# 5th International Conference on UK – China Emerging Technologies



Technically Sponsored by the IEEE Antennas and Propagation Society

# Final Program

## 20 – 21 August 2020

Web Link: https://www.gla.ac.uk/events/conferences/ucet/

## Zoom link

https://uofglasgow.zoom.us/j/99090370295?pwd=bzc5SThCN2kzWVAyUU1Ed0djbjRSUT09

# Chairs' Welcome

Welcome to the 2020 International Conference on UK – China Emerging Technologies (UCET) now in its fifth iteration!

The world today is striving to be smarter and ubiquitously connected resulting in an explosive growth of heterogeneous and intelligent devices with diverse capabilities. Communication, Sensing (including antennas), devices and heterogeneous systems are thus becoming increasingly interweaved and are considered an integral part of most modern technologies. Communication and sensing devices/systems are experiencing widespread applications beyond their usual domain and playing a crucial role in every aspect of our lives including healthcare, automation, transport, weather, gaming, education, safety and security.

The 5th International Conference on UK - China Emerging Technologies will be held on 20-21 August 2020 at the University of Glasgow, UK. The conference is aimed at providing a vibrant platform for sharing ideas among researchers and practitioners from both industry and academia working on state-of-the-art research and development in the aforementioned technologies. We welcome you to join us for an exciting program in Glasgow during August 2020 via telepresence technologies!

***General Chairs***

Muhammad Ali Imran
*University of Glasgow*

Bing Zeng
*University of Electronic Science and Technology of China*

# Conference Organizing Committee

### General Chairs

Muhammad Ali Imran, *University of Glasgow*
Bing Zeng, *UESTC, China*

### Executive Chairs

Qammer H Abbasi, *University of Glasgow*
Xingang Liu, *UESTC, China*
Supeng Leng, *UESTC, China*

### Technical Program Chairs

Masood Ur-Rehman, *University of Glasgow*
Lei Zhang, *University of Glasgow*

### Publicity Committee

Ahmed Zoha, *University of Glasgow (Chair)*
Chong Li, *University of Glasgow*
Hasan Abbas, *University of Glasgow*
Faisal Tariq, *University of Glasgow*
Lianping Hou, *University of Glasgow*

### Publication Committee

Abdullah Al-Khalidi, *University of Glasgow*
Bo Liu, University *of Glasgow*

### Local Organization Committee

Guodong Zhao, *University of Glasgow (Chair)*
Kaveh Delfanazari, *University of Glasgow*
Wasim Ahmad, *University of Glasgow*
Rami Ghannam, *University of Glasgow*
Kelum Gamage, *University of Glasgow*
Julien Le Kernec, *University of Glasgow*

### International Liaison

Yao Sun, *University of Glasgow*

### IEEE Liaison

Sajjad Hussain, *University of Glasgow*

### Finance

Imran Shafique Ansari*, University of Glasgow*

### Registration

Oluwakayode Onireti, *University of Glasgow*
Yusuf Sambo, *University of Glasgow*

# Conference Schedule

**Day 1:** Thursday, 20th August 2020

| Time | Activity | Speaker |
|---|---|---|
| 09:00 – 09:15 | Virtual Attendees Joining Phase | |
| 09:15 – 09:30 | Opening and Welcome | |
| 09:30 – 10:00 | Plenary Talk 1 | Rahim Tafazolli |
| 10:00 – 10:30 | Plenary Talk 2 | Tie Jun Cui |
| 10:30 – 11:30 | Invited Talks (20 min each) | Xiaoli Chu<br>Mohamed-Slim Alouini<br>Mugen Peng |
| 11:30 – 12:30 | **Paper Presentation Session I** | |
| 12:30 – 13:30 | Virtual Lunch Break | |
| 13:30 – 15:00 | Plenary Talks 3-5<br>(30 min each) | Ying-Chang Liang<br>Walid Saad<br>Vincent Fusco |
| 15:00 – 15:20 | Invited Talk | Lajos Hanzo |
| 15:20 – 15:40 | Virtual Coffee Break | |
| 15:40 – 16:40 | Invited Talks (20 min each) | Wonbin Hong<br>Asimina Kiourti<br>Toktam Mahmoodi |
| 16:40 – 17:40 | **Paper Presentation Session II** | |
| | Closing | |

Note: The time indicates British Standard Time (GMT+1)

**Day 2:** Friday, 21st August 2020

| Time | Activity | Speaker | |
|---|---|---|---|
| 09:15 – 09:30 | Opening and Welcome | | |
| 09:30 – 10:00 | Plenary Talk 1 | Martina Gerken | |
| 10:00 – 10:30 | Plenary Talk 2 | Xiangfei Chen | |
| 10:30 – 10:50 | Virtual Networking and Coffee Break | | **Workshop on Engineering Pedagogy Session - I** |
| 10:50 – 11:30 | Invited Talks (20 min each) | Yuan Shen<br>Hongbin Liu | |
| 11:30 – 12:30 | **Paper Presentation Session I** | | |
| 12:30 – 13:30 | Virtual Lunch Break | Demo 1: Connected Robot in 5G Era | |
| 13:30 –14:50 | Invited Talks (20 min each) | Mazier Nekovee<br>Lei Xing<br>XueFeng Liu<br>Shiwen Yang | **Workshop on Superconducting THz Devices (STD) Plenary & Invited Talks** |
| 14:50 – 15:10 | Virtual Coffee Break | | |
| 15:10 – 15:40 | Plenary Talk 3 | Cynthia Furse | |
| 15:40 – 16:00 | Invited Talk | Ching Man | |
| 16:00 – 16:20 | Demo 2: 5G Testbed | | |
| 16:40 – 17:40 | **Paper Presentation Session II** | **Workshop on Engineering Pedagogy Session - II** | |
| 17:40 – 18:00 | Virtual Award Ceremony | | |

Note: The time indicates British Standard Time (GMT+1)

# Detailed Program

## **Plenary Talks** – Thursday 20th August 2020

| | |
|---|---|
| Rahim Tafazolli | 09:30 – 10:00 |
| *University of Surrey, UK* | |
| Title: What Next: Faster and Farther Intelligently | |
| Tie Jun Cui | 10:00 – 10:30 |
| *Southeast University, China* | |
| Title: Information Metasurfaces for Intelligent Sensing and Wireless Communications | |
| Ying-Chang Liang | 13:30 – 14:00 |
| *University of Electronic Science and Technology (UESTC), China* | |
| Title: Symbiotic Radio Networks for 6G and Beyond | |
| Walid Saad | 14:00 – 14:30 |
| *Virginia Tech, USA* | |
| Title: Can Terahertz Communications Provide Highly Reliable and High-Rate Low Latency Communications in 6G Networks? | |
| Vincent Fusco | 14:30 – 15:00 |
| *Queen's University Belfast, UK* | |
| Title: The Role of Circular Arrays in Physical Layer Secure Wireless Communications | |

## **Plenary Talks** – Friday 21st August 2020

| | |
|---|---|
| Martina Gerken | 09:30 – 10:00 |
| *Kiel University, Germany* | |
| Title: Magnetoelectric Sensing for Biomedical Applications | |
| Xiangfei Chen | 10:00 – 10:30 |
| *NanJing University, China* | |
| Title: A Possible Way to Large-scale Photonic Integrated Circuits - The Combination of Precision Photonic Integration and Photonic Wire Bonding | |
| Cynthia Furse | 15:10 – 15:40 |
| *University of Utah, USA* | |
| Title: Finding Faults on Live Wires: Planes to Trains and Everything In Between | |

# Invited Talks –Thursday 20th August 2020

| | |
|---|---|
| **Xiaoli Chu** | 10:30 – 10:50 |
| *University of Sheffield, UK* | |
| Title: Dynamic Network Slicing and Resource Allocation in Mobile Edge Computing Systems | |
| **Mohamed-Slim Alouini** | 10:50 – 11:10 |
| *King Abdullah University of Science & Technology, Saudi Arabia* | |
| Title: Smart Villages: When Affordability Meets Connectivity | |
| **Mugen Peng** | 11:10 – 11:30 |
| *Beijing University of Posts and Telecommunications (BUPT), China* | |
| Title: Fog Radio Access Network (F-RAN): Architecture, Techniques, and Applications | |
| **Lajos Hanzo** | 15:00 – 15:20 |
| *University of Southampton, UK* | |
| Title: When pareto-optimal networking and quantum-computing meet | |
| **Wonbin Hong** | 15:40 – 16:00 |
| *Pohang University of Science and Technology (POSTECH), South Korea* | |
| Title: Recent trends in millimeter-wave based Beyond 5G mobile antennas: Challenges and possible approaches | |
| **Asmina Kiourti** | 16:00 – 16:20 |
| *Ohio State University, USA* | |
| Title: Electromagnetics for Next-Generation Body Area Sensing | |
| **Toktam Mahmoodi** | 16:20 – 16:40 |
| *King's College London, UK* | |
| Title: Connected Automated Driving - the role of Machine Learning in Cooperated Driving | |

## Invited Talks – Friday 21st August 2020

| | |
|---|---|
| Yuan Shen | 10:50 – 11:10 |
| *Tsinghua University, China* | |
| Title: Cooperative detection using mobile multi-agent systems | |
| Hongbin Liu | 11:10 – 11:30 |
| *King's College London, UK* | |
| Title: Robotic Haptic Sensing and Interaction in Medicine | |
| Mazier Nekovee | 13:30 – 13:50 |
| *University of Sussex, UK* | |
| Title: Smart and reconfigurable meta-surfaces for scalable and energy-efficient THz beam-forming towards 6G | |
| Lei Xing | 13:50 – 14:10 |
| *Nanjing University of Aeronautics and Astronautics, China* | |
| Title: Recent Development of Liquid Antennas for Wireless Communications | |
| XueFeng Liu | 14:10 – 14:30 |
| *Nanjing University of Science and Technology (NJUST), China* | |
| Title: Recent Research Advancement in Near Field PIMI Scattering Spectra of Nano Objects for Bio Macromolecular Sensing | |
| Shiwen Yang | 14:30 – 14:50 |
| *University of Electronic Science and Technology (UESTC), China* | |
| Title: A Review of Recent Advances in Four-Dimensional (4D) Antenna Arrays | |
| Ching Man | 15:40 – 16:00 |
| *Analogue Devices, USA* | |
| Title: Sensing and Imaging, applications using 3D Time-of-Flight (ToF) technology for object distance sensing, detection, recognition and classification | |

## Technical Demonstrations

**Friday 21st August 2020**

**Web Link:** https://uofglasgow.zoom.us/j/92487582524

**Connected Robot in 5G Era**                    12:30 – 13:30

In this session, we will first introduce our 5G robotic testbed developed in University of Glasgow. Then, we will show the live demo of remote operation between UK and China. Finally, the conference attendees would be able to control a robotic arm using their own mobile phone (an APP needs to be installed to your mobile phone)

**Friday 21st August 2020**

**Web Link:** https://uofglasgow.zoom.us/j/92487582524

**5G Testbed**                    16:00 – 16:20

The Glasgow 5G testbed team will present an overview of the 5G testbed along with its technical specifications. The different network architectures and combinations for various use cases will be explored. The team will then showcase the indoor testbed that operates on OpenAirInterface5G distribution on x86 based Linux and USRPs. Use cases that utilize this testbed will then be demonstrated including Pop Up Network and a Multi Hop Emergency Network.

# Paper Presentation Session I  <span style="color:red">Thursday 20th August 2020</span>

## *Session 1 a – Antennas for 5G and Beyond I*  11:30 – 12:30

Session Chair: Liying Li
Web Link: https://uofglasgow.zoom.us/j/95851034914

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | A Compact Multiband Multi-Mode Frequency Reconfigurable Antenna for Portable Devices | Adnan Ghaffar; Xue Jun Li; Wahaj Abbas Awan; Niamat Hussain |
| 11:42 | An Asymmetric Semi-Circular Meandered Line Monopole Antenna for 28 GHz 5G Communications | Farooq A. Tahir |
| 11:54 | Design and Analysis of Ku-Band Unit Cells for Reflectarray Antennas | Muhammad Inam Abbasi; Muhammad Yusof Ismail |
| 12:06 | Circularly Polarized Two Port MIMO Cylindrical DRA for 5G Applications | Ajay Kumar Dwivedi; Anand Sharma; Ashutosh Kumar Singh; Vivek Singh |
| 12:18 | Multiband Reconfigurable MIMO Antenna for GSM/GPS/GLONASS Wireless Terminals | Aqsa Ahmad; Farooq A. Tahir |

## *Session 1 b – Blockchain System*  11:30 – 12:30

Session Chair: Kelum Gamage
Web Link:
https://uofglasgow.zoom.us/j/93596538151?pwd=WWxLdDlsN1R3R01ESDVNaEY4eE5CUT09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | Blockchain Based Smart Model for Agricultural Food Supply Chain | Sabir Hussain Awan, Mr; Asif Nawaz; Sheeraz Ahmed; Hasan Ali Khattak; Khalid Zaman; Zeeshan Najam |
| 11:42 | A Block Access Control in Wireless Blockchain Networks | Yixin Li; Bin Cao; Liang Liang; Lei Zhang; Mugen Peng; Muhammad Ali Imran |
| 11:54 | A Lightweight Permission-Based Blockchain for IoT Environments | Andrew Connelly; Syed Ali Raza Zaidi; Muhammad Zeeshan Shakir; Hamed Ahmadi |
| 12:06 | Compressive Sensing Based Grant-Free Random Access for Massive MTC | Yikun Mei; Zhen Gao; De Mi; Pei Xiao; Mohamed-Slim Alouini |
| 12:18 | / | / |

## Session 1 c – Heterogeneous Devices and Systems I          11:30 – 12:30

Session Chair: Vahid Nabaei
Web Link:
https://uofglasgow.zoom.us/j/94976472035?pwd=ZlFhRHVFR0RSdjJrWGEzSkcxcW56dz09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | High Precision Laser Ranging Based on STM32 | Zongkang Li; John Marsh; Lianping Hou |
| 11:42 | Effects of Metamaterial Loading on Miniaturization of Loop and Open Loop Microstrip Filters | Saughar Jarchi; Mohsen Khalily; Rahim Tafazolli |
| 11:54 | ENG and NZRI Characteristics of Decagonal-Shaped Metamaterial for Wearable Applications | Kabir Hossain; Thennarasan Sabapathy; Muzammil Jusoh; Ping Jack Soh; Raghava Nallanthighal; Symon Podilchak; Dominique Schreurs; Qammer H Abbasi |
| 12:06 | Experimental Demonstration of Four-Channel Tunable in-Series DFB Laser Array with 100-GHz Spacing | Zhenxing Sun; Rulei Xiao; Gen Lv; Zhirui Su; Yating Zhou; Xiangfei Chen |
| 12:18 | / | / |

## Session 1 d – Wireless Communication I          11:30 – 12:30

Session Chair: Frederic Surre
Web Link:
https://uofglasgow.zoom.us/j/94120980044?pwd=aDFjaXgvZWVyNDBiMS9UUkFDT24xZz09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | Novel Small-Scale NOMA Communication Technique Using Auxiliary Signal Superposition | Joel Poncha Lemayian; Jehad Hamamreh |
| 11:42 | Numerical Investigation of OAM Based Indoor Communication in a Corridor with Electrical Conducting Walls | Lei Wang; Michael Wulff; Cheng Yang; Woocheon Park; Christian Schuster |
| 11:54 | Algorithm for Handover Decision Based on TOPSIS | Siddharth Goutam; Srija Unnikrishnan; Archana Karandikar |
| 12:06 | An Efficient Packet Scheduling Algorithm for URLLC Systems | Md. Ismail Husain; Md. Emdadul Haque; Faisal Tariq |
| 12:18 | A New Sampling Approach for Beam Shaping Through Superposition of Taylor Distributed Composing Functions | Awab Muhammad; Muhammad Umar Khan; Rifaqat Hussain; Farooq A. Tahir |

## Session 1 e – *Heterogeneous Devices and Systems II*    11:30 – 12:30

Session Chair: Kia Dashtipour
Web Link:

| Time | Paper Title | Authors |
|---|---|---|
| 11:30 | Study on the High-Power DFB Semiconductor Laser Based on Sampled Moiré Grating | Shengping Liu; Yuxin Ma; Min Chen; Yong Zhao; Yuechun Shi; Xiangfei Chen |
| 11:42 | A Dual-Wavelength DFB Laser Based on Reconstruction-Equivalent-Chirp Technology for Millimeter-Wave Generation | Bocheng Yuan; Jianqin Shi; Wenxuan Qi; Yunshan Zhang; Lianyan Li; Ning Xu; Xiangfei Chen |
| 11:54 | A Quasi-Optical THz Imaging System Using a Oneport Vector Netowrk Analyser | Zimo Zhao; Michael Farage; Chong Li |
| 12:06 | Hybrid Asymmetric Nanostructures for the Mid-Infrared | Ifeoma Mbomson |
| 12:18 | / | / |


## Session 1 f – *Machine Learning for Networks &*    11:30 – 12:30

## *Systems I*

Session Chair: Yao Sun
Web Link:

| Time | Paper Title | Authors |
|---|---|---|
| 11:30 | Travelers-Tracing and Mobility Profiling Using Machine Learning in Railway Systems | Syed Muhammad Asad; Kia Dashtipour; Sajjad Hussain; Qammer H Abbasi; Muhammad Ali Imran |
| 11:42 | Machine Learning Based Approach for Indoor Localization Using Ultra-Wide Bandwidth (UWB) System for Industrial Internet of Things (IIoT) | Fuhu Che; Abbas Ahmed; Qasim Zeeshan Ahmed; Syed Ali Raza Zaidi; Muhammad Zeeshan Shakir |
| 11:54 | Load-Aware Cell Switching in Ultra-Dense Networks: An Artificial Neural Networks Approach | Attai Ibrahim Abubakar; Metin Ozturk; Rao Naveed Bin Rais; Sajjad Hussain; Muhammad Ali Imran |
| 12:06 | Federated Machine Learning in Vehicular Networks: A Summary of Recent Applications | Julien Le Kernec; Duncan Bremner; Muhammad Ali Imran; Kang Tan |
| 12:18 | Human Activity Classification with Radar Signal Processing and Machine Learning | Julien Le Kernec; Francesco Fioranelli; Shufan Yang; Mu Jia; Shaoxuan Li; Olivier Romain |

# Paper Presentation Session II   Thursday 20th August 2020

*Note:* *if you have any difficulty in accessing the technical session, please go to the main conference zoom link to get support*

## *Session 2 a – Antennas for 5G and Beyond II*          16:40 – 17:40

Session Chair: Abdullah Al-Khalidi
Web Link: https://uofglasgow.zoom.us/j/5844843084

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Highly Isolated Compact Tri-Band MIMO Antenna with Trapezoidal Defected Ground Plane for 5G Communication Devices | Muhammad Usman; Kioumars Pedram; Yuanwei Zhu; Chao Yu; Anding Zhu |
| 16:52 | Dual Circular Polarisation Receive Antenna Element for Ka-Band Satellite Communications | Salvatore Liberto; George Goussetis; Nakul Haridas |
| 17:04 | Millimeter-Wave MIMO Array of a Compact Grid Antenna for 5G Wireless Networks and Beyond | Syeda Fizzah Jilani; Qammer H Abbasi; Akram Alomainy |
| 17:16 | Beam- Width Reconfigurable Antenna for 5G MMW Applications | Farzana Arshad |
| 17:28 | 3D Printable Phase Transformation Meta-Structure for Resonant Cavity Antennas | Sujan Shrestha; Bahare Mohamadzade; Affan Baba; Raheel M Hashmi |

## *Session 2 b – Wireless Sensor Networks*          16:40 – 17:40

Session Chair: Wasim Ahmad
Web Link:
https://uofglasgow.zoom.us/j/93550450302?pwd=RU40bkozaTJtRUxwU2UweUFMMU5zUT09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Joint Routing and Channel Assignment for Throughput Maximization in Mobile Wireless Sensor Networks | Mahmoud Nuimat; Ammar Gharaibeh; Ala Khalifeh |
| 16:52 | Evaluation of Energy Consumption and Delay in Different Modes of Data Aggregation for Wireless Sensor Networks | Bushra Qayyum |
| 17:04 | Energy Optimisation Through Path Selection for Underwater Wireless Sensor Networks | Kenechi Omeke; Michael Mollel; Lei Zhang; Qammer H Abbasi; Muhammad Ali Imran |
| 17:16 | / | / |
| 17:28 | / | / |

## *Session 2 c – Antenna Design I*                    16:40 – 17:40

Session Chair: Rupam Das
Web Link: https://uofglasgow.zoom.us/j/98501883711

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Linear to Circular Asymmetric Transmission Based on Chiral Metasurface | Urooj Qamar; Atika Faryal; Farooq A. Tahir |
| 16:52 | A Compact Size Implantable Antenna for Bio-Medical Applications | Nabeel Malik; Paul Sant; Tahmina Ajmal; Masood Ur-Rehman |
| 17:04 | Performance of Skin-Contact Meandered Bowtie Antenna with AMC Exposed to Sweat-like Liquid for Health Monitoring | Nazirah Othman; Noor Asmawati Samsuri; Mohamad Kamal A. Rahim |
| 17:16 | Design of 1-Bit Digital Subwavelength Metasurface Element for Sub-6 GHz Applications | Jalil ur Rehman Kazim; Masood Ur-Rehman; Muath Al-Hasan; Ismail Ben Mabrouk; Muhammad Ali Imran; Qammer H Abbasi |
| 17:28 | Graphene-Based Ultra Wideband Antennas | Isidoro Labiano; Akram Alomainy |

## *Session 2 d – Heterogeneous Devices and Systems III*                    16:40 – 17:40

Session Chair: Imran Ansari
Web Link: https://uofglasgow.zoom.us/j/93950376464

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Design of Integrated Polarization Mode Controllers | Sia ML Andersson; Lianping Hou; John Marsh; Corrie Farmer |
| 16:52 | EML Based on Lumped Configuration, Identical Epitaxial Layer and HSQ Planarization | Ali Al-Moathin; Lianping Hou; Eugenio Di Gaetano; John Marsh |
| 17:04 | The Fabrication of Thin-Film Micro-LED Arrays Using Tape-Assisted Laser Lift-off: Towards Rigid and Flexible Micro-Displays | Zhangxu Pan; Chan Guo; Jiucheng Liu; Jiantai Wang; Yanfen Gong; Zheng Gong |
| 17:16 | Photoacoustic Microscopy of Optical Absorption Distribution of Micron-Sized Copper Balls | Zhiying Xia; Xu Bin; Yang Zhang; Kai Gu; Xuefeng Liu; Jichuan Xiong |
| 17:28 | Fast and Accurate Range-Doppler Estimation in Multi-Target Wideband Automotive FMCW Radar | Ali Moussa; Wei Liu |

## Session 2 e – Sensor Applications I               16:40 – 17:40

Session Chair: Bo Liu
Web Link:
https://uofglasgow.zoom.us/j/98702559529?pwd=WHBTNlZ5aTFuL1gwdFVtZGlYbzFLQT09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Facile and Cost Effective Paper Based Triboelectric Nanogenerators for Self Powered Environmental Sensing System | Muhammad Umaid Bukhari; Memoon Sajid; Muhammad Qasim Mehmood; Muhammad Zubair; Kashif Riaz |
| 16:52 | Foldable, Eco-Friendly and Low-Cost Microfluidic Paper-Based Capacitive Droplet Sensor | Muhammad Hamza Zulfiqar; Muhammad Mubasher Saleem; Muhammad Zubair; Muhammad Qasim Mehmood; Kashif Riaz |
| 17:04 | Facile and Low-Cost Sensor System for Exploration of Non-Invasive Glucose Measurement | Umer Hassan, Jr.; Muhammad Hamza Zulfiqar; Memoon Sajid; Mujeeb-ur- Rehman; Kashif Riaz |
| 17:16 | An Intelligent Range Gate Pull-off (RGPO) Jamming Method | Rui Jia; Tianxian Zhang; Yuanhang Wang; Yanhong Deng; Lingjiang Kong |
| 17:28 | A Flexible and Compact Metamaterial UHF RFID Tag for Remote Sensing in Human Health | Muzammil Jusoh; Thennarasan Sabapathy; Qammer H Abbasi; Ping Jack Soh; Hasliza A Rahim; Mohd Najib Mohd Yasin |

## Session 2 f – Machine Learning for Networks &               16:40 – 17:40
## Systems II

Session Chair: Kaveh Delfanazari
Web Link: https://uofglasgow.zoom.us/j/92185074687

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Learning the Wireless Channel: A Deep Neural Network Approach | Guanxiong Shen; Muhammad R. A. Khandaker; Faisal Tariq |
| 16:52 | Using Machine Learning to Predict the Future Development of Disease | Lanxin Miao; Xuezhou Guo; Hasan Abbas; Khalid A. Qaraqe; Qammer H Abbasi |
| 17:04 | Continuous User Authentication Based on Deep Neural Networks | Anum Kiyani; Aboubaker Lasebae; Kamran Ali |
| 17:16 | A Novel Approach for Classifying Diabetes' Patients Based on Imputation and Machine Learning | Kaouthar Driss; Wadii Boulila; Jawad Ahmad |
| 17:28 | Elderly Care: Using Deep Learning for Multi-Domain Activity Classification | Francesco Fioranelli; Mu Jia; Julien Le Kernec; Shufan Yang; Olivier Romain; Shaoxuan Li |

# Paper Presentation Session III    Friday 21st August 2020

## Session 3 a – Wireless Communication II        11:30 – 12:30

Session Chair: Ali Rizwan
Web Link: https://uofglasgow.zoom.us/j/97802401435

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | Joint Channel and Spreading Factor Selection Algorithm for LoRaWAN Based Networks | Ala Khalifeh; Shefaa Shraideh; Khalid A. Darabkh |
| 11:42 | A Compact L-Shaped 16 Bit Polarization Independent Chipless RFID Tag | Usman Haider; Muhammad Noman; Hidayat Ullah; Farooq A. Tahir |
| 11:54 | Empirical Indoor Path Loss Models at 3.5GHz for 5G Communications Network Planning | Elijah Adegoke; Erik Kampert; Matthew D Higgins |
| 12:06 | EM Field Uniformity Analysis of RRA Reverberation Chamber | Jawad Yousaf; Hosang Lee; Muhammad Faisal; Han Junee; Wansoo Nah; Md Nazmul Hasan; Jun Gyu Yang |
| 12:18 | Multiband Stepped Impedance Resonator (SIR) Based Antenna for Future Wireless Applications | Muhammad Asfar Saeed; Sajjad Ur-Rehman; Masood Ur-Rehman; Syed Muhammad Zia; Muhammad Ammar Sohaib; Zagham Abbas Aqeel |

## Session 3 b – Signal Processing        11:30 – 12:30

Session Chair: Kelum Gamage
Web Link:
https://uofglasgow.zoom.us/j/97353476574?pwd=SEhWNlUrY3dqWVYxMjRibFc2Ymowdz09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | Searching the Adversarial Example in the Decision Boundary | Haoyang Jiang; Julien Le Kernec; Qingkui Song |
| 11:42 | An Iterative Filtering Algorithm for HEVC Intra Prediction Combined with Prediction Mode Characteristics | Zeng Li; Weiheng Sun; Shuhua Xiong; Pradeep Karn; Xiaohai He |
| 11:54 | Mobile Crowdsensing Based Architecture for Intelligent Traffic Prediction and Quickest Path Selection | Mohsin Raza; Ali Raza Barket; Ateeq Ur Rehman; Abdul Rehman; Inam Ullah |
| 12:06 | Visual Perception Enhancement for HEVC Compressed Video Using a Generative Adversarial Network | Ting Wang; Jingbo He; Shuhua Xiong; Pradeep Karn; Xiaohai He |
| 12:18 | Design of Infrared Imaging Data Acquisition and Transmission System Based on FPGA and USB3.0 | Huimin Zhang; Maohai Hu; Jichuan Xiong; Xuefeng Liu |

## *Session 3 c – Machine Learning for Networks &*        11:30 – 12:30

### *Systems III*

Session Chair: Wasim Ahmad
Web Link:
https://uofglasgow.zoom.us/j/99730371803?pwd=SUlZQlh5YnAxZ0NMYy9abjN4QkR4UT09

| Time | Paper Title | Authors |
|---|---|---|
| 11:30 | DRaNN: A Deep Random Neural Network Model for Intrusion Detection in Industrial IoT | Shahid Latif; Zeba Idrees; Zhuo Zou; Jawad Ahmad |
| 11:42 | A Novel Random Neural Network-Based Fall Activity Recognition | Syed Yaseen Shah; Hadi Larijani; Ryan Gibson; Dimitrios Liarokapis |
| 11:54 | Multi-Agent Learning Empowered Collaborative Decision for Autonomous Driving Vehicles | Jiayu Cao; Supeng Leng; Ke Zhang |
| 12:06 | Evaluating Machine Learning Techniques on Human Activity Recognition Using Accelerometer Data | Sheeraz Ahmed; Rimsha Khan; Rubia Anjum; Muhammad Abbas; Fahad Bangash; Fatima Waheed |
| 12:18 | Machine Learning Driven Method for Indoor Positioning Using Inertial Measurement Unit | Xu Qiwei |


## *Session 3 d – Vehicular Communication*        11:30 – 12:30

Session Chair: Frederic Surre
Web Link: https://uofglasgow.zoom.us/j/94120980044?pwd=aDFjaXgvZWVyNDBiMS9UUkFDT24xZz09

| Time | Paper Title | Authors |
|---|---|---|
| 11:30 | Driving Behaviour Analysis in Connected Vehicles | Muhammad Abdul Basit; Hasan Ali Khattak; Sheeraz Ahmed; Asif Nawaz; Masood Habib; Khalid Zaman |
| 11:42 | Graph-Coloring Based Spectrum Sharing for V2V Communication | Shuang Xiao; Wenzao Li |
| 11:54 | Sensor Aided Beamforming in Vehicular Environment | Moh Chuan Tan; Minghui Li; Qammer H Abbasi; Muhammad Ali Imran |
| 12:06 | Quantifying the Effects of Communication Network Performance in Vehicle-to-Grid Frequency Regulation Services | Islam Safak Bayram |
| 12:18 | / | / |

## Session 3 e – MIMO Systems  11:30 – 12:30

Session Chair: Kia Dashtipour
Web Link: https://zoom.us/j/91079725963?pwd=RDhtOUkwZGhXL1QxNFF1Q003K1lvUT09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | A Low Complexity Linear Precoding Method for Massive MIMO | Salah Berra; Mahmoud A. M. Albreem; Muntadher Suhail Abed |
| 11:42 | Multiple MIMO with Antenna Number Modulation | Muhammet Kirik; Jehad Hamamreh |
| 11:54 | Low-Complexity Expectation Propagation Detection for Uplink MIMO-SCMA Systems | Zeina Mheich; Ibrahim Hemadeh; Zilong Liu; Pei Xiao |
| 12:06 | Recurrent Neural Network-Based Channel Prediction in mMIMO for Enhanced Performance in Future Wireless Communication | Joel Poncha Lemayian; Jehad Hamamreh |
| 12:18 | High Isolation 8×8 MIMO Antenna Design for 5G Sub-6 GHz Smartphone Applications | Matthew Bridges; Mohsen Khalily; Mohammad Abediankasgari; Demos Serghiou; Pei Xiao; Rahim Tafazolli |

## Session 3 f – Communication Systems Security  11:30 – 12:30

Session Chair: Yao Sun
Web Link: https://uofglasgow.zoom.us/j/9570447632

| Time | Paper Title | Authors |
|------|-------------|---------|
| 11:30 | Design and Rapid Assessment of Efficient on-Chip ESD Protection Strategy | Jawad Yousaf; Muhammad Faisal; Wansoo Nah; Hassan Saif |
| 11:42 | Detection of Malicious Consumer Interest Packet While Mitigating Content Poisoning Attack with Name-Key Based Forwarding and Multipath Forwarding Based Inband Probe | Adnan Qureshi; Nadeem Anjum |
| 11:54 | Preventing Identity Attacks in RFID Backscatter Communication Systems: A Physical-Layer Approach | Ahsan Mehmood; Waqas Aman; Muhammad Mahboob Ur Rahman; Muhammad Ali Imran; Qammer H Abbasi |
| 12:06 | Security Challenges in Cyber Systems | Ghazanfar A. Safdar; Tahera Kalsoom; Naeem Ramzan |
| 12:18 | Polarization-Insensitive Beam Splitters with Variable Split Ratios Based on Phase Gradient Metasurfaces | Haoran Ma; Zhe Shen; Ziyao Wang; Jiawei Peng |

# Paper Presentation Session IV　　Friday 21st August 2020

16:40 – 17:40

## *Session 4 a – Sensor Applications II*

Session Chair: Abdullah Al-Khalidi
Web Link: https://uofglasgow.zoom.us/j/5844843084

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Sagacious Intrusion Detection Strategy in Sensor Network | Shahzad Ashraf |
| 16:52 | Highly Accurate Metamaterial Sensor for Measurement of Permittivity of Nanoscale Materials | Abdul Samad |
| 17:04 | Smart Wristband for Gesture Recognition | Yuanjie Xia; Hadi Heidari; Rami Ghannam |
| 17:16 | A Wearable Health Monitoring System | Haolin Fei; Masood Ur-Rehman |
| 17:28 | Near-Infrared Deep Imaging of Biological Phantom by Polarization Parametric Imaging | Ya Jiao; Heng Zhang; LiShan Zhi; Min Sun; Xuefeng Liu; Jichuan Xiong |

## *Session 4 b – Antenna Design II*　　　　16:40 – 17:40

Session Chair: Ali Rizwan
Web Link: https://uofglasgow.zoom.us/j/99461818502

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Fully-Transparent Transmission Surface for Outdoor-Indoor mmWave Coverage Enhancement | Vikrant Singh; Mohsen Khalily; Salman Behboudi Amlashi; J. David Carey; Rahim Tafazolli |
| 16:52 | Isolation Enhancement Between Waveguide Slot Arrays Using Quasi-Gap Waveguide Structure | Chao Gu; Vincent Fusco |
| 17:04 | 1.3, 1.55 Mm Photodetector Based on Ge/GaAs Hetero-Integration Prepared by MOCVD | Mingquan Xiao; Shijie Gong; Xieeng Zheng; Yunjiang Jin |
| 17:16 | Mixed Coupled Quarter-Wavelength Resonator Filter Utilizing J/K Inverters and Coupling-Path Phases | M. Sufian Anwar; Hamza Nawaz; Arslan Kiyani; Muhammad Ali Babar Abbasi |
| 17:28 | Electrically Small Frequency Reconfigurable Antenna for Heterogeneous Applications | Wahaj Abbas Awan; Syeda Naqvi; Niamat Hussain; Abir Zaidi; Aqeel Hussain Naqvi; Ahsan Hameed |

## *Session 4 c – Wireless Communication III*　　　　16:40 – 17:40

Session Chair: Adnan Zahid
Web Link:
https://us02web.zoom.us/j/2047086526?pwd=WFNwa3ZXTGsvRk5JamZQVWROOURMQT09

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Adaptive Mode Selection and Power Allocation for D2D Underlay Cellular Networks with Dynamic Fading Channel | Mengwei Sun; Yuan Ding; George Goussetis |
| 16:52 | Impact of Spreading Factor on LoRaWAN Propagation in a Metropolitan Environment | Salaheddin Hosseinzadeh; Naeem Ramzan; Mehdi Yousefi; Krystyna Curtis; Hadi Larijani |
| 17:04 | Spectrum Sharing of Radar and Communication for Multi-Detection Working Mode | Yanhong Deng; Tianxian Zhang; Rui Jia |
| 17:16 | Emerging Technologies and Sensors That Can Be Used During the COVID-19 Pandemic | Sagar Suresh Kumar |
| 17:28 | A Miniaturized Printed UWB LPDA Antenna | Syed Hamza; Hidayat Ullah; Farooq A. Tahir |

## *Session 4 d – Satellite Communication*　　　　16:40 – 17:40

Session Chair: Imran Ansari
Web Link: https://uofglasgow.zoom.us/j/98709065167

| Time | Paper Title | Authors |
|------|-------------|---------|
| 16:40 | Towards Holographic Beam-Forming Metasurface Technology for Next Generation CubeSats | Okan Yurduseven; Symon Podilchak; Mohsen Khalily |
| 16:52 | A Miniaturized FSS Based Band-Stop Filter for EMI Shielding Applications | Syed Muhammad Qasim Ali Shah; Fahad Ahmed; Nosherwan Shoaib |
| 17:04 | 3D Mapping Methods and Consistency Checks to Exclude GNSS Multipath/NLOS Effects | Jasmine Zidan; Osama Alluhaibi; Elijah Adegoke; Erik Kampert; Matthew D Higgins; Colin Ford |
| 17:16 | Ultra Wideband Terahertz Channel Propagation Measurements from 500 to 750 GHz | Demos Serghiou; Mohsen Khalily; Tim Brown |
| 17:28 | A Tri-Band Implantable Antenna for Biotelemetry Applications | Nabeel Malik; Paul Sant; Tahmina Ajmal; Masood Ur-Rehman |

## Session 4 e – Heterogeneous Devices and Systems IV

16:40 – 17:40

Session Chair: Bo Liu
Web Link:
https://uofglasgow.zoom.us/j/93038635136?pwd=c0VYUG04ZkQ0a3RJMDQ0Q1JhNkhtUT09

| Time | Paper Title | Authors |
|---|---|---|
| 16:40 | A Subspace Based Channel Mismatch Estimator for Time-Interleaved ADC Systems | Lun Ma |
| 16:52 | Multi-Dimensional Microscopic Imaging of Biological Tissues Based on Polarization Spectrum | Huizheng Tang; Heng Zhang; Juan Liu; Yongqiang Nie; Ji Wu; Bozhi Liu; Jichuan Xiong; Xuefeng Liu |
| 17:04 | Design of 2 μm Wavelength Polarization Mode Controllers | Shengwen Xie; Sia ML Andersson; Shengwei Ye; Zhichuan Niu; John Marsh; Lianping Hou |
| 17:16 | Compact AWG Based on Slot Arrayed Waveguides | Xiaotao Zhu; Wei Hong; Ningfeng Bai; Xiaohan Sun |
| 17:28 | / | / |

## Session 4 f – IoT

16:40 – 17:40

Session Chair: Paulo Klaine
Web Link: https://uofglasgow.zoom.us/j/99050712995

| Time | Paper Title | Authors |
|---|---|---|
| 16:40 | Societal Impact of IoT-Lead Smart Factory in the Context of Industry 4.0 | Tahera Kalsoom; Naeem Ramzan; Shehzad Ahmed |
| 16:52 | IoT Enabled Smart Lighting System Using STM32 Microcontroller with High Performance ARM® Cortex®-M3 Core | Wu Siyu; Amir Mohamed Abdulghani; Shuja Ansari; Qammer H Abbasi; Muhammad Ali Imran |
| 17:04 | Concept Drift Detection with False Positive Rate for Multi-Label Classification in IoT Data Stream | Pingfan Wang; Nanlin Jin; Gerhard Fehringer |
| 17:16 | Quantifying the Impact of Customized Feedback on User Energy Consumption Behavior with Low-Cost IoT Setup | Reeba Raza; Naveed Ul Hassan |
| 17:28 | / | / |

# Workshop on Superconducting Terahertz Devices (STD)

## Friday 21st August 2020                    12:50 – 17:30

Web Link: https://uofglasgow.zoom.us/j/92185074687

*Note:* *if you have any difficulty in accessing the technical session, please go to the main conference zoom link to get support.*

| Time | Paper Title | Authors |
|---|---|---|
| 12:50 | Opening and Welcome | Kaveh Delfanazari & Kazuo Kadowaki |
| 13:00 | Recent Advances in THz Emission from High- Tc Superconducting IJJ Mesa Structure | Kazuo Kadowaki |
| 13:30 | The Terahertz Device from hybrids of superconductors and topological materials | Fedor Kusmartsev |
| 14:00 | Evaluation of terahertz emission from intrinsic Josephson junction stacks | Huabing Wang, Valery Koshelets, Reinhold Kleiner, and Peiheng Wu |
| 14:30 | Mutual Synchronization of Terahertz Emissions from Multiple Intrinsic Josephson Junction Mesas | Ken Hayama; Shuma Fujita; Yuya Kuriyama; Keiichiro Maeda; Manabu Tsujimoto; Itsuhiro Kakeya |
| 14:50 | / | / |
| 15:10 | Terahertz Emission from Thin Annular and Slitted Annular Bi2212 Microstrip Antennas | Richard A Klemm; Nahi Shouk; Sheila Bonnough; Ruqayyah Shouk |
| 15:40 | Competing steady states in intrinsic Josephson junctions | Alexei E. Koshelev |
| 16:10 | Development of Bi2212-THz emitter | Takanari Kashiwagi |
| 16:30 | Magnetization Dynamics Features in the SFS $\varphi_0$ Josephson Junction | Yury Shukrinov |
| 16:50 | Stacked Intrinsic Josephson Junction Bi2Sr2CaCu2O8 Terahertz Sources: Design Issues for Achieving High Power Output Close to Tc | Timothy M Benseman; Karen Kihlstrom; Alexei Koshelev; Ulrich Welp; Wai-Kwong Kwok; Kazuo Kadowaki |
| 17:10 | Guiding of Terahertz Photons in Superconducting Nano-Circuits | Samane Kalhor, Majid Ghanaatshoar, Kaveh Delfanazari |
| 17:30 | Closing | Kaveh Delfanazari |

# Workshop on Engineering Pedagogy

## Friday 21st August 2020          10:30 – 11:00 & 16:20 – 17:20

Web Link: https://uofglasgow.zoom.us/j/98832106187?pwd=blJ1bWdZaGNEUmprU1hYSmZrR0FJUT09

*Note: if you have any difficulty in accessing the technical session, please go to the main conference zoom link to get support.*

The Workshop on Engineering Education Pedagogy aims to share the expertise of leading academics in engineering pedagogy. The workshop will be delivered virtually and is organised by the **University of Glasgow, UK**. The workshop will cover topics pertaining the effectiveness of engineering education, including:
• Community engineering education.
• The implementation of active learning techniques.
• The application of ICT tools to facilitate remote learning.

## Invited Talks

| | |
|---|---|
| Prof. Euan Lindsay<br><br>*CSU Engineering Foundation Professor of Engineering*<br>*Charles Sturt University, Australia.*<br>Title: High Quality Remote Laboratories | 10:30 – 11:00 |
| Prof. Caroline Baillie<br><br>*Professor of Praxis in Engineering and Social Justice*<br>*Shiley-Marcos School of Engineering*<br>*University of San Diego*<br>Title: Community Engineering Education. | 16:20 – 16:50 |
| Prof. Matthew W. Ohland<br><br>*Dale and Suzi Gallagher Professor and Associate Head of Engineering Education*<br>*Purdue University, USA.*<br>Title: Forming and managing engineering student teams | 16:50 – 17:20 |