



ASSET 3.0 TECHNICAL PROGRAMME

The Third International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference

Theme: Developing ASSETs for the Present and the Future Generations

Manchester, UK; Tuesday, 16 – Thursday, 18 July 2024; www.assetgrp.org; info@assetgrp.org



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Conference Abstract and Technical Programme

ASSET 3.0 Conference

16 – 18 July 2024

Manchester, UK

Scope of the Conference includes:

- Mobile and Satellite Communications
- Internet of Things, Artificial Intelligence and Big Data
- Sustainability, Environment and Climate Action
- Education, Entrepreneurship and Governance
- Adaptive and Complex Systems
- Renewable Energy Generation, Transmission & Utilisation
- Healthcare and Medical Applications
- General and Multidisciplinary Topics



SPRINGER NATURE





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Organising Committee

Steering Committee

Peter Aaen, Colorado School of Mines, Illinois, USA; **Quan Liu**, Wuhan University of Technology, China; **Zhipeng Wu**, The Univ. of Manchester, UK; **MfonObong Charles Uko**, MMU., UK; **Sunday Enahoro**, MMU., UK; **Olawole Kuti**, MMU., UK; **Daniel Nwandu**, DCLM, Inc., UK; **Joseph Essien**, Lagos, Nigeria; **Perpetual Eze-Idehen**, The Univ. of Manchester, UK; **Alan Lawrenson**, Sony Europe, UK; **Arslan Altaf**, MMU, UK; **Isaac Oluwatayo**, Uni. of Venda, South Africa

Organising Committee

General Chairs	Technical Programme Chairs	Short Courses Chairs	Exhibit Chairs	Local Organising Committee Chairs	Best Paper Award Chairs
Sunday Cookey Ekpo Manchester Met University, UK	Imeh Okop Akwa Ibom State University, Nigeria	Ayodeji Sunday Keysight Technologies UK Ltd	Balaji Snake Nation, South Africa	Ito Udo University of Uyo, Nigeria	Muhammad Ijaz Manchester Met University, UK
Umar Raza Manchester Met University, UK	Kolawole Olasunkanmi , SmOp CleanTech, UK	Samik Chakraborty Regent Edu. & Research Foundation, India	Ubong Ukommi Akwa Ibom State University, Nigeria	Gloria Iyawa University of Salford, United Kingdom	Jagadeesh V. K. National Institute of Tech., Calicut, India

Publicity Chairs: **Fanuel Elias**, MMU, UK; **Rahul Unnikrishnan**, SmOp CleanTech; **Aniebiet Kingsley Inyang**, MMU, UK





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Welcome Message

Welcome to the programme of the Third International Conference on Adaptive and Sustainable Science, Engineering and Technology (ASSET 2024).

We are all very glad to be able to meet onsite and online for this conference. This conference will enhance our collective global visibility for capacity-building and partnership.

Background: The ASSET Council facilitates interactions amongst experts and professionals from communities of interest on developing and deploying adaptive and sustainable science, engineering and technology and applications for national security and socio-economic development. The council embraces the disciplines of applied science, engineering and technology, focusing on the total integrated complex systems effectiveness of national and global significance. The applications base is sustained through knowledge transfer partnerships and multidisciplinary research and development collaborations.

Conference Objectives: This conference serves as an interactive forum for the advancement of the practice of adaptive and sustainable systems across the multiple disciplines and specialty areas involved with the science, engineering and technology of integrated entities, complex systems and networks. The conference will provide an avenue for ASSET practitioners, researchers, managers, developers, analysts, educators and users to exchange innovative ideas, concepts, applications and lessons learned in addressing domain-specific problems, applications-oriented topics, methodologies, standards and multidisciplinary research opportunities and findings relating to ASSET systems.

ASSET 3.0 conference will be held on 16 - 18 July 2024 in Manchester, UK. **Host:** Manchester Met University, UK

ASSET 2024 conference programme includes **Introduction** (Prof Nick Brooks, MMU, UK); **Welcome Address** (Prof Steve Rothberg, MMU, UK); **Conference Theme Exposition (Prof Mark Sterling)**; **13 Keynote Speakers**; **2 Invited Speakers**; **8 Short Courses**; **2 poster sessions**; **7 parallel and 13 plenary technical sessions**.

The ASSET 2015 (maiden) and ASSET 2023 conferences generated international collaborations that translated into at least 12 active trans-continental collaborations for mutual benefits. The success of the ASSET 3.0 conference is made possible by the collective efforts of many individuals. We appreciate our profound gratitude to the Conference Organising and the Technical Programme Committees. They worked hard and smart in planning the conference logistics and the programme. They ensured that the hybrid (i.e., onsite and the online) format of the ASSET 2024 provided a comfortable experience for all the participants. We extend our acknowledgement to the host institutions, Conference Track Chairs, Local Organising Committee, Programme Chairs, Publicity Committee and the external reviewers. Our heartfelt thanks go to the support and contributions of all the authors. We are eternally grateful to our Platinum





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Sponsor, SmOp CleanTech and profoundly thank all our industry and academic partners for their commendable technical sponsorships, assistance and noble support. We hope you have a rewarding, memorable and enriching experience as we bring the global north and the global south together with the ASSETs ecosystem. Finally, we look forward to hosting you again in our future ASSET events.





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Attendees' Guideline

Time Zone: British Summer Time (BST) (GMT+1)

- The duration of oral presentation slot is 15 minutes (including 2-3 minutes Q&A time).
- We will appreciate your punctual arrival and active engagement in each session.
- Prepare and backup your presentation PPT and/or PDF files.
- The official oral presentation time schedule is for reference only. Where absence or some presentations finish in less than 15 minutes, kindly join your session earlier.
- A participation certificate will be awarded to each presenter.
- A best presentation certificate will be awarded to the best presentation selected from each session.

For Onsite Participants

- Location-specific instructions will be provided.

Attention

Please, take care of your belongings in public area. For your personal and property safety, delegates are suggested to wear representative card during conference and not to lend it to those unconcerned to enter event rooms. Conference does not assume any responsibility for loss of personal belongings of participants.

- Avoid staying too late in the city;
- Avoid being alone in the remote area;
- Be vigilant and careful with the strangers who offer you service, sign of charity and other appealing experiences at scenic spots; and
- You can search online for more Security and Tourist Information tips.

For Online Participants





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Online Conference MS Teams Link:

- https://teams.microsoft.com/l/meetup-join/19%3ameeting_YjkyM2ZlMjktY2UzNS00ZjNhLTk5NGUtNWM5NzkyNmFIYW4%40thread.v2/0?context=%7b%22Tid%22%3a%22283ffb50-a30b-488c-90f4-cdae4f7ae6d1%22%2c%22Oid%22%3a%222d4ed2c9-af9e-40a9-a41b-080219478a98%22%7d
- [Join the meeting now](#)
- Meeting ID: 393 886 279 955
- Passcode: dSuCtb





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Conference Schedule

DAY 1: TUESDAY, 16 July 2024

8:45 – 09:00 Login via [MS Teams](#) Link sent and walk-in registration

INAUGURAL CEREMONY

Programme Director(s): Dr Jiling Feng and Dr Raul Ochoa Cabrero, Manchester Met University, UK

[Venue: MMU Lecture Theatre, Dalton Building (DB G.42) / [MS Teams](#) Room 1]

09:00 - 09:15	INTRODUCTION	Prof Nick Brook, Pro-Vice Chancellor (Research), Manchester Met University, UK
09:15 - 09:30	WELCOME ADDRESS	Prof Steve Rothberg, Provost / Deputy Vice Chancellor, Manchester Met University, UK
09:35 - 09:45	GUEST SPEAKER	“Building a Future-proofed Connected World with Green ASSETs” - Prof Peter Aaen, Department Head, Colorado School of Mines, Illinois, USA
09:50 – 10:20	KEYNOTE SPEAKER 1	“Reality Check: Space Power” – Prof Sang Choi, NASA Inventor/Scientist, NASA Langley Research Centre, Virginia, USA
10:20 - 10:40	CONFERENCE THEME EXPOSITION	Prof Mark Sterling, Pro-Vice Chancellor (S&EF), Manchester Met University, UK
10:40 - 11:10	KEYNOTE SPEAKER 2	“The Role of Additively Manufactured Electronics Technology in Achieving Ultra-Low-Carbon Satellite-Cellular Communication Convergence Ecosystem Missions” – Dr Rafael Del Rey, Nano Dimension, UK





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11:10 - 11:15	VOTE OF THANKS	Dr Umar Raza Short Courses Chair Manchester Met University, UK
TEA & COFFEE BREAK / TECHNICAL SESSION		
Track Chair(s): Dr Umar Raza, Manchester Met University (MMU), UK & Dr Ubong Ukommi, Akwa Ibom State University, Nigeria		
MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams		
11:30 – 12:00		
11:30 – 12:00	KEYNOTE SPEAKER 3	“Private 5G” – Stephen Muldowney, Hewlett Packard Enterprise, UK
Track Chair(s): Dr Umar Raza, MMU, UK & Dr Ubong Ukommi, Akwa Ibom State University, Nigeria		
[MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]		
12:00 – 12:30	KEYNOTE SPEAKER 4	“Design a Proof-of-Concept Reconfigurable Multiband Virtual Antenna for Low-Power Internet of Things Sensors Applications in 24 Hours” – Prof Jaume Anguera, FIEEE, Associate Professor and CTO/Founder, Ignion, Barcelona, Spain
Track Chair(s): Dr Umar Raza, MMU, UK and Engr MfonObong Uko, SmOp, UK		
12:30 – 13:00	KEYNOTE SPEAKER 5	“The Role of Artificial Intelligence Ethics in Developing ASSETs to Solve Societal Challenges” – Prof Keeley Crockett, Manchester Met University, UK
LUNCH BREAK and POSTER SESSION		
AFTERNOON SESSION		
Track Chair(s): Dr Jagadeesh V. K., National Institute of Tech., Calicut, India, UK & Dr Itoro Esiet, University of Uyo, Nigeria		
[MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]		





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13:40 – 14:10	ASSET_2024_paper_05: <i>Kiwifruit Grading Using Hyperspectral Imaging Combined with Hierarchical 3D Convolution and Attention Mechanism</i>	ASSET_2024_paper_09: <i>Sustainable Digital transformation in Healthcare</i>
14:10 – 15:00	Track Chair(s): Dr Itoro Esiet, <i>University of Uyo, Nigeria</i> and Dr Angham Sabagh, <i>MMU, UK</i>	
	Venue: MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams : Rooms 1 & 2	
14:10 – 14:40	SPEAKER 1	“Autonomous Vehicles Research Studio for Teaching and Research Activities” – Dan Vickers (<i>Regional Director of Academic Partnerships</i>) and Dr Daniel Abara (<i>R&D Engineer</i>), <i>Quanser UK Ltd, UK</i>
14:40 – 14:55	ASSET_2024_paper_02: <i>Cloud Detection and Removal from RGB Images using U-Net Semantic Segmentation and CloudGAN Models</i>	ASSET_2024_paper_14: <i>A study on Food Classification using Convolutional Neural Network</i>
15:00 -16:00	Track Chair: Dr Umar Raza and Dr Raul Ochoa Cabrero, <i>Manchester Met University, UK</i>	
15:00 – 15:20	INTRODUCTION	“Advanced Manufacturing of Electronics for Green Energy Harvesting Use Cases and Applications” – Engr Stephen Alabi, <i>Founder / CEO, SmOp CleanTech, UK</i>
15:20 – 15:50	KEYNOTE SPEAKER 6	“Advanced Semiconductors & Electronic Solutions for Satellite-Cellular 5G/6G Communication Convergence Use Cases and Applications” – Dr Jamal Mohamed Ahmouda Zaid, <i>Research and Development Center, HUAWEI Technologies, Canada</i>
15:40 – 16:10	EVENING SESSION	
15:40– 16:10	Track Chair: Engr MfonObong Uko, <i>SmOp, UK</i>	Track Chair: Dr Ubong Ukommi, <i>Akwa Ibom State University, Nigeria</i>
	Venue: MMU Lecture Theatre, Dalton Building (DB G.37) / MS Teams Room 1	Venue: MMU Lecture Theatre, Dalton Building (DB G.42) / MS Teams Room 2
15:40 – 15:55	ASSET_2024_paper_03: <i>Drought Monitor Creation using SMAP L4 Soil Moisture Data</i>	ASSET_2024_paper_22: <i>Harnessing the Power of Machine Learning: A Groundbreaking Approach to Predicting Lung Cancer and Revolutionizing Healthcare</i>





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15:55 -16:15	Track Chair: Dr Umar Raza and Dr Raul Ochoa Cabrero, Manchester Met University, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
15:55 – 16:15	SPEAKER 2	“Industrial IoTs Sensors and Digital Twins: A Case Study in Manufacturing” – Dr Aris Christos Alexoulis Chrysovergis, Manchester Met University / Siemens PLC, UK "
16:00 – 18:00	Short Courses and POSTER SESSION	
16:00 – 18:00	Short Courses Chair: Dr Umar Raza, MMU, UK and Engr MfonObong Uko, SmOp, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
16:00 – 18:00	Short Course Talk (SCT) 1: Artificial Intelligence, Big Data Analytics, Internet of Things Sensors, Digital Twins and Biomedical Systems	<p style="text-align: center;">16:00 – 16:30</p> <p>[1] SCT-1A: “A Great Asset to Society: Older People with a Sustained Physical and Cognitive Function” – Prof Hans Degens, Manchester Met University, UK</p> <hr/> <p style="text-align: center;">16:30 – 17:00</p> <p>[2] SCT-1B: “From Modelling to Hardware Implementation using the Quanser Qube Servo” – Dan Vickers (Regional Director of Academic Partnerships) and Dr Daniel Abara (R&D Engineer), Quanser UK Ltd, UK</p> <hr/> <p style="text-align: center;">17:00 – 17:30</p> <p>[3] SCT-1C: “The Role of AI and Big Data in Sustainable Food Security for All” – Prof Liangxiu Han, Co-Director of Centre for Advanced Computational Science and Deputy Director of ManMet Crime and Wellbeing / Big Data Centre, Manchester Met University, UK</p> <hr/> <p style="text-align: center;">17:30 – 18:00</p> <p>[4] SCT-DC: “Advanced Manufacturing of Electronics for Green Energy Harvesting Use Cases and Applications” –Dr Kolawole Olasunkanmi, R&D Officer, SmOp CleanTech, UK</p>





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DAY 2: WEDNESDAY, 17 July 2024

8:45 – 09:00	Login via MS Teams Link sent and walk-in registration	
09:00 – 10:00	Programme Director(s): <i>Engr MfonObong Charles Uko, SmOp CleanTech, UK and Prof Quan Liu, Wuhan University of Technology, China</i>	
09:00 – 09:20	INTRODUCTION AND WELCOME ADDRESS	<i>Prof Hans Degens, Manchester Met University, UK</i>
09:25 – 09:45	KEYNOTE SPEAKER 7	"Methodology and Real-World Applications of Dynamic Uncertain Causality Graph for Clinical Diagnosis with Explainability and Invariance" – Prof Qin Zhang, Tsinghua University, Beijing, China
09:50 – 10:05	<i>ASSET_2024_paper_24: High-Frequency Substrates Analysis for Hybrid Manufacturing of Wireless Energy Harvesting Subsystems</i>	<i>ASSET_2024_paper_17: Energy Harvester Design Considerations for the Wireless Charging of 5G/6G User Equipment</i>
10:10 – 10:40	KEYNOTE SPEAKER 8	"The Role of ASSETs in Sustainably Building, Maintaining, Integrating and Operating Drones / Unmanned Vehicles" – Balaji Perumal, Founder / CEO, Anya Consulting Services, UK
10:40 - 10:00	TEA & COFFEE BREAK TECHNICAL SESSION	
11:00 – 12:00	Track Chairs: Dr Umar Raza and Arslan Altaf, MMU, UK	Track Chairs: Dr Itoro Esiet, University of Uyo, Nigeria; Dr Ubong Ukommi, AKSU, Nigeria
	Venue: MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams Room 1	Venue: MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams Room 2
11:00 – 11:15	<i>ASSET_2024_paper_06: RFID-based Food Sensing System with Cloud Database</i>	
11:15 – 11:30	<i>ASSET_2024_paper_12: Development and Evaluation of a Commercially Viable Bio-Coal Recipe from Biomass for Clean Fuel Applications in the Heritage Sector</i>	<i>ASSET_2024_paper_08: Design Optimization and Performance Evaluation of an Efficient 2.4/6 GHz RF Energy Harvesting System</i>
11:30 – 11:45	<i>ASSET_2024_paper_11: A Highly Adaptive Small Satellite Experiment for Space</i>	<i>ASSET_2024_paper_27: Kinetic Analysis of Corrosion Inhibitive Efficiencies of Ethanol Leave Extract of</i>



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	Missions Modelling	Dracaena Arborea for Metallic Materials in Acidic Media
11:45 – 12:00	ASSET_2024_paper_13: Multiband Omni Directional Antenna for RF Energy Harvesting for Low Power IoT Applications	
12:00 – 13:00	Track Chair(s): Dr Segun Obadire, University of Venda, South Africa and Dr Raul Ochoa Cabrero, Manchester Met University, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
12:00 – 12:30	KEYNOTE SPEAKER 9	“The Role of Big Data Analytics, IoTs and Artificial Intelligence in ASSET-based Smart Infrastructure” – Engr Paul Sheedy, Unifi.id, UK
12:30 – 13:00	KEYNOTE SPEAKER 10	“Internet of Things Technologies for Food Industry” – Prof Zhipeng Wu, The University of Manchester, UK
13:00 – 13:30	LUNCH BREAK and POSTER SESSION	
AFTERNOON SESSION		
13:35 – 14:20	Track Chair(s): Prof Zhipeng Wu, The UoM, UK and Dr Angham Sabagh, MMU, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
13:35 – 14:20	KEYNOTE SPEAKER 11	“Cellular and Satellite Communication – A Test and Measurement Perspective” – Engr Naresh Kumar, CTO, Tektronix, EMEA-India, India
14:25 – 15:25	Track Chairs: Dr Kolawole Olasunkanmi, SmOp CleanTech, UK	Track Chairs: Dr Ubong Ukommi, Akwa Ibom State University, Nigeria
	Venue: MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams Room 1	Venue: MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams Room 2
14:25 – 14:40	ASSET_2024_paper_18: Wireless Charging Design Consideration for Autonomous Mobile Robots	ASSET_2024_paper_19: Predicting Car Prices: A Machine Learning Approach to Automotive Valuation





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14:40 – 14:55	ASSET_2024_paper_21: <i>Design and Performance Analysis of an Additively Manufactured Patch Antenna for 5.3 GHz Applications</i>	
14:55 – 15:25	Track Chair(s): and Dr Jagadeesh V. K., <i>National Institute of Tech., Calicut, India</i> [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
14:55 – 15:25	ASSET_2024_paper_26: <i>Multiband MIMO Antenna Design for Sub-6 GHz 5G IoT Applications</i>	
EVENING SESSION		
15:25 – 16:40	Track Chairs: Dr Lawrence Chinwa, <i>MMU, UK</i> and Dr Kolawole Olasunkanmi, <i>SmOp CleanTech, UK</i> Venue: MMU Lecture Theatre, Dalton Building (DB G.42) / MS Teams Room 1	
15:25 – 16:05	KEYNOTE SPEAKER 12	“Sustainable Additive Manufacturing of Fine-resolution Electronic Components and Interconnects for 3D Heterogenous Integration and Advanced Packaging” – Dr Ahmed Busnaina, <i>Chief Technology Officer and Engr Sudhir Jain, Chief Executive Officer, Nano OPS, Inc., Massachusetts, USA</i>
16:10 – 16:40	SCT-2C: “Wireless Human Vital Signs Monitoring Using Acoustic, Millimetre-wave, and Video” – Dr Jiafeng Zhou, <i>University of Liverpool, UK</i>	
Short Courses AND POSTER SESSION		
16:00 – 18:00	Short Courses Chair: Dr Mohammad Ijaz and Dr Raul Ochoa Cabrero, <i>Manchester Met University, UK</i> [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
16:00 – 17:30	Short Course 2: 5G/6G Radio Access Technologies / Satellite-Cellular Convergence / Metamaterials & Metasurfaces / Holographic Beamforming Technologies / Smart Manufacturing / Sustainable Energy Systems	<div style="text-align: center;">17:30 – 18:00</div> <div style="text-align: center;">[1] SCT-2A: “Drones / Unmanned Vehicles Development, Operations and Use Cases” – Balaji Perumal, <i>Founder / CEO, Anya Consulting Services, UK</i></div> <hr/> <div style="text-align: center;">16:30 – 17:00</div>





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			[2] SCT-2B: “No Change, No Progress or Decay” – Prof Sang Choi, NASA Inventor/Scientist, NASA Langley Research Centre, Virginia, USA
ASSET DINNER AND AWARDS CEREMONY			
17:00 – 19:30	Programme Director(s): Dr Umar Raza and Engr Aniebiet Inyang (MMU, UK); and Engr Rahul Unnikrishnan, SmOp CleanTech, UK [MMU Lecture Theatre, Dalton Building (DB G.37) and Hyatt Regency Hotel (55 Booth Street West, Manchester, M15 6PQ) / MS Teams Room 1]		
17:00 – 17:05	Opening Remarks	MMU Lecture Theatre, DB G3.35	Prof. Zhipeng Wu, The University of Manchester, UK
17:05 – 17:40	Dinner Talks	MMU Lecture Theatre, DB G3.35	[1] “Net Zero Now: The Role of ASSETs” by Engr Paul Sheedy, Founder / CEO, Unifi.id [2] “The Role of ASSETs in Achieving Internationalisation of Higher Education through Research Collaboration between the Global North and the Global South” by Dr Segun Obadire, University of Venda, South Africa
17:40 – 17:45	Closing Remarks	MMU Lecture Theatre, DB G3.35	Prof Keeley Crockett, Manchester Metropolitan University, UK
18:00 – 19:30	Dinner	Hyatt Regency Hotel, 55 Booth Street West, Manchester, M15 6PQ	
DAY 3: THURSDAY, 18 July 2024			
8:45 – 09:00	Login via MS Teams Link sent and walk-in registration		
09:00 – 10:00	Programme Director(s): Dr Qiuyu Wang, Manchester Met University, UK and Engr Rahul Unnikrishnan, SmOp CleanTech, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]		
09:00 – 09:20	INTRODUCTION AND WELCOME ADDRESS		Dr Kolawole Olasunkanmi, SmOp CleanTech, UK





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09:25 – 09:40	SCT-2D: “Holographic Beamformer Metasurfaces Design for Mobile Communication Applications” – Prof Samik Chakraborty, Regent Education and Research Foundation, Kolkata, India	
09:40 – 09:55	ASSET_2024_paper_25: A Metamaterial-Grounded Ultra-Wideband Cross-Fractal MIMO Antenna for K, Ka, and mmWave Applications	
10:00 - 11:40	TEA & COFFEE BREAK TECHNICAL SESSION	
10:00 – 11:40	Track Chair(s): Engr Fanuel Elia, and Engr Sunday Enahoro MMU, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
10:05 – 10:35	ASSET_2024_paper_20: Artificial Neural Network Modelling and Characterization of a 3.2 GHz to 3.8 GHz Low-Noise Amplifier for Sub-6 GHz Applications	
10:40 – 11:10	ASSET_2024_paper_04: Performance Analysis of Cooperative NOMA Network using DF strategy with MRC and SC Techniques	
10:00 – 12:25	Track Chair(s): Engr Fanuel Elias and Engr Aniebiet Inyang, MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams	
11:10 – 11:25	KEYNOTE SPEAKER 13	“Evaluating Entrepreneurial and Innovation Ecosystems Transformation in Universities in Kenya” – Dr Duncan Elly Ochieng, University of Nairobi, Kenya
11:25 – 11:40	ASSET_2024_paper_16: A Cost-effective Driver Behaviour Detection System Using Deep Learning	ASSET_2024_paper_31: Detection of Bio-information Using Novel Isotropic Metasurface Like Microstrip Patch Antenna
11:40 – 12:10	SCT-2D: “Computational Diagnostic Tools for Clinical Research”– Dr Aron Teklemariam, Manchester Met University, UK	
12:10 – 12:40	SCT-2D: “The Importance of Lifecycle Assessment to Determine the Environmental Impact and the Use of Technologies to Enhance Traceability and Circularity in the Fashion Industry”– Dr Prabhuraj Venkatraman, Manchester Met University, UK	
12:40 – 13:00	ASSET_2024_paper_23: Empowering Women's Health: Batteryless RF-Powered Sensor for Premenstrual Dysphoric Disorder Monitoring	





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Manchester, UK; Tuesday, 16 – Thursday, 18 July 2024; www.assetgrp.org; info@assetgrp.org

13:00 – 13:20	ASSET Conference Organising Committee Meeting & Networking Session [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
13:20 – 14:00	CLOSING SESSION	
13:20 – 14:00	Session Chair: Engr Rahul Unnikrishnan, SmOp CleanTech, UK and Dr Angham Sabagh, MMU, UK [MMU Lecture Theatre, Dalton Building (DB G.37 & G.42) / MS Teams]	
13:20 – 14:00	Closing Remarks	Dr Prabhuraj Venkatraman, <i>Doctoral College Lead, Manchester Met University, UK</i>
	Vote of Thanks	Dr Kolawole Olasunkanmi – <i>Technical Programme Chair, SmOp CleanTech, UK</i>
	Announcements	Dr Sunday Cookey Ekpo – <i>General Chair and Conference Proceedings Editor-in-Chief, MMU, UK</i>
14:00-15:00	NETWORKING AND LUNCH	
<p style="color: green; font-weight: bold;">ASSET 4.0 !!!</p> <p>[Tuesday, 08 – Thursday, 10 July 2025; Manchester, UK]</p>		





ASSET 3.0 TECHNICAL PROGRAMME

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Speakers' Introduction

Professor Zhipeng Wu, University of Manchester, Manchester M13 9PL, UK



Zhipeng Wu (BSc, PhD, DEng) is a professor in the Department of Electrical and Electronic Engineering, University of Manchester, Manchester, UK. His research interests include antennas and propagation, microwave sensors and imaging systems, RF/microwave circuits and measurement, Internet of Things (IoT) technologies, Machine-to-Machine (M2M) communication technologies, RFID based product traceability. He has published over 200 papers in these areas. Also, he has actively involved in a number of international conferences and was a conference chair of the IET-sponsored "International Workshop of IoT and Applications" in 2015. He received IET Innovation "Highly Commended" awards in "Electronics" and "Measurement in Action" in 2010, and in "Emerging Technologies" and "Measurement in Action" categories in 2011. He was awarded a Royal Society Industry Fellowship in 2012-2015 in bringing the microwave and antenna technologies to their uses in UK industries, and he has since been a member of the Royal Society Industry Fellow College.

IoT and Sensing Technologies for Applications in Food Industry

Abstract: Recent developments in Internet of Things (IoT) and sensing technologies have set off a revolution in many industries. These technologies offer the abilities to improve manufacturing or production processes from the provision of informed sensing data and modern data communication techniques. Advanced sensors will enable rapid data gathering of products online. Employment of RFID technologies will enable the tracking and tracing of products throughout the supply, production and delivery process, and identification and registration of product information to individual items. Advanced machine-to-machine (M2M) communication will enable instant process information exchange between machines and equipment on the production line, providing effective control of production processes and maximising outputs. In this talk, food industry will be taken as an example of applications of modern IoT and sensing technologies. Sensors and techniques suitable for food sensing will be reviewed. M2M communication protocols and production line online data handling techniques will be addressed. Implementation of IoT and M2M technologies for food production will be demonstrated.





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Prof. Sang H. Choi

Senior Lead Scientist, NASA Langley Research Center, Hampton, Virginia 23681

Dr. Choi is a senior lead scientist who leads a research team in advanced electronic and energetic materials at NASA Langley Research Center. At NASA, he has developed satellite ERBE sensors, solar-pumped lasers, plasma switches, iodine lasers, microwave reflectometers & rectennas, solar thermal rocket, bionano battery, smart optics, nano-energetic propellants, micro-spectrometer, neural probe, rhombohedral hybrid bandgap engineering, single crystal SiGe growth, and nuclear thermionic avalanche cells. Also Dr. Choi has served for NASA's Quantum Technology Committee, NASA's Risk-Taking Success Strategy Committee, NASA LaRC Ideation-Innovation Blue Sky Team, and NASA LaRC Honor Awards panel. Dr. Choi received 72 various awards from NASA. Dr. Choi also received 3 of Nano50 Awards for his innovative bionano technology in 2006 and 2007, respectively, and a Nano50 Award cited as an "Innovator of the Year" in 2008. He won R&D100

Award in 2009, the 2010 SOLAR Award in 2010, and 1st prize in the 2017 Create the Future Design Contest in Electronics. Dr. Choi published over 220 technical papers and reports. He received 59 U.S. patents and 6 patents pending out of his 169 inventions. He has total 34 invited, featured, plenary, or keynote talks on various technical areas. Dr. Choi has given 74 invited talks on general subject areas and has 43 news media captures. Dr. Choi served as the Editor-in-Chief of Recent Progress in Space Technology from 2009 to 2016. He is an editorial board member for 5 different journals. Dr. Choi has served as the conference chairs and session chairs for numerous professional events.

His honors are:

- a Fellow of National Academy of Inventors (NAI);
- a Fellow of SPIE;
- an Associate Fellow of AIAA;
- an Inductee of NASA Inventors Hall of Fame, 2020;
- NASA Exceptional Service Medal, 2021.

Talk Title: Reality Check: Space Power

Short Course Title: No Change, No Progress or Decay





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Dr. Ahmed A. Busnaina, William Lincoln Smith Chair Professor, Distinguished University Professor Northeastern University

Email: a.busnaina@northeastern.edu

URL: www.nanomanufacturing.us

Ahmed A. Busnaina, Ph.D., has been the founding Director of the National Science Foundation's Nanoscale Science and Engineering Center for High-rate Nanomanufacturing since 2004 and the NSF Center for Microcontamination Control at Northeastern University, Boston, MA, since 2002. He is also the founder and CTO of Nano OPS, Inc. since 2017. Prior to joining Northeastern University, he was a professor and a director of the Particulate Control Lab at Clarkson University from 1983-2000. Dr. Busnaina is internationally recognized for his work on semiconductor fabrication with an emphasis on yield. He also developed nano and microscale additive manufacturing for making interconnects, passive and active electronic components, LEDs, and sensors. He authored more than 600 papers in journals, proceedings, and conferences. He also has 25 granted and 45 pending patents. He was awarded the 2020 American Society of Mechanical Engineers (ASME) William T. Ennor Manufacturing Technology Award and Medal. He is a fellow of the National Academy of Inventors, a fellow of the American Society of Mechanical Engineers, and a Fulbright Senior Scholar. He is an editor of the Journal of Microelectronic Engineering. He also serves on many advisory boards, including Samsung Electronics, the Journal of Electronic Materials Letters, the Journal of Nanomaterials, and the Journal of Nanomanufacturing.





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Prof Keeley Crockett



Prof Keeley Crockett (SMIEEE, SFHEA) is a Professor in Computational Intelligence at Manchester Metropolitan University and Chair of the IEEE Technical Committee SHIELD (Ethical, Legal, Social, Environmental and Human Dimensions of AI/CI). She has over 27 years' experience of research and development in Ethical and responsible AI, computational intelligence algorithms and applications, including adaptive psychological profiling, fuzzy systems, semantic similarity, and dialogue systems. Keeley has led work on Place based practical Artificial Intelligence, facilitating a parliamentary inquiry with Policy Connect and the All-Party Parliamentary Group on Data Analytics (APGDA), leading to the inquiry report "Our Place Our Data: Involving Local People in Data and AI-Based Recovery". She obtained STRENGTH IN PLACES POLICY funded engagement work with Greater Manchester businesses on "SME Readiness for Adoption of Ethical Approaches to AI Development and Deployment" and has contributed to the recent APGDA: AI and Ethics Repot (launched 19-06-23). She is currently the PI on the EPSRC "PEAs in Pods: Co-production of community based public engagement for data and AI research." Grant, Co-I on The Alan Turing Institute "People-powered AI: responsible research and innovation through community ideation and involvement" Grant, and PI on the Innovate UK Knowledge Transfers Partnership with My First Five Years. Keeley is an International Collaborator on COMPROMISE 2021 – 2024: Enhancing COMMunication PROtocols with Machine Learning while Protecting SENSitive Data (Ministerio De Ciencia e Innovación, Spain). She was Co-academic lead of the GM AI Foundry and is Co-Lead for AI/Cybersecurity on the new Centre for Digital Innovation (CDI). She was also elected to the IEEE Computational intelligence member ADCOM (2023-25), Chair of the IEEE Computational Intelligence Diversity and Inclusion subcommittee and the Co-Chair of the IEEE Women in Engineering Educational Outreach, and she is a U.K. STEM Ambassador. She has 28 PhD completions and will be technical Co-Chair at IEEE FUZZ 2024 (IEEE WCCI 2024) Japan.

[Prof. Keeley A Crockett](#) SFHEA SMIEEE

Professor in Computational Intelligence

Lead [Data and AI Ethics Theme](#) / Lead [Machine Intelligence Theme](#)

[Chair IEEE Technical Committee on Ethical, Legal, Social, Environmental and Human Dimensions of AI/CI \(SHIELD\)](#)

[Chair IEEE Computational Intelligence Society Diversity and Inclusion subcommittee](#)

Department of Computing and Mathematics

Manchester Metropolitan University

Chester Street, Manchester, M1 5GD





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Email: K.Crockett@mmu.ac.uk

Keeley Crockett's Virtual Office Hours on Teams please email K.Crockett@mmu.ac.uk for an appointment



PEAs in Pods

Community | Engagement | Research

[EPSRC PEAs in Pods: Co-production of Community Based Public Engagement for Data and AI Research](#)

Abstract: The ethical, social, and legal landscape of Artificial Intelligence (AI) driven systems is rapidly changing. Since the General Data Protection Regulation (2018), stakeholders developing AI systems have faced numerous challenges in the interpretation and implementation of Article 22, specifically concerning an individual's rights in the context of automated decision making, the ability of AI to explain decisions, explanation of the logic involved, and to develop models using only "correct" data. This has and is causing major challenges due to the lack of legal guidance, case law and ethical principles about the use of AI in different contexts. In 2023, the passing of the EU AI Act and other Global "AI and Digital" legalisation promises to also be a big disrupter to all stakeholders working in the field as adopting a risk-based approach to AI becomes the norm. In this talk I will first briefly overview why ethics matters in developing ASSETS and outline my transformational journey. I will provide an overview of the policy and impact landscape and how adopting consequence scanning can help organisations start to adopt a risk-based approach to AI. Responsible innovation and ethical tech are essential to build public trust, yet how can businesses and researchers in academia harness People Power through community ideation and involvement? In this talk I will share two projects that involve public engagement and co-production as mechanisms to build citizen confidence and trust.



SPRINGER NATURE





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Prof. Liangxiu Han, Manchester Metropolitan University

Profile: <http://www2.docm.mmu.ac.uk/STAFF/L.Han/>

Prof. Liangxiu Han has a PhD in Computer Science from Fudan University, Shanghai, P.R. China (2002). Prof. Han is currently a Professor of Computer Science at the Department of Computing and Mathematics, Manchester Metropolitan University. She is a co-Director of Centre for Advanced Computational Science and Deputy Director of ManMet Crime and Well-Being Big Data Centre. Han's research areas mainly lie in the development of novel big data analytics/Machine Learning/AI, and development of novel intelligent architectures that facilitates big data analytics (e.g., parallel and distributed computing, Cloud/Service-oriented computing/data intensive computing) as well as applications in different domains (e.g. Precision Agriculture, Health, Smart Cities, Cyber Security, Energy, etc.) using various large scale datasets such as images, sensor data, network traffic, web/texts and geo-spatial data. As a Principal Investigator (PI) or Co-PI, Prof. Han has been conducting research in relation to big data/Machine Learning/AI, cloud computing/parallel and distributed computing (funded by EPSRC, BBSRC, Innovate UK, Horizon 2020, British Council, Royal Society, Industry, Charity, respectively, etc.). Prof. Han has served as an associate editor/a guest editor for a number of reputable international journals and a chair (or Co-Chair) for organisation of a number of international conferences/workshops in the field. She has been invited to give a number of keynotes and talks on different occasions (including international conferences, national and international institutions/organisations). Prof. Han is a member of EPSRC Peer Review College, an independent expert of European Commission for proposal evaluation/mid-term project review, and British Council Peer Review Panel.

Talk Title: Precision Agriculture: A Big Data Driven, AI-enabled Approach

Abstract:

The convergence of big data and artificial intelligence (AI) in agriculture offers tremendous potential in tackling food security challenges. Through the utilization of these technologies, agricultural practices can be optimized to enhance productivity and ensure a sustainable food supply. By leveraging big data and AI, farmers can make data-driven decisions regarding resource allocation, crop management, and yield optimization. This enables efficient use of resources, minimizes waste, and maximizes agricultural output to meet the growing global food demand. This talk will focus on our latest developments in scalable deep learning/AI from big data in the context of precision agriculture to address food security and sustainability.





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Engr Paul Sheedy, *Founder/ CEO, Unifi.id*

A serial entrepreneur in innovative technology. His is experienced in loyalty data solutions globally, digital comms, design and detection systems. Previously, Paul was the co-founder of EYC.

Talk Title: The Role of Big Data Analytics, IoTs and Artificial Intelligence in ASSET-based Smart Infrastructure



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Prof Qin Zhang
Tsinghua University, Beijing, China

Prof Qin Zhang graduated from Tsinghua University, Beijing, China, with BS., MS. and Ph.D. Degrees in nuclear engineering in 1982, 1984 and 1989 respectively. He was a visiting scholar with University of Tennessee, Knoxville, TN, USA, and University of California, Los Angeles, CA, USA, from 1987 to 1989, studying system reliability engineering and intelligent fault diagnoses. He is now a professor of Institute of Nuclear and New Energy Technology and Department of Computer Science and Technology, Tsinghua University, emeritus member of China Association for Science and Technology, member of International Nuclear Energy Academy, fellow of China Association for Artificial Intelligence (CAAI) and director of the specialized committee for causality and uncertainty in AI of CAAI, consultant of the specialized committee for wise medical care of CAAI. He originally developed a new AI model called Dynamic Uncertain Causality Graph for fault diagnoses and disease diagnoses.





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Dr. Jiafeng Zhou
University of Liverpool, UK

Dr. Jiafeng Zhou is with the Department of Electrical Engineering and Electronics, University of Liverpool, Liverpool, UK. His current research interests include microwave and radio frequency components and devices, metamaterials, electromagnetic energy harvesting and wireless power transfer. He has been the Editor-in-Chief of *Wireless Power Transfer* (Cambridge University Press and Hindawi), executive committee member of the IET Millimeter-Wave and Terahertz Engineering Colloquium, Deputy Chair of the IET Electromagnetic Network, etc.

Talk Title: Wireless Human Vital Signs Monitoring Using Acoustic, Millimeter-wave, and Video.

Abstract: This talk focuses on utilizing various techniques to detect respiration and heartbeat. It will be discussed how human vital signs can be detected and analyzed through sound generated by breathing, reflections of millimeter waves from body parts due to breathing and heartbeat, and colour changes in blood vessels due to the heartbeat, as captured on video. These techniques will be described and compared to demonstrate their applications in remote sensing, patient monitoring, and potentially for identification or medical diagnosis purposes.





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Dr Jamal Mohamed Ahmouda Zaid

Research and Development Center, HUAWEI Technologies, Canada

Jamal Zaid (Senior Member, IEEE) received his B.A.Sc. in Microwaves Engineering from Electrical and Electronic College, Bani-Walid, Libya, in 1997, his M.A.Sc. in Communications & Microwave Engineering from Academy of Graduate studies, Tripoli, Libya in 2008, and his Ph.D. in Telecommunication from the University of Quebec, Montreal, QC, Canada in 2018. He was Assistant Professor and Head of the Communications Department of the Higher Institute of Comprehensive Professions, Bani-Walid, Libya, from 2008 to 2013. He is currently a Senior Engineer in the Research and Development Center of Huawei Technologies, Ottawa, Canada. His research activities have been centered on antenna design, coupling reduction for multiple input and multiple-output (MIMO), Full Duplex System, Radio Frequency Identification (RFID), Frequency Selective Surface (FSS), Electromagnetic Bandgap (EBG), Wireless Sensor and antenna miniaturization. He is adjunct professor at Quebec University since 2019. Dr. Jamal Zaid was a recipient of Innovation Pioneer Award 2020 as well as future star Award 2023 from the Research and Development Center of Huawei Technologies.

Talk Title: Advanced Semiconductors & Electronic Solutions for Satellite-Cellular 5G/6G Communication Convergence Use Cases and Applications





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Dr. Jaume Anguera, IEEE Fellow, founder and CTO at the technology company Ignion (Barcelona, Spain). Associate Professor at Ramon Llull University and a member of the Smart Society research group. He is an inventor of more than 170 granted patents, most of them licensed to telecommunication companies. Among his most outstanding contributions is that of the inventor of Antenna Booster Technology, a technology that fostered the creation of Ignion. The wireless industry has adopted many of these products worldwide to allow wireless connectivity to IoT devices through a miniature component called an antenna booster that is ten times smaller than conventional antennas. Author of more than 280 widely cited scientific papers and international conferences (h-index 53). Author of 7 books. He has participated in more than 22 competitive research projects financed by the Spanish Ministry, CDTI, CIDEM (Generalitat de Catalunya), and the European Commission for an amount exceeding \$13M as a principal researcher in most of them. He has taught over 40 antenna courses worldwide (USA, China, Korea, India, UK, France, Poland, Czech Republic, Tunisia, Perú, Brazil, Canada, Spain). With over 23 years of R&D experience, he has developed part of his professional experience with Fractus in South Korea in designing miniature antennas for large Korean companies such as Samsung and LG. Since 2017 he has been with Ignion in the role of CTO. He leads the company's R&D activity to create new products, envisage new technologies, and provide technology strategy to scale the company's business. He has received several national and international awards (ex. 2004 Best Ph. D Thesis -two prizes, one given by Telefónica Mobile, 2004 IEEE New Faces of Engineering,

2014 Finalist European Patent Award). He has directed the master/doctorate thesis to more than 160 students, many of them have received awards for their thesis (COIT, COITT, Ministry of Education). His biography appears in Who'sWho in the World and Who'sWho in Science and Engineering. He is an associate editor of the IEEE Open Journal on Antennas and Propagation, Electronics Letters, and a reviewer in several IEEE and other scientific journals. He is an IEEE Antennas and Propagation Distinguished Lecturer and vice-chair of the working group "Software and Modeling" at EurAAP. More info at <http://users.salleurl.edu/~jaume.anguera/>

Prof Hans Degens



Expertise: Age-related Changes of the Muscles and Human Body Systems

Department of Life Sciences, Research Centre for Musculoskeletal Science and Sports Medicine, Manchester Metropolitan University, Manchester, UK; Institute of Sport Science and Innovations, Lithuanian Sports University, Kaunas, Lithuania

The main academic interest is age-related changes in skeletal muscle morphology and function. Thereto we apply single skinned muscles fibres from human muscle biopsies and rodents. The use of single skinned muscle fibres allows one to determine changes in cross-bridge kinetics and fibre function without bias that can be introduced in vivo by e.g. changes in neural drive. Muscle is highly adaptive and resistance (including overload model in rats) and endurance training are used to





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assess changes in muscle (fibre) function and morphology. Recently we have also explored how hypoxia does affect the muscle, as not only mountaineers, but also patients with chronic diseases as heart failure and chronic obstructive pulmonary disease and elderly people, may suffer from hypoxia. Of interest is how the muscle adapts to maintain an adequate oxygenation during hypoxia and hypertrophy. The latter is of interest as an increase in fibre size may increase the diffusion distances from the capillaries to the interior of the muscle cell. In smokers this may be aggravated by the presence of carboxyhaemoglobin that not only reduces the oxygen carrying capacity in the blood but also the release of oxygen in the muscle due to the left-shift of the haemoglobin dissociation curve. The impact of smoking and smoking cessation on muscle function is an area of continuing interest. In addition, we have an interest in the impact of space travel on the neuromuscular system.

Talk Title: A Great Asset to Society: Older People with a Sustained Physical and Cognitive Function

Abstract:

We are warned of an imminent global ecological catastrophe that can only be averted by draconian measures, such as reducing the global population. The thought of such measures may contribute to reducing the value the life of particularly older people, who are considered a liability to the economy. Realizing that i) rather than heading for an imminent catastrophe, ii) casualties from natural disasters and air pollution are significantly fewer than 100 years ago, and iii) life expectancy and quality of life have increased even in the poorest countries, puts human life in a more positive light, and sees older people with their wealth of experience more as an asset than a liability, supported by their significant socio-economic contribution to society. This then is an impetus to seek ways to improve the quality of life of the older person, and here it is suggested, using as an example the benefits of exercise for muscle and cognitive function, that regular exercise can be an effective means to do so.



Engr Stephen Alabi (MIET)

Engr Stephen Alabi is the Founder and Managing Director of SmOp CleanTech and has overall responsibility for its operational performance. Stephen is also the driving force behind SmOp's strategic plan. He holds a BSc in Engineering Physics and a MSc in Advanced Process Design for Energy from The University of Manchester, UK. His background is in the scientific aspects of the Company's project which has aided products delivery and knowledge transfer. Stephen's involvement in setting the strategic direction of the business and authority to commit resources to support Research and development projects make him the ideal candidate to act as Senior Business Employee. Mr Alabi was the Technical





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Programme Chair at the Second International Adaptive and Sustainable Science, Engineering and Technology (ASSET) Conference 2023 held in Manchester, UK and gave a Keynote Speech on “Hybrid Wireless Power Transfer for Passive Electronic Appliances.” SmOp CleanTech is the Diamond Sponsor of the ASSET Conference and Engr Alabi is an Executive Stakeholder of the ASSET Council. He has 10 peer-reviewed and refereed technical publications and 10+ peer-reviewed articles on “green energy development for future-generations telecoms infrastructure” in-preparation. Under Stephen’s R&D engineering leadership, SmOp has developed intellectual properties and patentable green radio frequency communication and low-carbon hybrid RF-solar energy harvesting products for different horizontal and vertical use cases spanning civil and commercial applications for the major industries/sectors. He currently leads the R&D of passive, hybrid and active energy-efficient and ultra-low-carbon internet of things sensors electronics innovations using advanced nanoscale integrated manufacturing technology for the global net zero attainment.



Dr Segun Obadire

University of Venda, South Africa

Dr Olusegun Obadire holds a Ph.D in Rural Development and has a background in Computer Science and Economics. He started working as international education practitioner in 2011 and he is the current Director International Relations at the University of Venda, South Africa where he is involved with strategic planning for linkages, partnerships and implementation of internationalisation at the University. He participates in teaching, learning, research and community engagement as supervisor, external examiner, journal reviewer, principal investigator and lecturer, teaching Entrepreneurship and Big Data. He has graduated one PhD, 3 master’s and 25 honour’s students since 2014. He is currently supervising one PhD candidate and 2 Master’s students. He has published about 45 articles in accredited journals on internationalisation of higher education, rural and community development. He has presented and chaired sessions at over 20 conferences around the world since 2012. His research work is mainly focusing on integration of intercultural programmes, internationalisation of higher education and rural entrepreneurship at the University.

Keynote / Dinner Talk Title: Internationalisation of Higher Education through Research Collaboration

Dr. Segun Obadire, University of Venda, South Africa

Email: Segun.Obadire@univen.ac.za



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Dr Prabhuraj Venkatraman (Prabhu)

Senior Lecturer in Technical Textiles and Sustainable Fashion, Manchester Fashion Institute [MFI], Manchester Metropolitan University, U.K.

Prabhu, a technical textile specialist and a Chartered Fellow of the Textile Institute, is a prolific researcher and a dedicated mentor. His research interests include using innovative sustainable materials, developing functional apparel, and technical textiles to improve health. He has made significant advancements in the development of bio-functional finishing of fabrics with antimicrobial properties using plant-based nano-emulsions. His other research areas include the development of socks for diabetic patients to monitor shear force or strain and prevent the formation of ulcers. His current projects include the development of smart face coverings with antimicrobial properties and the development of novel micro and nano-fibres using seaweed (alginate) for healthcare applications. He regularly disseminates his research at international and national events and is a journal peer reviewer. As a Doctoral college Department lead [DCDL] for Manchester Fashion Institute, he plays a crucial role in postgraduate admissions and progression. He imparts his knowledge of sustainable fashion and product innovation to PG and UG students, inspiring the next generation of researchers. He has supervised five PhD students and four Master by Research (primary supervisor). He supervises three PhD students and continues to nurture future scholars. He also serves as a personal tutor, offering pastoral guidance and support for UG students.

Talk Title: “The Importance of Lifecycle Assessment to Determine the Environmental Impact and the Use of Technologies to Enhance Traceability and Circularity in the Fashion Industry”– Dr Prabhuraj Venkatraman, Manchester Met University, UK

The fashion industry is valued at 2.5 trillion USD and employs more than 75 million people globally. Recently, apparel and textiles consumption has increased significantly, and people use clothes for a shorter period, resulting in substantial waste generation. The fashion supply chain is complex and consumes much water, energy, and resources. The textile finishing industry dries up water resources, and nearly 60-70% of products are synthetic. Washing up these products releases enormous volumes of micro-fibres, which affect the aquatics in river streams. These synthetic textiles contribute to a significant impact on the environment and climate. Due to their impact, it has been a focus for many, including the industry, government, and academics, to study the impact areas methodologically and lower or minimise the environmental impact. The lifecycle assessment [LCA] is an essential tool to evaluate the environmental impact of textiles and apparel products in each life stage, including raw material extraction, fibre processing, yarn spinning, fabric formation, garment manufacturing, distribution, consumer use and end-of-life. In addition to determining the impact, it has been essential to monitor the textiles and clothing at the production level, including who made the product, where and how it has been made, tracing its environmental footprint and how it should be cared for and maintained by the consumer and identifying its re-use potential after it reaches the end-of-life. A digital product passport (DPP) has been proposed for implementation in the EU by 2030 for all fashion and textiles, offering comprehensive data about the product’s environmental footprint. In this paper, the author identifies the challenges of implementing these initiatives within the supply chain with some examples and identifies a transition toward sustainable and circular fashion and textiles.



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Dr. Duncan Elly Ochieng
University of Nairobi, Kenya

Dr Duncan Elly Ochieng is a senior lecturer at the University of Nairobi, Faculty of Business and Management Sciences. Duncan has expertise in entrepreneurial and innovation ecosystems development, finance and investments. He leads global projects that blend academia, practical innovation and industry partnerships to drive sustainable development. He manages impactful initiatives including Entrepreneurship Educators Foundation of Eastern Africa, African Journal of Entrepreneurship and Innovation (AJeIN) and African Development Finance Journal (ADFJ). Duncan was a co- principal Investigator in both the Youth Entrepreneurship Accelerator Programme (YEAP) and the Global Entrepreneurial Talent Management (GETM4). He was also a principal investigator in the Triple H: Building Head, Heart and Hand set in young Entrepreneurs through Storytelling and Design Thinking.

Talk Title: Evaluating Entrepreneurial and Innovation Ecosystems Transformation in Universities in Kenya

Abstract:





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This study investigates the entrepreneurial and innovation ecosystems within Kenyan universities, recognizing their pivotal role in economic development through research commercialization and startup incubation. Despite their potential, universities face challenges such as limited infrastructure, funding constraints, and a nascent entrepreneurial culture. The research aims to fill gaps in empirical evidence by employing a Theory of Change framework to understand how universities contribute to these ecosystems and identifying factors influencing their effectiveness. Key objectives include assessing the impact of entrepreneurial initiatives and evaluating the applicability of performance metrics in measuring outcomes. Adopting a mixed-methods approach, the study integrates qualitative methods like interviews and case studies with quantitative analyses such as surveys and secondary data review. By exploring collaborative models like the Triple Helix, Quadruple Helix, and Quintuple Helix, the research seeks to enhance understanding and practices for sustainable innovation in Kenyan higher education, informing future policies and strategies.

Key Words: Entrepreneurial and Innovation Ecosystems, Transformation in Universities, Innovation Helices



Peter H. Aen received the B.A.Sc. degree in engineering science and the M.A.Sc. degree in electrical engineering from the University of Toronto, Toronto, ON, Canada, in 1995 and 1997, respectively, and the Ph.D. degree in electrical engineering from Arizona State University, Tempe, AZ, USA, in 2005. He was the Manager of the RF Division, RF Modeling and Measurement Technology Team, Freescale Semiconductor, Inc., Tempe, AZ, USA, a company which he joined in 1997, then the Semiconductor Product Sector, Motorola, Inc. In 2013, he joined the Faculty of Engineering and Physical Sciences, University of Surrey, Guildford, U.K., where he was a Reader of microwave semiconductor device modeling. He was also the Director of the Nonlinear Microwave Measurement and Modeling Laboratory, a joint University of Surrey/National Physical Laboratory, and the Director of National Physical Laboratory – South of England, Guildford U.K. In 2019, he joined the Colorado School of Mines as a Professor and Head of the Electrical Engineering Department. He has co-authored Modeling and Characterization of RF and Microwave Power FETs (Cambridge University Press, 2007). Dr. Aen is a member of the Microwave Theory and Techniques and Electron Device Societies, served as an Executive Committee Member and Vice-President of the Automatic RF Techniques Group, and was the Chair of the IEEE Technical Committee (MTT-1) on Computer-Aided Design.

Talk Title: Building a Future-proofed Connected World with Green ASSETs

Abstract: Microwave circuits, especially power transistors, are essential components of mobile communication as they amplify signals to be transmitted wirelessly from the base-station to subscriber terminals. Their compact design is increasingly difficult, as mobile network operators require operation at higher output power and frequency while simultaneously demanding a reduction in the circuit size. Shrinking the device and increasing operational frequency results in significant internal electromagnetic coupling and increased power results in higher temperatures, both of which are detrimental to performance. These requirements conflict with one another, and the device physics, electromagnetic fields and distributed



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temperatures co-couple to limit the overall efficiency. In this presentation, I'll discuss our efforts to develop computational multiphysics simulations techniques and the application of electromagnetic field and temperature measurements to quantitatively visualize the internal operations of these microwave devices under realistic operating conditions. These new techniques provide vast new amounts of data and insights that will enable future higher efficiency semiconductor devices.



Prof. Ernest Christian Winful
Accra Technical University, Ghana

Prof. Ernest Christian Winful (PhD) is an Astute Researcher, a Certified Research Fellow (The Institute of Certified Economists of Ghana, since 2014) and a Member of the Institute of Directors, Ghana, since 2011. He had his second circle education at Mfantsipim School and St. Augustines College respectively all in Ghana. He had his first and PhD degrees from University of Cape Coast, Ghana and the second degree from Kwame Nkrumah University of Science and Technology also in Ghana. Winful has 20-plus years of experiences in providing comprehensively high-quality teaching and research for Ghana and the world at large. He has over 30 published articles and conference presentations to his credit in the areas of Financial Economics, Social Entrepreneurs and Environmental Economics. He has served on several boards and committees and is currently, a member of a standing committee, Social Enterprise Ghana.

He has supervised several student-project works and in addition developed industry-relevant academic curricula. He has held different positions at different management levels which have contributed to his vast experiences in academia and industry. In terms of administrative experiences, he has held the position of the Dean of the Faculty of Business; Head of Department, Accounting and Finance; and Head of Department Procurement and Supply Chain Management at Accra Technical University (ATU), Ghana. Currently, he is the Dean, of International Programs and Institutional Cooperation. He organized Block Chain sensitization seminar and workshop in 2018 and 2019 respectively in Accra Technical University together with international partners due to his belief in the fourth industrial revolution as the means to job creation and wealth. In the area of grants and projects, Winful has won both international and national grants due to his ability to work with different groups to achieve results. His ambition in life has always been to impact others to become successful and beneficial to their community. God is his helper.

Talk Title: Circular: Economy: A Means to an Equilibrium between Environment and Economy





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Stephen Muldowney is the Head of Sales (UK & Northern Europe) with Hewlett Packard Enterprise, the global leader in private cellular network technology. Stephen has more than 25 years experience at the forefront of the global telecommunications sector working with some of the largest vendors and with the latest advances in mobile and wireless technologies with a particular focus on LTE/5G private mobile networks.

Talk Title: Private 5G (P5G)

Abstract:

- Market Trends;
- Why 5G-Standalone (5G-SA)?
- Private Mobile Networks / Networking (PMN);
- Enterprise Connectivity;
- P5G and PMN Opportunities;
- Why are Enterprises Adopting PMNs?
- Wireless Broadband Options;
- The Problems P5G Solve;
- What are Customers Demanding?
- Enterprise Network Interconnectivity Opportunities;
- 5G Use Cases.

Twitter: @hpe





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Naresh Kumar has illustrious experience as the CTO for EMEA and India at Tektronix who is responsible for Strategic Business Development for the region. Naresh Kumar is an industry veteran with over 30 years of experience in Semiconductor, Aerospace Defence as well as Telecom Industry. He has held various positions in Tektronix, HP, Agilent and Keysight over the last 30+ years as a Technical Expert as well as a General Manager, managing the Applications Support teams in India and South-East Asia. Naresh holds a Master's degree in Computer Science and a Bachelor's degree in Electronics and Communications Engineering.





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Technical Papers

Paper ID:	ASSET_2024_paper_02
Paper Title:	Cloud Detection and Removal from RGB Images using U-Net Semantic Segmentation and CloudGAN Models
Author(s):	Aziza I. Hussein, Mennatall Essam Hassan, Sunday Ekpo, Ghadah S. Alyami, Fanuel Elias, Ibrahim Salah and M. Mourad Mabrook

Paper ID:	ASSET_2024_paper_03
Paper Title:	Drought Monitor Creation using SMAP L4 Soil Moisture Data
Author(s):	Aziza I. Hussein, Manar Marwan Atia, Sunday Ekpo, Ghadah S. Alyami, Fanuel Elias and M. Mourad Mabrook

Paper ID:	ASSET_2024_paper_04
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Paper Title:	Performance Analysis of Cooperative NOMA Network using DF strategy with MRC and SC Techniques
Author(s):	Ashwini K, Jagadeesh V. K., Ashish Singh, Fanuel Elias, Sunday Ekpo

Paper ID:	ASSET_2024_paper_05
Paper Title:	Kiwifruit Grading Using Hyperspectral Imaging Combined with Hierarchical 3D Convolution and Attention Mechanism
Author(s):	Botao Zhang, Z.Q. Guo and Z.P. Wu

Paper ID:	ASSET_2024_paper_06
Paper Title:	RFID-based Food Sensing System with Cloud Database
Author(s):	Zeyu Cao, Zhipeng Wu, Chenyang Song and John Gray

Paper ID:	ASSET_2024_paper_08
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Paper Title:	Design Optimization and Performance Evaluation of an Efficient 2.4/6 GHz RF Energy Harvesting System
Author(s):	Sunday Enahoro, Sunday Ekpo, Mfonobong Uko, Stephen Alabi, Fanuel Elias, Rahul Unnikrishnan

Paper ID:	ASSET_2024_paper_09
Paper Title:	Sustainable Digital Transformation in Healthcare
Author(s):	Ijeoma Maduka

Paper ID:	ASSET_2024_paper_10
Paper Title:	Comparative Analysis of MIMO-Based Rectenna Configurations for Energy Harvesting in Ultra-Low Power Applications
Author(s):	Fanuel Elias, Sunday Ekpo, Stephen Alabi, Nurudeen Olasunkanmi, Rahul Unnikrishnan, Sunday Enahoro, Mfonobong Uko, Muhammad Ijaz, Helen Ji, and Zhipeng Wu





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Paper ID:	ASSET_2024_paper_11
Paper Title:	Highly Adaptive Small Satellite Experiment for Space Missions Modelling
Author(s):	Sunday C. Ekpo, Fanuel Elias, Mfonobong C. Uko, Sunday Enahoro, Rahul Unnikrishnan, Muhammad Ijaz, Stephen Alabi, and Kolawole Olasunkanmi

Paper ID:	ASSET_2024_paper_12
Paper Title:	Development and Evaluation of a Commercially Viable Bio-Coal Recipe from Biomass for Clean Fuel Applications in the Heritage Sector
Author(s):	Kadiri Abioye, Olawole Kuti, Mfonobong Uko and David Bamford

Paper ID:	ASSET_2024_paper_13
Paper Title:	Multi-band Omnidirectional Antenna for RF Energy Harvesting for Low Power IoT Applications





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Author(s):	Rahul Unnikrishnan, Sunday Ekpo, Nurudeen Olasunkanmi, Stephen Alabi, Helen Ji, Fanuel Elias, Sunday Enahoro and Mfonobong Uko
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Paper ID:	ASSET_2024_paper_14
Paper Title:	A study on Food Classification using Convolutional Neural Network
Author(s):	Chidiogo M. Maduka, Fanuel Elias, Sunday Ekpo, Andre Landa, Oluwatoyin Bakare, Richard Omole, Aniebiet Kingsley

Paper ID:	ASSET_2024_paper_15
Paper Title:	Industry-linked STEM-Enterprise Education Model for Innovation Incubation and Graduate-to-Graduate/Industry Partnership in the Sub-Saharan Africa
Author(s):	Sunday Ekpo, Fanuel Elias, Paul O. Anumodu, Helen Ji, and Isaac Oluwatayo

Paper ID:	ASSET_2024_paper_16
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Paper Title:	Cost-effective Driver Behaviour Detection System Using Deep Learning
Author(s):	Comfort Lawal, Olatayo M. Olaniyan, John S. Wejin, Elekwa Ogechukwu, Emmanuel O. Simonyan, Fanuel Elias, and Sunday C. Ekpo

Paper ID:	ASSET_2024_paper_17
Paper Title:	Energy Harvester Design Considerations for the Wireless Charging of 5G/6G User Equipment
Author(s):	Choice Amaizu, Fanuel Elias, Obinna Amaizu, Sunday Ekpo, Aziza I. Hussein, and Ghadah Alyami

Paper ID:	ASSET_2024_paper_18
Paper Title:	Wireless Charging Design Consideration for Autonomous Mobile Robots
Author(s):	Obinna Amaizu, Fanuel Elias, Choice Amaizu, Sunday Ekpo, Aziza I. Hussein, and Ghadah Alyami





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Paper ID:	ASSET_2024_paper_19
Paper Title:	Autotrader Car Price Prediction Using Machine Learning Concept
Author(s):	Aniebiet Inyang, Mfonobong Uko, Sunday Ekpo Sunday Enahoro, Fanuel Elias, Rahul Unnikrishnan, Unwana Ubong Iwok, and Ubong Ukommi

Paper ID:	ASSET_2024_paper_20
Paper Title:	Artificial Neural Network Modelling and Characterization of a 3.2 to 3.8 GHz Low Noise Amplifier for Sub-6 GHz Applications
Author(s):	Mfonobong Uko, Sunday Ekpo, Fanuel Elias, Sunday Enahoro, Ubong Ukommi, Rahul Unnikrishnan, Unwana Ubong Iwok, and Aniebiet Inyang

Paper ID:	ASSET_2024_paper_21
Paper Title:	Design and Performance Analysis of an Additively Manufactured Patch Antenna for 5.3 GHz Applications





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Author(s):	Mfonobong Uko, Sunday Ekpo, Fanuel Elias, Rahul Unnikrishnan, Nurudeen Olasunkanmi, and Stephen Alabi
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Paper ID:	ASSET_2024_paper_22
Paper Title:	Harnessing the Power of Machine Learning: A Groundbreaking Approach to Predicting Lung Cancer and Revolutionizing Healthcare
Author(s):	Theophilus Oluniyi, Moyinoluwa Oginni, Sunday Ekpo, Fanuel Elias

Paper ID:	ASSET_2024_paper_28
Paper Title:	Artificial Intelligence: A Dynamic and Revolutionary Tool in Oncology
Author(s):	Abiola Lotun

Paper ID:	ASSET_2024_paper_29
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Paper Title:	Evaluating Entrepreneurial and Innovation Ecosystems Transformation in Universities in Kenya
Author(s):	Duncan Elly Ochieng

Paper ID:	ASSET_2024_paper_30
Paper Title:	Kinetic Analysis of Corrosion Inhibitive Efficiencies of Ethanol Leave Extract of Dracaena Arborea for Metallic Materials in Acidic Media
Author(s):	Enefiok Okon Usungurua, Itoro Esiet Udo, Etinamabasiyaka E. Ekott, Sunday Cookey Ekpo, Fanuel Elias and Anietie Hanson

Paper ID:	ASSET_2024_paper_31
Paper Title:	Detection of Bio-information Using Novel Isotropic Metasurface Like Microstrip Patch Antenna
Author(s):	Fanuel Elias, Swarnadipto Ghosh, Amit Ghosh, Puja Mowar Banik, Dipankar Saha, Ardhendu Kundu, Ayona Chakraborty, Samik Chakraborty, Sunday Cookey Ekpo, and Stephen Alabi





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Paper ID:	ASSET_2024_paper_33
Paper Title:	A Great Asset to Society: Older People with a Sustained Physical and Cognitive Function
Author(s):	Hans Degens

Greater Manchester

Greater Manchester's contributions to the UK's innovation and education span over the last 200 years and the Manchester city-region is a globally recognised centre of cultural, industrial and technological excellence. Manchester is a student-focused city with enriching sporting and buzzing social scenes. It is one of the world's top 3 student cities (QS Best Student Cities 2023) that showcase dynamic real international cuisine and cultural events.





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