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Information Security

17th International Conference, ISSA 2018
Pretoria, South Africa, August 15–16, 2018
Revised Selected Papers


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Preface

ISSA is the annual conference for the information security community that continues with the successful recipe established in 2001. The conference is held under the auspices of the Academy for Computer Science and Software Engineering at the University of Johannesburg, the School of Computing at the University of South Africa, and the Department of Computer Science at the University of Pretoria.

The ISSA 2018 Conference was held during August 15–16, 2018. The conference has evolved each year in various ways. For the first time the conference was hosted at the premises of the University of Pretoria. We believe that the quality and relevance of the information presented by industry practitioners and academics have also evolved over the years, as have the opportunities for senior research students to present their research to a critical and representative audience. This year university students were allowed to register for the conference for an unprecedented ZAR200 per person in order to make the conference extremely accessible to students.

Conferences have become a major focus area – and often a money spinner – in many industries, so at any time a number of conferences are advertised in similar fields such as information or cyber security. What sets the ISSA conference apart is that it is not intended to generate profit for an organization, and it does not encourage marketing of products and services through presentations. Instead, the proceeds from registration fees are reinvested to ensure that the conference evolves each year. In exchange for their investment in the conference, sponsors are afforded an opportunity to present company-specific information that has a bearing on the conference themes, and presentations submitted by potential speakers go through a vigorous double-blind review process, managed by a team of respected international experts in information security.

We trust that the annual ISSA conference will continue to be recognized as a platform for professionals from industry as well as researchers to share their knowledge, experience, and research results in the field of information security on a South African but also on an international level.

To ensure ongoing improvement, every year we encourage input from all those interested in the field of information security, particularly those who are actively seeking to advance the field, to take part and share their knowledge and experience.

On behalf of the general conference chairs, we would like to extend our heartfelt appreciation to all the conference committee members and chairs for their hard work in organizing ISSA 2018! Without your continuous hard work and efforts, ISSA 2018 would not have been possible. Again, we thank you!

www.infosecsa.co.za

August 2018

Hein Venter
Marianne Look
Marijke Coetzee
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Conference Focus

Information security has evolved and in the past few years there has been renewed interest in the subject worldwide. This is evident from the many standards and certifications now available to guide security strategy. This has led to a clearer career path for security professionals.

The Internet of Things (IoT) together with advances in wireless communications has brought new security challenges for the information security fraternity. As these IoT devices become more available, and more organizations attempt to rid their offices of “spaghetti,” the protection of data in these environments becomes a more important consideration. It is this fraternity that organizations, governments, and communities in general look to for guidance on best practice in this converging world.

Identity theft and phishing are ongoing concerns. What we are now finding is that security mechanisms have become so good and are generally implemented by companies wanting to adhere to good corporate governance, attackers are now looking to the weak link in the chain, namely, the individual user. It is far easier to attack them than attempt to penetrate sophisticated and secure corporate systems. A spate of ransomware is also doing the rounds, with waves of viruses still striking periodically. Software suppliers have started stepping up to protect their users and take some responsibility for security in general and not just for their own products.

The conference therefore focused on all aspects of information and cyber security and invited participation across the information security spectrum including but not being limited to functional, business, managerial, theoretical, and technological issues.

Invited speakers talked about the international trends in information security products, methodologies, and management issues. In the past, ISSA has secured many highly acclaimed international speakers, including:

- Pieter Geldenhuys, Vice-chair of the Innovation Focus Group at the International Communications Union, Geneva, Switzerland. Topic: “BUSINESS UNUSUAL: Strategic Insight in Creating the Future. Leveraging the Value of the Hyper-connected World”
- Wayne Kearney, Manager: Risk & Assurance at Water Corporation. Topic: “Why Are Management Shocked with all the ‘PHISH’ Caught? A Case Study in Perspective”
- Prof. Sylvia Osborn, Associate Professor of Computer Science, The University of Western Ontario, Ontario, Canada. Topic: “Role-Based Access Control: Is it Still Relevant?”
- Prof. Steve Marsh, Associate Professor at the University of Ontario, Institute of Technology. Topic: “Trust and Security - Links, Relationships, and Family Feuds”
- Alice Sturgeon manages the area that is accountable for identifying and architecting horizontal requirements across the Government of Canada. Her topic made reference to “An Identity Management Architecture for the Government of Canada”

- Dr. Alf Zugenmaier, DoCoMo Lab, Germany. His topic was based on “Security and Privacy”
- William List, WM List and Co., UK. His topic was: “Beyond the Seventh Layer Live the Users”
- Prof. Dennis Longley, Queensland University of Technology, Australia. His topic was: “IS Governance: Will It Be effective?”
- Prof. TC Ting: University of Connecticut, and fellow of the Computing Re-search Association, United States
- Prof. Dr. Stephanie Teufel: Director of the International Institute of Management in Telecommunications (iimt). Fribourg University, Switzerland
- Rich Schiesser, Senior Technical Planner at Option One Mortgage, USA Rick Cudworth, Partner, KPMG LLP, International Service Leader, Security and Business Continuity - Europe, Middle East and Africa
- Dario Forte - CISM, CFE, Founder, DFLabs Italy and Adj. Faculty University of Milan
- Reijo Savola - Network and Information Security Research Coordinator, VTT Technical Research Centre of Finland
- Mark Pollitt - Ex Special Agent of the Federal Bureau of Investigation (FBI) and professor at the Daytona State College, Daytona Beach, Florida, USA
- Prof. Joachim Biskup - Professor of Computer Science, Technische Universität Dortmund, Germany
- Dr. Andreas Schaad - Research Program Manager, SAP Research Security & Trust Group, Germany
- Prof. Steven Furnell - Head of School, School of Computing and Mathematics (Faculty of Science and Technology), University of Plymouth, UK
- Prof. Matt Warren - School of Information and Business Analytics, Deakin University, Australia
- Christian Damsgaard Jensen - Associate Professor, Institute for Mathematics and Computer Science, Technical University of Denmark
- Prof. Rebecca Wright - Director of DIMACS, Rutgers University, USA

The purpose of the conference was to provide information security practitioners and researchers worldwide with the opportunity to share their knowledge and research results with their peers. The objectives of the conference are defined as follows:

- Sharing of knowledge, experience, and best practice
- Promoting networking and business opportunities
- Encouraging the research and study of information security
- Supporting the development of a professional information security community
- Assisting self-development
- Providing a forum for education, knowledge transfer, professional development, and development of new skills
- Promoting best practice in information security and its application in Southern Africa
- Facilitating the meeting of diverse cultures to share and learn from each other in the quest for safer information system

Organization

Conference General Chairs

Hein Venter	Department of Computer Science, University of Pretoria, South Africa
Marijke Coetzee	Academy for Computer Science and Software Engineering, University of Johannesburg, South Africa
Marianne Loock	School of Computing, University of South Africa
Mariki Eloff	Institute for Corporate Citizenship, University of South Africa
Jan Eloff	Department of Computer Science, University of Pretoria, South Africa

Organizing Committee

Mariki Eloff	Institute for Corporate Citizenship, University of South Africa
Marijke Coetzee	Academy for Computer Science and Software Engineering, University of Johannesburg, South Africa
Marianne Loock	School of Computing, University of South Africa
Hein Venter	Department of Computer Science, University of Pretoria, South Africa
Jan Eloff	Department of Computer Science, University of Pretoria, South Africa

Program Committee

Reinhardt Botha	Nelson Mandela University, South Africa
Marianne Loock	School of Computing, University of South Africa
Mariki Eloff	Institute for Corporate Citizenship, University of South Africa

Publication Chair

Hein Venter	Department of Computer Science, University of Pretoria, South Africa
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Honorary Committee

The following member is an honorary committee member of the ISSA conference. This committee member is honored for his effort as one of the founding members of the ISSA conference in 2001. The current conference committee feels obliged to honor him as such.

Les Labuschagne	University of South Africa
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Review Committee

A rigorous double-blind refereeing process was undertaken by an international panel of referees to ensure the quality of submissions before acceptance. Authors initially submit abstracts to determine if the paper meets the goals and fits into the theme of the conference. The ISSA Program Committee assesses each submission for relevance and fit. Authors are then notified whether their abstracts were accepted, and if so, invited to submit a full paper for peer review. The task of a reviewer is often a thankless task; however, without them this conference would not be possible. The ISSA Organizing Committee would like to extend their heartfelt thanks to the list of reviewers including leading information security experts from around the world.

On the due date, authors submit full papers, anonymized by the authors for the double-blind review process. Each paper goes through an administrative review and is assigned to at least three reviewers selected from an international panel of reviewers, in order to confirm that the paper conforms to the specifications and quality for the conference. If a paper does not meet the requirements, the author is asked to make the required changes as indicated by reviewers and asked to resubmit the paper, or to consider submitting the paper to another conference.

A review committee is invited to participate, consisting of both local and international experts in the field of information security. A process is followed by the Program Committee to allocate papers to reviewers based on their area of expertise. Reviewers are subject matter experts, of whom over 50% are international. Reviewers usually have five or six categories that they are willing to review in. Each reviewer will establish the number of papers they can review in a specific time period and are allowed to bid on the papers they want to review. An automated process allocated papers to each reviewer according to their preferences.















Each paper is reviewed by a minimum of two reviewers (but mostly by three reviewers) in a double-blind review process. Papers are reviewed and rated on a 5-point system with 1 being poor and 5 being excellent as follows:

- Originality (1 to 5)
- Contribution (1 to 5)
- Overall quality (1 to 5)
- Reviewer's confidence (1 to 5)
- Overall evaluation (calculated by an algorithm as a number in the range -5 to 5 , where a negative score of -5 would indicate an extremely strong reject, 0 would indicate a borderline paper and 5 would indicate an extremely strong accept)














The reviewers' confidence in their own rating is also taken into account by the algorithm that calculates the overall evaluation. Reviewers are also encouraged to make anonymous suggestions to the author(s) of the paper.

Based on the overall evaluation (-5 to 5), a paper with 0 or below points can be recommended for a poster/research-in-progress session and a 3 – 5 -point paper can be put in the "best paper" category. An acceptance rate of between 25% and 35% is maintained for the conference. In 2018 the acceptance rate was 30% .




Authors are notified of the outcome of the review process, which includes the anonymous suggestions and recommendations of the reviewers. Authors then have to submit the final version of the paper that will then be included in the formal conference proceedings. This volume is the official version of the proceedings. An unofficial version of the proceedings was distributed on USB flash drives during the conference. All USB proceedings from all previous ISSA conferences are also available at www.infosecsa.co.za/past.

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Contents

Distributed Ledger Technology to Support Digital Evidence Integrity Verification Processes	1
<i>William Thomas Weilbach and Yusuf Moosa Motara</i>	
Real-Time Face Antispoofing Using Shearlets.	16
<i>Dustin Terence van der Haar</i>	
Password Policies Adopted by South African Organizations: Influential Factors and Weaknesses	30
<i>Pardon Blessings Maoneke and Stephen Flowerday</i>	
An Investigation into Students Responses to Various Phishing Emails and Other Phishing-Related Behaviours	44
<i>Edwin Donald Frauenstein</i>	
Information Availability and Security in Foreign Corrupt Practices Act Investigations	60
<i>Tetyana Loskutova and Rivaj Parbhu</i>	
The Current State of Electronic Consent Systems in e-Health for Privacy Preservation.	76
<i>Lelethu Zazaza, H. S. Venter, and George Sibiya</i>	
Detecting Manipulated Smartphone Data on Android and iOS Devices	89
<i>Heloise Pieterse, Martin Olivier, and Renier van Heerden</i>	
An Evaluation of the Password Practices on Leading e-Commerce Websites in South Africa	104
<i>Silas Formunyuy Verkijika</i>	
SA-EF Cube: An Evaluation Framework for Assessing Intelligent Context-Aware Critical Information Infrastructure Protection Solutions	115
<i>Jan Hendrik van Niekerk and Elizabeth Marie Ehlers</i>	
Small and Medium-Sized Enterprises' Understanding of Security Evaluation of Cloud-Based Business Intelligence Systems and Its Challenges.	133
<i>Moses Moyo and Marianne Loock</i>	
Preventing and Mitigating Ransomware: A Systematic Literature Review.	149
<i>Zandile Manjezi and Reinhardt A. Botha</i>	

Mitigating the Ransomware Threat: A Protection Motivation
Theory Approach 163
Jacques Ophoff and Mcguigan Lakay

Skills Requirements for Cyber Security Professionals: A Content
Analysis of Job Descriptions in South Africa 176
Amaanullah Parker and Irwin Brown

Author Index 193