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SAICSIT 2018
TECHNOLOGY FOR CHANGE

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SAICSIT 2018
TECHNOLOGY FOR CHANGE

South African Institute of Computer Scientists and Information Technologists (SAICSIT)

Proceedings

26-28 September 2018
Port Elizabeth
South Africa

Conference Chair
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Programme Chairs
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MESSAGE FROM THE SAICSIT PRESIDENT

JAN KROEZE
UNISA
13 September 2018

The first South African Computer Symposium on Research in Theory, Software, Hardware was held on 4th and 5th September 1979 in Pretoria. It was organised by The Research Symposium Organising Committtee of The Computer Society of South Africa (CSSA), and the proceedings were published in two issues of Quaestiones Informaticae (QI), volume 1. This symposium was the precursor to the SAICSIT conferences that have been running uninterruptedly for at least 24 years. QI was originally the official journal of the CSSA, but since May 1983 it has been described as "An official publication of the Computer Society of South Africa and of the South African Institute of Computer Scientists [SAICS]". In January 1990 QI changed its name to South African Computer Journal (SACJ), while SAICS changed to the South African Institute of Computer Scientists and Information Technologists (SAICSIT) in 1993. The 2018 conference, therefore, continues a long and proud tradition of our computing society.

The 2018 conference theme is "Technology for change". This conference theme should stimulate ideas on the way forward in Computer Science and Information Systems given the current debate on decolonisation and Africanisation in the tertiary sector. It may guide the contributions that our academic disciplines can and should make to enrich the knowledge and practice of Information and Communication Technology from an African perspective. I would like to thank Sue Petratos, Johan van Niekerk, Bertram Haskins and their teams at the Nelson Mandela University for the operational and programme arrangements to facilitate this conference. All of us who have been involved in organising a conference know how much planning and work go into making all of this happen and we appreciate your service to our academic community!

I would like to thank all attendees who have submitted papers. Moreover, congratulations to the successful authors whose papers will be published in the 2018 proceedings that will appear in the ACM Digital Library. With an acceptance rate of 31%, getting a full paper accepted at SAICSIT 2018 is a real achievement – well done!

I would also like to thank our keynote speakers, Moira de Roche and Ulandi Exner, for their presence. Your contributions inform our theoretical reflections from an industry perspective and strengthen our ties with IFIP and the IITPSA. The IITPSA was formerly the CSSA where our society originated in the early eighties of the previous century.

It is a privilege to announce the 2018 SAICSIT Pioneer awardees. Paula Kotzé is well-known in our society and has been a leader not only in SAICSIT but also in the ACM, IFIP and the NRF. She served as president in 2001-2004 and transformed the annual conference of SAICSIT into a conference with an international standing having its proceedings published in the international digital library of the ACM. Jackie Phahlamohlaka has been serving the South African public over the last 37 years in the IT industry, academia, government and research environments. He served, amongst others, as chair of IFIP TC9 and established a workgroup on ICT uses in peace and war. SAICSIT is proud to recognise you for all your hard work and significant contributions over so many years.

Our project to record the history of the society and its conferences has made good progress over the past year. All issues of QI and SACJ that were published between 1979 and 2000 (Issue 25) were scanned in a searchable format and uploaded on the SAICSIT Digital Archive on the Unisa Institutional Repository (available at http://uir.unisa.ac.za/handle/10500/23854). Since 2000 (Issue 26) all issues are available at Sabinet (https://journals.co.za/content/journal/comp) and since 2009 (Volume 44) also on the SACJ website (http://sacj.cs.uct.ac.za/index.php/sacj/issue/archive). We therefore now have a complete digital collection of QI and SACJ.

The digitisation of the society's old printed proceedings has also made good progress. The proceedings for 1987, 1991 and 1995-2001 have been scanned and are available on the SAICSIT Digital Archive as well. The proceedings of 1979, 1981, 1983, 1989 and 1992 appeared in QI and SACJ and are also available on the SAICSIT Digital Archive. From 2002 all proceedings are available on the ACM Digital Library. So far, we could not locate copies – if these exist – of the 1993 and 1994 proceedings. If any of our members can assist us in locating any proceedings, we would appreciate it, and please do let us know so that we can continue our search to fill in the last two pieces of the proceedings' puzzle.

I would like to thank our members for their contributions during our crowd-sourcing project to collect old printed copies of the journals and proceedings that were used for the digitisation project (Ian Sanders, Paula Kotzé, Derrick Kourie, Judith Bishop, Hussein Suleman and Darelle van Greunen all made copies available). I would also like to thank our colleagues at Sabinet, as well as SAICSIT members and three assistants who helped me with the history project for their invaluable inputs – Thabang Methi, Tebogo Methi, Tendani Mawela, Brenda Scholtz, Patrick Marais, Suezette Opperman, Tawanda Madavo, and Charlotte Hlengwa. I would also like to express our appreciation towards UNISA for hosting the SAICSIT Digital Archive, and especially towards Ansie van der Westhuizen and Filistea Naudé, who played important roles to facilitate the creation of the archive.

I would also like to thank the council members and office bearers for their support over the past year. With your help, we have made significant progress to grow our membership to 475, to update our

website, to revise our constitution and continue our collaboration with affiliated and other academic bodies. Judith Bishop, Stella Bvuma and Marc van Kempen worked continuously to update our website, especially the Pioneer Awardees' webpage, to maintain the membership list and to screen new applications. Pieter Blignaut and Judith Bishop drove the process to revise the constitution and bylaws. This process is ongoing and the council will have to continue working on it in the next year. Our secretary, Hossana Twinomurinzi, was very efficient in planning and managing all our executive committee, council and AGM meetings and elections. Isaac Osunmakinde, our treasurer, kept a watchful eye on our finances, and I am happy to report that our financial situation is sound. The financial statements have been prepared by Johan Wasserman and will be tabled for approval at the AGM. I would also like to thank Alta van der Merwe and Irwin Brown for your inputs and advice as members of the executive committee over the past two years of my term as president, as well as the council members who liaised with SACNASP, the Gauteng e-Government Department, SACAB, and SABSPlat: Willem Visser, Jason Cohen, Machdel Matthee, Aurona Gerber and André Calitz.

SAICSIT is very proud of its journal, SACJ (formerly QI), that has been running for 39 years since June 1979. In 2018, the editor, Philip Machanick, the production editor, James Dibley, and the editorial team have once again done an excellent job to ensure that articles of high quality appear timely. SACJ is now listed as an accredited journal on the DHET, Scopus and SciELO SA platforms. The whole SAICSIT community appreciates your generous service and all the hours that you sacrificed to facilitate the peer reviews, revisions and publication processes.

No society can exist without members. SAICSIT is its members – both from academia and industry. I thank you all for you loyalty over the past years. I trust that you will enjoy the conference and will return safely to your homes and institutions enriched by the 2018 participation and networking, made possible by our generous hosts at the Nelson Mandela University.

MESSAGE FROM THE CONFERENCE CHAIR

SUE PETRATOS
NELSON MANDELA UNIVERSITY

SAICSIT 2018 seemed so far away at the time that we agreed to step in and host this function. Now, with the blink of an eye, it is upon us. It is my privilege to welcome you to this conference and share a few thoughts with you about this journey.

I must admit it was a rollercoaster of mixed successes and not a task easily accomplished. The organising committee worked very close together and without the support of Amber, Ashleigh and Amanda this would not have been possible – I thank them for always being there.

It is fitting that the School of ICT at Nelson Mandela University is hosting this prestigious conference in the year that celebrates the centenary of our namesake, Nelson Mandela. His passion for education is a well-known fact and our institution's slogan "Change the World" hails from Madiba himself, when he said that with education you have the power to change the world. Change, however, is happening at a pace faster than ever imagined. The advent of technology and Industry 4.0 not only brings change about in the fastest possible manner, but also in the most innovative and unique manner. SAICIST 2018 is focussing on "Technology for Change". Each researcher is making a change for the better in their field and with that, contributing to broaden the knowledge base for all experts. The School of ICT is very proud to be hosting the platform where these innovations and change technologies can be shared with others. We welcome you all warmly to SAICSIT 2018!

While you are here in Port Elizabeth, please remember to not only educate your mind, but also to pay attention to the call of the beautiful nature around you. Enjoy an uplifting beach walk, an invigorating morning swim or just a quiet moment gazing at the ocean. Who knows where inspiration lies, and what change that could bring.

Thank you all for your participation in SAICSIT 2018. We hope that whenever you visit PE, you will remember this event, and the friends made, with fond memories that ignite the spark for education, innovation and change.

Kindest Regards
Sue

MESSAGE FROM THE PROGRAMME CHAIRS

JOHAN VAN NIEKERK
NOROFF UNIVERSITY COLLEGE - NORWAY
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NELSON MANDELA UNIVERSITY

We would like to welcome you all to the SAICSIT 2018 Conference. This is the first year our university is operating as the Nelson Mandela University and it gives us great pleasure to host SAICSIT 2018. We invite you to share in a celebration of our new identity and our motto to "Change the World". We trust you will enjoy the pleasant environment and the beautiful beachfront, as well as the stimulating presentations.

We received a total of 116 full paper submissions for the 2018 conference. The submitted papers went through a rigorous double-blind reviewing process, before being carefully considered for acceptance by the Programme Committee. We attempted to have each paper reviewed by at least 3 reviewers. However, in the end we received a total of 299 reviews back, for an average of 2.66 reviews per paper.

A total of 36 papers were ultimately accepted, giving this conference an acceptance rate of 31%. The accepted papers cover a wide range of topics, spanning the fields of Information Systems/Informatics, Information Technology and Computer Science, and everyone is
sure to find something of interest among the subjects on offer. As before, all papers will appear in the proceedings, which has been accepted for publication in the ACM's International Conference Proceedings Series (ICPS) and will be available online in the ACM Digital Library.

We would like to thank the authors of the papers for choosing to present their research at SAICSIT 2018. We would also like to thank our Programme Committee who willingly gave of their time and energy to review the submissions and to provide valuable feedback on their
strengths and weaknesses. Without their support, the conference would not be possible.
We hope you will benefit from the presentation of these papers, and that you find value in our two keynote presentations, as well as the subsequent networking and discussions with other academics during this conference.

Enjoy SAICSIT 2018!

Johan van Niekerk and Bertram Haskins
Programme Chairs – SAICSIT 2018

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