

**12th International Conference on  
Global Security,  
Safety and Sustainability  
(ICGS3-2019)**

Hosted by: Northumbria University and QAHE

Date: 16 - 18 January 2019

Venue: Northumbria University London Campus

## **‘The age of AI, Blockchain and Internet of Everything’**

### **Foreword**

This Annual International Conference is an established platform in which security, safety and sustainability issues can be examined from several global perspectives through dialogue between academics, students, government representatives, chief executives, security professionals, and research scientists from the United Kingdom and from around the globe.

The three day conference will focus on the challenges of complexity, rapid pace of change and risk/opportunity issues associated with modern products, systems, special events and infrastructures. As Governments, corporations, security firms, and individuals look to tomorrow’s challenges of cyber security in ‘The age of AI, Blockchain and Internet of Everything’ conference provides a reference point for experts and for a forward thinking analyst at a time when the debate over how we plan for the cyber-security of the future has become a leading concern.

The conference provides an opportunity for systems scientists, assurance researchers, owners, operators and maintainers of large, complex and advanced systems and infrastructures to update their knowledge with the state of best practice in these challenging domains whilst networking with the leading researchers and solution providers. With an understanding of these motives, researchers, governments and practitioners can take the effective measures to tackle cybercrime and reduce victimization.

ICGS3-19 has received paper submissions from more than 20 different countries in all continents. Only 30 papers have been selected for presentation as full papers with 25 poster presentations. The programme also includes 6 keynote lectures by leading government representatives, researchers and security professionals.

Professor Hamid Jahankhani  
ICGS3-19 General Chair  
January 2019

# Conference Committee

## General Chair:

**Professor Hamid Jahankhani, UK**

hamid.jahankhani@northumbria.ac.uk

## Steering Committee

Professor Bobby Tait, University of South Africa, South Africa

Amie Taal, Stratagem Tech Solutions Ltd, UK

Professor Ali Hessami, Director Vega Systems, UK

Professor Sérgio Tenreiro de Magalhães, Catholic Univ. of Portugal, Braga, Portugal

Dr Arshad Jamal, QAHE and Northumbria University London, UK

Dr Mathews Z. Nkhoma, RMIT International University Vietnam, Ho Chi Minh City, Vietnam

Professor Babak Akhgar, Director of CENTRIC, Sheffield Hallam University, UK

Dr Amin Hosseinian-Far, University of Northampton, UK

Professor Gianluigi Me, Luiss University, Italy

Professor Vitor Sa, University of Minho, Braga, Portugal

Professor Antonio Mauro, Head of Security and Compliance Assurance, Octo Telematics S.p.A., Italy

Professor Mohammad Dastbaz, Deputy Vice-Chancellor, University of Suffolk, UK

Dr John McCarthy, Director, Oxford Systems, UK

## Programme Committee

Dr Christos Douligeris, University of Piraeus, Greece

Professor Orhan Gemikonakl, Middlesex University, UK

Dr Omar S. Arabiat, Balqa Applied University, Jordan

Mr Konstantinos Kardaras, Technical Consultant, Greece

Dr Chafika Benzaid, Computer Security Division, CERIST, University of Sciences and Technology Houari Boumediene, Algeria

Professor Bobby Tait, University of South Africa, South Africa

Dr Fouad Khelifi, Northumbria University, UK

Dr Graham Sexton, Northumbria University, UK

Dr Kenneth Revett, University of Maryland College Park, Massachusetts, USA

Dr Ken Dick, Nebraska University Centre for Information Assurance, USA

Dr Elias Pimenidis, University of West of England, UK

Professor Henrique M.D. Santos, University of Minho, Portugal

Professor Alexander Sideridis, Agricultural University of Athens, Greece

Mr Ray Brown, QAHE and Northumbria University, UK

Professor Murdoch Watney, University of Johannesburg, South Africa

Dr Mamoun Alazab, Macquarie University, Australia

Dr Gregory Epiphaniou, Commercial Director, Wolverhampton Cyber Research Institute (WCRI), University of Wolverhampton, UK

Dr Haider Alkhateeb, Wolverhampton Cyber Research Institute (WCRI), University of Wolverhampton, UK

Dr Carlisle George, Middlesex University, UK

Professor Gianluigi Me, University of Rome LUISS “Guido Carli”, Italy

Professor Antonio Mauro, Head of Security and Compliance Assurance, Octo Telematics S.p.A., Italy

Dr John McCarthy, Director, Oxford Systems, UK

Dr Ameer Al -Nemrat, University of East London, UK

Mrs Sukhvinder Hara, Middlesex University, UK

Dr Ian Mitchell, Middlesex University, UK

Professor Ahmed Bouridane, Northumbria University, UK

Dr Amin Hosseinian-Far, University of Northampton, UK

Dr Reza Montasari, Birmingham City University, UK

Mr Ayman Ayman El Hajjar, QAHE and Northumbria University, UK

Dr George Weir, University of Strathclyde, UK

Dr Sufian Yousef, Anglia Ruskin University, UK

Professor Richard Hill, Huddersfield University, UK

Dr Alireza Daneshkhah, Coventry University, UK

Dr Maryam Farsi, Cranfield University, UK

Mr Usman Butt, QAHE and Northumbria University, UK

Asim Majeed, QAHE and Roehampton University, UK

**Poster General Chair:**

**Professor Bobby Tait, South Africa**

**Poster Session Steering Committee**

Dr Amin Hosseinian-Far, University of Northampton, UK

Dr Ian Mitchell, Middlesex University, UK

Dr Reza Montasari, Birmingham City University, UK

Dr Mathews Z. Nkhoma, RMIT International University Vietnam, Ho Chi Minh City, Vietnam

Stefan Kendzierskyj, Northumbria University, UK

## Wednesday 16<sup>th</sup> January 2019

### Keynotes and Poster session

<b>Registration</b>	From 9:30am and we would appreciate you registering as early as possible so we can start promptly at 10:30am
<b>10:30 – 13:00</b>	
<b>Poster Session</b>	
<b>Afternoon session</b>	
<b>Keynotes</b>	
<b>Opening Session</b>	<b>Overview and welcome</b> Professor Hamid Jahankhani, General Chair of ICGS3
<b>Keynote address 1</b>	<b>Title: AI, Binary Arithmetic, Radicalisation and Reaction</b> Lord Carlile of Berriew, CBE, QC, FRSA
<b>Chaired by</b>	<b>Title: Securing Business Intelligence for the Industrial Internet of Things</b> Professor Richard Hill, Huddersfield University, UK
<b>13:30 - 15:30</b>	<b>Title: User Fortified Defence - the Use of Psychometrics in Human Vulnerability Assessments</b> Berta Papp-Silva, CEO and Co-Founder, The CyberFish Cyberpsychology Solutions, UK
	<b>Prof. Babak Akhgar, Director, Centre of Excellence in Terrorism, Resilience, Intelligence and Organised Crime Research (CENTRIC), UK</b>
<b>15:30 - 16:00</b>	<b>Afternoon Tea Break</b>
<b>Opening Session</b>	<b>Title: AI in the Battlespace for Maritime Force Defence</b> Aaron Parker – Maritime Systems Architect at Lockheed Martin, Portsmouth, UK
<b>Keynote address 2</b>	<b>Title: Technology Disruptions or Distractions: The State of Cyber Security Today</b> Amie Taal, Stratagem Tech Solutions Ltd, UK
<b>Chaired by</b>	<b>Title: Ethics, the next frontier for Global Security, Safety &amp; Sustainability</b> Prof. A G Hessami, Director, Vega Systems, London, UK
<b>Dr Gordon Bowen</b>	
<b>16:00 - 17:30</b>	
<b>17:30 – 19:30</b>	<b>Drinks Reception</b> <b>Overview Presentation</b>  Northumbria University London 110 Middlesex Street, London, E1 7HT, UK

**Thursday 17<sup>th</sup> January 2017**  
**Morning Session**

<b>Registration</b>	<b>From 9:00am and we would appreciate you registering as early as possible so we can start promptly at 9:30am</b>
<b>Session 1</b> <b>9:30-10:00</b>  <b>Chaired by</b>  <b>Dr Ian Mitchell</b>  <b>9:30 - 11:00</b>	<b>Title: Next-Generation Digital Forensics: Challenges and Future Paradigms</b> Reza Montasari, Richard Hill  <b>Title: Secure Social Media Spaces for Communities of Vulnerable People</b> Elias Pimenidis, Nikolaos Polatidis  <b>Title: The Role of Blockchain in Supporting Critical National Infrastructure</b> Stefan Kendzierskyj, Hamid Jahankhani  <b>Title: Hidden Protocol Strengthening with Random Sentences as Cryptographic Nonces</b> Martin J. Tunncliffe, Omega Obinna, Eckhard Pfluegel
<b>11:00 - 11:30</b>	<b>Morning Coffee Break</b>
<b>Session 2</b>  <b>Chaired by</b>  <b>Dr Reza Montasari</b>  <b>11:30 - 13:00</b>	<b>Title: Study of the means of online payment in the Portuguese population</b> Nuno Castro, Vítor J. Sá, Maria José Magalhães, Henrique Santos  <b>Title: Ransomware Impact to SCADA Systems and its Scope to Critical Infrastructure</b> Jaime Ibarra, Usman Javed Butt, Anh Do, Hamid Jahankhani, Arshad Jamal  <b>Title: Circle Of Trust: a high volume, energy efficient, stake blind and high attack tolerant Blockchain Consensus Protocol</b> Rahul Ravindran  <b>Title: dAppER : Decentralised Application for Examination Review</b> Ian Mitchell, Sukhvinder Hara and M. Sheriff
<b>13:00 – 14:00</b>	<b>Lunch</b>

**Thursday 17<sup>th</sup> January 2019**  
**Afternoon sessions**

<p><b>Session 3</b></p> <p><b>Chaired by</b></p> <p><b>Dr Daniel Hagan</b></p> <p><b>14.00 – 15:30</b></p>	<p><b>Title: Identifying Vulnerabilities Using Internet-wide Scanning Data</b> Jamie O'Hare, Rich Macfarlane, Owen Lo</p> <p><b>Title: The Effect of Nodes Density on Real Time Traffic in Mobile Ad Hoc Network</b> Firas Hazzaa, Sufian Yousef, Nada H. Ali, Erika Sanchez</p> <p><b>Title: Comparative Analysis of a Deep Convolutional Neural Network for Source Camera Identification</b> Farah Ahmed, Fouad Khelifi, Ashref Lawgaly, Ahmed Bouridane</p> <p><b>Title: AutoEncoded Domains with Mean Activation for DGA Botnet Detection</b> Binay Dahal, Yoohwan Kim</p>
<p><b>15:30 - 16:00</b></p>	<p><b>Afternoon Tea Break</b></p>
<p><b>Session 4</b></p> <p><b>Chaired by</b></p> <p><b>Professor Sérgio Tenreiro de Magalhães</b></p> <p><b>16:00 – 17:45</b></p>	<p><b>Title: A Study of the UK Undergraduate Computer Science Curriculum: A Vision of Cybersecurity</b> Rodrigo Ruiz</p> <p><b>Title: Security Perceptions in Cloud-based e-Government Services: Integration between Citizens' and IT-staff Perspectives</b> Abeer Alkhwaldi, Mumtaz Kamala, Rami Qahwaji</p> <p><b>Title: Federated Blockchain-based Tracking and Liability Attribution Framework for Employees and Cyber-Physical Objects in a Smart Workplace</b> Gabriela Ahmadi-Assalemi, Haider Al-Khateeb, Gregory Epiphaniou, Jon Cosson, Prashant Pillai</p> <p><b>Title: Hacking NHS Pacemakers: How feasible is it?</b> Jake L Beavers</p>
<p><b>Banquet 19:00 - 22:00</b></p>	

**Friday 18<sup>th</sup> January 2019**  
**Morning sessions**

<b>Registration</b>	<b>From 9:00am and we would appreciate you registering as early as possible so we can start promptly at 9:30am</b>
<b>Session 5</b>  <b>Chaired by</b>  <b>Professor Bobby L. Tait</b>  <b>9:30 - 11:00</b>	<p><b>Title: Security and Privacy Issues for Business Intelligence In IOT</b> Mohan Krishna Kagita</p> <p><b>Title: Cybersecurity and law in Israel – a case study Who will guard the guards themselves?</b> Joseph Zernik</p> <p><b>Title: Ransomware threat and its impact on SCADA</b> Usman Javed Butt, Maysam Abbod, Anzor Lors, Arshad Jamal, Arvind Kumar</p> <p><b>Title: Group-Based Key Exchange for Medical IoT Device-to-Device Communication (D2D) Combining Secret Sharing and Physical Layer Key Exchange</b> Uzma Mustafa and Nada Philip</p>
<b>11:00 - 11:30</b>	<b>Morning Coffee Break</b>
<b>Session 6</b>  <b>Chaired by</b>  <b>Dr Arshad Jamal</b>  <b>11:30 - 13:00</b>	<p><b>Title: Trends in General Interest in Biometric Technologies</b> Sérgio Tenreiro de Magalhães</p> <p><b>Title: eHealth: Challenges for Integrating Blockchain within Healthcare</b> Tariq Abdullah, Andrew Jones</p> <p><b>Title: A Study on Keyword Analytics as a precursor to Machine Learning to Evaluate Radicalisation on Social Media</b> Nishan Chelvachandran, Hamid Jahankhani</p> <p><b>Title: Encryption of Images file using a User controlled Automatically-generated Key</b> Halima Abdul halime Shnishah, David Mulvaney</p>
<b>13:00 – 14:00</b>	<b>Lunch</b>



**Friday 18<sup>th</sup> January 2019****Afternoon sessions**

<p><b>Session</b></p> <p><b>Chaired by</b></p> <p><b>Professor Vítor J. Sá</b></p> <p><b>14:00 - 15:30</b></p>	<p><b>Title: Behavioural biometrics authentication tested using EyeWriter technology</b> Bobby L. Tait</p> <p><b>Title: Can Future smart cities powered by 100% renewables and made cyber secured-A Analytical Approach</b> Mohamed Shaik Honnurvali, Naren Gupta, Keng Goh, Tariq Umar, Adnan Kabbani, Needa Nazeema</p> <p><b>Title: A Novel Privacy Framework for Secure M-health Applications: The Case of the GDPR</b> Uzma Mustafa, Eckhard Pflugel and Nada Philip, Title: Facial</p> <p><b>Title: An investigation of using classification techniques in prediction of type of targets in Cyber attacks</b> Sina Pournouri, Shahrzad Zargari, Babak Akhgar</p>
<p><b>15:30 - 16:00</b></p>	<p><b>Afternoon Tea Break</b></p>
<p><b>Session 2</b></p> <p><b>Chaired by</b></p> <p><b>Usman Javed Butt</b></p> <p><b>16:00 – 17:00</b></p>	<p><b>Title: A Comparative Study of Machine Learning Approaches for Handwriter Identification</b> Amal Durou, Ibrahim Aref, Mosa Elbendak, Somaya Al-Maadeed, Ahmed Bouridane</p> <p><b>Title: AdPExT: Designing a Tool to Assess Information Gleaned from Browsers by Online Advertising Platforms</b> Joseph Waldu Woensdregt, Haider M. al-Khateeb Gregory Epiphaniou, Hamid Jahankhani</p> <p><b>Title: The Internet of Things: Implications for Consumer Privacy &amp; Security</b> Sherese Bishop</p>
<p><b>17:00pm – 17:30pm</b></p>	<p><b>Closing Session</b></p> <p>Professor Hamid Jahankhani ICGS3 General Chair</p>

## **Poster Presentation lists**

### **A Conceptual Model to Predict Social Engineering Victims**

**Samar Muslah Albladi, George R S Weir, University of Strathclyde, UK**

### **Blockchain as a Tool for Financial Transparency in Development Aid**

**Anita Collins, Northumbria University London**

### **A Novel Framework for Identification of Critical Business Processes**

**Yousuf AlBlooshi, Amin Hosseinian-Far, University of Northampton, UK**

### **An examination into the level of training, education and awareness among officers in tackling cybercrime within the Metropolitan Police Service**

**Homan Forouzan, Northumbria University London**

### **Categorization of Threats and their Impacts on Critical National Infrastructure Systems**

**Anh Do, Northumbria University London**

### **Taxonomy of Threat Categorization and Threat Intelligence Platform**

**Ahuokpeme Chibueze Brendan, Northumbria University London**

### **Investigating Data Exfiltration in DNS over HTTPS Queries**

**David A E Haddon, Northumbria University London**

### **Practical Cybersecurity for Digital Trains**

**George Copeland, Northumbria University London**

### **“Privacy by Design” Governance Framework to Achieve Privacy Assurance of Personal Health Information (PHI) Processed by IoT-based Telemedicine Devices and Applications Within Healthcare Services**

**Jaime Ibarra Jimenez, Northumbria University London, UK**

### **Email Verification Fake or Genuine?**

**William Jahankhani, Liang Chen, University of West London, UK**

### **BRT – (Blockchain Relevance Theory): A Theoretical Framework for Blockchain & DLT in Cyber Security using CISv7 Controls.**

**Bharat Many, Northumbria University, London**

### **Data Mining Metrics to Identify and Evaluate Potential Radicalisation Through Social Media**

**Nishan Chelvachandran, Northumbria University London**

### **Web Accessibility Adoption Framework (WAAF) for Businesses and Web Professionals**

**Asifa Shad, Tariq Abdullah and Usman Butt, Northumbria University London**

### **Hybrid Cybersecurity Framework for the Internet of Medical Things (IoMT)**

**Danisa Nkomo, Northumbria University London**

**A Feasibility Study on Machine Learning Techniques for APT detection and protection in VANETs**

**Sergio de Abreu, Northumbria University London**

**FoRCE (Forensic Recovery of Cloud Evidence): A Digital Cloud Forensics Framework**

**Stephen S. SAMPANA, Northumbria University London**

**Blockchain as an Efficient and Alternative Mechanism for Strengthening and Securing the Privacy of Healthcare Patient and Clinical Research Data**

**Stefan Kendzierskyj Northumbria University London, UK**

**A Cybersecurity Threat Model for the Detection of a Ransomware Cyberweapon in a Networked Computing Environment**

**Thomas Welsh, Northumbria University London, UK**

**Preparing 11 – 17 years old girls to become cyber security experts in the future**

**Grace Adedotun-Ogundeji, Northumbria University London**

**An Investigatory Project on the Anonymity of Blockchain and Cryptocurrencies**

**Jacopo Semeraro, Northumbria University, UK**

**Ethical considerations of people with Autistic Spectrum Disorder**

**John Goldie, Northumbria University London**

**Management versus Technical Perspectives on Threats**

**Yvan da Silva Ramos, Northumbria University London**

**AI: the cyber-physical Project Manager and their digital twin**

**Liam Odell, Northumbria University London**

**An approach to identify risk based human behaviour profiling within an office environment**

**Jon Cosson, Northumbria University London**