Introduction

2015 IEEE International Symposium on Technology and Society (ISTAS 2015) takes place 11 - 12 November in Malahide, County Dublin. This is the flagship event of the IEEE Society on Societal Implications of Technology, and Technical Co-Sponsored by IEEE Consumer Electronics Society and IFIP TC9 - ICT and Society.

The Society on Social Implications of Technology (SSIT) of the Institute of Electrical and Electronics Engineers (IEEE) is concerned with how technology impacts the world, and with how the appropriate application of technology can improve the world.

SSIT focuses on issues such as: humanitarian engineering; environmental issues including climate change, green technologies, and sustainable design; privacy and security; other economic, health, and safety implications of technology; engineering ethics and professional responsibility; engineering education including k-12 and engineering education in social implications of technology; history of technology; public policy related to engineering, technology and science; health and healthcare technologies and impact; reliable energy and social issues related to energy, and social issues of information technology and telecommunications.

The central theme of IEEE ISTAS 2015 in the context of European Year of Development is "Culture, Ethics and the Knowledge Society". The objective is to bring together senior representatives from leading public, private, education & research and societal organisations from around the world (and particularly IEEE Region 8 - which includes Europe and Africa) to support greater coordination, cooperation and knowledge sharing, to maximise potential socio-cultural and socio-economic impact of SSIT activities.

Who will you meet?

The IEEE ISTAS Conference Series attracts policy makers, practitioners, and researchers from leading public, private, education and research and societal organisations around the world. Delegates and speakers attend to share knowledge and experience, insight and lessons learnt, and network with their peers from around the world.

IEEE ISTAS 2015 also provides the unique opportunity to identify partners and opportunities to co-operate in international implementation and pilot projects as well as research projects targeting the needs of developed and developing countries alike.

The Venue

IEEE ISTAS 2015 takes place at the Grand Hotel, Malahide, County Dublin, Ireland.

The Programme

The Preliminary Programme features three moderated plenary panels and a Scientific Programme with 15 parallel sessions featuring 60 presenters from leading public, private, education and research and societal sector organisations in 19 countries. The 2-day programme features an invigorating mix of paper and workshop sessions addressing thematic areas including ICT4D and Humanitarian Engineering, eHealth, Smart Cities, eAgriculture, Cloud Computing, Technology-enhanced Learning, Privacy and Security Issues, Professional and Research Ethics in STEM, Impact of Consumer Electronics, Technological Forecasting and Technology and Development Policy Issues. Session Chairs will ensure active discussion and facilitate delegate participation.

In the context of European Year of Development, the Opening Plenary on Wednesday 11 November features a high level plenary panel on "Technology and Development". As this year's Symposium theme is "Ethics, Culture and the Knowledge Society", the second Plenary on Wednesday 11 November is focused on "Professional and Research Ethics in STEM" (Science, Technology, Engineering, Maths), while the Closing Plenary on Thursday 12 November focuses on "Future Internet and Smart Cities".

The programme is subject to change and the IEEE ISTAS 2015 Organising Committee reserves the right to alter the contents, venue and/or speakers. This Programme is accurate as at 20 July 2015.

Networking

Networking is a key feature of the IEEE ISTAS Symposium Series. Paper and workshop sessions are designed to maximise knowledge sharing by providing time for interactive discussions during the conference programme itself. Coffee breaks and lunch facilitate informal small group and one-on-one discussions following paper or workshop sessions.

The Delegate Showcase on the Conference Portal allows registered delegates, speakers and exhibitors to publish their own short profile and research interests to facilitate networking before, during and after the conference. Leverage this functionality to contact potential partners in advance and arrange to meet during the conference.

Conference Proceedings

The IEEE ISTAS 2015 Symposium proceedings will be published on a memory key provided to each delegate during Registration.

Following the Symposium, registered delegates will have access to all PowerPoint presentations, which will be published on the ISTAS 2015 Portal.
Papers accepted for the Conference Proceedings and presented during the Symposium will be submitted to IEEE Xplore, with some IEEE ISTAS 2015 papers selected for publication in special issues of IEEE Technology and Society Magazine and IEEE Consumer Electronics Magazine.

**Symposium**

**Networking Dinner, 11 November**

A Networking Dinner will take place on 11 November. It is necessary for delegates to pre-register for the dinner by 03 November due to limited places.

Delegates must have pre-booked participation as there is a fixed capacity. All confirmed delegates must wear their conference badge as identification to participate in the Dinner. As there is already a Waiting List, please let the Secretariat know as soon as possible if you will not be able to attend. Dress code – Business Casual.

**Security, Health and Safety**

Please wear your name badge for all IEEE ISTAS activities, as it is your identification and allows you access to the facilities on offer. All delegates should take care of bags, personal computers, tablets, phones and other personal belongings at all times.

The organisers cannot accept any responsibility for losses incurred or for personal health and safety. Delegates should ensure they have personal health insurance and take due care when exploring Malahide and Dublin. Any special needs or requirements should be notified to the Conference Secretariat as far in advance of the event as possible.

**Hotel Accommodation**

Delegates can book accommodation in the Grand Hotel, Malahide, County Dublin at discounted rates through online registration for IEEE ISTAS 2015.

The Grand Hotel Malahide is one of the finest Four Star Hotels in County Dublin, with beautiful rooms (many with sea views), excellent conference, dining and fitness facilities.

Delegates are strongly recommended to book their accommodation early as it will be allocated on a first-paid basis. Hotel accommodation can only be confirmed upon receipt of the associated payment. For further information, please visit: www.ISTAS2015.org

**Malahide**

Malahide is a pretty heritage village founded in the 12th century and located by the sea, 16 kms north of Dublin City. It is located close to the M50 and Dublin airport with good rail and bus links.

Local places to visit include Malahide Castle and Gardens, Avoca Shop and Café, Malahide Marina.

There are also a good mix of restaurants and pubs close to the Grand Hotel.

**Transport**

It is possible to get either a taxi (c €15 and 20 mins) or Bus 102 (cheaper but with a longer transit time) directly from Dublin Airport to Malahide.

From Dublin City Centre, it is convenient to use the DART light rail system to get to Malahide Village.

**Sponsors**

IEEE ISTAS 2015 offers a variety of Sponsorship Opportunities to enhance your organisation’s image and standing.

Support organisations include IEEE Humanitarian AdHoc Committee and Conference Ireland.

For more information, please visit www.istas2015.org and contact secretariat@istas2015.org

**Visas for Ireland**

Please visit INIS to determine if you require a visa to visit Ireland - www.inis.gov.ie/en/INIS/Pages/Irish%20Visa%20Information

If based on the nationality of your passport you determine that you do require a visa, please note that due to the number of visas being processed, it is a requirement to apply at least three months in advance of the conference start date.

To review the process to apply for a Conference/Event Visa - www.inis.gov.ie/en/INIS/Pages/Conference%20or%20Event%20Visa

Visa fees and visa fee exemptions is outlined at www.inis.gov.ie/en/INIS/Pages/fees

Please complete your application on the INIS website and then follow up with the Irish Embassy in your country to submit the necessary documents.

You should also ensure that you have an invitation letter, proof of accommodation and other supporting documents available in case they are requested by immigration officials on arrival in Ireland.

Please note that Letters of Invitation can only be issued following online registration and receipt of the relevant conference fee. If you have any questions, please contact secretariat@istas2015.org
Plenary Speakers as at 03 November 2015 include:

- President of Ireland, Michael D Higgins
- Androulla Kaminara, Principal Advisor and Head of Task Force Knowledge, Performance & Results, DG DEVCO, European Commission
- Dr Greg Adamson (IEEE SSIT President), University of Melbourne, Australia
- Gordon Day, 2012 President, IEEE, USA
- Prof. Linda Hogan, Vice-Provost, Trinity College Dublin, Ireland
- Prof. Ron Arkin, Mobile Robot Laboratory, Georgia Institute of Technology, USA
- Prof. Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa
- Diane Whitehouse, Chair, IFIP TC9 - ICT and Society, UK
- Prof. Jaafar Elmirghani, University of Leeds, UK
- Louise Krug, Senior Researcher, BT plc, UK
- Charlie Sheridan, Director IoT Systems Research Lab, Intel Labs
- Prof. Robert Shorten, IBM Research, Ireland

International Programme Committee

A distinguished International Programme Committee (IPC) has been formed to review and provide feedback on papers and presentations, and chair sessions.

The IEEE ISTAS 2015 IPC includes:

- Paul Cunningham (Conference Chair), IIMC / IST-Africa, Ireland
- Dr Greg Adamson (SSIT President), University of Melbourne, Australia
- Dr Christopher Brewster, Aston University, UK
- Dr Maaruf Ali, University of East London, UK
- Satish Babu, International Centre for Free and Open Source Software (ICFOSS), India
- Assoc. Prof. Alejandra Boni, Universitat Politecnica de Valencia, Spain
- Dr. Carlos Calafate, Universitat Politècnica de Valencia, Spain
- Dr. Peter Corcoran, National University of Ireland, Galway
- Miriam Cunningham, IIMC International Information Management Corporation Ltd, Ireland
- Prof. Peter Excel, Glyndwr University, UK
- Dr Farank Fotouhi, University of Oum, Iran
- Prof. Ken Foster, University of Pennsylvania, USA
- Adj. Prof. Phil Hall, University of Melbourne, Australia
- Arnold Hensman, Institute of Technology, Blanchardstown, Ireland
- Dr Silvia Hostettler, Ecole Polytechnique Fédérale de Lausanne, Switzerland
- Steve Jubb, University of Sheffield, UK
- Prof. Laetus Lategan, Central University of Technology, South Africa
- Dr Pietro Manzoni, Universitat Politècnica de Valencia, Spain
- Prof. Balaji Parthasarathy, International Institute of Information Technology (Bangalore), India
- Dr. Agusti Pérez-Foguet, Universitat Politècnica de Catalunya, Spain
- Dr Andrew Power, Institute of Art and Design, Technology, Ireland
- Prof. Steve B Sawyer, Syracuse University, USA
- Dr Siraj Shaikh, University of Coventry, UK
- Dr Manuel Sierra-Castaner, Universidad Politècnica de Madrid, Spain
- Assoc Prof. Andrew Stranieri, Federation University Australia
- Dr Behnam Taebi, Delft University of Technology / Harvard University
- Prof. Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa
- Prof. Lav Varshney, University of Illinois at Urbana-Champaign, USA
- Diane Whitehouse, IFIP TC9 - ICT and Society, UK
- Dr Jane Zheng, University of Ulster Jordanstown, Northern Ireland

IEEE ISTAS 2015 Advisory Group

- Dr Greg Adamson, SSIT President
- Adj Prof. Phil Hall, University of Melbourne, Australia
- Laura Jacob, SSIT Past President
- Dr Elva Joffe, IEEE ISTAS 2014 Chair
- Dr Rob Reilly, IEEE Director (Region 6), USA
- Dr Lew Termann, IBM Research (Retired), USA

Conference Secretariat

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13 Docklands Innovation Park, 128 East Wall Road,
Dublin 3, Ireland
Tel: +353 (0) 1 8170607, Fax: +353 (0) 1 8170606
e-mail: secretariat@ISTAS2015.org
Wednesday, November 11, 2015

08:00 Registration

09:00 Opening Plenary 1a: Technology and Development
Chair: Paul Cunningham, IIMC, Ireland
Androulla Kaminara, Principal Advisor and Head of Task Force Knowledge, Performance & Results, DG DEVCO, European Commission
Gordon Day, 2012 President, IEEE
Dominic MacSorley, Chief Executive Officer, Concern Worldwide
Diane Whitehouse, Chair, IFIP TC9 - ICT and Society, UK
Prof. Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa

10:30 Plenary 2a: Official Opening Address
President of Ireland, Michael D. Higgins

11:00 Coffee Break

11:30 Session 3a: ICT4D and Humanitarian Engineering
Chair: Diane Whitehouse, IFIP TC9 - ICT and Society, United Kingdom
The Ethical Limits of Bungee Research in ICTD
Andy Dearden, Sheffield Hallam University, United Kingdom
The Potential Development Impact of Mobile Application Vendors in Developing Countries
Sami Hyrynsalmi, University of Turku, Finland
Mobile Cloud Computing for Disaster Emergency Operation: A Systematic Review
Teuku Aulia Geumpana, The University of New South Wales, Australia
ICT Interventions for Socio-Economic Development – A Practitioner’s View
Alida Veldsman, Nelson Mandela Metropolitan University, South Africa
Innovative Stove Design Delivers Local and Global Impact
John Weakliam, Vita, Ireland

11:30 Session 3b: Impact of Consumer Electronics
Chair: Peter Corcoran, National University of Ireland, Galway, Ireland
Biometric Technology and Smartphones - A consideration of the practicalities of a broad adoption of biometrics and the likely impacts
Peter Corcoran, National University of Ireland, Galway, Ireland
Study on Content Rating and Security Permissions of Mobile Applications in Google Play
Marius Marcu, Politehnica University of Timisoara, Romania
Pocket Psychopaths - An Anthropomorphic Intentional Stance to Facilitate Moral Intuitions about (Consumer) Technology
Wilhelm E. J. Klein, City University of Hong Kong, Hong Kong
New Technologies and Mixed-use Convergence - How Humans and Algorithms are Adapting to Each Other
Michael Fischer, University of Kent, United Kingdom

11:30 Session 3c Privacy & Security Issues
Chair: Greg Adamson, University of Melbourne, Australia
Iris Recognition on Consumer Devices – Challenges and Progress
Shejin Thavalengal, National University of Ireland Galway, Ireland
Palm-print Recognition for Authentication on Smartphones
Hossein Javidnia, National University of Ireland, Galway, Ireland
Modelling Cyber Security Governance Maturity
Rossouw de Bruin, University of Johannesburg, South Africa

13:00 Lunch

14:00 Workshop 4a: IST-Africa - Supporting Research Collaboration with Africa
Chair: Paul Cunningham, IIMC, Ireland
Overview of African Research Priorities and Research Capacity
Paul Cunningham, IST-Africa / IIMC, Ireland
Opportunities for Cooperation with Africa under Horizon 2020
Miriam Cunningham, IST-Africa / IIMC, Ireland
Insights into Open Innovation and ICT Entrepreneurship in Africa
Paul Cunningham, IIMC / IST-Africa / DSV, Stockholm University, Ireland
mHealth4Afrika
Miriam Cunningham, IST-Africa / IIMC, Ireland

14:00 Session 4b: Professional & Research Ethics in STEM
Chair: Katina Michael, University of Wollongong, Australia
Ethical Challenges for Future Technologists: The Growing Role of Technology and the Growing Ethical Responsibility of the Technologist
Greg Adamson, University of Melbourne, Australia
A Critical Realist Approach to Engineering Ethics
Eddie Conlon, Dublin Institute of Technology, Ireland
A Snapshot of the Subject Matter of Computing Ethics
Brian Hall, Champlain College, United States
Society enters a Science Curriculum
Penelope Engel-Hills, Cape Peninsula University of Technology, South Africa
Toward Meaningful Human Control of Autonomous Weapons Systems Through Function Allocation
Marc Canellas, Georgia Institute of Technology, United States

15:30 Coffee Break

16:00 Plenary 5a: Plenary II - Professional and Research Ethics in Science and Technology
Chair: Paul Cunningham, IIMC, Ireland
Dr Greg Adamson (SSIT President), University of Melbourne, Australia
Prof. Ron Arkin, Mobile Robot Laboratory, Georgia Institute of Technology, USA
Prof. Linda Hogan, Trinity College Dublin, Ireland

17:30 End of Parallel Sessions
Thursday, November 12, 2015

09:00 Session 6a: eHealth I
Chair: Diane Whitehouse, IFIP TC9 - ICT and Society, United Kingdom
Towards a Model for Enhancing ICT4 Development and Information Security in Healthcare System
Kehinde Kayode Agbele, Elizade University, Nigeria
Cloud Computing and Mobile Devices Based System for Healthcare Application
Hanen Jernal, ENIS, Tunisia
“CHN on the GO” A Motivational Tool for Rural Health Workers in Ghana
Jahera Otieno, Concern Worldwide, United States
Applying “Big Data” and Business Intelligence Insights to Improving Clinical Care for Cancer
John Lewis, University of New South Wales, Australia
Mobile Communication Tools for the Reduction of Secondhand Smoke in Public Places: Russian Public Health Programs using mHealth
Sergei Frolov, Health and Development Foundation, Russian Federation

09:00 Session 6b: Technological Forecasting I
Chair: Greg Adamson, University of Melbourne, Australia
The Future of Computing – the Implications for Society of Technology Developments, Technology Forecasting, and the Kurzweil Singularity
Peter Excell, Glyndwr University, United Kingdom
Driving the Self-Driving Vehicle: Expanding the Technological Design Horizon
Pascal-Louise Blyth, Aalto University, Finland
Forming an Ethical Paradigm for Morally Sentient Robots: Sentience is Not Necessary for Evil
Grant Tucker, Oklahoma Christian University, United States
Towards Uniformity for Smart Glasses Devices: An Assessment of Function as the Driver for Standardisation
Stuart Elder, Cork Institute Of Technology, Ireland
Development of the Fynbos Leaf Optical Recognition Application (FLORA)
Simon Winberg, University of Cape Town, South Africa

09:00 Session 6c: Technology-enhanced Learning
Chair: Alida Veldsman, Nelson Mandela Metropolitan University, South Africa
Factors Impacting on Adoption of Technology-enhanced Learning Techniques by Universities in Nairobi, Kenya
Miriam Cunningham, IMC / DSV, Stockholm University, Ireland
Improving Knowledge Worker Efficiency
Frank Gleeson, University College Dublin, Ireland
Community Engaged Scholarship: A Cyber Safety Awareness Project in South Africa
Elmarie Kritzinger, Unisa, South Africa
Empirical Findings: The use of Robotics to Engage the Youth from Lower-Socio Economic areas
Oluwadara Asinobi, Ulster University, United Kingdom

11:00 Session 7a: eHealth II
Chair: Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa
Exploring the Mismatch Between Mobile Phone Adoption and Use Through Survey Data From Rural India and China
Marco Haenssgen, University of Oxford, United Kingdom
A Falls Detection System for the Elderly Based on a WSN
Arnoldo Diaz-Ramirez, SEP/Istituto Tecnologico de Mexico, Mexico
A Semi-Automated Food Voting Classification System: Combining User Interaction and Support Vector Machines
Patrick McAllister, Ulster University, United Kingdom
Maker Movement for MNCH, A Model of Building Low Cost, High Quality Medical Devices Locally in Kenya
Edwin Maina, Concern Worldwide Kenya, Kenya

11:00 Session 7b: Technological Forecasting II
Chair: Peter Excell, Glyndwr University, United Kingdom
Vision for Secure Home Robots: Implementations of two-factor authentication
Dhvanik Miglani, Institute of Technology, Blanchardstown, Ireland
Challenges of Implementing a Social Prescription Service in the Clinic: Social Prescribing in the LAMP Project
Chris Soraghan, St James’s Hospital, Ireland
Making the UCWW a Reality
Ivan Ganchev, University of Limerick (UL), Ireland

11:00 Session 7c: Cloud Computing / IoT
Chair: Steve Jubb, University of Sheffield, United Kingdom
The Cloud Afterlife: Managing your Digital Legacy
Cathryn Peoples, Ulster University, United Kingdom
Subcutaneous Body Area Networks - A SWOT analysis
Philip Catherwood, Ulster University, United Kingdom
The Internet of Things and its Impact on Social Relationships of Mutual Trust
Guiou Kobayashi, Federal University of ABC, Brazil
i4Toys: Video technology in toys for improved access to play, entertainment, and education
Enrique García, University College Cork, Ireland
Open Standards in IoT, Society and Policy Setting Implications
Zeta Dooly, Waterford Institute of Technology, Ireland

12:30 Lunch

14:00 Session 8a: Smart Cities
Chair: Steve Jubb, University of Sheffield, United Kingdom
A Practise-based Theory of SEIDET Smart Community Centre Model
Innocentia Zama Dlamini, CSIR, South Africa
Towards a Citizen Actuation Framework for Smart Environments
David Crowley, Institute of Technology, Tralee, Ireland
Real-Time Ethics - A Technology Enabled Paradigm of Everyday Ethics in Smart Cities
Philip T. Wood, University of South Australia, Australia
UCWW Semantic-Based Service Recommendation Framework
Haiyang Zhang, University of Limerick, Ireland

14:00 Session 8b: Technology and Development Policy Issues
Chair: Lewis Terman, IEEE, United States
Biometrics in Social Grants: Separating Myth from Reality
Darelle Van Greunen, Nelson Mandela Metropolitan University, South Africa
Supporting a Culture of Innovation at a new University of Technology
Christine Winberg, Cape Peninsula University of Technology, South Africa
To What Extent has Human Thought and Personality become Encapsulated by Technology-Related Activity?
Tony Partridge, Institute of Technology, Sligo, Ireland

10:30 Coffee Break
A Review of the Policy Documents behind South Africa’s Renewable Energy Independent Power Producer Procurement Programme
Lynette Herbst, University of Pretoria, South Africa
Supply System’s Technology Configuration as a Contributor to End-User Vulnerability
Katina Michael, University of Wollongong, Australia

14:00 Session 8c: eAgriculture/mAgriculture
Chair: Paul Cunningham, IIMC, Ireland
mAgriculture among Pastoralist Communities: A Case of Livestock farmers in Kenyan Arid and Semi-Arid Lands
Amos Gichamba, Africa Nazarene University, Kenya
ICT supported Extension Services in Conservation Agriculture Information Access for Small Holder Farmers in Laikipia County, Kenya
Janet Achora, Makerere University Kampala- Uganda, Kenya
Agricultural Information Delivery Mechanism Using ICT: A Case Study from Kerala, India
Shely Koshy, Kerala Agricultural University, India

15:30 Coffee Break
16:00 Closing Plenary 9a: Future Internet and Smart Cities
Chair: Kerry Hinton, University of Melbourne, Australia
Prof. Jaafar Elmighani, Co-Chair IEEE Green ICT Initiative, University of Leeds, UK
Louise Krug, Senior Researcher, BT plc, UK
Charlie Sheridan, Director IoT Systems Research Lab, Intel Labs
Prof. Robert Shorten, IBM Research, Ireland

17:30 Best Paper Award

Registration Information
It is necessary for all IEEE ISTAS 2015 delegates to register separately online.

Conference Fees

Delegates’ Fees - Early Bird until 31 August
- Early Bird - Student Developing Countries €150
- Early Bird - IEEE Student or Life Members €250
- Early Bird - Non-IEEE Student €275
- Early Bird - Developing Countries €300
- Early Bird - IEEE Member €400
- Early Bird - Non-IEEE Member €500

Delegates’ Fees - Full Fee from 1 September
- Student Developing Countries €250
- IEEE Student or Life Member €350
- IEEE Student €375
- Developing Countries €400
- IEEE Member €500
- Non-IEEE Member €600

The Conference Fee includes:
- Entrance to all plenary and parallel sessions
- Documentation with proceedings on Memory Key
- Daily lunch and refreshments at morning and afternoon breaks

Student and IEEE Fees
Before completing registration, you must send an email with a copy of your 2015 student (undergraduate, Masters, PhD Candidate) or IEEE/IFIP TC9 membership card to secretariat@istas2015.org. The appropriate fee will then be set against your online profile to allow you to complete registration.

Terms & Conditions
1. All authors who are presenting a paper at IEEE ISTAS 2015 must complete payment registration by 16 August at the latest, prior to publication of the Final Programme.
2. In the case where a paper is jointly authored, the presenter of the paper is considered to be the author/presenter from a payment registration point of view. All co-authors are considered to be delegates.
3. Each presenter will present one paper in the Programme.
4. Delegates’ fees must be paid before admission to the Conference.
5. IEEE and IFIP TC9 Members are entitled to apply for a 10% discount on the appropriate fee. Please provide the Membership No. as part of online registration and email a copy of valid Membership card to secretariat@istas2015.org.
6. There are no refunds for cancellations but substitutions may be made at any time prior to the event by contacting the Conference Secretariat - secretariat@istas2015.org.
7. Each individual must be registered separately on the IEEE ISTAS Conference portal.
8. Payment may be made by bank transfer or credit card (with some restrictions). Payments made by bank transfer must be net of any bank charges and the payment instruction should refer to “IEEE ISTAS 2015”, your name, organisation and invoice number (if relevant).
9. Receipts are automatically issued electronically upon receipt of payment. If your organisation requires an invoice to process payment registration by bank transfer, please contact the Conference Secretariat.
10. Conference registration or hotel accommodation is not confirmed until full payment is received.
11. Letters of invitation can only be issued following delegate registration online and receipt of payment.