4TH INTERNATIONAL CONFERENCE ON UK - CHINA EMERGING TECHNOLOGIES

UK-China Emerging Technologies Conference

UCET

Final Program

21 – 22 August 2019
Conference Venue: Kelvin Hall,
1445 Argyle Street,
Glasgow G3 8AW, Scotland

University of Glasgow

IEEE ComSoc
IEEE Communications Society

UESTC

Conference Schedule

Time	Activity	Speaker
08:30 – 09:00	Registration and Coffee	
09:00 – 09:05	Welcome by HoS – James Watt School of Engineering	
09:05 – 09:10	Chair's Welcome	
09:10 – 09:40	Keynote 1	Rahim Tafazolli
09:45 – 10:15	Keynote 2	Vincent Fusco
10:20 – 11:00	Digital Poster Presentation Session 1, Networking and Coffee	
11:00 – 12:35	Invited Talks (20 min each)	Mohamed-Slim Alouini Toktam Mahmoodi Leila Musavian John Thompson
12:40 – 12:50	LatticeGear – Cleaving and Scribing Solutions	
12:50 – 14:15	Digital Poster Presentation Session 2 and Lunch	
14:15 – 15:55	Invited Talks (20 min each)	Timothy O'Farrell Hamed Al-Raweshidy Ali Imran Luiz A DaSilva
16:00 – 16:40	Digital Poster Presentation Session 3 and Coffee	
16:40 – 17:30	Invited Talks (20 min each)	Mathini Sellathurai Muhammad Mahtab Alam
18:00 – onwards	Plenary Dinner Talk, Award Ceremony and Dinner	Lajos Hanzo

Thursday, 22 August 2019

Time	Activity	Speaker
08:30 – 09:00	Registration and Coffee	
09:00 – 09:30	Keynote 3	Robert Stewart
09:35 – 10:05	Keynote 4	Harald Haas
10:10 – 11:10	Digital Poster Presentation Session 4, Networking and Coffee	
11:10 – 12:25	Invited Talks (20 min each)	Sami Muhaidat Raed Shubair Payam Barnaghi Atif Shamim
12:30 – 14:00	Digital Poster Presentation Session 5 and Lunch	
14:00 – 15:15	Invited Talks (20 min each)	Kianoush Nazarpour Sara Ghoreishizadeh Muhammad Awais Bin Altaf
15:15 – 16:00	Digital Poster Presentation Session 6 and Coffee	
16:00 – 17:15	Invited Talks (20 min each)	Ying Ding Yuan Shi Xuefeng Liu
17:15 – 17:30	Closing	

Chairs' Welcome

Welcome to the 2019 International Conference on UK – China Emerging Technologies (UCET) now in its fourth iteration!

As the world is striving towards becoming smarter and ubiquitously connected, there has been an explosive growth of heterogeneous and intelligent devices with ubiquitous connectivity. Communication and Sensing are thus becoming increasingly interweaved and core components of any modern technologies. Both communication and sensing technologies are now having widespread applications beyond communication technologies and playing crucial roles in every aspect of our lives such as healthcare, automation, transport, weather, gaming, education, safety, security and so on.

The 4th International Conference on UCET is sponsored by the IEEE Communications Society (ComSoc) and organised by the University of Glasgow, UK. The conference will be held at the Kelvin Hall located in the city of Glasgow, from where several local attractions and restaurants are within walking distance.

The theme of this year's conference is aimed at providing a platform for sharing ideas among researchers and practitioners from both the industry and academia working on the state-of-the-art research and development solutions related to communication and sensing technologies.

We welcome you to join us for an exciting program in Glasgow in August 2019!

General Chairs
John H Marsh
University of Glasgow

Bing Zeng
University of Electronic Science and Technology of China

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Detailed Program

Keynote Talks – Wednesday 21 August

Keynote 1   09:10 – 09:40

Rahim Tafazzoli   *University of Surrey*

Title: What is Next?

Abstract: The talk will review what 5G will deliver and identify 5 year and 10-year research challenges with support of some new use cases for 2030 and beyond.

Keynote 2   09:45 – 10:15

Vincent Fusco   *Queens University Belfast*

Title: Lens and Circular Array Beamforming for 5G and Beyond

Abstract: Data rate requirements for cellular communications are expected to increase 1000-fold by 2020, compared to 2010. This is mainly because of the rapid increase in the number of wireless devices and data hungry applications per-device. This creates a formidable bandwidth crisis. Millimetre-wave (mm-wave) systems with massive multiple-input multiple-output (MIMO) operation are two complementing concepts poised to meet this exploding demand, as verified by the wealth of investigations by both industry and academia. Nevertheless, existing MIMO processing techniques, requiring a dedicated radio-frequency (RF) up/down-conversion chain per antenna, results in prohibitively high complexity and cost of the mm-wave prototypes.
This work presents a complete feasibility study on alternative beamforming techniques targeted to reduce the system complexity without drastically compromising its performance. More precisely we investigate the end-to-end performance of different lens-based beamforming topologies (discussed later in the text). The study is an amalgam of theoretical modelling, electromagnetic design, and prototype manufacturing, yielding a comprehensive MIMO performance evaluation.

Plenary Dinner Talk – Wednesday 21 August

Lajos Hanzo   18:00

University of Southampton

Title: Full Steam Ahead - But Where Are We Heading Dr Shannon

Keynote Talks – Thursday 22 August

Keynote 3   09:00 – 09:30

Robert Stewart   *University of Strathclyde*

Title: 5G New Thinking - Shared Spectrum Private Networks for Rural Communities

Abstract: In this presentation, we will present on our experiences in the design and implementation of neutral host and shared spectrum network as part of the 5GRuralFirst project. The talk will review the progress from the 5GRuralFirst project, and present on some of the challenges in the rural deployment in the remote and rural Orkney Islands, alongside presenting a review of some of the use cases implemented.

Keynote 4   09:35 – 10:05

Harald Haas   *University of Edinburgh*

Title: What is the Status of LiFi and What Comes Next?

Abstract: The visible light spectrum is 1000 times larger than the entire radio frequency spectrum of 300 GHz, and this simple fact provides the motivation to use the visible light spectrum to augment RF cellular communications. We will set the scene by motivating the need for new wireless spectrum. Then we will go on to provide a general background to the subject of optical wireless communications. We will discuss the relationship between VLC and LiFi, introducing the major advantages of VLC and LiFi and discuss existing challenges. Recent key advancements in physical layer techniques that led to transmission speeds greater than 10 Gbps will be discussed. Moving on, we introduce channel modelling techniques, and show how this technology can be used to create fully-fledged cellular networks achieving orders of magnitude improvements of area spectral efficiency compared to current technologies. The challenges that arise from moving from a static point-to-point visible light link to a LiFi network that is capable of serving hundreds of mobile and fixed nodes will be discussed. An overview of recent standardization activities will be provided – primarily focusing on the new IEEE 802.11bb LC (light communication) Study Group activities. Lastly, we will moot commercialization challenges of this disruptive technology.

Invited Talks – Wednesday 21 August

Mohamed-Slim Alouini	11:00 – 11:20
King Abdullah University of Science & Technology, Saudi Arabia	
Title: Smart Villages: When Affordability Meets Connectivity	
Toktam Mahmoodi	11:25 – 11:45
King's College London	
Title: Connected Automated Driving - role of future connectivity solutions and what comes next	
Leila Musavian	11:50 – 12:10
University of Essex	
Title: Performance Analysis of NOMA for Low Latency Communications	
John Thompson	12:15 – 12:35
University of Edinburgh	
Title: An Overview of Sparse Low-Resolution Sampling Techniques for Millimetre Wave Communications	
Timothy O'Farrell	14:15 – 14:35
University of Sheffield	
Title: Energy Efficiency Evaluation Framework for Designing Ultra-Dense Small Cell RANs	
Hamed Al-Raweshidy	14:40 – 15:00
Brunel University	
Title: Upper-Band MmWave using UMMIMO Beamforming with AI for 6G Networks	
Ali Imran	15:05 – 15:25
University of Oklahoma	
Title: AI and Big Data for Network Automaton: Challenges and Opportunities	
Luiz A DaSilva	15:30 – 15:50
Trinity College Dublin	
Title: Network Planning for Drones as Mobile Communications Infrastructure	
Mathini Sellathurai	16:40 – 17:00
Heriot-Watt University, Edinburgh, UK	
Title: Development of Full-Duplex Communications Systems: From Theory to Practice	
Muhammad Mahtab Alam	17:05 – 17:25
Tallinn University of Technology, Estonia	
Title: Radio Resource Management in Narrowband Internet-of-Things: Perspectives from Standard to Real-Deployments	

Invited Talks – Thursday 22 August

Raed Shubair	11:15 – 11:35
Massachusetts Institute of Technology	
Title: Machine Learning for Evolving 5G and IoT Applications: A Multi-disciplinary Approach	
Payam Barnaghi	11:40 – 12:00
University of Surrey	
Title: Continual Machine Learning Models and Connected Sensors for Healthcare Applications	
Atif Shamim	12:05 – 12:25
King Abdullah University of Science & Technology, Saudi Arabia	
Title: Additively Manufactured Flexible and Disposable Wireless Sensors	
Kianoush Nazarpour	14:00 – 14:20
Newcastle University	
Title: Interfacing with Nervous System to Deliver Sensory Feedback	
Sara Ghoreishizadeh	14:25 – 14:45
University College London	
Title: Circuits and Systems for Wearable and Implantable Electrochemical Biosensing	
Muhammad Awais Bin Altaf	14:50 – 15:10
Lahore University of Management Sciences, Pakistan	
Title: On-Chip Chronic Disease Monitoring: Where Machine-Learning Meets Patient-Specific Wearable Healthcare Applications	
Ying Ding	16:00 – 16:20
Northwest University, China	
Title: Integrated InP-Tuneable External Cavity Lasers with Narrow Linewidth and Fast Tuning Speed	
Yuan Shi	16:25 – 16:45
Xi'an Institute of Optics and Precision Mechanics of Chinese Academy of Sciences	
Title: Core Devices' R&D for Coherent Optical Fibre Communication System	
Xuefeng Liu	16:50 – 17:10
Nanjing University of Science & Technology	
Title: Biomacromolecular Cell and Tissue Passage Way Spatial and Temporal Mapping in PIMI for Pathogenic Diagnosis	

Digital Poster Sessions
Wednesday 21 August

Session 1 – UAV, Drone and Vehicle　　　　　　　10:20 – 11:00

Communications

	Paper Title	Authors
1	UAV Aided Data Dissemination for Multi-hop Backhauling in RAN	Xiaoyan Shi; John Thompson; Majid Safari; Shenjie Huang; Rong Ke Liu
2	A Study on Beamforming for Coverage of Emergency Areas from UAVs	Luca Reggiani; Stefano Bolis; Davide Scazzoli; Maurizio Magarini
3	VANET Group Sizing for GFDM Relaying in Realistic Vehicular Networks	Scott Stainton; Martin Johnston; S Dlay
4	A Blockchain-based Secure Internet of Vehicles Management Framework	Md Abdur Rahman; Md Mamunur Rashid; Stuart Barnes; Syed Maruf Abdullah
5	UWB-RTK Positioning System Based on TDOA	Peng Zhao; Xiaozhang Zhu; Ling He; Ziyan Yang; Ying Liu; Zhiqin Zhao
6	The Selected Samples Effect on the Projection Matrix to Estimate the Direction of Arrival	Mohammed A. G. Al-Sadoon; Raed A Abd-Alhameed; Basman Al-Nedawe; Mohammed Bin Melha
7	UAV-assisted Cluster-head Selection Mechanism for Wireless Sensor Network Applications	Syed Kamran Haider; Muhammad Ali Jamshed; Aimin Jiang; Haris Bin Pervaiz; Qiang Ni
8	Prototyping Autonomous Vehicles Applications with Heterogeneous Multi-FPGA Systems	Tarek Elouaret; Stephane Zuckerman; Lounis Kessal; Yoan Espada; Nicolas Cuperlier; Guillaume Bresson; Fethi Ben Ouezdou; Olivier Romain
9	Clustering Algorithm in Vehicular Ad-hoc Networks: A Brief Summary	Kang Tan; Julien Le Kernec; Duncan Bremmer; Muhammad Ali Imran
10	A Vision-Based Amateur Drone Detection Algorithm for Public Safety Applications	Kainat Abbasi; Ayesha Batool; Fawad Fawad; Muhammad Asghar; Ayesha Saeed; Muhammad Khan; Masood-ur-Rehman

Digital Poster Sessions

Wednesday 21 August

Session 2 – Modelling, Performance & Theory of   12:40 – 13:50

Communication Systems

	Paper Title	Authors
1	Active Constellation Extension for Peak Power Reduction Based on Positive and Negative Iterations in OFDM Systems	Yong Xiao; Lei Zhang; Muhammad Ali Imran
2	Pairwise Error Probability of Non-Orthogonal Multiple Access with I/Q Imbalance	Lina Bariah; Bassant Selim; Lina Mohjazi; Paschalis C. Sofotasios; Sami Muhaidat; Walaa Hamouda
3	An Free of Iteration Array-Error Estimation Method for Multi-Channel SAR Systems	Lun Ma
4	Trace-Driven Simulation for LoRa WAN 868 MHz Propagation in an Urban Scenario	Eugen Harinda; Hadi Larijani; Ryan Gibson
5	Design and Simulation of an S Band Frequency Synthesizer for Satellite Communication Systems	Irid Sidi Mohammed Hadj; Samir Kameche
6	Coded OFDM in PLC Channels with SαS Distribution Impulsive Noise Using MRC Detector	Shirui Zhang; Charalampos C. Tsimenidis; Huan Cao; Said Boussakta
7	Coverage Analysis for Indoor-Outdoor Coexistence for Millimetre-Wave Communication	Aysenur Turkmen; Michael Mollel; Metin Ozturk; Yao Sun; Lei Zhang; Rami Ghannam; Muhammad Ali Imran
8	Communication and Control Co-Design Using MIMO Wireless Network	Abdulrahman Saeed Al Ayidh; Joao Nadas; Rami Ghannam; Guodong Zhao; Muhammad Ali Imran
9	Use of Expert System in Requirements Engineering Process A Systematic Literature Review	Bushra Haq; Muhammad Nadeem; Kamran Ali; Imran Ali; Masood Ur Rehman

Digital Poster Sessions

Wednesday 21 August

Session 3 – Beamforming and Antenna Design 15:30 – 16:10

	Paper Title	Authors
1	Hardware Constraints in Compressive Sensing Based Antenna Array	Muhammad Ali Babar Abbasi; Vincent Fusco
2	Design of an LCP-based Antenna Array for 5G/B5G Wearable Applications	Muhammad Saeed; Masood Ur-Rehman
3	Remote Condition Monitoring: A Prototype Based on Pycom Development Board FiPy and Pysense	Shahriar A Al-Ahmed; Muhammad Zeeshan Shakir; Andrea Voisin-Grall; Obabiolorunkosi Malaolu; Yingbo Zhu; Tanveer Ahmed
4	Experimental Investigation of Empty Substrate Integrated Waveguide-Fed MMW Patch Antenna for 5G Applications	Zia Ullah Khan; Akram Alomainy; Tian Hong Loh
5	A Dual Band Dual Sense Circularly Polarised Single Feed Microstrip Patch Antenna	Sandip Goshal; Raed Shubair
6	Implementation of Highly Accurate Test-Bed for Practical Evaluation of Wired and Wireless Internet Based Smart Grid Communications	Mehdi Zeinali; John Thompson
7	Single-Point-Fed Broadband CP Antenna with Enhanced Axial Ratio	Ismail Mabrouk; Qammer H Abbasi; Akram Alomainy; Ubaid Ullah
8	Demonstration of a Smart Villa Energy Monitoring Platform in Qatar	Islam Safak Bayram; Olivier Van Cutsem; Johann Bigler; Jean-Charles Fosse; Maher Kayal
9	Beam Steerable Antenna Development for Wireless Health Monitoring	Muhammad S Rabbani; Alexandros Feresidis
10	Wearable UHF RFID Tag Antenna Design Using Hilbert Fractal Structure	Abubakar Sharif; Jun Ouyang; Hasan Tariq Chattha; Muhammad Ali Imran; Qammer H Abbasi
11	Channel Impulse Response-based Physical Layer Authentication in a Diffusion-based Molecular Communication System	Sidra Zafar; Waqas Aman; Muhammad Mahboob ur Rahman; Akram Alomainy; Qammer H Abbasi

Digital Poster Sessions

Thursday 22 August

Session 4 – Machine Learning, Deep Learning and   10:10 – 10:50

Artificial Intelligence

	Paper Title	Authors
1	Human Action Recognition Using GLAC Features on Multi-view Binary Coded Images	Mohammad Farhad Bulbul; Syed Md. Galib; Hazrat Ali
2	Reinforcement Learning Method for Beam Management in Millimetre-Wave Networks	Ruiyu Wang; Oluwakayode Onireti; Lei Zhang; Muhammad Ali Imran; Guangmei Ren; Jing Qiu; Tingjian Tian
3	Deep Learning for Signal Detection in Non-Orthogonal Multiple Access Wireless Systems	Narengerile; John Thompson
4	Deep Leaning Based Ensemble Convolutional Neural Network Solution for Distributed Denial of Service Detection	Shahzeb Haider; Adnan Akhunzada; Ghufran Ahmed; Mohsin Raza
5	Texture Classification Using a Hybrid Deep and Handcrafted Features	Fawad Fawad; Muhammad Asghar; Ayesha Saeed; Muhammad Khan; Muhammad Zahid; Masood Ur-Rehman
6	A Survey on Deep Learning for the Routing Layer of Computer Network	Fengling Jiang; Kia Dashtipour; Jawad Ahmad; Amir Hussain
7	A New Discriminative Feature Learning for Person Re-Identification Using Additive Angular Margin Softmax Loss	Jie Su; Xiaohao He; Linbo Qing; Yanmei Yu; Shengyu Xu; Yonghong Peng
8	Spectrum Cost Optimization for Cognitive Radio Transmission over TV White Spaces Using Artificial Neural Networks	Metin Ozturk; Attai Ibrahim Abubakar; Naveed Ul Hassan; Sajjad Hussain; Muhammad Ali Imran; Chau Yuen

Digital Poster Sessions

Thursday 22 August

Session 5 – Biomedical, Health and Sensing   12:30 – 14:00

	Paper Title	Authors
1	Monitoring Body Motions Related to Huntington Disease by Exploiting the 5G Paradigm	Daniyal Haider; Julien Le Kernec; Olivier Romain; Muhammad Umer Farooq; Syed Shah; Zunaira Qadus
2	ECG-based Affective Computing for Difficulty Level Prediction in Intelligent Tutoring Systems	Fehaid Alqahtani; Stamos Katsigiannis; Naeem Ramzan
3	Wearable Peripheral Neuropathy Detection System Based on Surface Electromyography	Kainat Yousaf; Hamna Athar; Wala Saadeh
4	Wearable ECG Measurement System for Detection of Cardiac Arrhythmia	Arish Adil; Hassan Abid; Nadir Najib; Usama Jillani; Wala Saadeh; Muhammad Awais Bin Altaf
5	Air Quality Monitoring Using Portable Multi-Sensory Module for Neurological Disease Prevention	Rami Ghannam; Hadi Heidari; Yanjun Chen
6	The Design of a Customised Portable BCI Headset for Home Based Neurorehabilitation	Nina Petric-Gray; Craig Whittet; Tiejun Liu; Aleksandra Vuckovic
7	Wearable Resistive-based Gesture-Sensing Interface Bracelet	Yujia Chen; Xiangpeng Liang; Maher Assaad; Hadi Heidari
8	Design and Implementation of a 3D Printed Sensory Ball for Wireless Water Flow Monitoring	Hadi Heidari; Rami Ghannam; Yi Zhang; Manousos Valyrakis
9	Visual Hand Tracking on Depth Image Using 2-D Matched Filter	Hadi Heidari; Xiangpeng Liang; Yongdian Sun; Muhammad Ali Imran
10	A Miniaturized Novel-Shape Implantable Antenna for Gastrointestinal Monitoring	Zubair Bashir; Naeem Abbas; Muhammad Yousaf; Muhammad Zahid; Sultan Shoaib; Fawad Fawad; Muhammad Asghar

Digital Poster Sessions

Thursday 22 August

Session 6 – Security in Communication Systems   15:15 – 16:00

	Paper Title	Authors
1	Intrusion Detection Using Swarm Intelligence	Ayyaz-ul-Haq Qureshi; Hadi Larijani; Abbas Javed; Nhamoinesu Mtetwa; Jawad Ahmad
2	Non-intrusive Electricity Sub-metering in Selected Households in Qatar	Islam Safak Bayram
3	An Effective Android Ransomware Detection Utilizing Multi-Factor Feature Filtration and Recurrent Neural Network	Iram Bibi; Adnan Akhunzada; Jahanzaib Malik; Ghufran Ahmed; Mohsin Raza
4	Frozen Bit Selection Scheme for Polar Coding Combined with Physical Layer Security	Huan Cao; Martin Johnston; Stephane Y. Le Goff
5	Awareness of Kill Switch Application Among Mobile Phone Users	Kamran Ali; Bushra Qayyum; Bushra Naeem; Dhaii Al-Qahtani; Mohsin Raza
6	A Partial Light-weight Image Encryption Scheme	Jawad Ahmad; Ahsen Tahir; Muazzam A Khan; Fadia Khan; Jan Sher Khan
7	Intrusion Detection Through Leaky Wave Cable in Conjunction with Channel State Information	Syed Aziz Shah; Syed Shah; Syed Shah
8	Radio Spectrum Occupancy Measurement from 30MHz to 1030MHz in Pakistan	Mohammad Daniyal Zulfiqar; Khalid Ismail; Naveed Ul Hassan; Sajjad Hussain; Meng Zhang
9	The Need for Real Time and Robust Sensing of Infrastructure Risk Due to Extreme Hydrologic Events	Manousos Valyrakis; Eftychia Koursari; Stuart Wallace; Panagiotis Michalis
10	Infrastructure Scour Risk Assessment Using Instrumented Particles	Manousos Valyrakis; Cameron Houston; David Muir