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 Hosseini-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 16th January 2019**

**Keynotes and Poster session**

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<td>13:30 - 15:30</td>
<td>Professor Hamid Jahankhani, General Chair of ICGS3</td>
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<tr>
<td></td>
<td><strong>Title:</strong> AI, Binary Arithmetic, Radicalisation and Reaction</td>
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<td>Lord Carlile of Berriew, CBE, QC, FRSA</td>
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<td><strong>Title:</strong> Securing Business Intelligence for the Industrial Internet of Things</td>
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<td>Professor Richard Hill, Huddersfield University, UK</td>
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<td></td>
<td><strong>Title:</strong> User Fortified Defence - the Use of Psychometrics in Human Vulnerability Assessments</td>
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<td>Berta Papp-Silva, CEO and Co-Founder, The CyberFish Cyberpsychology Solutions, UK</td>
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<td></td>
<td>Prof. Babak Akhgar, Director, Centre of Excellence in Terrorism, Resilience, Intelligence and Organised Crime Research (CENTRIC), UK</td>
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<td>16:00 - 17:30</td>
<td>Dr Gordon Bowen</td>
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<td><strong>Title:</strong> AI in the Battlespace for Maritime Force Defence</td>
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<td>Aaron Parker – Maritime Systems Architect at Lockheed Martin, Portsmouth, UK</td>
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<td><strong>Title:</strong> Technology Disruptions or Distractions: The State of Cyber Security Today</td>
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<td>Amie Taal, Stratagem Tech Solutions Ltd, UK</td>
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<td><strong>Title:</strong> Ethics, the next frontier for Global Security, Safety &amp; Sustainability</td>
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<td>Prof. A G Hessami, Director, Vega Systems, London, UK</td>
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<td>17:30 – 19:30</td>
<td><strong>Drinks Reception</strong></td>
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<td><strong>Overview Presentation</strong></td>
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<td>Northumbria University London</td>
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## Thursday 17th January 2017
### Morning Session

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<td>9:00am</td>
<td>Registration: From 9:00am and we would appreciate you registering as early as possible so we can start promptly at 9:30am</td>
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<tr>
<td>9:30-10:00</td>
<td><strong>Session 1</strong>&lt;br&gt;Title: Next-Generation Digital Forensics: Challenges and Future Paradigms&lt;br&gt;Reza Montasari, Richard Hill</td>
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<td>Title: Secure Social Media Spaces for Communities of Vulnerable People&lt;br&gt;Elias Pimenidis, Nikolaos Polatidis</td>
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<td>Chaired by Dr Ian Mitchell&lt;br&gt;Title: The Role of Blockchain in Supporting Critical National Infrastructure&lt;br&gt;Stefan Kendzierskyj, Hamid Jahankhani</td>
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<td>Title: Hidden Protocol Strengthening with Random Sentences as Cryptographic Nonces&lt;br&gt;Martin J. Tunnicliffe, Ómego Obinna, Eckhard Pfluegel</td>
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<td>11:00-11:30</td>
<td>Morning Coffee Break</td>
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<td>11:30-13:00</td>
<td><strong>Session 2</strong>&lt;br&gt;Title: Study of the means of online payment in the Portuguese population&lt;br&gt;Nuno Castro, Vítor J. Sá, Maria José Magalhães, Henrique Santos</td>
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<td>Chaired by Dr Reza Montasari&lt;br&gt;Title: Ransomware Impact to SCADA Systems and its Scope to Critical Infrastructure&lt;br&gt;Jaime Ibarra, Usman Javed Butt, Anh Do, Hamid Jahankhani, Arshad Jamal</td>
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<td>Title: Circle Of Trust: a high volume, energy efficient, stake blind and high attack tolerant Blockchain Consensus Protocol&lt;br&gt;Rahul Ravindran</td>
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<td>Title: dAppER : Decentralised Application for Examination Review&lt;br&gt;Ian Mitchell, Sukhvinder Hara and M. Sheriff</td>
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<td>13:00 – 14:00</td>
<td>Lunch</td>
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Thursday 17th January 2019
Afternoon sessions

| Session 3 | Title: Identifying Vulnerabilities Using Internet-wide Scanning Data
|           | Jamie O’Hare, Rich Macfarlane, Owen Lo
| Chaired by | Title: The Effect of Nodes Density on Real Time Traffic in Mobile Ad Hoc Network
|           | Firas Hazzaa, Sufian Yousef, Nada H. Ali, Erika Sanchez
|           | Title: Comparative Analysis of a Deep Convolutional Neural Network for Source Camera Identification
|           | Farah Ahmed, Fouad Khelifi, Ashref Lawgaly, Ahmed Bouridane
|           | Title: AutoEncoded Domains with Mean Activation for DGA Botnet Detection
|           | Binay Dahal, Yoohwan Kim

15:30 - 16:00  Afternoon Tea Break

| Session 4 | Title: A Study of the UK Undergraduate Computer Science Curriculum: A Vision of Cybersecurity
|           | Rodrigo Ruiz
| Chaired by | Title: Security Perceptions in Cloud-based e-Government Services: Integration between Citizens’ and IT-staff Perspectives
|           | Abeer Alkhwaldi, Mumtaz Kamala, Rami Qahwaji
|           | Title: Federated Blockchain-based Tracking and Liability Attribution Framework for Employees and Cyber-Physical Objects in a Smart Workplace
|           | Gabriela Ahmadi-Assalemi, Haider Al-Khateeb, Gregory Epiphaniou, Jon Cosson, Prashant Pillai
|           | Title: Hacking NHS Pacemakers: How feasible is it?
|           | Jake L Beavers

Banquet 19:00 - 22:00
### Friday 18\textsuperscript{th} January 2019

**Morning sessions**

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<tr>
<td><strong>Session 5</strong></td>
<td><strong>Chaired by</strong> Professor Bobby L. Tait</td>
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<tr>
<td>Title: Security and Privacy Issues for Business Intelligence In IOT</td>
<td>Mohan Krishna Kagita</td>
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<td>Title: Cybersecurity and law in Israel – a case study Who will guard the guards themselves?</td>
<td>Joseph Zernik</td>
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<tr>
<td>Title: Ransomware threat and its impact on SCADA</td>
<td>Usman Javed Butt, Maysam Abbod, Anzor Lors, Arshad Jamal, Arvind Kumar</td>
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<td>9:30 - 11:00</td>
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<td>11:00 - 11:30</td>
<td>Morning Coffee Break</td>
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<td><strong>Session 6</strong></td>
<td><strong>Chaired by</strong> Dr Arshad Jamal</td>
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<tr>
<td>Title: Trends in General Interest in Biometric Technologies</td>
<td>Sérgio Tenreiro de Magalhães</td>
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<tr>
<td>Title: eHealth: Challenges for Integrating BlockChain within Healthcare</td>
<td>Tariq Abdullah, Andrew Jones</td>
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<td>Title: A Study on Keyword Analytics as a precursor to Machine Learning to Evaluate Radicalisation on Social Media</td>
<td>Nishan Chelvachandran, Hamid Jahankhani</td>
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<td>11:30 - 13:00</td>
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<td>Lunch</td>
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### Friday 18th January 2019
#### Afternoon sessions

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

Bharat Manya, 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