We would like to offer our sincere gratitude for your help and support for the conference.

Scalability is one of the key evaluation criteria of computing systems. In particular, scalability is essential in HPC systems. High scalability represents a kind of elasticity, which can guarantee high throughput, small delay and high performance. Additionally, with the need to process data deluge and to solve difficult or large-scale problems, new architectures like computing accelerator, e.g., GPU and MIC have appeared. Improvements to these architectures are still needed in order to use them in large scale heterogeneous systems. Similarly, new parallel algorithms, software, and tools are needed to improve scalability.

ScalCom-2019 consists of the main conference and 3 workshops/symposia. We would like to thank Laurence T. Yang and Albert Y. Zomaya, the Steering Chairs; Limin Chen and Maria F. Cabrera-Umpierrez, the Executive General Chairs, for giving us the opportunity to hold this conference and for their guidance on organizing the conference. We would like to thank the Advisory Committee, Yi Pan, Geyong Min, and Dave Robertson, for their valuable advices towards the success of this conference. The Program Chairs, Jia Hu, Simone Ludwig, Vlado Stankovski, and Li Yang have put enormous efforts in selecting the excellent papers for technical presentations based on a rigorous refereeing process. We are grateful to them for their efforts and time. We would like to thank Workshop Chairs - Maciej Huk and Xiaojun Zhai; Post and Demo Chairs- Liang Zhao and Antoine Bagula; Publicity Chairs - Xiaokang Zhou and Hui Lin and Journal Special Issue chairs - Yulei Wu and Po Yang, for their professional and excellent expertise in organizing the attractive workshops/symposia. We express our appreciation to all the members of the Organizing Committee for their support and efforts. We are grateful to all the authors who submitted their high-quality papers to the ScalCom-2019 main conference and workshops/symposia.

We thank all of you for participating in ScalCom-2019 and hope you find the conference stimulating and interesting.

## **General Chairs of ScalCom-2019**

Liangxiu Han, Manchester Met. University, UK

Omer Rana, Cardiff University, UK

Wenbing Zhao, Cleveland State University, USA

# Welcome Message from the ScalCom-2019 Program Chairs

It is our great pleasure to welcome you to the 19<sup>th</sup> IEEE International Conference on Scalable Computing and Communications (ScalCom-2019) in Leicester, UK. The ScalCom conference is well established in its 19th year and enjoys wide acceptance and an outstanding reputation in a broad field of scalable computing and communications.

This year ScalCom comprises of many technical tracks including Cloud and Fog Computing, Extreme Scale, Multicore, GPU Accelerators and Novel Architectures for Scalability-Rethinking, Tools for Big Data, Modelling and Simulation of Large Complex Systems, Mobile, Wireless and Pervasive Computing, Scalable Machine Learning, and Blockchain and Distributed Ledger Technology. The main conference consists of 14 papers selected from 41 submissions, giving an acceptance rate of 34%. We wish to acknowledge the authors for choosing ScalCom-2019 as the venue to present their research results. The final decision of acceptance/rejection of submissions has been taken after a high-quality review process involving all the Program Committee members and some additional reviewers. We thank the Program Committee and additional reviewers that contributed their valuable time and expertise to provide professional reviews working under a very tight schedule.

The coordination with the Steering Chairs - Laurence T. Yang, and Albert Y. Zomaya, Executive General Chairs - Liming Chen and Maria F. Cabrera-Umpierrez and the General Chairs – Liangxiu Han, Omer Rana, and Wenbin Zhao was essential for the success of the final program. We sincerely appreciate their constant support and guidance. It was a great pleasure to work with such an excellent team.

Finally, we expect that the conference favours a fruitful interaction between researchers and provides a stimulating forum for exchanging and developing new ideas in the exciting and rapidly changing field of scalable computing and communications.

## **Program Chairs of ScalCom-2019**

Jia Hu, University of Exeter, UK  
Simone Ludwig, North Dakota State University, USA  
Vlado Stankovski, University of Ljubljana, Slovenia  
Li Yang, Dalian University, China



# Welcome Message from the IEEE UIC 2019 General Chairs

On behalf of IEEE UIC 2019 Chairs and Committees, we are very pleased to welcome you to the 16th IEEE International Conference on Ubiquitous Intelligence and Computing. UIC is a forum for presenting leading work on ubiquitous intelligence including 4 tracks, Intelligent/Smart Object & Interaction, Intelligent/Smart Systems & Services, Intelligent/Smart Environment & Applications, and Personalization and Social Aspects. The theme of this year is *Weaving Ubiquitous Sensing and Computing into Ubiquitous Intelligence*, aiming to select high-quality papers and push the ubiquitous computing into the next frontiers. During the conference, we expect to provide opportunities to scientists and engineers in both academia and industry to present their high-quality work in these tracks to push beyond the limits of existing technologies.

The Steering Committee and Advisory Board members have provided excellent guidance to our Organizing Committee and PC Committee. The PC Chairs, Professor Chao Chen, Professor Oliver Amft, Professor Sten Hanke, Professor Daniel Roggen, the Track Chairs, and the PC committee members have attracted, reviewed, and selected quality papers. The successful conference program preparation and quality proceeding publication the IEEE Ubiquitous Intelligence and Computing have been due to the incredible efforts of the PC committee members, conference organization chairs, including the Workshop Chairs, Professor Jiangtao Wang, Professor Shuhong Chen, the Poster and Demo Chairs, Professor Longbiao Chen, Professor Liang Wang, the Publicity Chairs, Professor Zhu Wang, Professor Luis Lopera, Professor Manuel Roveri, the Journal Special Issue Chair, Professor Leye Wang, and the Local Arrangement Chair, Professor Feng Chen. They have worked very hard to ensure the successful call for papers, review and quality production of the conference proceedings. We would also like to give our thanks to Keynote Speakers, Prof. Xin Yao and Prof. Vincenzo Piuri, for offering insightful and enlightening talks. Last but not least, we would like to thank all the authors who submitted their papers to the conference, and we hope that you will be able to attend this wonderful event.

## General Chairs

**Yasha Wang**, Peking University, China

**Claudio Bettini**, University of Milan, Italy

**Yiqiang Chen**, Chinese Academy of Sciences, China

**Liming Chen**, Ecole Centrale de Lyon, France

## Executive General Chairs

**Liming Chen**, De Montfort University, UK

**Raouf Hamzaoui**, De Montfort University, UK

# **Welcome Message from the IEEE UIC 2019 Program Chairs**

On behalf of the Program Committee of the 16th IEEE International Conference on Ubiquitous Intelligence and Computing (UIC), we would like to welcome you to join the conference in Leicester, UK, August 19-23, 2019

As the computational and ubiquitous intelligence is significantly transforming our daily life, the IEEE UIC 2019 Conference has become a great venue for both researchers and practitioners to present leading work on ubiquitous intelligence and computing. The UIC 2019 conference has attracted research papers on the related research issues from all around the world. This year we received 145 submissions. All submissions received at least three reviews from a high-quality review process. According to the review results, 64 regular papers are selected for oral presentation at the conference, giving an acceptance rate of 44%.

The success of UIC is the result of the efforts and time from numerous people. We would like to use this opportunity to thank the program committee members and the referees for their time and efforts, and for their well-constructed reviews given such a compressed schedule. We would also like to express our gratitude to our General Chairs, the Chairs of the Steering Committee, for their guidance and dedication to this conference. We are deeply in debt to their untiring efforts and assistance, without which it would be close to impossible to pull together this program at all.

Last but not the least, we would like to thank all the authors of submitted papers and the attendees for their contribution and participation. Without their strong support, we could not have a successful conference.

## **Program Chairs**

**Chao Chen**, Chongqing University, China

**Oliver Amft**, Friedrich-Alexander Universität Erlangen-Nürnberg, Germany

**Sten Hanke**, Austria Institute of Technology, Austria

**Daniel Roggen**, University of Sussex, UK

# **Welcome Message from the IEEE SCI 2019 Program Chairs**

On behalf of the Program Committee of the 3<sup>rd</sup> IEEE International Conference on Smart City Innovations (SCI 2019), we would like to welcome you to join the conference in Leicester, UK, August 19-23, 2019.

SCI2019 provides an opportunity for researchers to discuss the state-of-the-art in Smart Cities, from both a theoretical and applied perspective. The Conference provides a unique platform for multi-disciplinary researchers and teams, industry solution vendors, and government agencies to exchange innovative ideas and discuss challenges, research results and solutions.

The IEEE SCI 2019 will include a highly selective program of technical papers, accompanied by, demos, panel discussions and keynote presentations. The theme of this year's edition focuses on how Smart City Innovations can manage issues surrounding reliability in addition to considering how ideas and concepts can be deployed on a large scale.

We would like to thank all the researchers and practitioners who submitted their manuscripts, and to the Program Committee and the external reviewers that contributed their valuable time and expertise to provide professional reviews working under a very tight schedule. We would also like to express our gratitude to General Chairs of SCI, Chris Nugent, Lei Shu, Hui Wang and Sungyoung Lee and Executive chairs Liming Chen and Weishan Zhang for their providing helpful guidance and advice.

We hope that SCI 2019 will provide an excellent opportunity and forum for research exchanges and ongoing as well as new collaborations. Enjoy the conference!

## **Program Chairs**

**Ian Cleland**, Ulster University, UK

**Javier Medina**, University of Jaen, Spain

**Zakirul Alam Bhuiyan**, Fordham University, USA

**Lingmei Wang**, Shanxi University, China

# Keynote 1: Ambient Intelligence: Convergence Of Artificial Intelligence, Machine Learning, Biometrics, Cloud-Computing, And Internet-Of-Things

*Speaker: Prof. Vincenzo Piuri*  
*Department of computer Science, University degli Studi di Milano, Italy*

**Chair: TBA**

*09:20-10:00, 19th October (Tuesday)*  
*Hugh Aston Building (Room 0.10)*

## About the Keynote Speaker



Vincenzo Piuri has received his Ph.D. in computer engineering at Politecnico di Milano, Italy (1989). He is Full Professor in computer engineering at the Università degli Studi di Milano, Italy (since 2000). He has been Associate Professor at Politecnico di Milano, Italy and Visiting Professor at the University of Texas at Austin and at George Mason University, USA. His main research interests are: artificial intelligence, computational intelligence, intelligent systems, machine learning, pattern analysis and recognition, signal and image processing, biometrics, intelligent measurement systems, industrial applications, digital processing architectures, fault tolerance, dependability, and cloud computing infrastructures. Original results have been published in more than 400 papers in international journals, proceedings of international conferences, books, and book chapters. He is Fellow of the IEEE, Distinguished Scientist of ACM, and Senior Member of INNS. He has been IEEE

Vice President for Technical Activities (2015), IEEE Director, President of the IEEE Computational Intelligence Society, Vice President for Education of the IEEE Biometrics Council, Vice President for Publications of the IEEE Instrumentation and Measurement Society and the IEEE Systems Council, and Vice President for Membership of the IEEE Computational Intelligence Society. He is Editor-in-Chief of the IEEE Systems Journal (2013-19), and Associate Editor of the IEEE Transactions on Cloud Computing and IEEE Access, and has been Associate Editor of the IEEE Transactions on Computers, the IEEE Transactions on Neural Networks and the IEEE Transactions on Instrumentation and Measurement. He received the IEEE Instrumentation and Measurement Society Technical Award (2002). He is Honorary Professor at: Obuda University, Hungary; Guangdong University of Petrochemical Technology, China; Northeastern University, China; Muroran Institute of Technology, Japan; and the Amity University, India.

### Abstract:

Adaptability and advanced services for ambient intelligence require an intelligent technological support for understanding the current needs and the desires of users in the interactions with the environment for their daily use, as well as for understanding the current status of the environment also in complex situations. This infrastructure constitutes an essential base for smart living. Various technologies are nowadays converging to support the creation of efficient and effective infrastructures for ambient intelligence.

Artificial intelligence can provide flexible techniques for designing and implementing monitoring and control systems, which can be configured from behavioral examples or by mimicking approximate reasoning processes to achieve adaptable systems. Machine learning can be effective in extracting knowledge from data and learn the actual and desired behaviors and needs of individuals as well as the environment to support informed decisions in managing the environment itself and its adaptation to the people's needs.

Biometrics can help in identifying individuals or groups: their profiles can be used for adjusting the behavior of the environment. Machine learning can be exploited for dynamically learning the preferences and needs of individuals and enrich/update the profile associated either to such individual or to the group.

Biometrics can also be used to create advanced human-computer interaction frameworks. Cloud computing environments will be instrumental in allowing for world-wide availability of knowledge about the preferences and needs of individuals as well as services for ambient intelligence to build applications easily.

This talk will analyze the opportunities offered by these technologies to support the realization of adaptable operations and intelligent services for smart living in an ambient intelligent infrastructures.

## Keynote 2: Enabling Positioning And Personalisation Capabilities In The Wild - Challenges And Opportunities

*Speaker: Prof. Niki Trigoni, University of Oxford, UK*

*Chair: TBA*

*13:30-14:15, 19<sup>st</sup> August (Tuesday)*

*Hugh Aston Building (Room 0.10)*

### About the Keynote Speaker



Niki Trigoni is Professor at the Oxford Department of Computer Science, heading the Cyber Physical Systems Group. Her interests lie in the tight integration of sensing and machine intelligence for context inference, control and human-machine interaction using a variety of sensor modalities, including inertial, visual, magnetic and radio signals. She has applied her work to a number of application scenarios, including asset monitoring for construction sites, mobile autonomy with humans and robots, and track worker localisation for safety and efficiency. Trigoni is also Director of the Centre for Doctoral Training on Autonomous and Intelligent Machines and Systems and Founder of the Navenio Oxford spinout.

### Abstract:

Smart devices are becoming increasingly affordable and ubiquitous; whether they are seamlessly embedded in the environment, or carried by people and robots, they continually generate sensor data about the world that surrounds them. Recent advances in machine learning have revolutionised the ability of smart sensors to perceive and interpret context, infer human activities and react to human preferences. This talk will highlight challenges and opportunities in designing machine learning techniques to solve problems of context inference in the wild. I will then show how the power of machine learning, can become a severe vulnerability, in the absence of sufficient measures to protect the privacy of individuals.

## Keynote 3: Network Traffic Theory and Technologies: Practice, Challenges and Trends

*Speaker: Prof. Chengsheng Pan, Dalian University, China,*

*Chair: TBA*

*09:00-09:50, 21<sup>st</sup> August (Wednesday)*

*Hugh Aston Building (Room 0.10)*

### About the Keynote Speaker



Chengsheng Pan, Professor of Nanjing University of Information Science and Technology in China, Ph.D., doctoral supervisor. Millions of Talent Projects National candidates at hundred level, the National May 1st Labor Medal winner. He has been engaged in integrated network theory and technology research, and has achieved systematic and innovative results, and solved important practical problems for major national projects in China. He has won two second prizes for national scientific and technological progress, and six first prizes for provincial and ministerial level technological inventions and scientific and technological progress. He served as a member of the expert committee in the field of network information and deputy leader of the national high technology project expert group for two terms. He completed the

first space information network ground verification test in China and the first space and air information network verification test in China. He also undertook the design and development of key network systems for a series of major projects in China .

### Abstract:

In complex network systems, there are over ten different types of heterogeneous links, including cable, short-wave, ultra-short-wave, satellite, etc. Heterogeneous networks can also be categorized into over ten types, including wired local area network, wireless short-wave network, etc. How to make these links converged and the networks unified bearing using efficient network traffic theory is the main difficulty to shorten the information transmission time and improve the network throughput.

This talk will briefly describe the definition and theorems of the traffic self-similarity in network traffic theory, discusses several methods of establishing models of heterogeneous link convergence and heterogeneous network unified bearing based on network traffic self-similarity principle, and forecasts the challenges faced by intelligent network traffic theory and key technologies.

## Keynote 4: Building Qualitative Models of Spatio-Temporal Behaviour

*Speaker: Prof. Tony Cohn, Leeds University*

**Chair: TBA**

*13:30-14:15, 21<sup>st</sup> August (Wednesday)*

*Hugh Aston Building (Room 0.10)*

### About the Keynote Speaker



Tony Cohn holds BSc and PhD degrees from the University of Essex. He spent 10 years at the University of Warwick before moving to Leeds in 1990 where he founded a research group working on knowledge representation and reasoning with a particular focus on qualitative spatial/spatio-temporal reasoning. His research has broadened to encompass Cognitive Vision, Robotics, Grounding Language in Vision, Decision Support Systems, and computational neuroscience. He also holds an appointment as a Turing Fellow at the UK Alan Turing Institute. He is the recipient of the 2015 IJCAI Donald E Walker Distinguished Service Award which honours senior scientists in AI for contributions and service to the field during their careers, as well as the 2012 AAI Distinguished Service Award for "extraordinary and sustained service to the artificial intelligence community". He is a Fellow of the Royal Academy of Engineering, and is also a Fellow of AAI, AISB, EurAI (Founding Fellow), the BCS, and the IET. He is Editor-in-Chief of the journal *Spatial Cognition and Computation* and has been Chairman/President of the UK AI Society SSAISB, the European Association for Artificial Intelligence (EurAI), KR inc, the IJCAI Board of Trustees and was the Editor-in-Chief of the journal *Artificial Intelligence* 2007-2014 and of the *AAAI Press* 2004-14. He remains a Director of KR Inc. He holds visiting Distinguished Professor Appointments at Tongji University and Qingdao University of Science and Technology.

### Abstract:

In this talk I will present research conducted at Leeds on building models of activity from video and other sensors, using both supervised and unsupervised techniques. Activities may occur in parallel, while actors and objects may participate in multiple activities simultaneously. The representation exploits qualitative spatio-temporal relations to provide symbolic models at a relatively high level of abstraction. For supervised learning, I will show how the supervisory burden can be reduced by using what we term "deictic supervision," whilst in the unsupervised case I will present a method for learning the most likely interpretation of the training data. I will also show how objects can be "functionally categorised" according to their spatio-temporal behaviour and how the use of type information can help in the learning process, especially in the presence of noise.



## Keynote 5: Turning Ubiquitous Smartness into Ubiquitous Playability

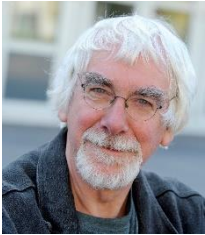
*Speaker: Prof. Anton Nijholt, University of Twente, Netherlands*

*Chair: Prof. Yasha Wang, Peking University, China*

*10:00-10:40, 20<sup>th</sup> August (Tuesday)*

*Hugh Aston Building (Room 0.10)*

### About the Keynote Speaker



Anton Nijholt has interest in human-computer interaction, playability, entertainment computing, humor research and brain-computer interfacing. He is author of hundreds of research papers in these areas and wrote and edited several books. He has been program chair and general chair of many international conferences and workshops devoted to affective computing, virtual agents, computer animation, faces & gestures, computational humor, entertainment computing, playable cities, and brain-computer interfaces. Nijholt is chief-editor of the specialty section Human-Media Interaction of *Frontiers in Psychology*, *Frontiers in Computer Science*, and he is series editor of the Springer Book Series on Gaming Media and Social Effects. Recent edited books are

“Brain Art: Brain-Computer Interfaces for Artistic Expression” (Springer, 2019) and “Making Smart Cities More Playable. Exploring Playable Cities” (Springer, 2019).

### Abstract:

Digital technology makes cities smart. City managements can make use of information that can be extracted from databases in which data is collected about energy consumption, traffic behavior, waste management, human behavior in public environments and even opinions of the general public, for example as they can be obtained from social media use. But can this help to make living in a city more enjoyable? How can digital technology make cities 'playful', allow citizens to engage in playful and entertaining activities that help to enjoy their daily and sometimes boring activities such as commuting, working, career and social obligations, housekeeping? In this talk we investigate how sensors and actuators in a smart urban environment can be introduced and used to design playful experiences. We discuss how ideas about playable cities have developed in recent years and we will illustrate them with many examples ranging from top-down (city management) to bottom-up (DIY urbanism) initiatives, and the technology behind these initiatives.

## Keynote 6: Ten Scientific Problems in Human Behavior Understanding

*Speaker: Prof. Zhiwen Yu, Northwestern Polytechnical University, China*

*Chair: Diego López-de-Ipiña, University of Deusto, SPAIN*

*10:00-10:40, 20<sup>th</sup> August (Tuesday)*

*Hugh Aston Building (Room 0.08)*

### About the Keynote Speaker



Dr. Zhiwen Yu is currently a professor of the School of Computer Science, Northwestern Polytechnical University, China. He has worked as an Alexander Von Humboldt Fellow at Mannheim University, Germany from Nov. 2009 to Oct. 2010, a research fellow at Kyoto University, Japan from Feb. 2007 to Jan. 2009, and a post-doctoral researcher at Nagoya University, Japan in 2006-2007. His research interests cover ubiquitous computing, mobile social networks, and human-computer interaction. He has served as an associate/guest editor for a number of international journals, such as IEEE Transactions on Human-Machine Systems, IEEE Communications Magazine, and ACM Transactions on Intelligent Systems and Technology. He is the General Chair of CPSCom 2019, SmartCity 2016, CPSCom 2015, and UIC 2014, the Program Chair of ACM TURC 2018, EUC 2013, HumanCom 2012, and UIC 2010, the Vice Program Chair of PerCom 2015, the Workshop Chair of UbiComp 2011. He has published around 150 scientific papers in refereed journals and conferences, e.g., ACM Computing Surveys, IEEE TKDE, IEEE TMC, IEEE THMS, ACM TKDD, UbiComp, PerCom, etc. Zhiwen Yu is a senior member of IEEE, a distinguished member of CCF (China Computer Federation) and the vice chair of CCF Pervasive Computing Technical Committee. He received the CCF Young Scientist Award in 2011, the CPSCom'13/GPC'12/AMT'12/UIC'09 best paper awards, the Humboldt Fellowship in 2008, and the CCF Excellent Doctoral Dissertation Award in 2006. He got the National Science Fund for Distinguished Young Scholars in 2017.

### Abstract:

Human behavior understanding is of great importance for variety of applications, such as personalized recommendations, smart home, urban planning, and anti-terrorism. Although there has been significant progress on the understanding of human behaviors, we still face a number of theoretical and technical challenges that need be further explored. In this talk, I will introduce ten most important fundamental open problems in this field. They are expected to provoke innovative studies on human behavior understanding, e.g., theory improvement and data collaboration. In this talk, I will also present our recent research works in this topic.

## Keynote 7: Autonomous Operation and Maintenance in Scalable Computing and Networking Systems

*Speaker: Prof. Geyong Min, University of Exeter, UK*  
*Chair: Liangxiu Han, Manchester Met. University, UK*  
*10:00-10:40, 20<sup>th</sup> August (Tuesday)*  
*Hugh Aston Building (Room 2.06)*

### About the Keynote Speaker



Professor Geyong Min is a Chair in High Performance Computing and Networking. His recent research has been supported by European Horizon-2020, FP7, UK EPSRC, Royal Society, Royal Academy of Engineering, and industrial partners including British Telecom, IBM, and INMARSAT. He has published more than 200 research papers in leading international journals including IEEE/ACM Transactions on Networking, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Computers, IEEE Transactions on Parallel and Distributed Systems, and at reputable international conferences, such as SIGCOMM-IMC, INFOCOM, and ICDCS. He is an Associated

Editor of several international journals, e.g., IEEE Transactions on Computers, IEEE Transactions on Cloud Computing, and Computer journals. He served as the General Chair/Program Chair of a number of international conferences in the area of Information and Communications Technologies.

#### **Abstract:**

As scalable computing and networking systems are becoming larger and more complex, the operations and management of such systems pose grand challenges. An important trend is to achieve autonomous operation and maintenance and create secure, reliable and dependable systems with a “zero perceived” downtime for services provisioning. To this end, an efficient method is to develop efficient big data analytics in order to dig valuable knowledge and actionable insights hidden in content-rich big data for improving the design, operation, management, and intelligence of scalable computing and networking systems. This talk will present the innovative big data processing technologies and integrate big data, machine learning, and artificial intelligence technologies to automate and enhance operations and management. This talk opens up a new horizon of research and development by exploiting the key intelligence and insights hidden in big data for the design and improvement of scalable computing and networking systems.

## Keynote 8: Visual Computing for Smart AR Assistance

*Speaker: Prof. Peter Eisert, Humboldt University Berlin, Germany*  
*Chair: Prof. Liming Chen, De Montfort University & Ulster University, UK*  
*14:15-15:00, 20<sup>th</sup> August (Tuesday)*  
*Hugh Aston Building (Room 0.10)*

### About the Keynote Speaker



Nijholt Peter Eisert is Professor for Visual Computing at the Humboldt University Berlin and heading the Vision & Imaging Technologies Department of Fraunhofer HHI, Berlin, Germany. He is also Professor Extraordinaire at the University of Western Cape, South Africa. In 2000, he received the Dr.-Ing. degree "with highest honors" from the University of Erlangen-Nuremberg, Germany. He then worked as a postdoctoral fellow at the Stanford University, USA, on 3D image analysis as well as facial animation and computer graphics. In 2002, he joined Fraunhofer HHI, where he is coordinating and initiating numerous national and international 3rd party funded research projects. He has published more than 150 conference and journal papers and is Associate Editor of the International Journal of Image and Video Processing as well as in the Editorial Board of the Journal of Visual Communication and Image Representation. His research interests include 3D image/video analysis and synthesis, face and body processing, image-based rendering, computer vision, computer graphics, machine learning in application areas like multimedia, industry, security, and medicine.

### Abstract:

The current progress in Virtual and Augmented Reality, especially with the development and availability of VR/AR glasses, has enabled many novel tools that assist humans in complex working processes. By tracking the user as well as objects in the scene, additional context based information can be visualized directly on the surface of objects of interest. In this talk, 3D image and video analysis methods will be presented that allow the 3D registration of computer graphics information with the real scene. The visualization is not restricted to simple text and iconic information but can also provide rich content like the structure of a tumor in medical images or natural humans for remote collaboration. This includes hybrid visualization that combine video-based methods with semantic computer graphics objects to achieve high visual quality while creating the possibility to interact with and modify the augmented content. Examples from real-world applications will be shown in the areas of multimedia, industry and medicine.

## Keynote 9: Data Security and Privacy in Emerging Scenarios

*Speaker: Prof. Pierangela Samarati,  
Department of Computer Science of the Università degli Studi di Milano, Italy  
Chair: Prof. Zheng Yan, Xidian University, China & Aalto University, Finland  
14:15-15:00, 20<sup>th</sup> August (Tuesday) 2019  
Hugh Aston Building (Room 0.08)*

### About the Keynote Speaker



Pierangela Samarati is a Professor at the Department of Computer Science of the Università degli Studi di Milano, Italy. Her main research interests are on data and applications security and privacy, especially in emerging scenarios. She has participated in several projects involving different aspects of information protection. On these topics, she has published more than 270 peer-reviewed articles in international journals, conference proceedings, and book chapters. She has been Computer Scientist in the Computer Science Laboratory at SRI, CA (USA). She has been a visiting researcher at the Computer Science Department of Stanford University, CA (USA), and at the Center for Secure Information Systems of George Mason University, VA (USA). She is the chair of the IEEE Systems Council Technical Committee on Security and Privacy in Complex Information Systems (TCSPCIS), of the ERCIM Security and Trust Management Working Group (STM), and of the ACM Workshop on Privacy in the Electronic Society (WPES). She is a member of several steering committees. She is ACM Distinguished Scientist (named 2009) and IEEE Fellow (named 2012). She has received the ESORICS Outstanding Research Award (2018), the IEEE Computer Society Technical Achievement Award (2016), the IFIP WG 11.3 Outstanding Research Contributions Award (2012), and the IFIP TC11 Kristian Beckman Award (2008). She has served as General Chair, Program Chair, and program committee member of several international conferences and workshops.

### Abstract:

The rapid advancements in Information and Communication Technologies (ICTs) have been greatly changing our society, with clear societal and economic benefits. Mobile technology, Cloud, Big Data, Internet of things, services and technologies that are becoming more and more pervasive and conveniently accessible, towards to the realization of a 'smart' society'. At the heart of this evolution is the ability to collect, analyze, process and share an ever increasing amount of data, to extract knowledge for offering personalized and advanced services. A major concern, and potential obstacle, towards the full realization of such evolution is represented by security and privacy issues. As a matter of fact, the (actual or perceived) loss of control over data and potential compromise of their confidentiality can have a strong detrimental impact on the realization of an open framework for enabling collection, processing, and sharing of data, typically stored or processed by external cloud services.

In this talk, I will illustrate some security and privacy issues arising in emerging scenarios, focusing in particular on the problem of managing data while guaranteeing confidentiality and integrity of data stored or processed by external providers.

## Keynote 10: IOT Enabled Smart Energy Management Systems for Smart City Applications-An Indian Context

*Speaker: Prof. Reeba Korah,  
Alliance College of Engineering and Design, Alliance University, Bangalore, India  
Chair: Chris Nugent, Ulster University, UK  
14:15-15:00, 21<sup>st</sup> August (Wednesday), 2019  
Hugh Aston Building (Room 2.06)*

### About the Keynote Speaker



Dr. Reeba Korah heads Alliance College Engineering and Design. She has a vast experience of over 24 years in the field of engineering, academics, administration and active research. Prof. Korah is an alumna of prestigious Anna University, Chennai. Her technical expertise spans VLSI design, image and video processing and wireless sensor networks. She has about 40 research publications to her credit in reputed international journals and conference proceedings. She has presented her research works in IEEE International conferences held in China, Spain and Canada. She has authored five books pertaining to electronics engineering. Dr. Korah serves as a doctoral level research supervisor in Anna University and Alliance University, Bangalore. She has produced eleven Ph.D. holders so far. She is also a doctoral committee member in these universities. She serves as a reviewer for the reputed Elsevier International Journal of Micro Electronics and Emerald Compe International Journal for Computation and Mathematics in Electrical and Electronic Engineering. Dr. Korah is the recipient of the Karnataka Government's research funding to establish a Centre of Excellence in Electronic device modelling and VLSI Chip design.

### Abstract:

One of the key features in any smart city project is the application of smart solutions to infrastructure and services in area based development in order to make them better. For example, using fewer resources and providing cheaper services. Smart cities focus on usage of IOT to collect data and use them to manage assets and resources efficiently. Monitoring and managing waste, power generation, home and building automation, smart water supply management and intelligent transport and road management are some of the works in progress in mu institution, Alliance University.

The talk will focus on the problems in waste management by monitoring the current state of waste bins and their surroundings, extraction of energy from the collected waste and later converting into electricity to provide clean and cheap electricity to remote places of the city as well to the poor community, and nn integrated Vehicle to grid technology system with capability to control bidirectional flow of electric energy between a vehicle and a grid.

# Keynote 11: Challenges And Solutions For Building A Self-Evolving Smart City

*Speaker: Prof. Yasha Wang, Peking University, China*

*Chair: TBA*

*09:50-10:40, 21<sup>st</sup> August (Wednesday)*

*Hugh Aston Building (Room 0.10)*

## About the Keynote Speaker



Yasha Wang is a professor and associate director of National Research & Engineering Center of Software Engineering in Peking University, China. He is also the leader of the technical special group of the National Big Data Standards Committee of China and the vice chairman of the China Smart City Industry and Technology Innovation Strategic Alliance. His research interest includes ubiquitous computing, artificial intelligence, urban computing and software reuse. He has published more than 60 papers in international high-level academic conferences and journals such as ACM Ubicomp, IJCAI, AAI, ACM CSCW, IEEE TMC, and IEEE IOTJ. Through cooperation with enterprises, he promoted relevant research results of smart cities to more than 20 cities in China. His research results won the second prize of National Science and Technology Progress Award, the second prize of Beijing Science and Technology Award, and the first prize of Science and Technology Progress Award of the Ministry of Education of China.

### Abstract:

Utilizing modern ICT technology to sense, understand and optimize the city, or in another word, to make the city smarter is becoming consensus of different city government around the world. The wisdom of the city is carried through a large number of smart applications. These applications often originate in several areas and gradually spread to various areas of the city. With the development of the city, the accumulation of data, and the advancement of technology, these applications have become increasingly intelligent. From a macroscopic point of view, an ideal smart city should evolve and improve in the interaction with technology, environment and regional culture like a living body, forming a self-evolving smart city. To build a self-evolving smart city faces many challenges. The first challenge is how to build rich urban applications. These applications have multiple levels of technical requirements. No single enterprise can provide a complete solution. How to establish a synergistic mechanism and ecosystem to promote the prosperity of smart applications? The second challenge is how to make the application more convenient and smarter. Too many applications in a city may cause information overload to users. How to make the application more convenient to use, to cause less intrusion during use, so that the general public can effectively benefit from various smart-city applications, is another challenge that must be solved. Based on the research and practice of the speaker in urban computing and bigdata, this report gives possible solutions to the above challenges from both the crowdsourcing software development platform and the data-driven intelligent extraction.



## Keynote 12: Vertical Workflows: Service Orchestration Across Cloud & Edge Resources

*Speaker: Prof. Omer F. Rana, Cardiff University, UK  
Chair: Wenbing Zhao, Cleveland State University, USA  
09:50-10:40, 21<sup>st</sup> August (Wednesday)  
Hugh Aston Building (Room 0.08)*

### About the Keynote Speaker



Omer F. Rana is Professor of Performance Engineering at Cardiff University, with research interests in high performance distributed computing, data analysis/mining and multi-agent systems. He was formerly the deputy director of the Welsh eScience Centre and had the opportunity to interact with a number of computational scientists across Cardiff University and the UK. He is a fellow of Cardiff University's multi-disciplinary "Data Innovation" Research Institute. Rana has contributed to specification and standardisation activities via the Open Grid Forum and worked as a software developer with London-based Marshall Bio-Technology Limited prior to joining Cardiff University, where he developed specialist software to support biotech instrumentation. He also contributed to public understanding of science, via the Wellcome Trust funded "Science Line", in collaboration with BBC and Channel 4. Rana holds a PhD in "Neural Computing and Parallel Architectures" from Imperial College (London Univ.), an MSc in Microelectronics (Univ. of Southampton) and a BEng in Information Systems Eng. from Imperial College (London Univ.). He serves on the editorial boards (as Associate Editor) of IEEE Transactions on Parallel and Distributed Systems, (formerly) IEEE Transactions on Cloud Computing, IEEE Cloud Computing magazine and ACM Transactions on Internet Technology. He is a founding-member and associate editor of ACM Transactions on Autonomous & Adaptive Systems.

### Abstract:

Many Internet of Things (IoT) applications today involve data capture from sensors that are close to the phenomenon being measured, with such data subsequently being transmitted to Cloud data centers for analysis and storage. Currently devices used for data capture often differ from those that are used to subsequently carry out analysis on such data. Increasing availability of storage and processing devices closer to the data capture device, perhaps over a one-hop network connection or even directly connected to the IoT device itself, requires more efficient allocation of processing across such edge devices and data centers. Scalability in this context needs to consider both cloud resources and initial processing on edge resources closer to the user. We refer to these as "vertical workflows" – i.e. workflows (a combined set of services) which are enacted across resources that can vary in: (i) type and behaviour; (ii) processing and storage capacity; (iii) latency and security profiles. Understanding how a workflow can be enacted across these resource types is outlined, motivated through multiple application scenarios. The overall objective considered is the completion of the workflow within some deadline constraint, but with flexibility on where data processing is carried out.



# Keynote 13: FedHealth: A Federated Transfer Learning Framework for Wearable Healthcare

Speaker: Prof. Yiqiang Chen

Chair: TBA

09:50-10:40, 21<sup>st</sup> August (Wednesday)  
Hugh Aston Building (Room 2.08)

## About the Keynote Speaker



TBA Dr. Yiqiang Chen received the BS and MS degrees in computer science from Xiangtan University, Xiangtan, China, in 1996 and 1999, respectively, and the PhD degree in computer science from the Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China, in 2003. In 2004, he was a visiting scholar researcher with the Department of Computer Science and Engineering, Hong Kong University of Science and Technology (HKUST), Hong Kong. He is currently a professor and the director of the Pervasive Computing Research Center, Institute of Computing Technology (ICT), Chinese Academy of Sciences (CAS). His research interests include artificial intelligence, pervasive computing, wearable computing, and human computer interaction. He is a senior member of the IEEE. He has a lots of publications on several top journals and conferences, including Science (supplementary), TKDE, TNN, Scientific Reports, Scientific Data, IJCAI, AAI UbiComp, ACM MM, ICDM. His work on wearable and transfer learning was awarded the best paper of GameNets 2014, PlatCon 2015, and ICCSE 2018. Dr. Chen is the associate editor (AE) of several journals such as IEEE Trans. On Emerging Trend on Computational Intelligence, International Journal of Machine Learning and Cybernetics, and IEEE Access. He is also the TPC chair (member) of IJCAI 2019, ISWC 2018, PerCom 2017, AAI 2015 的 TPC Member, ICCSE 2017, and ICAA 2018. He is the chair of IEEE UIC 2019, PCC 2010, PCC 2017, and CSCC 2019.

### Abstract:

With the rapid development of computing technology, wearable devices such as smart phones and wristbands make it easy to get access to people's health information including activities, sleep, sports, etc. Smart healthcare achieves great success by training machine learning models on large quantity of user data. However, there are two critical challenges. Firstly, user data often exists in the form of isolated islands, making it difficult to perform aggregation without compromising privacy security. Secondly, the models trained on the cloud fail on personalization. In this talk, I will introduce FedHealth, the first federated transfer learning framework for wearable healthcare to tackle these challenges. FedHealth performs data aggregation through federated learning, and then builds personalized models by transfer learning. It is able to achieve accurate and personalized healthcare without compromising privacy and security. Experiments demonstrate that FedHealth produces higher accuracy (5.3% improvement) for wearable activity recognition when compared to traditional methods. FedHealth is general and extensible and has the potential to be used in many healthcare applications.

## Keynote 14: Developing Smart and Connected Solutions for Healthcare and Medicine

Speaker: Prof. Wenbing Zhao Cleveland State University, USA

Chair: TBA

09:00-09:50, 22<sup>nd</sup> August (Thursday)

Hugh Aston Building (Room 2.09)

### About the Keynote Speaker



Dr. Zhao is a Professor at the Department of Electrical Engineering and Computer Science, Cleveland State University. He earned his Ph.D. at University of California, Santa Barbara in 2002. He has over 200 peer-reviewed publications. Dr. Zhao's research spans from dependable distributed systems to human centered smart systems. His research has been funded by the US NSF, US Department of Transportation, Ohio Bureau of Workers' Compensation, Ohio Department of Higher Education, and Ohio Development Services Agency. He has delivered more than 10 keynotes, tutorials, public talks and demonstrations in various conferences, industry and academic venues. Dr. Zhao is an associate editor for IEEE Access, MDPI Computers, and PeerJ Computer Science, and a member of the editorial board of several international journals, including Applied System Innovation, Internal Journal of Parallel, Emergent and Distributed Systems and International Journal of Distributed Systems and Technologies. He is currently an IEEE Senior Member and serves on the executive committee of the IEEE Cleveland Section.

### Abstract:

In recent years, we have seen exciting new innovations in connectivity (NFC and Bluetooth LE), sensing (motion, position, voice, vision, physiology, and environment), visualization (touch screen, virtual and mixed reality), computing (mobile phones and cloud services), and algorithms (big data, machine learning and artificial intelligence). These technologies form the backbone of the Internet of Things, and they facilitate the development of previously unthinkable smart and connected solutions that promise to transform healthcare and medicine from reactive and hospital-centered to preventive and personalized, from disease focused to well-being centered. In this talk, Dr. Zhao will provide an overview of this field, present his current project on a computer-vision-based system that aims to increase the workers' compliance to best practices in using proper body mechanics, and outline several projects he is planning, including their main hypotheses, the research problems to which he is seeking answers, and the main approaches he will be taking.

## Keynote 15: Data-Driven Service Computing

*Speaker: Prof. Lu Liu, Leicester University*

**Chair: TBA**

*09:50-10:40, 22<sup>nd</sup> August (Thursday)*

*Hugh Aston Building (Room 3.05)*

### About the Keynote Speaker



TBA.

#### **Abstract:**

TBA.

## Panel 1: Future Computing in Smart World

*Location: HU 0.10, 11:00-12:30, Tuesday, 20<sup>th</sup> August 2019*

**Abstract:** Due to the information intensive nature of many services required in the smart world, information technology, especially those aspects heavily relying on computing, will continue to be vital in building the smart world. Recent advances in areas, such as big data, multimedia, machine learning, language processing, as well as powerful and intelligent computing systems, ranging from large-scale cloud systems to mobile intelligent devices, and Internet of Things, have shown significant progress in meeting the challenges of providing the desirable services in the smart world. Furthermore, quality of services, such as security, privacy, dependability and adaptability, need to be incorporated in the services with human-centric characteristics in the smart world environment. In doing so, some existing research areas, such as applications of neuron networks and blockchains, have emerged as promising approaches to addressing certain challenging problems in the smart world due to the recent major progress made in other areas. such as big data, algorithms, computing systems, networking, and sensing. In this panel session, we have four distinguished panelists with different research and practical background in computing will discuss the future research directions of computing in the smart world in their opening remarks, followed by open discussions from the floor.

**Chairs:** Stephen S. Yau, Arizona State University, USA

**Panelists:** Julient Bourgeois, University of Bourgogne Franche-Comté, France  
Runhe, Hosei University, Tokyo, Japan  
Sumi Helal, Lancaster University, UK  
Man Liu, St. Francis Xavier University, Canada

### Statements:

#### **Towards Smart World with Power of Synergy of Cognitive Learning and Machine Learning (Runhe Huang)**

*Cognitive learning* refers to the mechanisms of the brain's learning that explain how humans process information, accumulate/update knowledge, and apply knowledge by a set of abstract intelligence: interpretation, assimilation, and instantiation. *Machine Learning* at its most basic refers to the practice of using algorithms to assimilate experience from observed data. Machine learning can build knowledge models based on acquired past experiences, while Cognitive learning can perform reasoning using prior knowledge or past experiences (existing models) to arrive at a solution to a problem. This plenary talk will address the power of the synergy of cognitive learning and machine learning for machine intelligence towards smart worlds. The *KID* (Knowledge-Information-Data) as a generic cognitive learning model will be introduced and the framework how it conjuncts with machine learning algorithms will be explained.

#### **Pervasive distributed robotic systems for Smart World (Julien Bourgeois)**

Technological advances, especially in the miniaturization of robotic devices foreshadow the emergence of large-scale ensembles of small-size resource-constrained robots that distributively cooperate to achieve complex tasks. These ensembles are formed by independent, intelligent and communicating units which act as a whole ensemble which can be used to build programmable matter i.e. matter able to change its shape. In my talk, I will present our research effort in building Programmable Matter (PM) based on modular robots. To do this, we use micro-technology to scale down the size of each element, and we study geometry, structure, actuation, power, electronics and integration. To manage

the complexity of this kind of environment, we propose a complete environment including programmable hardware, a programming language, a compiler, a simulator, a debugger and distributed algorithms. This distributed robotic system could be embedded in many day-to-day objects enabling the creation of smart world.

### **Enabling Future IoT Scenarios through Smart Thing Architectures (Sumi Helal)**

In this panel, I will call for a "Walk Before We Run" adjustment in the Internet-of-Things (IoT) research and development landscape. Without first settling the quest for what thing is or could be or do, we run the risk of presumptuous visions, or hypes, that can only fail the realities and limits of what is actually possible, leading to customers and consumers confusion as well as market hesitations. Specifically, without a carefully-designed Thing architecture in place, it will be very difficult to find the “magic” we are so addicted and accustomed to – programming! Programming the IoT, as we once programmed the mainframe, the workstation, the PC and the mobile devices, is the natural way to realize a fancy IoT scenario or an application.

### **Towards Smart Energy-Aware Cyber-Physical Systems through Learning-based Scheduling (Man Lin)**

One goal of technical support for "smart world" is to design or apply computational intelligence techniques to the development of cyber-physical systems that are resource-constrained. This plenary talk addresses one aspect of “Smartness” for cyber-physical resource-constrained systems, which is smart resource allocation that promotes energy efficiency. Cyber-physical systems regularly interact with an uncertain environment, and thus, the workload of a cyber-physical system at a given time point could be unpredictable. Traditional scheduling methods are, therefore, hard to achieve energy efficiency without prior knowledge of the workload. Reinforcement learning is a learning technique where an agent can choose an action based on history and reward. Reinforcement learning is thus a suitable technique to learn from past experience and environment feedback without manually labeling data for the learning process. The learning-based scheduling for smart energy-aware cyber-physical systems will be explained, and the challenges will be discussed in this talk.

### **Biographies:**



#### **Stephen S, Yau**

*Arizona State University, USA*

Stephen S, Yau is Professor of Computer Science and Engineering at Arizona State University (ASU), Tempe, Arizona, USA. He served as the chair of the Department of Computer Science and Engineering, and later as the director of Information Assurance Center at ASU. Previously, he was on the faculties of Northwestern University, Evanston, Illinois, and University of Florida, Gainesville. He served as the president of the Computer Society of the Institute of Electrical and Electronics Engineers (IEEE) and the editor-in-chief of IEEE COMPUTER magazine. He organized many major conferences, including the 1989 World Computer Congress sponsored by the International Federation for Information Processing (IFIP), and the 2018 IEEE World Congress on Services in July, 2018. His current research includes cloud and services computing, cyber security, software engineering, ubiquitous computing and Internet-of-Things. He has received many awards and recognitions, including the Tsutomu Kanai Award and Richard E. Merwin Award of the IEEE Computer Society, and the Outstanding Contributions Award of the Chinese Computer Federation. He is a Life Fellow of the IEEE and a Fellow of the American Association for the Advancement of Science. He received the Ph.D. degree from the University of Illinois, Urbana in electrical engineering.



**Julien Bourgeois**

*University of Bourgogne Franche-Comté (UBFC) in France*

Julien Bourgeois is a professor of computer science at the University of Bourgogne Franche-Comté (UBFC) in France. He is leading the computer science department at the FEMTO-ST institute/CNRS. His research interests include distributed intelligent MEMS (DiMEMS), Programmable Matter, P2P networks and security management for complex networks. He has worked for more than 15 years on these topics and has co-authored more than 140 international publications. He was an invited professor at Carnegie Mellon University (US) from September 2012 to August 2013, at Emory University (US) in 2011 and at Hong Kong Polytechnic University in 2010, 2011 and 2015. He led different funded research projects (Smart Surface, Smart Blocks, Computation and coordination for DiMEMS). He is currently leading the programmable matter project funded by the ANR and the ISITE-BFC project. He has also worked in the Centre for Parallel Computing at the University of Wetsminster (UK) and in the Consiglio Nazionale delle Richerche (CNR) in Genova. He organized and chaired many conferences (dMEMS 2010, 2012, HotP2P/IPDPS 2010, Euromicro PDP 2008 and 2010, IEEE GreenCom 2012, IEEE iThings 2012, IEEE CPSCom 2012, GPC 2012, IEEE HPCC 2014, IEEE ICCESS 2014, CSS 2014, IEEE CSE 2016, IEEE EUC 2015, IEEE ATC 2017, IEEE CBDCom 2017). He is also acting as a consultant for the French government and for companies.



**Runhe Huang**

*Faculty of Computer and Information Sciences, Hosei University, Tokyo, Japan*

Dr. Huang received her B.Sc. in Electronics Technology from the National University of Defense Technology, China, in 1982, and her Ph.D. in Computer Science and Mathematics from the University of the West of England, UK, in 1993. She worked at the National University of Defense Technology during the period 1982-1988. In 1988, she received a Sino-Britain Friendship Scholarship for her Ph.D. study. She worked at the University of Aizu, Japan from 1993 to 1999 and has been working at Hosei University, Japan since 2000. She has become a full professor since 2004 and headed the Department of Computer Science from 2008 to 2010. She is currently serving as IEEE CIS SWTC chair.

**Sumi Helal**

*Lancaster University, UK*

Sumi Helal received the Ph.D. degree in computer sciences from Purdue University, West Lafayette, IN, USA. He is currently professor and the Chair in Digital Health, School of Computing and Communications, and the Division of Health Research, Lancaster University, UK. Before joining Lancaster University, he was professor in the department of Computer and Information Science and Engineering, University of Florida, USA, where he directed the Mobile and Pervasive Computing Laboratory and the Gator Tech Smart House. His research interests span pervasive systems, the

Internet of Things, smart spaces, with applications to digital health and assistive technologies for successful aging and independence.

**Man Lin**

*St. Francis Xavier University, Canada*



Man Lin received the B.E. degree in Computer Science and Technology from Tsinghua University, Beijing, China, in 1994. She received the Lic. and Ph.D. degrees from the Department of Computer and Information Science at Linkoping University, Linkoping, Sweden, in 1997 and 2000, respectively. She is currently a Professor of Computer Science at St. Francis Xavier University, Canada. Her research interests include real-time and cyber-physical system design and analysis, scheduling, energy aware computing, optimization algorithms, and machine learning techniques. Her research is supported by National Sciences and Engineering Research Council, Canada (NSERC). She is currently serving as IEEE CIS SWTC vice chair.

## **Panel 2: Intelligence Analytics: The Confluence of Data Analytics and Artificial Intelligence**

*Location: HU 0.10, 11:00-12:30, Wednesday, 21<sup>th</sup> August 2019*

**Abstract:** Data Analytics has evolved over the years from Descriptive (what has happened) to Diagnostic (why did it happen) to Predictive (what could happen) to Prescriptive (what action could be taken). On the other hand, artificial intelligence has evolved over the years from dominant symbolic AI, featured by explicit knowledge modelling, representation and reasoning, to data-driven computational AI, featured by machine learning and in particular, neural network based deep learning techniques. With the widely availability of big data, significantly improved computation algorithms and the high performance computing facilities such as cloud, what will be the next big paradigm shift arising from the confluence of data analytics and AI? Will intelligence analytics combine and fuse data analytics and AI to reach the holy-grail of human level intelligence? This panel brings together researchers and thought leaders from different perspectives to cross-examine and speculate next big “thing” beyond the current state of art as well as challenges, solutions and the direction forward.

**Chairs:** Sally McClean / Liming Chen, Ulster University, UK,

**Panelists:** Sally McClean, Ulster University, UK  
Claudio Bettini, Università degli Studi di Milano, ITALY  
Hongji Yang, Leicester University, UK  
Alison B Lowndes, NVIDIA Ltd, UK  
Liming Chen, Ulster University, UK

### **Statements:**

#### **Intelligent Analytics: Towards developing end-to-end support for systems, processes, things and environments (Sally McClean)**

There is an ever-increasing capability to collect, process and use complex knowledge and big data that are online, diverse and heterogeneous, through developing technologies such as the internet of things. This provides huge potential for data-driven AI to provide intelligent end-to-end solutions that combine diverse knowledge and data for smart, joined-up and evolving support, prediction, situation assessment, situation prediction and action for systems, processes, things and environments. Such data-driven intelligence can provide an integration of artificial intelligence data analytics, and performance management for improved functionality, trust, security and dependability. However, in order to realise this potential, emerging and enabling technologies such as databases, data warehouses, cloud, sensor technology, and internet of things must be fully exploited to provide optimal integration of highly heterogeneous devices, machines, systems and technologies.

Towards this goal we will discuss some recent work carried out in the BT Ireland Innovation Centre (BTIIC), funded by Invest Northern Ireland and representing a major partnership between BT and Ulster University, which is at the intersection of Artificial Intelligence, the Internet of Things and Telecommunications. The centre builds on previous research in Ulster University and BT in cloud computing, optimisation, vision systems, resilient communications, smart environments and big data analytics.

#### **Why Is Intelligence Big Data? (Hongji Yang)**



“Data” can be further classified into data, information, knowledge, intelligence and wisdom, and it can be viewed that these can be manipulated by computing individually. It would be helpful to data analytics if connections between these can be formulated fully or even just to certain extent, and possible connections are to be speculated at the discussion.

### **Fuelling the Artificial Intelligence Revolution with Gaming (Alison B Lowndes)**

Artificial Intelligence does not stop at deep learning. The field is evolving at an unprecedented pace, impacting all areas of society, from healthcare and transportation to smart cities and energy. AI won't be an industry, it will be part of every industry. NVIDIA invests both in pure research and its GPU computing platform to enable a diverse customer base, across gaming, VR, AI, robotics, graphics, visualisation, HPC, healthcare, edge & more. Alison will briefly highlight innovations from evolutionary & reinforcement learning, to embedded low SWaP intelligent video & more, across fascinating deployments both on and off the planet!

#### **Biographies:**



**Sally McClean**

*Ulster University, United Kingdom*

TBA



**Hongji Yan**

*Leicester University, UK*

Professor Hongji Yan's research interests include Software Engineering, Creative Computing and Internet Computing. He is a Golden Core Member of IEEE Computer Society. He has been an organising member for many international conferences, including acting as a Programme Chair for IEEE International Conference on Software Maintenance (ICSM'99) and the Programme Chair for IEEE Computer Software and Application Conference (COMPSAC'02). He is currently serving as the Editor-in-Chief for International Journal of Creative Computing (IJCrC)



**Alison B Lownde**

*NVIDIA Ltd, UK*

Joining in 2015, Alison spent her first 18 months with NVIDIA as a Deep Learning Solutions Architect and is now responsible for NVIDIA's Artificial Intelligence Developer Relations across the EMEA region (Europe, Middle East, Africa). She is a mature graduate in Artificial Intelligence combining technical and theoretical computer science with a physics background & over 25 years of experience in international project management, entrepreneurial activities and the internet. She consults on a wide range of AI applications, including planetary defence with NASA, ESA & the SETI Institute and works closely with the community of AI & ML researchers around the world, remaining knowledgeable in state of the art across all subsets of AI. She also travels, advises on & teaches NVIDIA's GPU Computing platform, around the globe. Follow her on Twitter: @AlisonBLowndes.



**Claudio Bettini**

*Università degli Studi di Milano, Italy*

Claudio Bettini is full professor in the Computer Science department at Università degli Studi di Milano, where he leads the EveryWare laboratory. He received his PhD in Computer Science from the University of Milan in 1993. Among several visiting appointments, he has been for more than a decade, an affiliate research professor at the Center for Secure Information Systems at George Mason University, VA. His research interests cover the areas of data management in mobile and pervasive computing, data privacy and security, context-awareness and context reasoning, temporal and spatio-temporal data management. He is a member of the steering committee of the IEEE PerCom conference and he has been associate editor of the Pervasive and Mobile Computing Journal, The VLDB Journal, and the IEEE Transactions on Knowledge and Data Engineering.

## **Panel 3: Urban Computing 2.0**

*Location: HU 0.08, 13:30-15:00, Wednesday, 21<sup>th</sup> August 2019*

**Abstract** Urban computing connects urban sensing, data management, data analytics, and service providing into a recurrent process for an unobtrusive and continuous improvement of people's lives, city operation systems, and the environment. With the advancement of information, communication and data analysis technologies, the connotation and extension of urban computing were extended in depth and breath. How to build a cloud-based, big data-driven and intelligent-fusion smart city ecosystem based on massive multi-source heterogeneous data resources and cloud service resources in cities become a new challenge. Advanced researches such as information island interoperability, model-driven adaptation, domain knowledge modeling, urban dynamic portrait and smart service developing are coming to the fourth. In this session, we have four distinguished panelists who will share their insights on urban computing 2.0 in different aspects, such as sensing, modeling, analyzing, fusing, etc. for the future smart city.

**Chairs:** Junfeng Zhao, Peking University, China

**Panelists:** Kieran O'Hea, Head of Smart Cities, Leicester City Council  
Bin Guo, Northwestern Polytechnical University, China  
Kevin I-Kai Wang, The University of Auckland, New Zealand  
Diego López-de-Ipiña González-de-Artaza, Universidad de Deusto, Spain

### **Statements:**

#### **Connected People and Prosperous Places – the Making of a Smart City (Kieran O'Hea)**

Leicester residents hail from over 50 countries across the globe, making the city one of the most ethnically and culturally diverse places in the UK. The City Council is developing a Smart Cities programme that is primarily designed to have an impact across the city and deliver benefits to its residents. The first step in Leicester's smart journey was to engage with people and ask them what they want – what does a Smart Leicester mean to them and what should it deliver? From the outset, the programme was designed to be city-needs led and demand-driven, not industry-led and demand-driven. We want to help people to become better connected, in terms of digital inclusion, social integration and personal mobility. We also want our neighbourhoods to become prosperous places where the economy, the environment and our communities are secure and sustainable. The Smart Cities programme will also respond to environmental and social challenges, including austerity, climate change and social and economic inequality, supported by digital technology, city-wide data and collaboration to improve community wellbeing. It is our intention that every part of the city has access to affordable, fast broadband internet and that we will work with providers to rapidly widen access to full fiber services. We will continue to work to get free Wi-Fi on our housing estates and facilitate the best mobile services. We will build the opportunities for all people to develop digital skills and make our services and information more accessible online. We will revitalize our city infrastructure and planning rules so that Leicester works towards becoming a carbon neutral city. The Smart Cities programme is a roadmap for transforming Leicester into a smart city that establishes our direction of travel towards a stronger, more sustainable and inclusive future for all citizens. With innovative technology built into the fabric of the city, Leicester will improve the quality of life of its residents, making its neighborhoods, communities and places more prosperous and sustainable.

## **Harnessing Crowd Intelligence in Urban Computing 2.0 (Bin Guo)**

With the development of Internet of Things and mobile Internet, we can obtain more and more human-centered data in the real world and the cyber world. Crowd intelligence leverages online/offline human-contributed data to extract useful knowledge about the group, organization, as well as the city. In this talk, we will characterize the concept model of crowd intelligence and present our practice of the usage of crowd intelligence in the urban computing 2.0 era, including explicit/implicit crowd intelligence, crowd knowledge fusion, crowd knowledge transfer, and crowd-augmented learning models.

## **IoT-based Human Activity Recognition for Ambient Intelligence Applications (Kevin I-Kai Wang)**

Over the last decade, consumer electronic devices have entered a new era and penetrated everyone's life. Enormous amount of data can be collected and information be exchanged to facilitate intelligent services that can assist our day-to-day lives. The existing trend aligns with the concept of the Internet of Things (IoT), which envisioned to embed and interconnect electronics to day-to-day objects for data collection and service provision. Today, numerous IoT technologies have been developed to provide solutions to pervasive healthcare, intelligent location-based services, and environmental monitoring applications. In this talk, human activity recognition (HAR) and its challenges in real-time data analytics and data uncertainties using wearable and ambient IoT devices will be presented.

## **Empowering Citizens into CO-CREATORS of datasets and public services (Diego López-de-Ipiña González-de-Artaza)**

Open Government aims to enhance the transparency, participation and collaboration of city stakeholders in order to give place to Smarter Cities. In this talk, work on the WeLive and AUDABLOK research projects fostering citizen empowerment will be described. Regarding WeLive, its associated co-creation fostering methodology together with its co-creation tools and a wide range of resulting co-created artefacts, will be illustrated. Regarding AUDABLOK, how Open Data and Human Computation can be brought together through blockchain to foster the collaboration of citizens on the continuous enhancement of Open Data portals will be explored. In both cases, our quest for continuous and sustainable engagement of citizens in urban co-creation activities will be explored and the lessons learnt from our previous research efforts will be outlined.

### **Biographies:**

#### **Junfeng Zhao**

*Peking University, China*



Dr. Junfeng, Zhao is an associate professor in the Software Institute, School of Electronics Engineering and Computer Science, Peking University. She received her Ph.D. from Peking University in 2015. Her research interests include Big Data Analysis, Software Engineering and Knowledge Engineering, Software Reuse and Component Technology. Dr. Zhao has published more than 40 research papers, and most of them are published in High rank conferences, such as AAAI, ICSR, and ICDM. She has presided 6 national technical research projects including NSFC, 863 projects, etc. She also took in charge of 4 Provincial and ministerial level projects. She was awarded Second prize of national science and technology progress award (Rank Fifth) in 2006

and Second prize of Beijing science and technology progress award (Rank Fifth). She is the Secretary General of “Big Data Techniques Standardization Group” and “SOA Key Techniques and Middleware Standardization Working Group” of China national information Technology Standardization.



**Kieran O’Hea**

*Leicester City Council, United Kingdom*

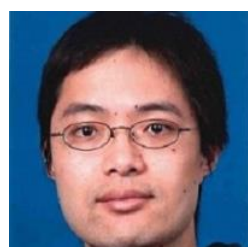
Kieran O’Hea is Leicester City Council’s Head of Smart Cities and is leading the development of its Smart City Strategy. His role involves engaging internal and external stakeholders and identifying the priorities for positioning Leicester as a smart city. He was formerly Chief Digital Officer of Brisbane, which was only the second city in the world after New York to appoint a Chief Digital Officer. He led the development of the city’s Digital Strategy, which continues to support thousands of residents, SMEs and start-ups. Before focusing on city strategies, Kieran previously worked for the European Commission developing its digital content and web funding programmes.



**Bin Guo,**

*Northwestern Polytechnical University, China*

Dr. Bin Guo is a professor with Northwestern Polytechnical University, China. He received his Ph.D. degree in computer science from Keio University, Tokyo, Japan, in 2009. His current research interests include Ubiquitous Computing, Mobile Crowd Sensing, and Urban Computing. He has published over 100 papers in refereed journals and conference proceedings such as IEEE Comm. Surveys and Tutorials, ACM Computing Surveys, IEEE TMC, IEEE THMS, IEEE TKDE, ACM TKDD, IEEE IoT, UbiComp, INFOCOM, CSCW, IJCAI, etc. He has served as an associate editor of IEEE Communications Magazine, IEEE Trans. on Human-Machine-Systems, ACM IMWUT, and so on. He is the program chair of IEEE CPSCom’16 and UIC’13, the general co-chair of UIC’15 and IEEE IoP’17. He has also served as TPC member for a number of CCF-ranked conferences, such as UbiComp, PerCom, CHI, WWW, etc. He is a senior member of IEEE and CCF. He received the support from the National Youth Talent Support Program of China in 2016.



**Kevin I-Kai Wang**

*The University of Auckland, New Zealand*

Kevin I-Kai Wang received his Bachelor of Engineering (Hons.) degree in Computer Systems Engineering and PhD degree in Electrical and Electronics Engineering from the Department of Electrical and Computer Engineering, the University of Auckland, New Zealand, in 2004 and 2009 respectively. He is currently a Senior Lecturer in the Department of Electrical, Computer, and Software Engineering, the University of Auckland. He worked as a research engineer designing commercial home automation systems and traffic sensing systems from 2009 to 2011. He joined the University of Auckland again in 2012, focusing on researches include wireless sensor network based ambient intelligence, pervasive healthcare systems, human activity recognition, behavior data analytics and bio-cybernetic systems. He has more than 100 publications in refereed journals and conference proceedings in the field of

pervasive and mobile computing, ambient intelligence, and industrial informatics. He is currently the associate editor of the Journal of Ambient Intelligence and Smart Environments and serving on the editorial board of the IET Journal of Wireless Sensor Systems and the Elsevier Ad Hoc Networks. He is a member of the IEEE Computational Intelligence Society Smart World Technical Committee; IEEE System, Man, Cybernetics Society Technical Committee on Cybermatics; IEEE Industrial Electronics Society Technical Committee on Industrial Agents.

### **Diego López-de-Ipiña**

*University of Deusto in Bilbao, SPAIN*



Dr. Diego López-de-Ipiña is an associate professor and principal researcher of “MORElab – Envisioning Future Internet” group (<http://www.morelab.deusto.es/>), collaborating as senior researcher at DeustoTech – Deusto Institute of Technology (<http://www.deustotech.eu>), University of Deusto in Bilbao, SPAIN. He received his PhD from the University of Cambridge, U.K in 2002. His main research interests are pervasive computing, internet of things, semantic service middleware, open linked data, social data mining and mobile-mediated and tangible human-environment interaction. He is currently focusing his work on the role of citizens as active data contributors to the knowledge of a city modelled as Linked Data. He has been PhD supervisor in 15 dissertations. He is taking and has taken part in several big consortium-based research European (PARITY, EDI, SIMPATICO, CITY4AGE, GREENSOUL, WELIVE, MOVESMART, IES CITIES, MUGGES, SONOPA, GO-LAB) and Spanish (THOFU, mIO!, ADAPTA, SABESS, PIRAmIDE, ACROSS) projects, mostly as principal researcher from the Deusto part, involving the adoption of mobile computing, Cloud Computing, semantic web, social data mining, linked open data, social robotics, smart cities, open government and Web 2.0 and beyond to novel AmI-related application areas such as urban computing, sustainable computing or AAL. He has more than 200 publications in relevant international conferences and journals on Ubiquitous Computing, Semantic Web, Middleware, Smart Cities and AmI, including more than 60 JCR-indexed journal articles.

## 1. SESSIONS AND PAPERS IN ACE 2019

*The 3rd International Workshop on Applications of ICT, Cyber Security and Ecommerce Data Security*

**Session: ACE-1:** 11:00-12:30, 19<sup>th</sup> August (Monday), Room 0.08

**Chair:** TBA

### **Short**

Security and Forensics Challenges to the MK Smart Project

*E. Okai; X. Feng; P. Sant*

Challenges in ROS Forensics

*Iroshan Abeykoon; X. Feng; Renxi Qiu*

Computer Laws Consideration on Smart City Data Planning of Chongli 2022

*X. Feng; Yunzhong Feng; Junke Xu; Shu Sun; Yuping Zhao*

### **Regular**

Consideration and Research on Data Architecture for the Future Cyber Society

*Fang Miao; Wenhui Yang; Yan Xie; Wenjie Fan*

Autonomous Vehicles' Forensics in a Smart City

*Edward Dawam; X. Feng; Paul Sant*

**Session: ACE-2:** 13:30-14:00, 19<sup>th</sup> August (Monday), Room 0.08

**Chair:** TBA

### **Regular**

Finger-Drawn Signature Verification on Touch Devices Using Statistical Anomaly Detectors

*Mudhafar M. Al-Jarrah; Shawq S. Al-Khafaji; Saad Amin*

## 2. SESSIONS AND PAPERS IN ATC 2019

**Session: ATC-1:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 3.04

**Chair:** TBA

### **Short and Work-in-Progress papers**

Research on a Multi-level Combination of Software Defect Localization Method

*Peng Wang; Chun Shan; Shanshan Mei; Ning Li*

Software Defect Prediction Model Based On KPCA-SVM

*Yan Zhou; Chun Shan; ShiYou Sun; Shengjun Wei; SiCong Zhang*

Intelligent Resource Discovery in Inter-cloud using Blockchain

*Mekhla Sharma; Jaiteg Singh; Ankur Gupta*

A Privacy-Preserving Coalition Loyalty Program

*Kok-Seng Wong; Myung Ho Kim*

Segmental Symbolic Execution Based on Clustering

*Haoran Gao; Rui Ma; Bowen Dou; Xiajing Wang; Changzhen Hu*

Convolution neural network development support system using approximation methods to evaluate inference accuracy and memory usage in an embedded system

*Toki Matsumoto; Yukikazu Nakamoto; Ryota Yamamoto; Shinya Honda; Kazutoshi Wakabayashi*

Automatic Feature Extraction and Selection For Machine Learning Based Intrusion Detection

*Sun Sunnie Chung; Jinjie Liu*

### **Regular**

Analysis space reduction with state merging for ensuring safety properties of self-adaptive systems

*Kazuya Aizawa; Shinichi Honiden; Kenji Tei*

**Session: ATC-2:** 11:00-12:30, 21<sup>st</sup> August (Wednesday), Room 3.04

**Chair:** TBA

***Short and Work-in-Progress papers***

The Spread of Disinformation on the Web: An Examination of Memes on Social Networking

*Marc Dupuis; Andrew Williams*

My Voiceprint Is My Authenticator: A Two-layer Authentication Approach Using Voiceprint for Voice Assistants

*Yun-Tai Chang; Marc Dupuis*

Toward Interactional Trust for Humans and Automation: Extensions to Interdependence

*Yosef S. Razin; Karen Feigh*

Privacy and security aspects on a Smart City IoT Platform

*Paolo Nesi; Pierfrancesco Bellini; Claudio Badii; Angelo Difino*

***Regular***

Framework for Analysis and Prediction of NBA Basketball Plays: On-Ball Screens

*Andrew Yu; Sun Sunnie Chung*

**Session: ATC-3:** 14:15-15:30, 21<sup>st</sup> August (Wednesday), Room 3.04

**Chair:** TBA

***Short and Work-in-Progress papers***

Satellite Network Load Balancing Strategy for SDN/NFV Collaborative Deployment

*Chengsheng Pan; Jinjin Shi; Yang Li; Zhixiang Kong*

***Regular***

Energy Optimization of Streaming Applications in IoT on NoC based Heterogeneous MPSoCs using Re-timing and DVFS

*Haider Ali; Umair Ullah Tariq; Lu Liu; Xiaojun Zhai; John Panneerselvam*

Analysing and Evaluating Syntactic Privacy Games via a Recommender Systems Case Study

*Robin Ankele; Andrew Simpson*

Abstracting Syntactic Privacy Notions via Privacy Games

*Robin Ankele; Andrew Simpson*

**Session: ATC-4:** 15:50-17:30, 21<sup>st</sup> August (Wednesday), Room 3.04

**Chair:** TBA

***Regular***

A vulnerability detection model for java systems based on complex networks

*Ling Xiong; Chun Shan; Changzhen Hu; Zijun Yu; Wenjie Xiong*

AAKA-D2D: Anonymous Authentication and Key Agreement Protocol in D2D Communications

*Mingjun Wang; Zheng Yan; Bin Song; Mohammed Atiquzzaman*

Joint Beacon Power and Rate Control for Vehicular Ad Hoc Networks

*Forough Goudarzi; Hamid Asgari; Hamed Al-Raweshidy; Evtim Peytchev*

Learning Constraint-based Model for Detecting Malicious Activities in Cyber Physical Systems

*Andrea Balogh; Deepak Mehta; Piotr Sobonski; Alie El-din Mady; Satyanarayana Vuppala*

### **3. SESSIONS AND PAPERS IN CESHAPP 2019**

**Session: CESHAPP-1:** 14:45-15:30, 19<sup>th</sup> August (Monday), Room 0.08

**Chair:** TBA

Minimizing Errors in the Nursing Profession with Technology-Enhanced Education and Training

*ZhaoWenbing*

Access Control for Physical Objects in Internet of Things

*Rongyang Li; Shan Cui; Xuanxia Yao*

Recognition of similar activities based on activity relationship

*LiQingjuan*



## 4. SESSIONS AND PAPERS IN DMTS 2019

*International Symposium on Data & Model-Driven Methods for Trustworthy System (DMTS 2019)*

**Sessions: DMTS-1:** 11:00-12:30; **DMTS-2:** 13:30 – 15:30, 19<sup>th</sup> August (Monday), Room 3.06

**Chair:** Wangyang Yu

*Invited talk:* Deep Reinforcement Learning for Multi-Access Edge Computing

*Dr Jia Hu, University of Exeter*

Analyzing the Validation Flaws of Online Shopping Systems Based on Coloured Petri Nets

*Wangyang Yu; Lu Liu; Xiaojun Zhai; Yisheng An*

A Privacy-preserved Probabilistic Routing Index Model for Decentralised Online Social Networks

*Bo Yuan; Jiayan Gu; Lu Liu*

Data Aggregation Challenges in Fog Computing

*Mohammad Shahzad; John Panneerselvam; Lu Liu; Xiaojun Zhai*

A Method of Chinese Tourism Named Entity Recognition Based on BBLC Model

*Leyi Xue; Han Cao; Fan Ye; Yuehua Qin*

Discriminant Subspace Alignment for Cross-project Defect Prediction

*Zhiqiang Li; Chao Qi; Li Zhang; Jie Ren*

## 5. SESSIONS AND PAPERS IN EHRIS 2019 (SWC2019)

*SWC2019: Forum on Ethics and Human Rights in Smart Information Systems*

**Session: EHRIS-1:** 09:00-17:30, 19<sup>th</sup> August (Monday), Room 2.08

**Chair:** TBA

*Invited Talk:* The Challenge of Practical Ethics

*Declan Brady*

Technofixing the Future: Ethical Side Effects of Using AI and Big Data to meet the SDGs

*Mark Ryan; Laurence Brooks; Tilimbe Jiya; Kevin Macnish; Bernd Stahl; Josephina Antoniou*

Ethics and Design in the Smart Bikeshare Domain

*Robert Bradshaw*

What if we had fair - people-centred - data economy ecosystems?

*Jani Simo Sakari Koskinen; Sari Knaapi-Junnila; Minna Rantanen*

Embedding private standards in AI and Mitigating Artificial Intelligence Risks

*Martijn Scheltema*

Panel Session

Creating companions for senior citizens with technologies that mimic people

*David Wright*

AI Management: An exploratory survey of the influence of GDPR and FAT principles

*Chiara Addis; Maria Kutar*

Automated Automobiles in Society

*Olli Heimo; Kai Kimppa; Antti Hakkala*

AI and information warfare in 2025

*David Wright*

Internet Filtering: Solution to Harmful and Illegal Content?

*Marie Eneman*

## 6. SESSIONS AND PAPERS IN IOP 2019

**Session: IOP-1:** 14:45-15:30, 19<sup>th</sup> August (Monday), Room 0.10

**Chair:** TBA

### ***Workshop on Internet of Elderly People***

Extensible Environment for Monitoring and Detecting Symptoms of Depression

*Enrique Moguel; Javier Berrocal Olmeda; José García-Alonso; Daniel Flores-Martin; Jaime Galán-Jiménez;*

**Session: IOP-2:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 3.05

**Chair:** TBA

### ***IOP 2019 Short papers and Work-in-Progress papers***

Veterans and their Inherent Cybersecurity Preparedness: Myth or Reality?

*Marc Dupuis; Maximilian Weiss*

Facebook vs. Twitter: An Examination of Differences in Behavior Type and Substance Based on Psychological Factors

*Marc Dupuis; Seth D Pham; Maximilian Weiss*

### ***Regular***

Decision Tree Model of Smoking Behaviour

*Maryam Abo-Tabik; Nick Costen; John Darby; Yael Benn*

Behavioural Smoking Identification via Hand-Movement Dynamics

*Mohamed Benouis; Maryam Abo-Tabik; Yael Benn; Olivia Salmon; Alex Barret-Chapman; Nick Costen*

"Persuade Me!" A User-based Recommendation System Approach

*Ruben Sanchez-Corcuera; Diego Casado-Mansilla; Diego López-de-Ipiña*

Parameter Optimization for Deriving Bluetooth-based Social Network Graphs

*Bojan Simoski; Michel C.A. Klein; Eric Fernandes de Mello Araújo; Aart van Halteren; Thabo van Woudenberg; Kirsten Bevelander; Moniek Buijzen; Henri Bal*

Towards a Human-Centered Model in SIoT -- Enhancing the Interaction Behaviour of Things with Personality Traits

*Daniel Defiebre; Panagiotis Germanakos*

**Session: IOP-3:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 3.05

**Chair:** TBA

### ***IOP 2019 Short papers and Work-in-Progress paper***

IoT in Smart Cities: Exploring Information Theoretic and Deep Learning Models to Improve Parking Solutions

*Piyush K Sharma*

Abductive Causal Reasoning for Internet of Things

*Anshuman Venkateswaran; Huan Liu; Adrienne Raglin*

### ***Regular***

A hybrid human-robot collaborative environment for recycling electrical and electronic equipment

*Georgios Th. Papadopoulos; Apostolos Axenopoulos; Dimitris Giakoumis; Ioannis Kostavelis; Alexis Papadimitriou; Petros Daras; Dimitrios Tzovaras; Ozgur Oguz; Dirk Wollherr; Eugenio Garnica; Vasiliki Vouloutsi; Paul Verschure; Sara Sillaurren; Leire Bastida*

eSports Pro-Players Behavior During the Game Events: Statistical Analysis of Data Obtained Using the Smart Chair

*Anton Smerdov; Andrey Somov; Evgeny Burnaev*

Dynamically Programmable Virtual Profiles as a Service

*Alejandro Pérez-Vereda; Carlos Canal; Juan Manuel Murillo Rodriguez*

**Session: IOP-4:** 14:15-15:30, 21<sup>th</sup> August (Wednesday), Room 3.05

**Chair:** TBA

Going Back for that One Last Thing in the House on Fire: How Fear, Attentiveness, Sadness, Joviality, and Other Lower Order Dimensions of Affect Influence Our Security and Privacy Behavior

*Marc Dupuis*

AI-Powered Tangible Interfaces to Transform Children's Mental Well-being

*Kieran Woodward; Eiman Kanjo; David Brown*

Evaluation of an IoT Framework for a Workplace Wellbeing Application

*Nithya G. Nair; Ahmed Saeed; Md. Israfil Biswas; Mamun Abu-Tair; Pushpinder Kaur Chouhan; Ian Cleland; Joseph Rafferty; Chris Nugent; Philip J. Morrow; Mohammad Hossein Zoualfaghari; Zhan Cui*

**IOP 2019 Short papers and Work-in-Progress papers**

Complementing Travel Itinerary Recommendation Using Location-Based Social Networks

*Jing Zhou; Yajie Gu; Weiguo Lin*

**Session: IOP-5:** 15:50-17:30, 21<sup>th</sup> August (Wednesday), Room 3.05

**Chair:** TBA

Towards Understanding of eSports Athletes Potentialities: Sensing System for Data Collection and Analysis

*Alexander Korotin; Nikita Khromov; Anton Stepanov; Andrey Lange; Andrey Somov; Evgeny Burnaev*

A Socio-economic Survey for Understanding Self-perceived Effectiveness of Persuasive Strategies Towards Energy Efficiency in Tertiary Buildings

*Dimitris Papageorgiou; Diego Casado-Mansilla; Apostolos Tsolakis; Oihane Kamara-Esteban; Angeliki Zacharaki; Cruz E. Borges; Ioannis Moschos; Ane Irizar-Arrieta; Stelios Krinidis; Diego López-de-Ipiña; Dimitrios Tzouvaras; Jose M Avila*

The People Perspective: categorization and controversial information in Wikipedia

*Massimo Marchiori*

Combining Human and Machine Intelligence to foster wider adoption of e-services

*Koldo Zabaleta; Ana Belén Lago; Marco Pistore; Giuseppe Di Modica; Raul Santos; Diego López-de-Ipiña; Juan Manuel Murillo Rodriguez*

**Session: IOP-6:** 09:50-10:40, 22<sup>nd</sup> August (Thursday), Room 3.04

**Chair:** TBA

Redefining Micro-moments for improving energy behaviour: The SIT4Energy approach

*Konstantinos Peppas; Adamantia Chouliara; Apostolos Tsolakis; Stelios Krinidis; Dimitrios Tzouvaras*

## 7. SESSIONS AND PAPERS IN IoT5GB 2019

*International Workshop on IoT-related Technologies for 5G and Beyond*

**Session: IoT5GB-1:** 13:30-15:30; **IoT5GB-2:** 15:50-17:30, 19<sup>th</sup> August (Monday), Room 2.09

**Chair:** TBA

Optimal RTS Threshold for IEEE 802.11 WLANs: Basic or RTS/CTS?

*Yachao Yin; Yayu Gao; Sohaib Manzoor; Xiaojun Hei*

Towards Accurate and Robust Fall Detection for the Elderly in a Hybrid Cloud-Edge Architecture

*Kazi Md Shahiduzzaman; Junqing Peng; Yayu Gao; Xiaojun Hei; Wenqing Cheng*

A Novel Task Offloading Framework to Support Wireless Body Area Networks with MEC

*Yangzhe Liao; Liqing Shou; Quan Yu; Xiaojun Zhai; Qingsong Ai; Quan Liu*

LTE-LAA and WiFi in 5G NR Unlicensed: Fairness, Optimization and Win-Win Solution

*Yayu Gao*

Energy-Efficient Base Station Deployment in Heterogeneous Communication Network

*Kehao Wang; Xueyan Chen; Jihong Yu; Lin Chen; Pan Zhou*

Storage-Repair Tradeoff for Hierarchical Distributed Storage Systems

*Quan Yu; Xinyi Zeng; Yangzhe Liao; Qingsong Ai*

QoE Oriented Adaptive Streaming Method for 360° Virtual Reality Videos

*Yi Han; Ma Yafeng; Yangzhe Liao; Gabriel-Miro Muntean*

Investigating Network Services Abstraction in 5G enabled Device-to-Device (D2D) Communications

*Ed Kanya Kiyemba Edris; Mahdi Aiash; Jonathan Loo*

## 8. SESSIONS AND PAPERS IN ISRCPS 2019 (SWC2019)

*SWC2019: Workshop on Intelligence, Security and Resilience in Cyber Physical Systems*

**Session: ISRCPS-1:** 15:50-16:20, 19<sup>th</sup> August (Monday), Room 0.10

**Chair:** TBA

Intelligent Algorithms in Home Energy Management Systems: A Survey

*Qi Liu; Williams Dannah; Xiaodong Liu*  
A Survey on Demand-Response in HEMS: Algorithm Types, Objectives and Constraints  
*Raphael Anaadumba; Xiaodong Liu; Mingxu Sun; Yi Yang; Qi Liu*

## 9. SESSIONS AND PAPERS IN PER-HEALTH 2019

**Session: PER-HEALTH:** 14:45-15:30, 19<sup>th</sup> August (Monday), Room 2.07

**Chair:** TBA

Performance and Endurance Training for Equine Racing (PETER)  
*Yousef Al tawil; Wathiq Mansoor; Shadi Atalla; Husameldin Mukhtar; Kamarul Faizal Hashim; Sami Miniaoui, SM*

Data Science tools for Crime Investigation, Archival, and Analysis  
*Karl Biron; Wathiq Mansoor; Sami Miniaoui, SM; Shadi Atalla; Husameldin Mukhtar; Kamarul Faizal Hashim*

## 10. SESSIONS AND PAPERS IN RTDPCC 2019

**5th International Symposium on Real-time Data Processing for Cloud Computing (RTDPCC 2019)**

**Session: RTDPCC-1:** 15:50-17:30, 19<sup>th</sup> August (Monday), Room 3.05

**Chair:** TBA

*Invited talk:* What is it? and Why Should We Care?  
Paul Taylor, BT, Business Process Analytics

An Experimental Online Judge System Based on Docker Container for Learning and Teaching Assistance  
*Yibo Han*

Boosting Domestic Energy Efficiency Through Accurate Consumption Data Collection  
*Abdullah Alsalemi; Mona Ramadan; Faycal Bensaali; Abbes Amira; Christos Sardianos; Iraklis Varlamis; George Dimitrakopoulos*

Cloud computing in government organizations: towards a new comprehensive model  
*Naif Al Mudawi; Natalia Beloff; Martin White*

IoT-Based Fall and ECG Monitoring System: Wireless Communication System Based on Firebase Realtime Database  
*Ayman Al-Kababji; Lisan Shidqi; Issam Boukhenoufa; Abbes Amira; Faycal Bensaali; Mohamed Sadok Gastli; Abdulah Jarouf; Walid Aboueata; Alhusain Abdalla*

## 11. SESSIONS AND PAPERS IN ScalCom 2019

**Session: ScalCom-1:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 2.09

**Chair:** TBA

**ScalCom 2019 Short papers and Work-in-Progress papers**

Based on super-pixels to simulate water ripples from a single image  
*Li Zhu; YA YU; Jun Li; Tao Hu; Li Guo*

Persistent Cooperative Monitoring System of Disaster Area Using UAV Networks  
*Taku Noguchi*

**ScalCom 2019 Regular papers**

Review of innovative cyberspace security research inspired by bionics computing methods  
*Jianfeng Chen; Chunlin Li; ZhiHong Rao; Rui Xu; Chunhui Hu*

Collision Evaluation in Low Power Wide Area Networks  
*Riyadh Abbas; Ali Al-Sherbaz; Abdeldjalil Bennecer; Phil Picton*

Data Flow Management and Visual Analytic for Big Data Smart City/IOT  
*Paolo Nesi; Pierfrancesco Bellini; Francesco Bugli; Michela Paolucci; Imad Zaza*

Multiprocessor Task Programming and Flexible Load Balancing for Time-stepping Methods on Heterogeneous Cloud Infrastructures  
*Thomas Rauber; Gudula Rünger*

A Novel Relationship Extraction Scheme Based on Negative Feedback Attention  
*Weidong Li; Jing Liu; Jun Tie; Zimao Li; Jun Qin; Lu Liu*

**Session: ScalCom-2:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 2.09

**Chair:** TBA

A Novel Meta-Heuristic for Green Computing on VFI-NoC-HMPSoCs

*Umair Ullah Tariq; Haider Ali; Lu Liu; Xiaojun Zhai*

Integration of Apache Spark with Invasive Resource Manager

*Jeeta Ann Chacko*

Decentralized Parallel Ant Colony Optimization for Distributed Memory Systems

*Huw Lloyd*

QARPF: A QoS-aware Active Resource Provisioning Framework Based on OpenStack

*Weichao Ding; Fei Luo; Chunhua Gu; Haifeng Lu*

**Session: ScalCom-3:** 14:15-15:30, 21<sup>st</sup> August (Wednesday), Room 2.09

**Chair:** TBA

Graph Data Modelling for Genomic Variants

*Sanna Aizad*

Improved Procedures for Training Primal Wasserstein GANs

*Tao Zhang; Zhongnian Li; Qi Zhu; Daoqiang Zhang*

Unsupervised Domain Adaptation for Multi-center Autism Spectrum Disorder Identification

*You Jiang; Zhongnian Li; Daoqiang Zhang*

The Function Extension Method for SDN Controller Based on LightGBM

*Yang Li; Peng Yang; Debin Wei; Shi HuaiFeng*

## 12. SESSIONS AND PAPERS IN SCI 2019

**Session: SCI-1:** 16:20-17:30, 20<sup>th</sup> August (Tuesday), Room 2.08

**Chair:** TBA

Development of Huffman Code For Lora Technology

*Pramoth Pongpunpurt; Weerawat Khawsuk; Nikorn Sutthisangiam*

Road Traffic Event Detection Using Twitter Data, Machine Learning, and Apache Spark

*Ebtessam Alomari; Rashid Mehmood; Iyad Katib*

Millimeter-Wave Multi-Radar System for Ubiquitous Concealed Dangerous Object Detection

*Yi Xu; Xin Di; Zhaoyu Zhang; Lei Li; Jun Tian*

**Session: SCI-2:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 2.08

**Chair:** TBA

SIVEQ: an Integrated System for the Valorization of Surplus Food

*Davide Scazzoli; Giulia Bartezzaghi; Annalaura Silvestro; Maurizio Magarini; Marco Melacini; Giacomo Verticale*

Impact Analysis of Erroneous Data on IoT Reliability

*Samuel J Moore; Chris Nugent; Ian Cleland; Shuai Zhang*

An Analysis of the Impact of Uncertainty on the Internet of Things: A Smart Home Case Study

*Tazar Hussain; Chris Nugent; Jun Liu; Adrian Moore*

Building Smart City Drone for Graffiti Detection and Clean-up

*Shuqin Wang; Jerry Gao*

**Session: SCI-3:** 14:15-15:30, 21<sup>th</sup> August (Wednesday), Room 2.08

**Chair:** TBA

Health Zone Monitoring: a passive approach

*Massimo Marchiori*

Follow-me Prefetching for Video Streaming over Mobile Edge Computing Networks

*Is-Haka Mkwawa; Ibrahim Mohammedameen; Lingfen Sun*

Invited paper: TBA

*Stephen S. Yau, Arizona State University, USA*

**SCI 2019 Short papers and Work-in-Progress papers**

A Review of IoT Service Provision to Assess the Potential for System Interoperability in an Uncertain Ecosystem

*Cathryn Peoples; Kashif Rabbani; Mamun Abu-Tair; Bin Wang; Philip J. Morrow; Adrian Moore; Sally McClean; Mohammad Hossein Zoualfaghari; Parag Kulkarni; Joseph Rafferty*

**Session: SCI-4:** 09:00-09:50, 22<sup>th</sup> August (Thursday), Room 2.08

**Chair:** TBA

The Impact of Bike-Sharing Ridership on Air Quality: A Scalable Data Science Framework

*Diane Myung-kyung Woodbridge; Nina Hua; Victoria Suarez; Philip Trinh; Paul Intrevado; Rebecca Reilly*

Distributed Data Analytics Framework for Cluster Analysis of Parking Violation

*Diane Myung-kyung Woodbridge; Evan Liu; Xi Yang; Nan Lin; Fiorella Tenorio; Paul Intrevado*

Swarm Wisdom for Smart Mobility - The next generation of Autonomous Vehicles

*Mona Jaber; Aisha Naseer*

## **13. SESSIONS AND PAPERS IN SmarterAAL 2019 (SWC2019)**

*SWC2019: Workshop on Advanced Technologies for Smarter Assisted Living Solutions*

**Session: SmarterAAL-1:** 11:00-12:30, 22<sup>th</sup> August (Thursday), Room 2.09

**Chair:** TBA

Effects of Task-dependent Robot Errors on Trust in Human-Robot Interaction: A Pilot Study

*Mohammad Reza Loghmani; Clara Haider; Yegor Chebotarev; Christiana Tsiourti; Markus Vincze*

A Privacy Aware Architecture for IoT Enabled Systems

*Ismeni Psychoula; Liming Luke Chen; Xuanxia Yao; Huansheng Ning*

Autonomous air quality management system based on Web of Things standard architecture

*Jose G. Terius-Padron; Ezequiel Simeoni; Rebeca Isabel García-Betances; Nikolaos Liappas; Eugenio Gaeta; Maria Fernanda Cabrera-Umpierrez; Maria Teresa Arredondo*

Best practices on personalization and adaptive interaction techniques in the scope of Smart Homes and Active Assisted Living

*Nikolaos Liappas; Jose G. Terius-Padron; Rebeca Isabel García-Betances; Eduardo Machado; Mohammad Reza Loghmani; Markus Vincze; Ivan Carrillo; Maria Fernanda Cabrera-Umpierrez*

## **14. SESSIONS AND PAPERS IN SMCN 2019**

*International Workshop on Security Measurements of Cyber Networks (SMCN) 2019*

**Session: SMCN-1:** 12.00-12:30, 19<sup>th</sup> August (Monday), Room 0.10

**Chair:** TBA

Research on the Destructive Capability Metrics of Common Network Attacks

*Yi Zi Jia; Chensi Wu; Zhang Yuqing*

A Security Formal Model for Multiple Channels Communication

*Yulong Fu; Xinyi Yuan; Ke Wang; Zheng Yan; Hui Li*

**Session: SMCN-2:** 13.30-15:45, 19<sup>th</sup> August (Monday), Room 0.10

**Chair:** TBA

A Study and Enhancement to the Security of MANET AODV Protocol Against Blackhole Attacks

*Yulong Fu; Guoquan Li; Mohammed Atiqzaman; Zheng Yan; Jin Cao; Hui Li*

Design Patterns for Compensating Controls for Securing Financial Sessions

*Marc Dupuis; Camelia Bejan; Matt Bishop; Scott David; Brent Lagesse*

Security Analysis of Smart Home Based on Life Cycle

*Mao Yu Hang; Xuejun Li; Jia Yan; Shangru Zhao; Zhang Yu qing*

Research on the Impact of Attacks on Security Characteristics

*Zhang Yuqing; Chensi Wu; Xie WeiQiang; Yi Zi Jia; Huiyang Shi; Su Yang; Shangru Zhao*

Attack-Defense Utility Quantification And Security Risk Assessment

*Su Yang; Xie WeiQiang; Chensi Wu; Wenjie Wang; Zhang Yuqing*

## 15. SESSIONS AND PAPERS IN Smart-PDS 2019 (SCI2019)

*SCI2019: International Workshop on Personalisation and Decision Support for Citizen Service Enhancement at Scale (Smart-PDS 2019)*

**Session: Smart-PDS-1:** 16:50-17:30, 19<sup>th</sup> August (Monday), Room 2.06

**Chair:** TBA

Dynamic Cloud Service Management for Scalable Internet of Things Applications  
*Alex Mavromatis, Sam Morgan, Theo Tryfonas, Dimitra Simeonidou*

## 16. SESSIONS AND PAPERS IN SR4CSW 2019 (SWC2019)

*SWC2019: Workshop on Smart Robots to Construct Future Smart Worlds*

**Session: SR4CSW-1:** 14:00-15:30, 19<sup>th</sup> August (Monday), Room 2.06

**Chair:** TBA

An Autonomous Navigation and Exploration System for Search and Rescue Robots in mine incidents  
*Noé Pérez-Higueras; Alberto Jardón; Ángel J.A. Rodríguez; Carlos Balaguer*

Surface Exploration with a Robot-Trailer System for Autonomous Subsurface Scanning

*Efthimios Tsiogas; Ioannis Kostavelis; Georgios Kouros; Andreas Kargakos; Dimitris Giakoumis; Dimitrios Tzovaras*

A New Shopfloor Orchestration Approach for Collaborative Human-Robot Device Disassembly

*Ioannis Chatzikonstantinou; Dimitris Giakoumis; Dimitrios Tzovaras*

Automatic Subsurface Map Generation based on GPR Data Processing

*Evangelos Skartados; Ioannis Kostavelis; Dimitris Giakoumis; Dimitrios Tzovaras*

uSLAM Implementation for Autonomous Underground Robot

*Elisabeth Menendez; Santiago Martínez de la Casa; Marcos Marín; Carlos Balaguer*

Design and Implementation of a Control System for a Tunneling Robot

*Kevin Worrall; Douglas Thomson; Euan McGookin; Patrick Harkness; Thaleia Flessa; Cameron Houston; Mikulas Cebecauer*

## 17. SESSIONS AND PAPERS IN SSESS 2019 (SWC2019)

*The 3<sup>rd</sup> Symposium on Software Engineering for Smart Systems (SSESS 2019)*

**Session: SSESS-1:** 15:50-16:50, 19<sup>th</sup> August (Monday), Room 2.06

**Chair:** TBA

Puffin-Pod Marine Evacuation System (POMES)

*Eda Tumer; Stefan Kuhn*

FFMRA: A Fully Fair Multi-Resource Allocation Algorithm in Cloud Environments

*Hamed Hamzeh; Sofia Meacham; Kashaf Khan; Keith Phalp; Angelos Stefanidis*

IoT in e-learning

*Rodion Yakoubovsky*

Benefit and Cost of Cloud Computing Security

*Vasileios Germanos*

## 18. SESSIONS AND PAPERS IN SUC 2019

*The 1<sup>st</sup> International Workshop on Security of Ubiquitous Computing*

**Session: SUC-1:** 15:50-17:30, 19<sup>th</sup> August (Monday), Room 0.08

**Chair:** TBA

A Classification Method and Implementation of Trojan and BotNet Infected User Based on Threat Matrix Model

*Xiaoping Dai; Li Yao*

A practical differentially private support vector machine

*Feifei Xu; Jia Peng; Ji Xiang; Daren Zha*

Differential Attribute Desensitization System for Personal Information Protection  
*Jia Peng; Xin Huang; Min Li; Jiacheng Zhang; Yifei Zhang; Neng Gao*  
 PPSI: Practical Private Set Intersection over Large-Scale Datasets  
*Shuo Qiu; Zekun Dai; Daren Zha; Zheng Zhang; Yanan Liu*  
 Fast Algorithms on Primality Testing for Numbers  $\leq 2^{255}$   
*Dandan Huang; Zheng Zhang; Zhihao Tang*

## 19. SESSIONS AND PAPERS IN SWC 2019

### *The 5<sup>th</sup> Smart World Congress (SWC) 2019*

**Session: SWC-1:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 0.08

**Chair:** TBA

#### **SWC2019 Short Papers and Work-in-Progress Papers**

A Multi-Modal Framework for Future Emergency Systems

*Ahmed O Basil; Mu Mu; Michael Opoku Agyeman*

Efficient BLE Fingerprinting through UWB Sensors for Indoor Localization

*Qing Zhang; Matthew J.A. D'Souza; Uyen Balogh; Vanessa Smallbon*

Image-based Text Classification using 2D Convolutional Neural Networks

*Erinc Merdivan; Anastasios Vafeiadis; Dimitrios Kalatzis; Sten Hanke; Johannes Kropf; Konstantinos Votis; Dimitris Giakoumis; Dimitrios Tzovaras; Liming Luke Chen; Raouf Hamzaoui; Matthieu Geist*

Object Handling of Cognitive Robots Using Deep Learning Based Object Recognition

*Hyunsik Ahn*

Virtualisation as a means for dynamic software update within the automotive E/E architecture

*Nicholas Ayres; Lipika Deka; Benjamin Passow*

#### **SWC2019 General Papers**

Fuzzy-based Fine-grained Human Activity Recognition within Smart Environments

*Darpan Triboan; Liming Luke Chen; Feng Chen*

Real-time Outlier Detection over Streaming Data

*Kangqing Yu; Wei Shi; Nicola Santoro; Xiangyu Ma*

**Session: SWC-2:** 14:15-15:30, 21<sup>th</sup> August (Wednesday), Room 0.08

**Chair:** TBA

Software-Defined Edge Computing (SDEC): Principles, Architecture and Challenges

*Pengfei Hu; Wai Chen*

Dynamic Multiparty Authentication using Cryptographic Hardware for the Internet of Things

*Hussain Al-Aqrabi; Anju Johnson; Richard Hill*

Stochastic Optimization of Electric Vehicle Charging Stations

*Georgios Chrysanidis; Dimitrios Kosmanos; Antonios Argyriou; Leandros A. Maglaras*

**Session: SWC-3:** 15:50-17:30, 21<sup>th</sup> August (Wednesday), Room 0.08

**Chair:** TBA

Optimal Demand Side Management in Generation Constrained Power Systems

*Julus Azasoo; Michael Opoku Agyeman; Triantafyllos Kanakis; Ali Al-Sherbaz*

Towards a Smart(er) Social Science using high-dimensional continuous-time trajectories from the Open Dynamic Interaction Networks (ODIN) platform

*Bilal Khan; Kirk Dombrowski; Gisela Font Sayeras; Alekhya Bellam; Devan Crawford; Kin Pi; Patrick Habecker; Maisha Jauernig*

A Scalable and Reliable Model for Real-time Air Quality Prediction

*Liyong Li; Zhi Li; Lara G Reichmann; Diane Myung-kyung Woodbridge*

Predicting Unethical Physician Behavior At Scale: A Distributed Computing Framework

*Diane Myung-kyung Woodbridge; Anastasia Keck; Miguel Romero; Robert Sandor; Paul Intrevado*

Improving a 3-D Convolutional Neural Network Model Reinvented from VGG16 with Batch Normalization

*Nontawat Pattanajak; Hossein Malekmohamadi*



**Session: SWC-4:** 09:00-10:40, 22<sup>st</sup> August (Thursday), Room 0.08

**Chair:** TBA

A Smart Gateway enabling OPC UA and DDS interoperability

*Ranti Endeley; Nanlin Jin; Gerhard Fehringer*

A dynamic grid-based algorithm for taxi ridesharing in multiple road condition

*Yuxin Wang; Bin Wu; Tongkun Xu; Yanming Shen; Feng Chen*

An Integrated Framework for Packing CAN-FD Frames and Assigning Offsets

*Gang Zeng; Hui Wang; Shan Ding*

Leveraging Graph Neural Network With LSTM For Traffic Speed Prediction

*Zhilong Lu; Weifeng Lv; Zhipu Xie; Bowen Du; Runhe Huang*

An Automatic Laser Scanning System for Objects with Unknown Model

*Yipeng Yang; Zhan Li; Zhaoting Li; Liu Yang; Yingxin Yan*

**Session: SWC-5:** 11:00-12:30, 22<sup>st</sup> August (Thursday), Room 0.08

**Chair:** TBA

Prediction of Road Traffic Flow Based on Deep Recurrent Neural Networks

*Zoe E Bartlett; Liangxiu Han; Trung Nguyen; Princy Johnson*

Happy Cows, Happy Milk: smart cows and quality factors

*Massimo Marchiori*

Visual Attention-Based Object Detection in Cluttered Environments

*Eduardo Machado; Ivan Carrillo; Miguel Collado; Liming Luke Chen*

## 20. SESSIONS IN SWTC PhD FORUM 2019

*IEEE CIS Smart World Technical Committee (SWTC)*

**Session: SWTC-1:** 15:50-16:20, 19<sup>th</sup> August (Tuesday), Room 2.07

**Chair:** TBA

**Organizers:**

Dr. Man Lin

Vice Chair of IEEE Smart World  
Technical Committee

St. Francis Xavier University  
Canada

Dr. Liming Chen

General Co-Chair of 2019 IEEE  
Smart World Congress

De Montfort University  
UK

Dr. Runhe Huang

Chair of IEEE Smart World  
Technical Committee

Hosei University,  
Japan

## 21. SESSIONS AND PAPERS IN UIC 2019

**Session: UIC-1:** 15:20-16:20, 20<sup>th</sup> August (Tuesday), Room 2.06

**Chair:** TBA

*UIC 2019 Short papers and Work-in-Progress papers*

Interactive Design of Geofences for Proactive Location-based Services in Smart Cities

*Sandro Rodriguez Garzon; Thomas Pöllabauer; Sebastian Zickau; Axel Küpper*

Collaborating with Users in Proximity for Decentralized Mobile Recommender Systems

*Felix Beierle; Tobias Eichinger*

Visualising the Invisible: Augmented Reality and Virtual Reality as Persuasive Technologies for Energy Feedback

*Alexander D Fredericks*

Towards Autonomic Educational Cyber Physical Systems

*Samia Bachir; Angel Abenia; Laurent Gallon; Philippe Aniorte; Ernesto Exposito*

## 22. SESSIONS AND PAPERS IN UIC 2019 – Track 1

**Session: UIC-T1-1:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 2.06

**Chair:** TBA

### *Short*

Catch the Shadow: Person Tracking Under Occlusion with a Single RGB-D Camera

*Wei Gai; Meng Qi; Lu Wang; Chenglei Yang; Mingcong Ma; Juan Liu; Yulong Bian; Gerard de Melo;*

*Shijun Liu; Xiangxu Meng*

Leveraging Blowing as a Directly Controlled Interface

*Yeqing Chen; Yulong Bian; Chenglei Yang; Xiyu Bao; Yafang Wang; Gerard de Melo*

Deep Neural Network Based Multiple Targets DOA Estimation for Millimeter-Wave Radar

*Geyu Tang; Xingyu Gao; Zhenyu Chen; Yu Zhang*

A collaborative multi-modality selection method based on data utility assessment

*Yunlong Xiao; Yang Gu; Jiwei Wang; Tong Wu*

CoFINLo: Coarse to Fine Indoor Navigation and Localization System

*Yang Gu; Yiqiang Chen; Xinlong Jiang; Jiwei Wang; Yunlong Xiao; Tong Wu*

Passive Embroidered Stretch Sensor Utilizing UHF RFID Antennas

*Mengxia Yu; Silong Wang; Yulong Liu; Lulu Xu; Terry Ye*

A multi-database hybrid storage method for big data of power dispatching and control

*Can Cui; Zhenyu Chen; Dapeng Li; Xingyu Gao*

**Session: UIC-T1-2:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 0.10

**Chair:** TBA

Differential Privacy-based Indoor Localization Privacy Protection in Edge Computing

*Qian Chen; Xuejun Zhang; Xiaohui Peng; Xinlong Jiang*

DrowsyDet: A Mobile Application for Real-time Driver Drowsiness Detection

*Chaohui Yu; Xin Qin; Yiqiang Chen; Jindong Wang; Chenchen Fan*

Indoor Trajectory Restoration Method Based on PoI Relation Constraints

*Xinlong Jiang; Yiqiang Chen; Yang Gu; Junfa Liu; Yunbing Xing*

ViHand: Gesture Recognition with Ambient Light

*Qianhong Hu Qianhong, Hu; Zhiwen Yu; Zhu Wang; Guo Bin; Chao Chen*

LWS: A LoRaWAN Wireless Underground Sensor Network Simulator for Agriculture Applications

*Kevin I-Kai Wang; Shiyang Wu; Ameer Ivoghlian; Andrew C M Austin; Zoran Salcic; Xiaokang Zhou*

A Driving Attention Detection Method Based on Head Pose

*Ya Li; Jiying Li; Xinlong Jiang; Chenlong Gao; Teng Zhang*

## 23. SESSIONS AND PAPERS IN UIC 2019 – Track 2

### *Track 2: Intelligent/Smart Environment & Applications*

**Session: UIC-T2-1:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 0.10

**Chair:** TBA

Traffic Speed Prediction with Missing Data based on TGCN

*Liang Ge; Hang Li; Aoli Zhou; Junling Liu*

Deep Spatial-Temporal Fusion network for Fine-grained Air Quality Prediction

*Liang Ge; Aoli Zhou; Hang Li; Junling Liu*

A Scoring Method for Driving Safety Credit Using Trajectory Data

*Wenfu Wang; Yao Yang; An Chen; Zhijie Pan*

Persistent Transportation Traffic Volume Estimation with Differential Privacy

*Wenjian Yang; Yu-e Sun; He Huang; Yang Du; Danlei Huang; Fanzhang Li; Yonglong Luo*

**Session: UIC-T2-2:** 14:15-15:30, 21<sup>th</sup> August (Wednesday), Room 0.10

**Chair:** TBA

Varied Priority-based Data Forwarding via NDN in VANET

*Siyang Wang; Weigang Wu; Zhi Zhou*

Short-term travel time prediction on urban road networks using massive ERI data

*Jing Huang; Linjiang Zheng; Jiangling Qin; Dong Xia; Li Chen; Dihua Sun*

CNNLoc: Deep-Learning Based Indoor Localization with WiFi Fingerprinting

*Xudong Song; Xiaochen Fan; Chaocan Xiang; Xiangjian He; Qianwen Ye; Gengfa Fang; Liming Luke Chen; Chao Chen; Zumin Wang; Jing Qin; Xiang Huang*

**Session: UIC-T2-3:** 15:50-17:30, 21<sup>th</sup> August (Wednesday), Room 0.10

**Chair:**

CurveCluster: Automated Recognition of Hard Landing Patterns based on QAR Curve Clustering

*Xu Li; Jiaxing Shang; Linjiang Zheng; Dajiang Liu; Lin Qi; Liu Liu*

Diabetes diagnosis and treatment research based on machine learning

*Heng Zhang; Bo He; Kuangi Shu; Jiakun Li*

BikeNet: Accurate Bike Demand Prediction Using Graph Neural Networks for Station Rebalancing

*Ruiying Guo; Zhihan Jiang; Cheng Wang; Jonathan Li; Longbiao Chen*

iDrug: Pediatric Drug Interaction Modeling and Risk Evaluation Leveraging Prescription Big Data

*Yunting Shao; Linghong Hong; Jinzhun Wu; Ming Cheng; Cheng Wang; Jonathan Li; Longbiao Chen*

Supervised Nonnegative Tucker Decomposition for Computational Phenotyping

*Kai Yang; Wenqi Sun; Junfeng Zhao; Yasha Wang; Bing Xie*

**Session: UIC-T2-4:** 09:00-10:40, 22<sup>th</sup> August (Thursday), Room 0.10

**Chair:** TBA

Gaze-based Assessment of Dyslexic Students' Motivation within an E-learning Environment

*Ruijie Wang; Liming Luke Chen; Aladdin Ayesh; Jethro Shell; Ivar Solheim*

Enhancing Multi-Hop Sensor Calibration with Uncertainty Estimates

*Balz Maag; Zimu Zhou; Lothar Thiele*

Multi-Source Data Integration-Based Urban Road GPS Environment Friendliness Estimation

*Liantao Ma; Yasha Wang; Guangju Peng; Chaohe Zhang; Chao Chen; Junfeng Zhao; Jiangtao Wang*

An efficient method for tri-axis magnetometer calibration

*Jiakun Li; Heng Zhang; Kuangi Shu; Bo He*

Probabilistic Analysis of Temporal and Sequential Aspects of Activities of Daily Living for Abnormal Behaviour Detection

*Alexandros Konios; Matias Garcia-Constantino; Stavros-Richard Christopoulos; Mustafa Asan Mustafa; Idongesit Ekerete; Colin Shewell; Chris Nugent; Gareth Morrison*

**Session: UIC-T2-5:** 11:00-12:30, 22<sup>th</sup> August (Thursday), Room 0.10

**Chair:** TBA

**Short**

Study on Optimal Allocation of Inference Nodes for Distributed Inference in Smart Environment

*ChengLiang Wang; XinTian Huang; MinHui Zou; Rahim Baig*

Network-Aware Data Transmission Scheduling for Saving Energy in Cellular Networks

*Di Zhang; Yuezhi Zhou; Yaoyue Zhang*

A Context-aware Map Matching Method Based on Supported Degree

*Congcong Liu; Hengxin Chen; Mingqi Gao*

A LSTM Based Bus Arrival Time Prediction Method

*Lingqiu Zeng; Guangyan He; Qingwen Han; Lei Ye; Fengxi Li; Lidong Chen*

Decision-Making for Drone Services in Urban Environments: a Simulated Study on Clients' Satisfaction and Profit Maximisation

*Majed Alwateer; Seng W Loke*

Power Load Prediction Based On An Improved Clock-Work RNN

*Fangwan Huang; Shijie Zhuang; Zhiyong Yu*

**Session: UIC-T2-6:** 09:50-10:40, 22<sup>th</sup> August (Thursday), Room 2.08

**Chair:** TBA

**Short**

An Amplification DDoS attack Defence Mechanism using Reinforcement Learning

*Tony Chang*

A Business Process Oriented Dynamic Cyber Threat Intelligence Model

*Yuanchen Xu; Yingjie Yang; Ying He*

Selecting Sensing Location Leveraging Spatial and Cross-domain Correlations  
*Huijuan Chang; Zhiyong Yu; Zhiwen Yu; Guo Bin*

**Session: UIC-T2-7:** 11:00-12:30, 22<sup>th</sup> August (Thursday), Room 2.08

**Chair:** TBA

**Short**

Fine-Grained Sleep-Wake Behaviour Analysis

*Sarah Fallmann; Liming Luke Chen; Feng Chen*

Image Caption Generation with Local Semantic Information and Global Information

*Weibin Liu*

Scalable Real-time Prediction and Analysis of San Francisco Fire Department Response Times

*Xu Lian, Sarah Melancon, Jon-Ross Presta, Adam Reevesman, Brian J. Spiering, Diane Myung-kyung Woodbridge*

## 24. SESSIONS AND PAPERS IN UIC 2019 – Track 3

### *Track 3: Intelligent/Smart Systems & Services*

**Session: UIC-T3-1:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 2.06

**Chair:** TBA

**Short**

Energy-efficient Activation/Inactivation Strategy for Long-term IoT Network Operation

*Zhishu Shen; Kenji Yokota; Atsushi Tagami; Teruo Higashino*

Dynamic No-Fly Zone for Drones

*Guiyu Tian; Chunhua Xiao; Weichen Liu*

Considerations on the Deployment of Heterogeneous IoT Devices For Smart Water Networks

*Essa Shahra; Wenyan Wu; Michele Romano*

A fast action recognition method with cascaded networks

*Liqing Wan; Weiwei Xing; Shunli Zhang; Xiaoping Che*

k-NN-based EMG recognition for gestures communication with limited hardware resources

*Carlos Cedeño Z.; Jose Cordova-Garcia; Victor Asanza A.; Ronald Ponguillo; Leonardo Muñoz M.*

AI-Powered Text Generation for Harmonious Human-Machine Interaction: Current State and Future Directions

*Qiuyun Zhang; Guo Bin; Hao Wang; Yunji Liang; Shaoyang Hao; Zhiwen Yu*

**Session: UIC-T3-2:** 12:15-15:30, 21<sup>th</sup> August (Wednesday), Room 2.06

**Chair:** TBA

**Short**

Sentiment Analysis Based on Attention Mechanisms and Bi-directional LSTM Fusion Model

*YangYang Zhu; Mei Wang*

Energy-Aware Anomaly Detection in Industrial Multi-Modal IoT Applications

*Xiaocui Li; Zhangbing Zhou*

Using Eye Tracking to Gain Insight into TV Customer Experience by Markov Modelling

*Zhi Chen; Shuai Zhang; Sally I McClean; Gaye Lightbody; Michael Milliken; Ian Kegel; Aygul Garifullina*

Egocentric Hand Track and Object-based Human Action Recognition

*Georgios Kapidis; Ronald Poppe; Elsbeth van Dam; Lucas Noldus; Remco Veltkamp*

Code Refactoring from OpenMP to MapReduce Model for Big Data Processing

*Junfeng Zhao; Minjia Zhang; Hongji Yang*

**Session: UIC-T3-3:** 15:50-17:30, 21<sup>th</sup> August (Wednesday), Room 2.06

**Chair:** TBA

Two-stream Network with 3D Common-specific Framework for RGB-D Action Recognition

*Xiaolei Qin; Yongxin Ge; Jinyuan Feng; Yida Chen; Liuwei Zhan; Xuchu Wang; Yuangan Wang*

Content and Network Aware Replication and Scheduling Mechanism for User Generated Content Videos

*Qilin Fan; Hao Yin; Geyong Min; Sen Wang; Lyu Yongqiang; Xu Zhang*

Improving Fast Adaptation for Newcomers in Multi-robot Reinforcement Learning System

*Yiyang Li; Wei Zhou; Wang Huaimin; Bo Ding; Kele Xu*

Wearable Sensors based Automatic Box and Block Test System

*Yingwei Zhang; Yiqiang Chen; Hanchao Yu; Zeping Lv; Pan Shang; Yiyi Ouyang; Xiaodong Yang; Wang*

Lu

**Session: UIC-T3-4:** 09:00-10:40, 22<sup>th</sup> August (Thursday), Room 2.06

**Chair:** TBA

MSAHTA: Mixed Spatial Attention and Hierarchical Temporal Aggregation for Action Recognition

*Jinyuan Feng; Dan Yang; Yongxin Ge; Xiaolei Qin; Yida Chen; Yuangan Wang*

Research on Road Condition Detection Based on Crowdsensing

*Xiaoping Che; Yi Yuan*

Dynamic Allocation for Complex Mobile Crowdsourcing Task with Internal Dependencies

*Congying Yang; Zhiwen Yu; Liu Yimeng; Liang Wang; Guo Bin*

An Online Computation Offloading Mechanism for Mobile Edge Computing in Ultra-Dense Small Cell Networks

*Junyi He; Di Zhang; Yuezhi Zhou; Yaoxue Zhang*

FEDet: Feature enhancement single shot detector

*Yangwei Sun; Jian Ye*

**Session: UIC-T3-5:** 11:00-12:30, 22<sup>th</sup> August (Thursday), Room 2.06

**Chair:** TBA

Characterizing Collective Knowledge Sharing Behaviors in Social Network

*Jian Kang; Zhiwen Yu; Yunji Liang; Jiayu Xie; Guo Bin*

Deep-WiID: WiFi-Based Contactless Human Identification via Deep Learning

*Zhiyi Zhou; Chang Liu; Xingda Yu; Cong Yang; Pengsong Duan; Yangjie Cao*

Correlating MSM's Mental Health with Usage Behaviors on MSM-Specific Social Applications

*Xin Gao; Chaohe Zhang; Liantao Ma; Yasha Wang; Jiangtao Wang; Daqing Zhang*

MUSEFood: Multi-sensor-based Food Volume Estimation on Smartphones

*Junyi Gao; Weihao Tan; Liantao Ma; Yasha Wang; Wen Tang*

**Session: UIC-T3-6:** 09:00-10:40, 22<sup>th</sup> August (Thursday), Room 2.07

**Chair:** TBA

Measures for Improving Outdoor Crowdsourcing Photo Collection on Smart Phones

*Huihui Chen; Guo Bin; Zhiwen Yu*

A New Image Classification Architecture Inspired by Working Memory

*Jiahui Shen; Ji Xiang; Nan Mu; Lei Wang*

CrackSense: A CrowdSourcing Based Urban Road Crack Detection System

*Liang Wang; Congying Yang; Zhiwen Yu; Liu Yimeng; Zhu Wang; Guo Bin*

An Event-based User Experience Evaluation Method for Virtual Reality Applications

*Xiaoping Che; Siqi Ma; Yu Qi; Chenfeng Yue*

Your Pedometer tells you: Attribute Inference via Daily Walking Step Count

*Yiwen Jiang; Wei Tang; Neng Gao; Ji Xiang; Daren Zha; Xiang Li*

**Session: UIC-T3-7:** 11:00-12:30, 22<sup>th</sup> August (Thursday), Room 2.07

**Chair:** TBA

Comparing CNN and Human Crafted Features for Human Activity Recognition

*Federico Cruciani; Anastasios Vafeiadis; Chris Nugent; Ian Cleland; Paul McCullagh; Konstantinos Votis;*

*Dimitris Giakoumis; Dimitrios Tzovaras; Liming Luke Chen; Raouf Hamzaoui*

An Improved ACO with First-job Restriction and P-ANT for Batch Scheduling Problem

*Yang Yang; Zhaohong Jia; Yiwen Zhang; Kai Li*

Urban Micro-circulation Bus Planning Based on Temporal and Spatial Travel Demand

*Bowen Du; Yanan Qiao; Jiejie Zhao; Leilei Sun; Weifeng Lv; Runhe Huang*

Traffic Accident Prediction Based on Deep Spatio-temporal Analysis

*Le Yu; Bowen Du; Xiao Hu; Leilei Sun; Weifeng Lv; Runhe Huang*

**Session: UIC-T3-8:** 09:00-09:50, 22<sup>nd</sup> August (Thursday), Room 3.04

**Chair:** TBA

CrowdTravel: Leveraging Cross-Modal CrowdSourced Data for Fine-grained and Context-based Travel Route Recommendation

*Jing Zhang; Guo Bin; Zhimin Li; Yan Liu; Zhiwen Yu; Qi Han*

**Short**

HISMA: A Human-machine Iterative Schema Matching Algorithm

*Shuang Tang; Junfeng Zhao; Yasha Wang; Da Cui*

Online Intelligent Resource Management for Power-Delay Tradeoff in Backhaul-Limited Mobile Edge Computing Systems

*Yuan Sun; Gang Yang; Xingshe Zhou*

## 25. SESSIONS AND PAPERS IN UIC 2019 – Track 4

### Track 4: Personalization and Social Aspects

**Session: UIC-T4-1:** 15:20-17:30, 20<sup>th</sup> August (Tuesday), Room 2.07

**Chair:** TBA

**Short**

Friend Recommendation Algorithm Based on Interest and Cognition Combined with Feedback Mechanism

*Yunfei Yin; Xuesong Feng*

Device Free Human Activity Recognition using WiFi Channel State Information

*Jörg Schäfer; Neena Damodaran*

Assessing Mental Stress Based on Smartphone Sensing Data: An Empirical Study

*Feng Wang; Yasha Wang; Jiangtao Wang; Haoyi Xiong; Junfeng Zhao; Daqing Zhang*

BDMF: A Biased Deep Matrix Factorization Model for Recommendation

*Jianjun Li; Changsheng Ma; Peng Pan; Guohui Li; Junbo Du*

A Carpooling Service for Private Vehicles using Electronic Registration Identification Data

*Chen Cui; Linjiang Zheng; Dong Xia; Li Chen; Dihua Sun*

Personalized Preference Collaborative Filtering: Job Recommendation for Graduates

*Qing Zhou; Fenglu Liao; Liang Ge; Jianglin Sun*

Dynamic ensemble pruning selection using meta-learning for multi-sensor based activity recognition

*Jingjing Cao; Wenjing Yuan; Wenfeng Li; Xiaozheng E*

**Session: UIC-T4-2:** 11:00-12:30, 21<sup>th</sup> August (Wednesday), Room 2.07

**Chair:** TBA

LISC: Location Inference Attack Enhanced by Spatial-Temporal-Social Correlations

*Bing Li; Hong Zhu; Meiyi Xie*

Projection-induced Access Point Deployment for Fingerprint-based Indoor Positioning

*Qiaolin Pu; Joseph Kee-Yin Ng; Kai Liu*

Handling Fingerprint Sparsity for Wi-Fi based Indoor Localization in Complex Environments

*Hao Li; Joseph Kee-Yin Ng; Kai Liu*

**Short**

Modeling Chinese Input Interaction for Patients with Cloud based Learning

*Farzana Jabeen; Linmi Tao; Tong Lin; Shanshan Mei*

Mutual Graph Embedding in LBSN: Capturing Multi-factor influence for Point-of-Interest Prediction

*Zhengxun Zhao; Weiqi XU; Lei Wang; Cong Xue*

**Session: UIC-T4-3:** 14:15-15:30, 21<sup>th</sup> August (Wednesday), Room 2.07

**Chair:** TBA

CoxRF: Employee Turnover Prediction based on Survival Analysis

*Qianwen Zhu; Jiaying Shang; Xinjun Cai; Linli Jiang; Feiyi Liu; Baohua Qiang*

**Short**

Optimal Bandwidth Allocation for Web Crawler Systems

*Weiping Zhu; Yaodong Li; Yi Xu; Xiaohui Cui*

Game Theoretical Study on a Client-Controlled Deduplication Scheme

*Xueqin Liang; Zheng Yan; Wenxiu Ding; Robert Deng*

Attention-Based Adaptive Sampling in Continuous EMG-Data Streams

*Giovanni Schiboni; Oliver Amft*

**Session: UIC-T4-4:** 15:50-17:30, 21<sup>th</sup> August (Wednesday), Room 2.07

**Chair:** TBA

Personal Trait Analysis Using Word2vec Based on User-generated Text

*Guanqun Sun; Ao Guo; Jianhua Ma; Jianguo Wei*

An Effective Deep Learning Approach for Dialogue Emotion Recognition in Car-hailing Platform

*Yuxin Zhang; Yiqiang Chen; Chenlong Gao*

Where to Build New Public Toilets? Multi-source Urban Data Tell the Truth

*Chaoxiong Chen; Yuyang Liu; Chengwu Liao; Chao Chen; Liang Feng; Zhu Wang*

Attributed Network Embedding via a Siamese Neural Network

*Jiong Wang; Neng Gao; Jia Peng; Jingjie Mo*

LSTM Based Semi-supervised Attention Framework for Sentiment Analysis

*Hanxue Ji; Wenge Rong; Jingshuang Liu; Yuanxin Ouyang; Zhang Xiong*

## 26. SESSIONS AND PAPERS IN UIC-MWDA 2019 (UIC2019)

*Workshop on Mobile Web Data Analytics*

**Session: UIC-MWDA-1:** 11:00-12:00, 19<sup>th</sup> August (Monday), Room 0.10

**Chair:** TBA

Individual Risk Prediction of Gastric Cancer Using Fully Connected Neural Network with Weighted Neighborhood Feature

*Jun Liao; Dandan Liu; Li Liu*

Modeling Data-driven Liver Cancer Prediction with Medical Knowledge on Chinese Population

*Dandan Liu; Jun Liao; Li Liu*

Exploring mobile phone data for urban activity analysis: Applications from individual activity pattern to group activity regularity

*Rong Xie*

## 27. SESSIONS AND PAPERS IN VPVC 2019 (SWC2019)

*SWC2019: Symposium on Visual Perception and Visual Computing*

**Session: VPVC-1:** 11:00-12:30, 19<sup>th</sup> August (Monday), Room 2.07

**Chair:**

Robotic Chinese Calligraphy with Human Preference

*Fei Chao*

Study of LSTM model in sea surface temperature prediction of the Yellow Sea cold water mass area

*Zikun Chen; Junyu Dong*

Multi-level Similarity Learning for Low-Shot Recognition

*Hongwei Xu; Xin Sun; Junyu Dong; Shu Zhang; Qiong Li*

The BIDS Toolbox: A web service to manage brain imaging datasets

*Unai Lopez-Novoa; Cyril Charron; John Evans; Leandro Beltrachini*

PhytoGAN: Unpaired Dead-to-Live Phytoplankton Translation

*Shuai Han; Xin Sun; Junyu Dong; Shu Zhang; Qiong Li*

Spatial-Temporal Skeleton Feature: An Unit-Level Feature for Temporal Action Proposal Generation

*Tingting Chen; Junyu Dong; Lin Qi; Shu Zhang; Xiang Wang; Qilu Zhao*

**Session: VPVC-2:** 13:30-14:45, 19<sup>th</sup> August (Monday), Room 2.07

**Chair:** TBA

Optimization Strategies for Real-Time Rendering of virtual Scenes on Heterogeneous Mobile Devices

*Wei Gai; Xiyu Bao; Meng Qi; Yafang Wang; Juan Liu; Gerard de Melo; Lu Wang; Lizhen Cui; Chenglei Yang; Xiangxu Meng*

Semi-Supervised Learning Based on Local Adaptive Kernels

*Guo Niu; Zhikui Duan*

Leveraging an Instance Segmentation Method for Detection of Transparent Materials

*Amanuel Hirpa Madessa; Junyu Dong; Xinghui Dong; Ying Gao; Hui Yu; Israel Mugunga*

## **28. SESSIONS AND PAPERS IN WSIWSC 2019 (SWC2019)**

*SWC2019: Workshop on Security Issues in the World of Smart Cities*

**Session: WSIWSC-1:** 11:00-12:30, 19<sup>th</sup> August (Monday), Room 2.09

**Chair:** TBA

External manipulation of autonomous vehicles

*Gabor Kiss*

Exploring performance and energy consumption differences between recent Intel processors

*Unai Lopez-Novoa*

Employing Blockchain Technology for Decentralized Crowdsourced Data Access and Management

*Nitin Sukhija*

Towards a Framework for Monitoring and Analyzing High Performance Computing Environments Using Kubernetes and Prometheus

*Nitin Sukhija*

Man-tracking and sign cutting by surveillance UAV

*Mahmod Al-Bkree*



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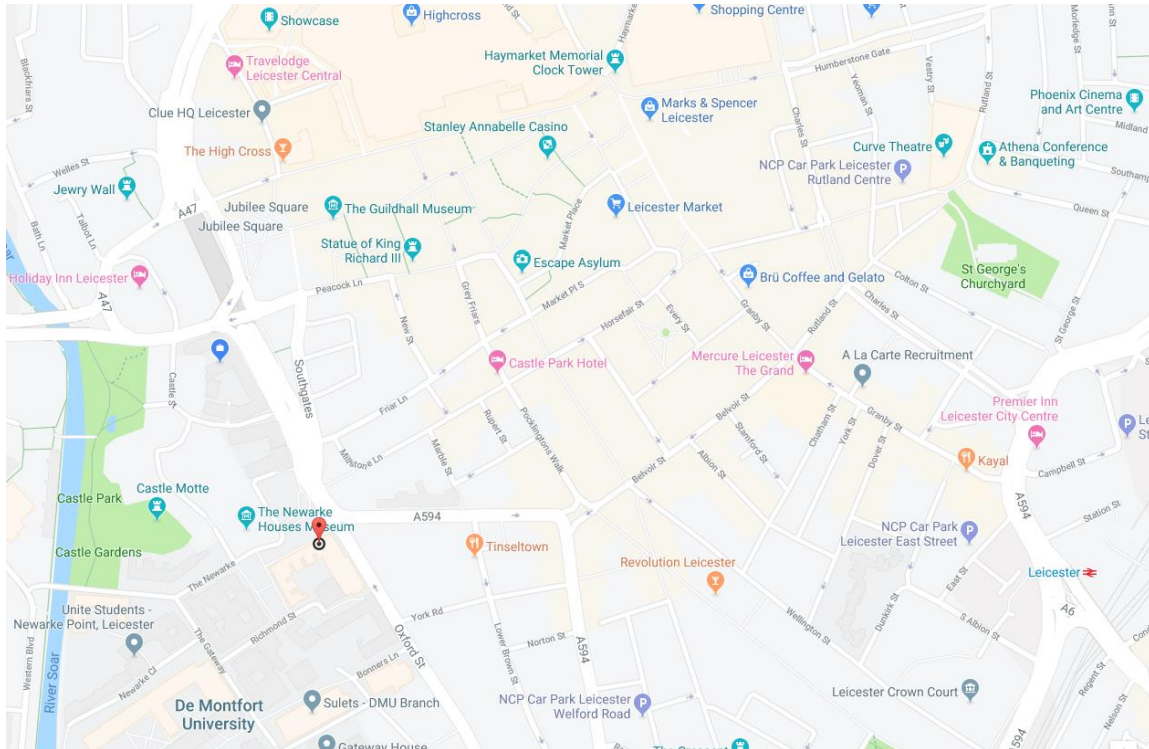
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## *Introduction to De Montfort University*

De Montfort University (DMU) is proud to be recognised as a university ranked Gold under the Teaching Excellence Framework (TEF). The award is a recognition of the consistently outstanding teaching and learning on offer at DMU and the extraordinary impact that it has on our students.

DMU is a dynamic institution with a long and vibrant history of improving people's lives through education. Originally founded as the Leicester School of Art in 1870, the university has evolved through many incarnations including the Leicester Colleges of Art and Technology and Leicester Polytechnic. Leicester Polytechnic officially became De Montfort University on 26 June 1992. The name was chosen to reflect the University's long association with Leicester by commemorating the celebrated Simon de Montfort, Earl of Leicester, a crucial figure in medieval history who established the first parliament in 1265.

Located in the heart of Leicester, De Montfort University's campus blends the historical and the new, reflecting the great tradition of our home city and its buildings, while creating a legacy. We believe our campus is one of the finest in the country - we have invested £136 million to make it an exciting and inspiring place in which to study. The centrepiece is the stunning Vijay Patel Building, the new home of our art and design courses. There is also our newly refurbished Campus Centre, home of the De Montfort Students' Union, our striking Hugh Aston building, for business and law, our magnificent 19th-century Hawthorn building for health and life sciences, and many others. We have also spent £4.2 million restoring Leicester Castle, located at the edge of our campus, giving new life to this historic gem and making it the base for our Leicester Castle Business School.

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