



Message from the Chairperson

Dear ICCSSA members,

2019 commenced with some new initiatives for ICCSSA. The first was the two-way joint seminar between the SASA Western Cape Chapter, ICCSSA and DST-NRF CoE-MaSS. Audiences gathered at University of the Western Cape (UWC) and at Wits University. The talks were also accessible to a digital audience through Vidyo. Prof. Ben Herbst delivered his talk live at UWC and thereafter Benjamin Rosman delivered his talk live at Wits. Both talks were informative and interesting. The talk by Dr. Rosman was recorded on video, thanks to the support from StatsSA. The video has been uploaded to the Youtube channel and you can find it here: <https://www.youtube.com/watch?v=nN4GV0ijmOk>. If you want to download the video, you can use the following website to download: <https://www.onlinevideoconverter.com/youtube-converter>.

The development of the CPD system is nearing completion. The Board of Institute (Bol) hopes to test the system soon so that it can go live before the next Annual General Assembly (AGA) which will be held on 14 June 2019. This means that members will soon be able to formally document and collect evidence of CPD activities.

The marketing team has been actively working to improve our visibility digitally. Follow us @ ICCSSA on LinkedIn and Twitter. Please feel free to contact the Bol (admin@iccssa.org.za) to communicate any ideas or comments on how we can best serve you.

The Seminar on Machine learning

The ICCSSA, Western Cape Chapter of SASA and the DST-NRF Centre of Excellence in Mathematics and Statistical Sciences (CoE-MaSS) joint seminar was hosted jointly by the University of the Witwatersrand (Wits) and University of the Western Cape (UWC) on the 22nd February 2019. As the chairperson has indicated, Prof. Ben Herbst delivered his talk live at UWC and thereafter Benjamin Rosman delivered his talk live at Wits.

Prof Ben Herbst obtained his PhD in 1981 from the University of the Free State. He has spent sabbaticals at the University of Dundee Scotland, Clarkson University, New York, University of Colorado, Boulder, Trento University, Italy, and University of Novi Sad, Serbia. His research interests have morphed from numerical analysis and nonlinear waves, to computer vision and machine learning. His talk was entitled "From academia to industry, is it a smooth transition?" After 41 years in academia, a period substantially characterised by working on topics like computer vision and machine learning, Prof. Herbst joined Praelix, a Stellenbosch-based machine learning (ML) company in January 2018, started by his ex-student. In this talk, he highlighted some of the challenges he faced in



making transition from ML researcher to data scientist in an industrial environment. He indicated that if he were to return to academia, he would undoubtedly do some few changes. He drew comparisons between working in the Research and Industry environments.

Prof. Herbst pointed out that things are done differently in research and Industry. He indicated that in Industry, the problem needs to be solved now and therefore existing solutions are implemented using available tools because clients want solutions not ideas while on the other hand, in Research there is no huge time constraint and therefore novel techniques and algorithms are developed to solve problems and interesting ideas can be explored. The problem is formulated by clients in Industry while in Research a researcher finds a good research problem. The data in the Industry always need some cleaning whereas in Research data is generally clean. In Industry the development of software is crucial and the health of the company is paramount while in Research, the software development discipline is not a priority.



Dr. Benjamin Rosman is a Principal Researcher in the Mobile Intelligent Autonomous Systems group at the Council for Scientific and Industrial Research (CSIR) and a Senior Lecturer in the School of Computer Science and Applied Mathematics at Wits University where he runs the Robotics, Autonomous Intelligence and Learning Laboratory. He received his Ph.D. in Informatics from the University of Edinburgh in 2014. His research interests focus primarily on reinforcement learning and decision making in autonomous systems, in particular how learning can be accelerated through abstracting and generalising knowledge gained from solving related problems. He is a founder and organiser of the Deep Learning Indaba and a 2017 recipient of a Google Faculty Research Award in machine learning.



Dr. Rosman conducted the seminar from the University of the Witwatersrand. His talk was titled “Learning to make decisions in an uncertain world”. He indicated that the reinforcement learning is the sub-discipline of machine learning focused on decision making under uncertainty. It is particularly powered by the recent advances in areas such as deep learning. Reinforcement learning has over the last couple of years started to deliver solutions to highly complex research problem domains such as Go and StarCraft, leading to widely publicised results. In his talk, he introduced the area of reinforcement learning, and highlighted some of the recent developments, before indicating some of the potential application areas in Industry such as in manufacturing, logistics, finance, health and education.

The StatsSA symposium on 4th industrial revolution

The symposium was held on the 13th March 2019 at StatsSA offices in Pretoria. The theme of the symposium was “statistics for the 4th industrial revolution”. On behalf of the Statistician General, Mr. Ashwell Jenneker welcomed the attendees. He highlighted the relevance of the theme as our world of work is undergoing multiple changes at a rapid pace that orthodox ways of doing business are being increasingly substituted by mechanisation and robotics. A revolution that is upon us is the fourth industrial revolution and it has the potential to change the fortunes of not just South Africa but the whole world.

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According to Professor Klaus Schwab, the 4th Industrial Revolution “is characterised by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres”. Mr Jenneker indicated that this is exemplified by Cell phones that are no-longer used just to phone or receive calls, but to measure our daily activities, our position in space, where and how fast we move. Watches that do not just tell time, but calculating our steps, heart rate, and our stress levels. Mr Jenneker argued that people and these technologies have become inseparable. By the same token, Statistics and technology are indivisible and StatsSA is one of the leading agencies with regard to harnessing technology for statistical purposes. He argued that, strides made in digital collection, at the scale done by StatsSA, have proven to be ground-breaking and a source of inspiration to the rest of the continent.



He announced that StatsSA has already begun the process of planning and organising the participation of South Africa in the United Nations 2020 Round of Population and Housing Censuses. StatsSA will conduct the Census in 2021. The census gives a report card, at the lowest geographic level, of how households and persons are doing in social and economic terms. Census is the biggest mobilisation of a nation at peace time, with massive logistics that include 150 000 people employed and about 8 000 cars on the road. Mr Jenneker pointed out that on average year, StatsSA has an accident rate of 22% and it increases during Census. The Driverless Automated Cars as the invention of the 4th industrial revolution could potentially reduce accidents and save human lives and reduce the cost of Census operation. The thought leader in this area is one of our own Elon Mask and his company Tesla.

Another development that could have a bearing on Census taking is the work done by Afrigis, a GIS company that is using cell phone signals to calculate the night time and daytime population. The question they are asking is where do people sleep and where do they work. The consequence of this is that we could have a census every month, maybe even in real time. We need to think through this and make sure our model works to avoid over and undercounting, but the technology and opportunities are here and harnessing it, is the clever thing to do. Mr Jenneker stressed the importance of harnessing technology and he pointed out that StatsSA is currently undertaking a Census of Commercial Agriculture. In Australia the use of satellite imagery for crop type and area statistics is at an advanced stage. He argued that we could use satellite imagery to determine crop types and sizes. In addition we could get the farmers financial information from the accountants and you could potentially have a Census of commercial agriculture every year instead of every 5 years.

For statisticians, the revolution should bring about new opportunities for fastening the collection, processing and dissemination of data at a pace rapid to what the 4th industrial revolution offers. As a result of the modernising world of technology and robotics, he made a plea to the delegates and leaders to give innovation a chance, by playing their part in the development of the new order. As a nation we must be aware that we live in tough employment and economic times, and to be part of the information age we need to develop the requisite skills in society to build a sustainable future. StatsSA for its part wants to remain at the cutting edge of society by becoming amongst the leading institutions of state that have their hands on the pulse of the 4th industrial revolution. We have not stopped innovating and ensuring that we are up to scratch with regard to development of new methodologies that appreciates the information super-highway that is at the heart of our future and human society. We have set ourselves an objective of removing collection of data with the use of paper as it were the situation for decades, and thus saving the planet and its trees. We are fusing computers and telephony as part of the future trajectory in

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the medium term. Mr Jenneker pointed out that they are however nimble enough to be disrupted by the wave of the 4th industrial revolution, where revolution is about the substitution of one social order with another.

ICCSSA Bursary winners

Mr Regard du Toit is 23 years of age. He won the ICCSSA bursary in 2017. In that same year he obtained his BSc. (Hons) degree (Cum Laude) in Data Mining from the North West University (the Potchefstroom Campus). He also won the MF Kruger Trophy for the best BSc. (Hons) Data Mining student.



Upon completion of his Honours degree, his family moved to Cape Town where he accepted a position as a Designate Credit Risk Analyst at The Foschini Group (TFG). In this role he got a taste of how statistical modelling techniques are implemented in industry. He has been particularly involved in the IFRS9 standard provisions modelling, time series forecasting and ad hoc analytics. He will soon move to a role in optimisation analytics.

He expects 2019 to be a momentous year. He received his first promotion in February, they are expecting a little girl in April 2019, he has decided to further his studies and he is currently enrolled for a part-time Masters degree in Statistical Sciences with specialisation in Data Science at the University of Western Cape.



Mr Sabelo Mokoena is the 2015 ICCSSA Honours bursary winner. He completed his Master's degree in statistics in 2018 at the University of KwaZulu-Natal.

He is currently employed by ABSA bank as a SAS Developer. He secured a bursary with the CSIR to do his Masters degree. He therefore, wants to thank the CSIR for awarding him a bursary. He is enthusiastic and willing to continue his studies up to a PhD level in Statistics and would eventually like to join the world of research as he believes this would enable him to make a contribution and an impact towards statistical literature.

SASA 2019 Conference

The 2019 SASA conference will be hosted by the Department of Statistics of the Nelson Mandela University in Port Elizabeth from 26 - 29 November 2019.

Forthcoming Events

Look out for further details on forthcoming seminars which will be part of the joint seminar series between ICCSSA and ORRSA, SASA, SAS, CSIR and CoE-MASS.

Please look out for the announcement of the **ICCSSA General Assembly** to be held in June 2019.

The tentative date is the **14 June 2019**.

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