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The future of Data Science is bright at the Department of Statistics and Actuarial Science

Artificial intelligence, machine learning, big data. These concepts are currently generating a lot of press and hype, and Data Science is a core part of it all.

With the deluge of data comes the increasing need for people to make sense of the data, and in 2012, Harvard Business Review called Data Science “the sexiest career of the 21st century”. Studies by LinkedIn and McKinsey also show that statistical analysis and data acumen are some of the top skills in demand globally at the moment, and that demand far outstrips supply.

What is a data scientist?

There is currently no widely accepted or formal definition of what exactly constitutes the field of Data Science; in fact, the term appears to have different meanings in different environments across industry and academia. What seems very clear, however, is that Data Science is very much an interdisciplinary field. In a 2015 article for ComputerWorld UK, Tim Barker argued that data scientists are the new polymaths. Centuries ago, Renaissance men like Da Vinci and Galileo excelled in many fields and displayed in-depth knowledge of a wide range of subjects. Today, data scientists are expected to display similar characteristics. This requires a broad skills and experience set, spanning many different areas.

In our opinion, the two core skills data scientists should possess are technical data skills (which covers the collecting and storing of data, including data cleaning and wrangling) as well as statistical expertise (which covers the exploration and analysis of data, including transforming, visualising and modelling data coupled with the ability to implement algorithms).

In addition to these two core skills, a data scientist should also possess commercial or domain expertise to enable him/her to ask relevant questions and spot the opportunities within the data, and to communicate results to end-users. A true data scientist should be able to perform all of the functions described above.

Equipping our students for a career in Data Science

The Department of Statistics and Actuarial Science is constantly re-assessing the training we offer our students to ensure that we are up to date and that we are equipping our students for their future careers. In previous newsletters, we discussed our current Data Science offerings, namely our Honours programme with a Data Science focus, as well as our new Data Science focus area within the BCom Mathematical Sciences programme. In the **December 2017 newsletter**, we also detailed new appointments, new modules and industry collaboration within the Department’s Data Science domain.

New developments

Two additional initiatives currently in the pipeline at the University in this regard are:

- 1. A proposed degree in Data Science.** Staff members from the Department met with role-players from the University in June for a full-day workshop to discuss the introduction of a four-year degree programme in Data Science. This degree will further enhance our current Data Science offering and will open up the field of study to many more students. This workshop was the first in a series of planned workshops to discuss the offering of a Bachelor degree in Data Science, with first enrollments in 2021.

SUBJECT-SPECIFIC DEVELOPMENTS



Staff members of the Department of Statistics and Actuarial Science recently met with role-players from the University to discuss the introduction of a four-year degree programme in Data Science.

2. Discussions are also underway at Stellenbosch University about the establishment of a multi-disciplinary **School or Institute for Data Science and Computational Thinking** and the Department is very excited to be part of this new initiative, which brings with it not only its own challenges but also magnificent opportunities for staff members and students. We believe the skills residing in the

Department of Statistics and Actuarial Science form an essential and integral component of Data Science and the Department will therefore embrace this initiative with all the energy it deserves.

Prospective students interested in pursuing studies in Data Science at Stellenbosch University can send an email to Dr Trudie Sandrock [trudies@sun.ac.za] or visit the Department's website: www.sun.ac.za/statistics.

The Centre for Statistical Consultation

The Centre for Statistical Consultation (CSC) is a unit within Stellenbosch University (SU), created with the specific mission to assist students and researchers at the University with all statistical aspects related to and required to produce top-quality research. From study design aspects to analysis and interpretation of data, the CSC sees its goal as enabling the production of good quality research, acceptable for publication. Although the service primarily assists researchers within SU, the centre does from time to time assist undergraduate students, private corporations and institutions as well as students from other universities and academic institutions.

The CSC was established in its current form by Prof Daan Nel and Prof Martin Kidd in 2002. Prof Nel, previously a professor at the University of the Free State as well as a statistician at Clover South Africa, was the first Director of the CSC. Prof Martin Kidd, previously from the Institute for Maritime Technology, was employed as chief statistician in 2002 and was subsequently appointed as the Director of the CSC in 2009.

Since its establishment the CSC has assisted more than 4 000 students and researchers at SU, as well as students from other academic institutions and private companies and individuals. For more information contact Prof Kidd at mkidd@sun.ac.za or visit their website: <http://www.sun.ac.za/english/research-innovation/csc>



Prof Martin Kidd



Prof Daan Nel

SUBJECT-SPECIFIC DEVELOPMENTS

Actuarial Science: Teaching and Beyond

Like all lecturers at the University, the members of the Department of Statistics and Actuarial Science's actuarial team enjoy helping our students kick-start their careers through our regular teaching role – but that is not where our responsibility ends.

Curriculum 2019

Every few years the International Actuarial Association makes changes to the curriculum required to become an actuary – and the next set of changes are due in 2019. All of the major actuarial associations, in particular the Actuarial Society of SA (ASSA) and the Institute and Faculty of Actuaries (IFoA), will change their curriculums with effect from January 2019.

The new curriculum includes a few important and interesting changes, such as the addition of material on Data Science and an increased focus on practical computer modelling skills. Due to the change in the ASSA curriculum and in order to continue improving the education provided to students, the University will be changing the curriculum for the BCom Actuarial Science degree in 2019 (with changes to the second-year curriculum). This will be followed by changes to the third-year and honours curriculums in 2020. New material on Data Science will also be brought into third-year Mathematical Statistics.

At the same time, ASSA is further localising its actuarial qualification with the introduction of material into the Actuarial Risk Management subject that is useful to actuaries working in South Africa, for example introducing concepts used in microinsurance.

Several members of the actuarial team are involved in ASSA committees or working groups to facilitate these (and other curriculum) changes. They include Prof Garrett Slattery and Mr Rob Clover (Education Board), Ms Rika Cilliers (Maths of Finance & Contingencies working group), Ms Monica Matthews (Actuarial Risk Management working group, Tuition Committee) and Mr Davy Corubolo (Investment committee).

More than just technical skills

The SA profession believes in the importance of developing the broader skills that actuaries need in order to translate their technical expertise into a truly professional service to their clients. Assignments in various university courses start to address these skills. These skills are then developed further through workshops that the students participate in once they have started working. The skills include communication skills, interpersonal skills, professionalism, strategic thinking and awareness of developments in the financial services sector and principles of law.

Ms Cilliers and Mr Clover are involved in the various committees that ensure that the curriculums remain relevant and Ms Cilliers, in particular, ensures that these workshops run smoothly. Mr Stephen Burgess and Ms Natalie van Zyl are also involved as members of interdisciplinary teams that present at some of these workshops.

Practical academics

ASSA also has a “public interest” role through providing sound research to inform the public debate or through involvement in finding solutions to industry problems. Ms Matthews is the assistant editor of the open-access South African Actuarial Journal, which publishes research relevant to South Africa.

Ms van Zyl is driving the work of ASSA's Social Security Member Forum on projections of social grants and provided the risk assessment included in ASSA's submission to the government commission on free tertiary education.

Mr Corubolo is a member of the Investment Committee, where he was recently involved in work done by the JSE to update their various JSE indices.

The microinsurance industry is a large and important part of the South African financial services landscape and the regulator is looking at ways to support the growth of this sector further. This renewed focus creates new opportunities for actuaries. Mr Burgess is involved in developing standards that will provide guidance to actuaries working in this sector.

There have been some recent changes in the methodology used to tax life insurance companies. Tax is not everyone's cup of tea, but somebody has to do it – here Mr Clover was involved in the ASSA committee that dealt with this challenge of finding a tax basis that is not only fair to companies and policyholders but also to the revenue collector.

But why ...

Through our involvement in the various ASSA initiatives, we are able to influence developments in the curriculums.

We are also able to stay closely involved in industry challenges and help maintain and build the relevance of the actuarial profession – all of which, we think, also directly benefit our students.

Department welcomes two new staff members



Meet Rousseau Lötter

Dr Rousseau Lötter graduated with an MSc degree in Quantitative Risk Management from the Centre for BMI at the North West University. He completed his PhD in Investment Management at Stellenbosch University. He joins the Department as a senior lecturer in Financial Risk Management.

Share some of your career highlights

After working as an investment analyst at mCubed Holdings and Advantage Asset Managers in Johannesburg, I was appointed as a portfolio manager at Advantage (now known as Momentum Investments). I directly co-managed more than R3 billion in segregated balanced portfolios with Nina Saad, Head: Corporate Portfolio Solutions. In my time there, I worked with some of the best people in the business. It was an amazing experience.

What skills taught in Financial Risk Management are particularly valuable in the “real world”?

Our students need to develop a tenacity to overcome complex problems that involve many factors simultaneously. It is immensely important for them to develop an analytical and pragmatic process to tackle the challenges in today’s financial environment. Secondly, humans are prone to think linearly about the world, and cannot visualise how current patterns will play out in the future. We need to teach our students to understand the compounding effect over time and the influence of tipping points.

What do you enjoy most about Financial Risk Management?

I love that it is a developing, dynamic field and that it is right at the centre of the current intertwining of finance, statistics, informatics and behavioural finance.

What do you think are important characteristics that a (prospective) student should possess if she/he wants to pursue a career in Financial Risk Management?

They should be inquisitive, analytical, hardworking, and have a love for both finance and maths because they will be spending a lot of time with both concepts.

What are the opportunities in Financial Risk Management?

Over the past five years, the financial market as a whole has really started to value “quants” and to embrace applied statistics. Opportunities are opening up all over the place because industry players are realising the need for the skill set we are teaching, especially in the context of “big data” and “machine learning”. An exciting field that I like personally – the field of behavioural finance – is developing fast and receiving a lot of attention locally and internationally.

In your opinion, what should the Department do to make sure it is keeping up with industry?

As an ex-industry academic I would say that every focus group should speak to their respective industry players on an annual basis, and give them the opportunity to critique our courses and programmes.



Meet Francois Kamper

Mr Francois Kamper obtained his MCom in Mathematical Statistics from Stellenbosch University and is busy with the final corrections to his PhD thesis. He joins the Department as a lecturer in Mathematical Statistics.

Share some of your career highlights

The highlight of my career is being able to do a PhD and my appointment as a lecturer at Stellenbosch University.

What skills taught in Mathematical Statistics are particularly valuable in the "real world"?

The most important skill taught in Statistics is the ability to extract meaningful results from complicated data structures. This practice is often labelled as "Data Science" in the industry and academia – a very relevant topic.

What are the opportunities in Mathematical Statistics?

The relevance of Data Science within the industry makes collaboration easy and satisfying. The growth of Data Science makes collaboration between different

departments necessary to explore novel ways of solving complex problems that cannot be solved in isolation.

What do you think are important characteristics that a (prospective) student should possess if she/he wants to pursue a career in Mathematical Statistics?

The student must be strong mathematically, be able to think critically and independently and be hardworking.

In your opinion, what should the Department do to make sure it is keeping up with industry?

Collaboration with the industry is crucial. Students must be trained to understand the fundamentals of Data Science and be exposed to the type of problems they are going to encounter after their studies.

Department bids farewell to Ivona

The Department of Statistics and Actuarial Science said farewell to one of its staff members at the end of 2017. Ms Ivona Contardo-Berning and her husband, Dr Tom Berning, will soon be immigrating to Canada. Ivona is in the final stages of her PhD studies in Statistics under supervision of Prof Sarel Steel. She joined the Department as a full-time lecturer in 2010 after being involved in the Department on a part-time basis since 2006.

Her research interests mainly focus on Statistical Learning Theory and Machine Learning, Natural Language Processing, Non-parametric Statistical Process Control, Data Visualisation and Statistics Education. Ivona was instrumental in developing the Statistics

186 module in its current form, an important service module for the Faculty of Economic and Management Sciences. She presented the Statistics 214 and Theory of Interest 152 modules, was involved with the Data Management module on the Tygerberg campus and presented the postgraduate module in Statistical Process Control.

Ivona was also a Top 12 finalist in the Best Lecturer in the Faculty of Economic and Management Sciences competition twice. Her enthusiasm, friendship and innovative ideas will be missed and we wish her all the best.



STUDENT ACHIEVEMENTS

More students benefit from Schroders and Correlation Risk Partners bursaries

Bursaries funded by Schroders and Correlation Risk Partners were awarded to 19 postgraduate students in the Department of Statistics and Actuarial Science at Stellenbosch University (SU) in 2018.

This brings the total of bursaries awarded to Stellenbosch students over the past three years to 46. The first cohort of five bursary recipients as well as 15 Honours students in the second cohort have all graduated successfully.

An agreement between SU's Department of Statistics and Actuarial Science and Schroders and Correlation Risk Partners, which comprises postgraduate bursaries, research collaboration and an annual high-profile investment seminar, was signed in November 2015.

Schroders is one of the largest independent investment management firms listed on the London Stock Exchange, with more than \$600 billion under management (as at 31 December 2017).

As per the agreement, a third investment symposium was hosted in March. Events were held in Cape Town and Johannesburg, as well as in Stellenbosch.

According to Schroders' Doug Abbott, the symposium focused on their most interesting market views as well as thought leadership.

"As a global manager with investment experience of over 200 years the events gave us the opportunity to demonstrate to the South African academic and investment community some of our leading ideas and challenges currently. This year we focused on global markets, the case for an exposure to value stocks, the strengths and weaknesses of investing in hedge funds and the case for active management."

Postgraduate students in Financial Risk Management, Actuarial Science and Financial Analysis also had the opportunity to listen to the different speakers and benefit from their knowledge and expertise. Through this symposium, they had access to the same information and insights as industry representatives who attended the symposium's presentations in Cape Town and Johannesburg.

The bursaries were awarded at a special dinner.

"Schroders supports education across the globe in a number of ways and we recognise our role in helping to develop talent in the markets we operate in. Our support for education in South Africa is designed to enable students to enter our industry and is an important commitment by us to the South African finance sector and young people who wish to enter the industry," said Abbott.



Mr Tom Mann (Schroders), Mr Chris Paine (Schroders), Mr Azad Zangana (Schroders), Mr Gavin Ralston (Schroders), Prof Willie Conradie (SU), Mr Jaco Marx (Correlation Risk Partners), Mr Doug Abbott (Schroders) and Prof Niel Krige (SU).

Schroders bursary holders with officials from Schroders, Correlation Risk Partners and Stellenbosch University.



STUDENT ACHIEVEMENTS

Graduation 2017/18: PhD and Master's Students

The Department of Statistics and Actuarial Science is proud of the following students who obtained their PhD or Master's degrees in 2017/2018.



Student: Dr Mwanabute Ngoy
Degree: PhD (Statistics)
Supervisor: Prof NJ Le Roux

TITLE OF THESIS:

A statistical analysis of student performance for the 2000-2013 period at the Copperbelt University in Zambia

ABSTRACT:

Education in general, and tertiary education in particular, are the engines for sustained development of a nation. In this line, the Copperbelt University (CBU) plays a vital role in delivering the necessary knowledge and skills requirements for the development of Zambia and the neighbouring Southern Africa Region. It is thus important to investigate relationships between school and university results at the CBU. This study is a comprehensive statistical analysis of student performance for the 2000-2013 period at the Copperbelt University in Zambia. One of the major contributions of this thesis is the use of optimal scores as an alternative imputation method applicable to interval-valued and categorical data.

Find thesis here: <http://hdl.handle.net/10019.1/102668>



Student: Ms Frances Coetzer
Degree: MCom
(Mathematical Statistics)
Supervisor: Dr MMC Lamont

TITLE OF THESIS:

Aspects of multi-class nearest hypersphere classification

ABSTRACT:

Using hyperspheres in the analysis of multivariate data is not a common practice in Statistics. However, hyperspheres have some interesting properties that are useful for data analysis in the following areas: domain description, detecting outliers and the classification of objects into known classes. This thesis demonstrates how a hypersphere is fitted around a single dataset to obtain a support region and an outlier detector. The hyperspheres are then extended to multi-class classification, which is called nearest hypersphere classification.

Find thesis here: <http://hdl.handle.net/10019.1/102662>



Student: Ms Tessa Rodseth
Degree: MCom (Statistics)
Supervisor: Prof SJ Steel

TITLE OF THESIS:

Statistical classification in high-dimensional scenarios with a focus on microarray data sets

ABSTRACT:

High-dimensional data analysis characterises many contemporary problems in Statistics and arise in many application areas. This thesis focuses on very high-dimensional problems in which the input predictor variables are gene expression measurements in microarray studies. Various classification techniques are investigated in this thesis as binary (and multi-class) classification procedures on microarray data sets. The important problem of eliminating redundant input variables before implementing classification procedures in high-dimensional data sets is addressed in this thesis.

Find thesis here: <http://hdl.handle.net/10019.1/102771>

STUDENT ACHIEVEMENTS



Student: Mr Luca Steyn
Degree: MCom
(Mathematical Statistics)
Supervisor: Prof T de Wet

TITLE OF THESIS:

Extreme value-based novelty detection

ABSTRACT:

This dissertation investigates extreme value-based novelty detection. An in-depth review of the theoretical proofs and an analytical investigation of current novelty detection methods are given. It is concluded that the use of extreme value theory for novelty detection leads to superior results. The first part of this dissertation provides an overview of novelty detection and the various methods available to construct a novelty detection algorithm. Four broad approaches are discussed, with this dissertation focusing on probabilistic novelty detection.

Find thesis here: <http://hdl.handle.net/10019.1/102955>



*Prof WJ Conradie and
Mr Jacobus Viljoen*

Student: Mr Jacobus Viljoen
Degree: MCom (Financial Risk Management)
Supervisor: Prof WJ Conradie

TITLE OF THESIS:

The application and testing of smart beta strategies in the South African market

ABSTRACT:

Smart Beta portfolios have recently prompted great interest both from academic researchers and market practitioners. Investors are attracted by the performances produced by these portfolios compared to the traditional market capitalisation weighted indices. The question that this thesis attempts to answer is: Do smart beta portfolios outperform the traditional cap-weighted indices in the South African market? In this thesis five different fundamental factor portfolios were created based on the smart beta methodology. The factors that were used are well researched in the market and have been proven to provide investors with excess return over the market.

Find thesis here: <http://hdl.handle.net/10019.1/103749>

STUDENT ACHIEVEMENTS

2017 Third-year prize winners

Every year, the Department of Statistics and Actuarial Science awards prizes to the best final-year undergraduate students in each of the four disciplines offered by the Department. At a cocktail function for Honours students, Prof Ronel du Preez, Vice-Dean: Teaching of the Faculty of Economic and Management Sciences handed cash prizes to the following students:

Statistics: *Shannon Davies*



*Prof Paul Mostert,
Shannon Davies and
Prof Ronel du Preez*

Shannon grew up in Johannesburg and matriculated from De La Salle Holy Cross College. She has a passion for cooking and baking and loves being outdoors with friends. Shannon is currently doing an Honours degree in Statistics.

Do you think Statistics is a useful subject that can bring change to our society at large?

Definitely! I feel like, especially with the big data boom, in a few years everyone will be expected to be able to collect and analyse their own data. I also believe that almost any problem can be solved with an effective algorithm, which is basically what Statistics is all about. Statistics is just so applicable to so many areas and fields.

Why did you decide to study Statistics?

Looking back, it kind of just happened this way. I have always loved maths and numbers and each year at university, Statistics ended up being my favourite subject. So, when it came to choosing what to study for Honours, Statistics seemed the best choice.

What are your future career plans?

I'm not sure where I'm going to end up or what I'm going to be doing just yet. I was so set on the finance sector for a long time but who knows, I'm really open to all opportunities and also to maybe trying something completely new. I think I will eventually get my Master's degree and maybe that will make choosing a career path easier.

STUDENT ACHIEVEMENTS

Financial Risk Management: *Juan Naude*



Prof Paul Mostert, Prof Ronel du Preez and Juan Naude

Juan grew up in Citrusdal and later moved to Cape Town. He attended Groote Schuur Primary School and matriculated from Rondebosch Boys' High School. Juan likes to participate in triathlons and loves to spend time making good memories with friends. He is doing an Honours degree in Financial Risk Management.

Why did you decide to study Financial Risk Management?

I actually started off studying Actuarial Science and about six months into my first year, I realised that this career path was not for me. During this stressful time, I consulted many lecturers for advice regarding this matter and it was Prof Conradie who finally persuaded me to do Financial Risk Management – a decision that I do not regret.

This degree really offers it all and I believe it definitely equips students with everything they need to become successful risk managers in the future.

Do you think Financial Risk Management is a useful subject that can bring change to our society at large?

Yes, indeed. The special aspect of Financial Risk Management is that it develops a certain mind set. Individuals become experts at identifying potential risks and how to handle them in the best way possible. We therefore have a society of controlled risk takers where return is maximised with risk minimised. Major banks in South Africa are already employing a large number of risk managers to handle their credit risks. If experts monitor and control these risks of major financial institutions, it will certainly have a positive effect on the society.

What are your future career plans?

I would like to start working next year. I have started my studies towards completing the CFA programme and would like to complete an MBA later on. These programmes will help me to get into senior management roles. I'm excited about what the future holds and the many places this degree will take me in the years to come.

STUDENT ACHIEVEMENTS

Actuarial Science: This prize was shared by *Willem Ackerman, Louis Lategan and Pierre du Plessis*



Prof Ronel du Preez, Pierre du Plessis, Louis Lategan, Willem Ackerman and Prof Paul Mostert

Pierre du Plessis

Pierre lived in Somerset West until he was 17 before moving to Stellenbosch. He went to Somerset House Primary School and matriculated from Somerset College. Pierre loves watching and playing sports and enjoys spending time with family and friends. He is doing an Honours degree in Actuarial Science.

Why did you decide to study Actuarial Science?

I enjoyed maths and problem solving in high school and was not a big fan of parrot learning. Actuarial Science appeared to tick all of these boxes with the reported salary being a nice bonus. My mother also studied Actuarial Science. She believed I would enjoy it and do well so it seemed like the obvious choice.

Do you think Actuarial Science is a useful subject that can bring change to our society at large?

Of course! I believe Actuarial Science already plays an important role in society's well-being. I believe our in-depth understanding of risk as well as our ability to analyse and use data can be applied in a variety of different fields going forward.

What are your future career plans?

In terms of studies, I would like to qualify as an Actuarial Fellow as soon as possible. I'd love to work in Cape Town, as it is ideal for an active and social lifestyle, with the consulting environment particularly appealing due to the variety of work it offers.

STUDENT ACHIEVEMENTS

Willem Ackerman

Willem was born in Johannesburg, but moved to George when he was four years old. He matriculated from Outeniqua High School. He enjoys tennis, soccer and socialising with friends. He is currently doing an Honours degree in Actuarial Science.

Why did you decide to study Actuarial Science?

I had Actuarial Science in the back of my mind for quite some time, but only made my final decision at the start of my matric year. I think what I enjoy most about Actuarial Science is seeing how all the intricate systems that we study come together to form something meaningful. I think the aspect of Mathematical Statistics that I like most is how fundamentally important it is and how you start from scratch and derive results with so many real-world applications.

Do you think Actuarial Science is a useful subject that can bring change to our society at large?

Yes, I think actuaries make a huge contribution in the lives of all members of our society and this contribution is often overlooked, because most of the hard work happens behind the scenes. There are so many fields where actuarial concepts are used and where actuaries can help by providing knowledge.

What are your future career plans?

I will start working next year, continuing with my actuarial exams so that I can obtain my qualification. I am still exploring the various actuarial fields to see which ones I would like to study further.

Louis Lategan

Louis grew up in a small farming community called Breërivier. He attended Breërivier Primary School and later moved to Stellenbosch where he matriculated from Stellenbosch High School. He enjoys watching series and tries to spend as much time as possible with family and friends. Louis is currently doing an Honours degree in Actuarial Science.

Why did you decide to study Actuarial Science?

I was not certain about what I wanted to study at all, so I decided on Actuarial Science because I figured that it kept my options open if I ever decided to change my major within the field of finance. Actuarial Science encompasses a wide range of topics and ideas. I really enjoy constantly dealing with new and challenging concepts.

Do you think Actuarial Science is a useful subject that can bring change to our society at large?

The actuarial skill set equips us to deal with a very wide range of different problems that, if solved, will benefit our society at large. The National Health Insurance (NHI) that the government wants to implement is one topical example. It is a contentious issue at the moment, but if implemented correctly, it can have many benefits for society. Actuaries have a very important role to play in its successful implementation.

What are your career plans?

I am considering a Master's degree in Actuarial Science, but I have a good job opportunity on the horizon so I am waiting to see if it comes to fruition before making any definite decisions.

The prize for Mathematical Statistics was shared by Willem Ackerman and Louis Lategan.

STUDENT ACHIEVEMENTS

NRF-SASA Academic Statistics Bursaries



Sven, Annegret, Bronwyn, Dylon, Michail

In 2014, the national Department of Science and Technology (DST) classified Statistics as a “vulnerable discipline” in South Africa due to the scarcity of well-qualified professionals and academics in this field. Administered by the NRF and the South African Statistical Association, the fund is used to provide full-time bursaries to Master’s and PhD students. The only criterion to obtain a bursary is academic merit.

Stellenbosch University’s second Master’s cohort (2016/2017) all graduated at the end of 2017, while the first cohort of PhD students will graduate in 2018. The

main purpose of these bursaries was to attract our top students back to an academic career. This is indeed what was achieved in our Department.

Francois Kamper, a PhD bursar, and Luca Steyn, a Master’s bursar were permanently appointed as lecturers in the Department at the end of 2017.

The recipients of these prestigious NRF bursaries in 2018 are Sven Buitendag (PhD) as well as Annegret Muller, Bronwyn Dumbleton, Dylon Botha and Michail Melonas (all Master’s students).

Third-year bursary winner sponsored by ICCSSA



In 2017, the SASA Education committee awarded one scholarship and two bursaries to worthy recipients. Zoë-Mae Adams, who is currently doing her Honours degree in Statistics at Stellenbosch University, was the recipient of one of the bursaries sponsored by ICCSSA. Here she is with Prof Paul Mostert, chairperson of the Department, and Dr Morne Lamont.

MEET AN ALUMNUS

Dawid Krige: A South African success story in London

Dawid Krige obtained his BCom degree in 1999 and was one of the first students to enrol for the Honours programme in Financial Risk Management offered in the Department of Statistics and Actuarial Science at Stellenbosch University. He moved to London shortly after obtaining his Honours degree cum laude in December 2000. In 2011, he was one of the co-founders of the London-based company Cederberg Capital, an investment boutique that focuses on Greater Chinese equities. The net return on their China Equity Fund for the last five years was 20% per annum. If compared with the return of the Bloomberg universe of equity funds with a greater China geographical focus of 10% per annum over the last five years, the success of Cederberg Capital is as clear as daylight.



Tell us more about your career path

I came to London after graduating in 2000, and have been based in this great city since then. I started my career in FirstRand's multimanager division, where meeting 300 portfolio managers over three years taught me why some investment managers excel, and why most don't! It led me to join Mondrian Investment Partners as a China equity analyst in 2005; I subsequently became a portfolio manager. In 2011, I co-founded Cederberg Capital. Our assets under management are currently \$500 million, and we're starting to gain traction with UK and US institutions on the back of top percentile performance since the fund's inception.

What are the main opportunities and challenges of your current role?

As CEO and CIO (Chief Investment Officer) of a small investment manager focused on China, there is always something to do. It is a pleasure to work alongside smart people and to focus on one of the most dynamic equity markets in the world.

Challenges... to prove to cynics that a South African based in London can continue to add significant value relative to the index and our peers; and to challenge conventional thinking regarding the risks and rewards that China offers investors.

MEET AN ALUMNUS

Share a few memories from your time at Stellenbosch University

I was a very poor student. In fact, I failed my second year! While it stung at the time, it was one of the best things that could have happened to me. Firstly, it forced me to deal with “failure”, a wonderful teacher that has taught me many valuable lessons over the years. I learnt not to be afraid of failure, especially not in terms of how the world defines it. Secondly, it allowed me to switch to the newly launched Institutional Investment course, which – it is fair to say – changed my life.

I have many fond memories from my five years studying in the Stats department. There were only six of us in our Honours class, and we had a lot of fun inside and outside the classroom. Of course, Professors Mark Claassen, Willie Conradie, Tertius de Wet, Sarel Steel and many other brilliant teachers set us up for success through the phenomenal education they gave us.

As South Africans, we often assume that the standards in the rest of the world must be higher than what we are used to in SA. This couldn't be further from the truth. In fact, one of our classmates, Chris van Zijl, who went on to study abroad, came back quite disappointed – he felt the Honours degree in Statistics he did at Stellenbosch was of a higher level than the Master's degree in Statistics he did at Oxford! Having done a Master's degree in Finance at London Business School, I can vouch for Stellenbosch's high standards.

What are the main opportunities in the financial services industry?

There will always be opportunities in finance for bright, ethical, energetic people who aim to do things a little differently to the crowd. I am excited to see what the current crop of Stellenbosch students will achieve in years to come!

What skills that were developed through your undergraduate and postgraduate studies did you find particularly valuable in your career?

A degree in Statistics can be a great foundation to many careers in finance. It teaches rationality, which is surprisingly rare in the real world – note the terrific work that has been done by Daniel Kahnemann on behavioural economics. Secondly, it encourages one to think probabilistically – I find this incredibly useful when I'm considering the risk/reward potential of different investment opportunities every day.

What do you think are the most important characteristics that a prospective student in our Department should possess if s/he wants to pursue a career in the financial industry?

Curiosity, critical thinking, and intellectual honesty – that's it! If you're a team player that seeks mutual wins, even better.

What are the main challenges facing the financial services industry at the moment?

With respect to asset management, it has earned a reputation for poor value for money: hedge fund managers often earn outsized pay packets despite mediocre returns. At Cederberg, we aim to give more than we get. Utilising performance fees and eating our own cooking (the bulk of my net worth is invested in the fund) help to align our interests with those of our clients.

Another challenge is managing potential conflicts of interests. At its heart, asset management is a simple business: when you're unsure what to do, ask yourself: What's best for the client? This will typically also be best for staff and shareholders in the long run.

It is a great privilege to celebrate and showcase our alumni. As an alumnus/a of Stellenbosch University, you are our most valuable stakeholder and ambassador. You form part of a global community of more than 120 000 graduates. Your involvement with us ensures that you are kept abreast of developments here, that you receive a range of opportunities to remain connected to other alumni and that your degree and alma mater remain relevant. Contact alumni@sun.ac.za

IMPORTANT INFORMATION

Upcoming Seminars

SEMINAR PROGRAMME: SECOND SEMESTER 2018

Stellenbosch University
Department of Statistics and Actuarial Science

3 August	Johan Louw (Department of Logistics, SU) Visual data analytics: your visuals providing clarity and insight or more confusion?
24 August	Hanjo Odendaal (Bureau for Economic Research, SU) Digital age economics: applications of statistical learning for economic indicators
7 September	Hélène Nieuwoudt (Institute for Wine Biotechnology, SU) Modelling the sensory space of varietal wines: mining of large, unstructured text data and visualisation of style patterns
28 September	Francois Kamper (Department of Statistics and Actuarial Science, SU) Regularised Gaussian belief propagation
12 October	Rousseau Lötter (Department of Statistics and Actuarial Science, SU) Implementing smart beta: the untold story
26 October	Monica Matthews (Department of Statistics and Actuarial Science, SU) The South African investor: a year in review

Seminars start at 13:00 and are held in room 2048 of the Van der Sterr Building, c/o Victoria and Bosman streets, Stellenbosch.

Enquiries: Prof Danie Uys: 021 808 3879, dwu@sun.ac.za

Prof Sugnet Lubbe gives inaugural lecture

Professor Sugnet Lubbe (middle) gave her inaugural lecture on 21 June 2018. The title of her talk was: “Essential data science maps to safely navigate potholes”. It was a very significant day for the Department of Statistics and Actuarial Science as Sugnet is the first female full professor appointed in the Department. Prof Lubbe obtained all her degrees in the Department and did her PhD under the supervision of Prof Niel le Roux. With Prof Lubbe is Prof Ingrid Woolard (Dean, Faculty of EMS) and Prof Hester Klopper (Vice-Rector, Strategy and Internationalisation).



PHOTO CREDIT: Anton Jordaan (SFFD/SCPS)

IMPORTANT INFORMATION

Academic papers presented in 2017/18

Presentations at the 59th annual conference of the South African Statistical Association (SASA 2017), Bloemfontein, South Africa

- Hayward, C. and Wagenaar, B. The application of natural language processing in the prediction of customer experience (poster).
- Muller, C. Dealing with missing data when modelling multi-state panel data.
- Hofmeyr, D. Interactive clustering using projections.
- Lamont, M.M.C. Sparse linear discriminant analysis for high-dimensional data: Techniques and packages in R.
- Le Roux, N.J. and Lubbe, S. Biplot visualisations of interactions in a bilinear model having a qualitative dependent variable.
- Lubbe, S. and Le Roux, N.J. clusboot: An R package for visualising bootstrapping of cluster analysis.
- Schoonees, P. and Le Roux, N.J. An assessment of methods for calculating neural reliability from EEG recordings.
- Steyn, M.L. and De Wet, T. Extreme value-based novelty detection.
- Coetzer, F. and Lamont, M.M.C. Aspects of multi-class nearest hypersphere classification.
- Marais, J. and Bierman, S. Convolutional neural networks for multi-label classification of satellite images.
- Nienkemper-Swanepoel, J., Le Roux, N.J. and Lubbe, S. Competing approaches to the visualisation of incomplete categorical data sets.

Presentations at International Conferences: IN 2017

- Lubbe, S. Visualisations associated with bootstrapping cluster analysis. Data Science, Statistics and Visualisation conference, 12-14 July 2017, Lisbon, Portugal.
- Nienkemper-Swanepoel, J., Le Roux, N.J. and Lubbe, S. The virtues and pitfalls of the visualisation of incomplete categorical data. Data Science, Statistics and Visualisation conference, 12-14 July 2017, Lisbon, Portugal.
- Lubbe, S., Nicol, M.P. and Zar, H.J. Functional Discriminant Analysis for Multivariate Longitudinal Data. World Statistics Congress, 16-21 July 2017, Marrakesh, Morocco.
- Lubbe, S. A comparison of different applications of functional linear discriminant analysis. International Federation of Classification Societies Conference, 8-10 August 2017, Tokyo, Japan.
- Nienkemper-Swanepoel, J., Le Roux, N.J. and Lubbe, S. Challenges in visualising and imputing missing categorical data. International Federation of Classification Societies Conference, 8-10 August 2017, Tokyo, Japan.
- Ganey, R. and Lubbe, S. Biplots based on Principal Surfaces. International Federation of Classification Societies Conference, 8-10 August 2017, Tokyo, Japan.
- Le Roux, N.J. and Gurr, B.W. A biplot view of violent crime in South Africa. 7th International Workshop on Compositional Data Analysis (CoDaWork), 5-9 June 2017, Abbadia San Salvatore, Italy.
- Le Roux, N.J. and Ngoy, M. Geometric perspectives on student performance at the Copperbelt University in Zambia. 61st ISI World Statistics Congress, 16-21 July 2017, Marrakech, Morocco.
- Le Roux, N.J. A visualisation technique to identify critical variables in multivariate process monitoring. Conference of the International Federation of Classification Societies, 8-10 August, 2017 Tokyo, Japan.
- Schoonees, P. and Le Roux, N.J. Computing neural reliability. Conference of the International Federation of Classification Societies, 8-10 August, 2017 Tokyo, Japan.

IMPORTANT INFORMATION

Presentations at International Conferences: IN 2018

- Uys, D.W. Forward stagewise linear regression for ensemble methods. 5th European Conference on Data Analysis (ECDA), 4-6 July 2018, Paderborn, Germany.
- Uys, D.W. Forward stagewise linear regression for ensemble methods. Data Science, Statistics and Visualisation conference (DSSV), 9-11 July 2018, Vienna, Austria.
- Hofmeyr, D. Finding non-linear cluster separators using multi-variate projection pursuit, Data Science, Statistics and Visualisation conference (DSSV), 9-11 July 2018, Vienna, Austria.
- Hofmeyr, D. and Pavlidis, N. Model selection for projected divisive clustering. 5th European Conference on Data Analysis (ECDA), 4-6 July 2018, Paderborn, Germany.
- Harvey, J. and Van der Merwe, A.J. Objective Bayesian Analysis of the Variance of Lognormal Data. (ISBA 2018), Edinburgh (poster presentation).
- Harvey, J. and Raubenheimer, L. Objective Bayesian Prevalence Modelling, (ISBA 2018), Edinburgh (poster presentation).
- Ganey, R. and Lubbe, S. Principal Surface biplots, 5th European Conference on Data Analysis (ECDA), 4-6 July 2018, Paderborn, Germany.
- Rowen, A., Lubbe, S., Le Roux, N.J. and Schoonees, P. Unravelling black box machine learning technique predictions using biplots, 5th European Conference on Data Analysis (ECDA), 4-6 July 2018, Paderborn, Germany.
- Ganey, R. and Lubbe, S. Visualising Multivariate data using Principal Surfaces Biplots, Data Science, Statistics and Visualisation conference (DSSV), 9-11 July 2018, Vienna, Austria.
- Le Roux, N.J., Gower, J. and Lubbe, S. Can within-group information be used to supplement visual representations of two or three group Canonical Variate Analyses? Data Science, Statistics and Visualisation Conference (DSSV), 9-11 July, 2018, Vienna, Austria.

Planned for the rest of 2018

- Lubbe, S. Visualisation as a tool to understand the sights and sounds of data. BRICS mathematics conference, 23-27 July 2018, Foz do Iguaçu, Brazil.
- Lubbe, S. A naïve visualisation of Data Science, COMPSTAT, International Conference on Computational Statistics, 28-31 August 2018, Iasi, Romania.
- Le Roux, N.J. and Ngoy, M. Biplot perspectives on student performance at the Copperbelt University in Zambia. Conference on Computational Statistics, 28-31 August 2018, Iasi, Romania.
- Schoonees, P. and Le Roux, N.J. Computing and validating neural reliability from EEG recordings. Conference on Computational Statistics, 28-31 August 2018, Iasi, Romania.



In memoriam

It is with great sadness that we inform you that Dr Johan van Vuuren passed away on 16 May 2018. Dr Van Vuuren joined the Department in 1983 and completed his PhD in 1998. He was a staff member in the Department for 33 years until his retirement in 2016.

IMPORTANT INFORMATION

Stellenbosch alumni become Fellows of the Actuarial Society of SA

Being admitted as a Fellow of the Actuarial Society of South Africa (FASSA) is a big achievement that requires many years of dedicated study. The long road starts with a very challenging degree at university and continues for a number of years whilst working. The following alumni from Stellenbosch University have been admitted as Fellows of ASSA and the Department would like to congratulate them:

Surname	Initial	FASSA	Surname	Initial	FASSA
Alant	EJT	2017	Paterson	N	2017
Barry	AE	2017	Penberthy	J	2017
Botha	AF	2017	Reynolds	B	2017
Cloete	RL	2017	Stassen	J	2017
Conradie	GJ	2017	Van Zyl	E	2017
Erasmus	L	2017	Venter	JP	2017
Erwee	SP	2017	Welgemoed	MR	2017
Esterhuysen	MC	2017	Brink	AJ	2018
Gouws	JH	2017	Burger	CRDW	2018
Grotepass	BE	2017	De Klerk	S	2018
Hatherell	DJ	2017	Fismer	L	2018
Kocks	JF	2017	Fourie	W	2018
Lamprecht	JM	2017	Herbert	CP	2018
Le Roux	JS	2017	Kruger	NAS	2018
Louw	EM	2017	Prodehl	MC	2018
Malherbe	JE	2017	Schreiber	LM	2018
Mentz	IN	2017	Snyman	JC	2018
Muller	MH	2017	Sohnge	JH	2018
Myoli	RT	2017	Theron	JGM	2018

We hope you enjoyed this edition of the Department of Statistics and Actuarial Science's biannual newsletter. Please keep in touch through our Alumni Office, and send any interesting news snippets to Dr Morné Lamont at mmcl@sun.ac.za. The next newsletter will be distributed in December.

