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**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 Coggins 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	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>	<i>Lunch</i>

	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, 211 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 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 1415-1425 Cybersecurity Incident Response for the Sub-Saharan 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 1445-1455 A Conceptual Cybersecurity Capacity Building Model for Mozambique de Barros Martina, Technical University of Dresden, Germany 1500-1515 - Discussion and Feedback	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	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 1415-1425 Cybersecurity Incident Response for the Sub-Saharan 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 1445-1455 A Conceptual Cybersecurity Capacity Building Model for Mozambique de Barros Martina, Technical University of Dresden, Germany 1500-1515 - Discussion and Feedback	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: Literature Survey Grant Tim, Retired But Active Researchers (R-BAR), Benschop, Netherlands	Contextualising 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	Cybersecurity Incident Response for the Sub-Saharan 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 1445-1455 A Conceptual Cybersecurity Capacity Building Model for Mozambique de Barros Martina, Technical University of Dresden, Germany 1500-1515 - Discussion and Feedback	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 the 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	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, Anapolis and Joram Ngwenya , Iowa State University, USA
15:15	<i>Refreshments</i>	<i>Refreshments</i>	<i>Refreshments</i>	<i>Refreshments</i>	<i>Refreshments</i>
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 Esterhuysen
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 use of 3D-Printing Technologies: Operational Realities, Technical Capabilities, Intentions and the risk of Psychological Operations 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 Proliferation of Software as a Weapon Silomon Jantjie, 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	<i>Close of Conference Day</i>	<i>Close of Conference Day</i>	<i>Close of Conference Day</i>	<i>Close of Conference Day</i>	<i>Close of Conference Day</i>
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 <i>The Evolving Demands of a Data-Driven Society: The New Cyber Challenge</i>				
09:50	Introduction to ICCWS 2020				
10:00	Refreshments <i>Poster contributors stand by their posters for others to discuss the research</i>				
	Room: Auditorium 1 Stream A - Mini Track on 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 , Siphon 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 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	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		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 <i>Cybercrime as part of a trans-national organised crime threat: a law enforcement response</i>				
12:45	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 Pantsev 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	Cybersecurity for Higher Education
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	
14:45	Evolution of US Cybersecurity Strategy Karahan Saltuk B., Hongyi Wu , Old Dominion University, 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	<i>Close of Conference</i>	<i>Close of Conference</i>	<i>Close of Conference</i>	<i>Close of Conference</i>	<i>Close of Conference</i>
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 Pantsev 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)		