Programme for the

14th International Conference on

Cyber Warfare and Security

14th International Conference on Cyber Warfare and Security
ICCWS 2019
28 February - 1 March 2019
Stellenbosch Institute for Advanced Study (SIAS)
10 Marais Road, Mostertsdrift, Stellenbosch, 7600, South Africa

	Wednesday 27 February 2019
18:30	**Welcome Drinks and Pre-Conference Registration at the Stellenbosch Hotel (until 19:30)**
	Corner of Dorp and Andringa Street, 7600 Stellenbosch
	Thursday 28 February 2019
09:00	**Registration and Coffee**
09:30	**Room: Auditorium 2**
	Welcome and Opening of the Conference:
	Prof M.S. Tshehla, Dean of Military Science, Stellenbosch University and Sipho Mbhokota, CSIR, South Africa
09:50	**Keynote Presentation: Sascha Bachmann, Bournemouth University, UK**
	Hybrid Conflict as 21st Century Conflict
10:30	*Conference splits into streams*

	Room: Auditorium 1 **Stream A -** Privacy Issues **Chair -** Bruce Watson	**Room:** Auditorium 2 **Stream B -** Mini Track on Africa's Contribution to Global Cybersecurity **Chair -** Jackie Phahlamohlaka	**Room:** Breakaway 1/2 **Stream C -** Military Context **Chairs -** Jabu Mstweni	**Room:** Seminar 2 **Stream D -** Cyber Education **Chair -** Elmarie Biermann	**Room:** Manor Library **Stream E -** Mini Track on Legal Perspectives to Cyber Warfare and Security **Chair -** Trishana Ramluckar
10:45	Preserving Privacy and Integrity in Automotive Tire Sensors **Hacker** Kenneth and Scott **Graham**, Air Force Institute of Technology, Dayton, USA	Africa's Contribution to Academic Research in Cybersecurity: Review of Scientific Publication Contribution and Trends from 1998 to 2018 **Von Solms** Sune, University of Johannesburg, South Africa	The Limitations of National Cyber Security Sensor Networks Debunked: Why the Human Factor Matters **Skopik** Florian, AIT Austrian Institute of Technology, Vienna, Austria	Applying Game Elements to Cyber eLearning **Tomcho** Landon, Mark **Reith** and David **Long**, Air Force Institute of Technology, Dayton, OH, Mark **Cogginsv** Air Education and Training Command Headquarters, San Antonio, TX, USA and Alan **Lin**, Air Force Office of Scientific Research, Tokyo, Japan	Framework for the Development and Implementation of a Cybercrime Strategy in Africa **Jansen van Vuuren** Joey, Tshwane University of Technology, Pretoria, Louise **Leenen**, CSIR and Piet **Pieterse**, South African Police Service, South Africa
11:15	A Socio-Technical Systems Analysis of Privacy Issues in Social Media Sites **Shozi** Nobubele and Jabu **Mtsweni**, CSIR, Pretoria, South Africa	Cybersecurity Awareness Among Rural Communities in Sango Ota, Ogun State, Nigeria **Okon** Patrick, Tolulope **Kayode-Adediyi**, Tayo-Adigboluja **Afolayan** and Charles **Iruonagbe** Covenant University, Ota, Ogun State, Nigeria	Developing Military Cyber Workforce in a Conscript Armed Forces: Recruitment, Challenges and Options **Somer** Tiia, Birgy **Lorenz** and Rain **Ottis**, Tallinn Technical University, Estonia	A Rollout Strategy for Cybersecurity Awareness Campaigns **Mashiane** Thulani, Zama **Dlamini** and Thabo **Mahlangu**, CSIR, Pretoria, South Africa	Social Media as a Declaration of War? **Ramluckan** Trishana, University of KwaZulu-Natal, Durban, South Africa
11:45	Managing Classified Records in Inter-Governmental Organizations **Katuu** Shadrack, University of South Africa, Pretoria, South Africa	Effective Policing Apparatus in Nigeria: The Place of Forensic Soundness **Alhassan** John, Joseph **Ojenity**, Adamu **Muhammed**, Musa **Aibinu**, N. **Iwokhagh** and A. **Uduimoh**, Federal University of Technology, Minna, Nigeria	A Framework for the Cultivation of a Military Cybersecurity Culture **Leenen** Louise, CSIR, Cape Town, and Joey **Jansen van Vuuren**, Tshwane University of Technology, South Africa	Constructing Large Scale Cyber Wargames **Bumanglag** Kimo, Peter **Barrett**, David **Tileston** and Christopher **May**, Carnegie Mellon University, Pittsburgh, USA (Non-academic contribution)	Navigating the Cyber Sea: Dangerous Atolls Ahead **Greiman** Virginia, Boston University, MA, USA
12:15	*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*

Room: Auditorium 1 Stream A - Ontologies Chair - Sascha Dov Bachmann	Room: Auditorium 2 Stream B - Mini Track on Africa's Contribution to Global Cybersecurity Chair - Jackie Phahlamohlaka	Room: Breakaway 1/2 Stream C - Mini Track on on Big Data Privacy and Cloud Security Chair - Joey Jansen van Vuuren	Room: Seminar 2 Stream D - PhD Colloquium Chair - Dr Sune von Solms	Room: Manor Library Stream E - Development and Implementation Issues Chair - Noelle Van der Waag-Cowling
13:15 Categorising Cyber Security Threats for Standardisation **Khan** Zubeida, Council for Scientific and Industrial Research, Pretoria, South Africa	The Cyber Security Dilemma: A South African Perspective **van Niekerk** Brett, University of KwaZulu-Natal, Westville, South Africa	Analysing approaches to Cross-border Electronic Evidence Data-Sharing in Criminal Matters **Watney** Murdoch, University of Johannesburg, South Africa	**1315-1325** Securing the Internet of Battlefield Things While Maintaining Value to the Warfighter **Miller** Kasey, Bryan **O'Halloran**, Anthony **Pollman** Naval Postgraduate School, Monterey, and Megan Feeley, 2II Marine Expeditionary Force, Camp Lejeune, USA **1330-1340** Strategic Culture Theory as a Tool for Explaining Russian Cyber Threat Perception **Kari** Martti, University of Jyväskylä, Finland	Cyber Security Investment Cost-Benefit Investigation using System Dynamics Modelling **Oosthuizen** Rudolph, Francois **Mouton**, Miriam **Molekoa**, CSIR, Pretoria, South Africa and Leon **Pretorius**, University of Pretoria, South Africa
13:45 Enriching Behavioural Biometrics Experiments with an Ontology **Khan** Zubeida, Council for Scientific and Industrial Research, Pretoria, South Africa	The Applicability of the Tallinn Manuals to South Africa **Ramluckan** Trishana, University of KwaZulu-Natal, Durban, South Africa	Fake Narratives, Dominant Discourses: The role and Influence of Algorithms on the Online South African land reform Debate **Jansen van Vuuren** Anna-Marie, University of Johannesburg, and Turgay **Celik**, Wits University, South Africa	**1345-1355** Encryption Methodologies based on floating point algorithms **Govere** Weston and Jonathan **Blackledge**, University of KwaZulu Natal, South Africa **1400-1410** Small and Medium-Sized Enterprises' Perceptions of Security Evaluation in Cloud Business Intelligence **Moyo** Moses and Marriane **Loock**, UNISA, Cape Town, South Africa	Develop and Maintain a Cybersecurity Organisational Culture **Van't Wout** Carien, CSIR, Pretoria, South Africa
14:15 Building an Ontology for Planning Attacks that Minimize Collateral Damage: Liturature Survey **Grant** Tim, Retired But Active Researchers (R-BAR), Benschop, Netherlands	Contexualising Cybersecurity Readiness in South Africa **Veerasamy** Namosha, Thulani **Mashiane**, Council for Scientific and Industrial Research (CSIR), South Africa and Kiru **Pillay**, LINK Centre, Pretoria South Africa	Database Security: Ensuring that the Database Course Can Serve Cybersecurity Students as well as Traditional Computer Science Students **Hawley** Douglas, Northwest Missouri State University, Maryville, USA	**1415-1425** Cybersecurity Incident Response for the Sub-Sarharan Aviation Industry **Lekota** Faith and Marijke **Coetzee**, University of Johannesburg, South Africa **1430-1440** A Taxonomy for Cybercrime Attack in the Public Cloud **Baror** Stacey and Hein **Venter**, University of Pretoria, South Africa	Acknowledging and Reducing the Knowing and Doing Gap in Employee Cybersecurity Compliance **Gundu** Tapiwa, Sol Plaatje University, Kimberley, South Africa
14:45 Economic Information Warfare: Classifying Cyber-attacks against Commodity Value Chains **van Niekerk** Brett, University of KwaZulu-Natal, Westville, South Africa	A Digital Economy Technology Intergration Model Incorporating te Cyber Security Layer **Gamundani** Attlee M., Fungai Bhunu **Shava** and Mercy **Chitauro**, Namibia University of Science and Technology, Windhoek, Namibia	Token-based Lightweight Image Cryptography Method for Internet of Things **Lee** Shih-Hsiung, and Chu-Sing **Yang**, National Cheng Kung University, Tainan, Taiwan	**1445-1455** A Conceptual Cybersecurity Capacity Building Model for Mozambique **de Barros** Martina, Technical University of Dresden, Germany **1500-1515** - **Discussion and Feedback**	Towards the Development of a Neo4j tool for Client Forensics **Shumba** Rose, USNA, Anapollis and Joram **Ngwenya**, Iowa State University, USA
15:15 *Refreshments*	*Refreshments*	*Refreshments*	*Refreshments*	*Refreshments*

15:45 Room: **Auditorium 2**

Keynote Presentation: Dr. Edward L. Mienie, Department of Political Science and International Affairs, University of North Georgia (UNG), USA

The Role of Cyber in National and Global Human Security

Room: Auditorium 1 Stream A - Artificial Intelligence Chair - Peter Barrett	Room: Auditorium 2 Stream B - Mini Track on Africa's Contribution to Global Cybersecurity Chair - Jackie Phahlamohlaka	Room: Breakaway 1/2 Stream C - Mini Track on Psychological Warfare Chair - Evgeny Pashentsev	Room: Seminar 2 Stream D - Authentication Chair - Bryson Paine	Room: Manor Library Stream C - Cyber Innovations and Cyber Threats Chair - Abel Esterhuyse
16:30 AI-Based Deterrence in the Cyber Domain **Chen** Jim, US National Defense University, Washington DC., USA	Eating the Elephant - A Structural Outline of Cyber Counterintelligence Awareness Training **Sithole** Thenjiwe, Petrus **Duvenage,** Victor **Jaquire** and Sebastian **von Solms**, University of Johannesburg, South Africa	Terrorist/Jihadi ese of 3D-Printing Technologies: Operational Realities, Technical Capabilities, Intentions and the risk of Pscyological Opperations **Haberl** Ferdinand, University of Vienna and Florian **Huemer**, TU Wien, Austria	A Validated Lightweight Authentication Protocol Towards Commercial low-cost RFID tags **Mpalane** Kea, Zothile **Singano** and Samuel **Lefophane**, CSIR, Pretoria, South Africa	Exploiting Cyber Innovations: Strategies and Tactics **Rosser** Roy, Princeton Plasma Physics Lab, NJ, USA (Presentation only)
17:00 Artificial Intelligence in the Cyber Security Environment **Vähäkainu** Petri and Martti **Lehto**, University of Jyväskylä, Finland	Positioning South Africa in the BRICS Cybersecurity Context: A Strategic Perspective **Mitrovic** Zoran and Colin **Thakur**, Durban University of Technology, South Africa	A Bayesian Network Approach to the Prolifeition of Software as a Weapon **Silomon** Jantje, University of Oxford, UK	Online Security Behaviour: Factors Influencing Intention to Adopt two-factor Authentication **Holmes** Mitch and Jacques **Ophoff**, University of Cape Town, South Africa	System for Detecting Location-based Violations **Chan** Peter and Lauren **Hankel**, CSIR, South Africa
17:30 *Close of Conference Day*	*Close of Conference Day*	*Close of Conference Day*	*Close of Conference Day*	*Close of Conference Day*
19:00	Bus leaves Stellenbosch for the Conference Dinner			
19:30	Conference Dinner - Restaurant Barrique			

	Friday 1 March 2019				
09:00	**Room:** Auditorium 2 **Opening Messages**				
09:05	Keynote Presentation: Dr John Hurley, National Defense University, Washington DC, USA *The Evolving Demands of a Data-Driven Society: The New Cyber Challenge*				
09:50	**Introduction to ICCWS 2020**				
10:00	*Refreshments* *Poster contibutors stand by their posters for others to discuss the research*				
	Room: Auditorium 1 **Stream A -** Mini Track on Securing Cyber-Physical Systems against Cyber-Attacks **Chair -** Brett van Niekerk	**Room:** Auditorium 2 **Stream B -** Cyber Warfare **Chair -** Eddie Mienie	**Room:** Breakaway 1/2 **Stream C -** Mini Track on Psychological Warfare **Chair -** Evgeny Pashentsev	**Room:** Seminar 2 **Stream D -** Masters Colloquium **Chair -** Dr Sune von Solms	**Room:** Board Room **Stream E -** Steganography and Cyber Threats **Chair -** Louise Leenen
10:30	Implementing SCADA Attack Scenarios and Introducing Attacks to Obtain Training Data for Intrusion Detection Methods **Duque Anton** Simon, Michael **Gundall**, Daniel **Fraunholz** and Hans Dieter **Schotten**, German Research Center for Artificial Intelligence, Kaiserslautern, Germany	Data Poisoning: Achilles Heel of Cyber Threat Intelligence Systems **Mahlangu** Thabo, Sinethemba **January**, Thulani **Mashiane**, Moses **Dlamini**, Sipho **Ngo-beni** and Nkqubela **Ruxwana** , CSIR, Pretoria, South Africa	Destabilization of Unstable Dynamic Social Equilibriums through High-Tech Strategic Psychological Warfare **Pashentsev** Evgeny, Diplomatic Academy at the Ministry of Foreign Affairs of Russia, Moscow, Russia	**1030-1040** Distributed-Ledger Based Event Attestation for Intelligent Transportation Systems **Cintron** Luis, Scott Graham, Douglas **Hodson** and Barry **Mullins**, Air Force Institute of Technology, Dayton, OH, USA **1045-1055** Rethinking USAF Cyber Education and Training **Martin** Seth and Mark **Reith**, Air Force Institute of Technology, Dayton Ohio, USA	Enhancing the Security of a Gateway Through Steganography **Nwanebu** Docas, CSIR, Pretoria, South Africa
11:00	Testing the Fault Tolerance of a Backup Protection System using SPIN James **Kenneth** and Kenneth **Hopkinson,** Air Force Institute of Technology, Dayton, USA	A Mathematical Model of Hacking the 2016 US Presidential Election **Nilsson Sjöström** Dennis, Simovits Consulting, Sweden	Exploring Interactive Narrative and Ideology in War Games **Jansen van Vuuren** Anna-Marie, University of Johannesburg and Tristan **Jacobs**, AFDA (School for the Creative Economy), South Africa	**1000-1110** A Comparison of AODV and DSR Under Attack by Blackhole nodes in an NS3 Simulation **Fogwell** Thomas, Stanchion Payment Solutions, Dubai, UAE **1115-1125** Quantifying Cyber Vulnerability Risk in Acquisitions **Pendleton** Aaron and Mark **Reith**, Air Force Institute of Technology, Dayton Ohio, USA **1130-1140** Building Irrefutable Trust throughout Computer Networks using Blockchains **Pettit** Dillon and Mark **Reith**, Air Force Institute of Technology, Dayton Ohio, USA **1145-1200**- **Discussion and feedback**	How the United States Constructs Cyber-Threat Scenarios **Schmoldt** Janine, University of Erfurt, Germany
11:30	IIoT Security: Do I really need a Firewall for my Train? **Pretorius** Barend and Brett **Van Niekerk,** University of KwaZulu-Natal, South Africa	Advanced Technologies Combating Terrorism in the EU: the Psychological Warfare Aspect **Bazarkina** Darya, Academy of National Economy and Public Administration under the President of the Russian Federation, Moscow, Russia	Artificial Intelligence: Playing the Imitation Game **Silomon** Jantje and Monica **Kaminska**, University of Oxford, UK		Distributed IDS Using Agents: An Agent-based Detection System to Detect Passive and Active Threats to a Network **Arabo** Abdullahi, University of the West of England, Bristol, UK
12:10	Keynote Presentation: Theodorus (Piet) Pieterse, South African Police Force *Cybercrime as part of a trans-national organised crime threat: a law enforcement response*				
12:45	*Lunch*	*Lunch*	*Lunch*	*Lunch*	*Lunch*

	Room: Auditorium 1 Stream A - Cybercrime Chair - Francois Vrey	Room: Auditorium 2 Stream B - Approaches and Techniques Chair - Doug Hawley	Room: Breakaway 1/2 Stream C - Mini Track on Psychological Warfare Chair - Evgeny Pashentsev	Room: Seminar 2 Stream D - Masters Colloquium Chair - Dr Sune von Solms	Room: Board Room Stream D - Panel discussion on Cybersecurity for Higher Education Panel Chairs- Joey Jansen van Vuuren and Louise Leenen
13:45	The Cybercrime Combating Platform **Mapimele** Fikile and Bokang **Mangoale**, CSIR, Pretoria, South Africa	A Survey of APT Defence Techniques **Chitauro** Mercy, Hippolyte **Muyingi**, Samuel **John** and Shadreck **Chitauro,** Namibia University of Science and Technology, Windhoek, Namibia	Countering Terrorist Propaganda in Asia: Towards a Better Communications Strategy in Cyberspace **Pantserev** Konstantin and Konstantin **Golubev**, Saint-Petersburg State University, Russia	**1345-1355** State of the art in Digital Forensics for the Internet of Things **Kruger** Jaco-Louis and Hien **Venter**, University of Pretoria, South Africa	
14:15	South African Android Applications', their Security Permissions and Compliance with the Protection of Personal Information Act **White** Quintin and Wynand **Van Staden**, University of South Africa, South Africa	Digital Forensic Readiness Approach for Potential Evidence Preservation in Software-Defined Networks **Munkhondya** Howard, Adeyemi **Ikuesan** and Hein **Venter** University of Pretoria, South Africa	Ethics of Trust in Man-Machine AI Interactions **Manjikian** Mary, Regent University, Chesapeake, USA	**1400-1410** Towards Understanding the Value of Ethical Hacking **Wallingford** Jason, Mihika **Peshwa** and Douglas **Kelly** , University of Maryland, College Park, USA **1415-1425** A Context-aware Trigger Mechanism for Ransomware Forensics	**Cybersecurity for Higher Education**
14:45	Evolution of US Cybersecurity Strategy **Karahan** Saltuk B., Hongyi **Wu**, Old Dominion Unversity, Norfolk, USA and Leigh **Armistead**, Peregrine Technical Solutions, LLC, USA	A Novel Perspective on Cyber Attribution **Morgan** Ronald and Douglas **Kelly**, University of Maryland, College Park, USA (Masters Research presented by Supervisor)	Enabling Trust in IIoT: A PhySec based Approach **Lipps** Christoph, Simon **Duque Anton** and Hans-Dieter **Schotten**, German Research Center for Artificial Intelligence, Germany	**Singh** Avinash, Adeyemi **Ikuesan**, and Hein **Venter**, University of Pretoria, South Africa **1425-1445** Discussion and Feedback	
15:15	**Room: Auditorium 2** **Summary of the Conference:** **Award to the winner of the Best PhD Paper and Best Poster**				
15:30	*Close of Conference*	*Close of Conference*	*Close of Conference*	*Close of Conference*	*Close of Conference*
	Posters on display from noon on Thursday and to be presented during the Friday Coffee break between 1000-1030				
	Poster	**Invited Posters**			
	Smart Algorithms and Psychological Warfare **Polunina** Olga, Russian State Social University, Moscow, Russia	Artificial Intelligence in the Context of Psychological Security: Theoretical and Practical Implication **Pantserev** Konstantin and Golubev **Konstantin**, Saint-Petersburg State University, Russia(invited poster)	TimeGraphs-Time Series-based Anomaly Detection on Communication Graphs **Duque Anton** Simon D, Daniel **Fraunholz**, and Hans Dieter **Schotten** Intelligent Networks Research Group, German Research Center for Artificial Intelligence, Kaiserslautern, Germany (invited poster)		
			Merging FKSS with Artificial Intelligence (AI) Engines to Maximize Data Mining Capabilities **Miller** Kasey, Bryan **O'Halloran**, Anthony **Pollman** Naval Postgraduate School, Monterey, and Megan Feeley, 2II Marine Expeditionary Force, Camp Lejeune, USA (invited Poster)		