




# STATISTICAL SOCIETY OF AUSTRALIA INCORPORATED NEWSLETTER

 June 2010  
Number 131

## Australian Statistical Conference 2010

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**It gives me great pleasure to introduce one who should receive star status billing at the upcoming conference ASC2010. In fact it would seem to me that if anyone should be able to encompass the philosophical, spiritual and mathematical nature of the statistician, together with the ability to entertain an audience, it should be Professor Persi Diaconis from Stanford University. Persi's origins are somewhat unique in the field of statistics academia. Indeed, he started off as a magician. Everyone loves a story of rags to riches, and in Persi's case it is a story of one who used his knowledge of magic tricks to pave his way into academia. At his website <http://news.stanford.edu/news/2004/june9/diaconis-69.html> a detailed description of his exploits can be found. In summary, he left his New York home at 14 to travel with a "sleight-of-hand expert", presumably a magician, and then followed a decade of training in magic. From gambling houses that used crooked dice, having had one hundredth of an inch shaved off an edge, he chose to pursue a career understanding the mathematical realms of chance... beginning with William Feller's text book *An Introduction to Probability and Its Applications*. Realizing**

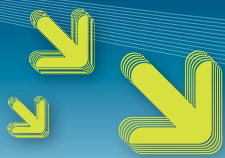


Professor Persi Diaconis, Stanford University. Photo credit: L.A. Cicero.

**he needed an understanding of calculus eventually he was led back to study at age 24, paying his way through night school by performing tricks in the day.**

The columnist for the *Scientific American* magazine who published two of Persi's card tricks on their puzzle page gave him a recommendation enough to lure Fred Mosteller - a statistician on the staff at Harvard who also dabbled in magic - into taking him on as one of his graduate students. Three years later, in 1974, he completed his doctorate and joined the faculty at Stanford.

For Persi, coming to Perth in 2010 may be considered déjà vu, since he was a



June 2010



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**DEADLINE FOR NEXT ISSUE:  
10 August 2010**



Alice Richardson,  
Editor.

## Editorial

**The end of the year is closer than you may care to think about! May is nearly gone, June is filling up fast, and the other day I was pencilling in an event in my diary in mid-December. Of course early December should be booked out already for Statistical Society members, with the Australian Statistical Conference, ASC 2010, scheduled for December 6 – 10 in Perth. The conference features on the front page of this issue and I suggest you read carefully about the wide variety of workshops and invited speakers.**

In the months leading up to the conference, do keep in touch with Branch events. There is a huge variety of events reported in this issue, from Branches right around the country.

And on a wider stage, Jef Teugels, ISI President, recently sent a message out to all national and regional statistical societies, about World Statistics Day.

World Statistics Day (WSD) will be celebrated on Wednesday 20th October 2010 (20-10-2010).

The United National Statistical Commission (UNSC) decided during its 41st Session in February 2010 with great enthusiasm to celebrate WSD under the theme 'Celebrating the Many Achievements of Statistics, Service, Professionalism and Integrity'. The UN Statistics Division (UNSD) will call on governments to celebrate this day in co-operation with the national statistical services.

More information about the UNSD activities can be found on <http://unstats.un.org/unsd/wsd/Default.aspx>

On behalf of the ISI Jef called upon all national and regional statistical societies to celebrate World Statistics Day and to develop plans for communicating this to the wider public. In June the ISI will launch a webpage for communication purposes and we are all invited to present our plans and announcements at [isi@cbs.nl](mailto:isi@cbs.nl) for publication on that web page.

I hope the Branches will be able to embrace this day – it sounds like a great excuse for a party at the very least. Please consider reporting on your event for this newsletter too.

*Alice Richardson*

**Alice Richardson**

Editor ■

## CONFERENCES AND WORKSHOPS

ISBA 10th World Meeting / 9th Valencia International Meeting on Bayesian Statistics incorporating the ISBA 10 / Valencia 9 Student Video Competition  
3 – 8 June 2010, Benidorm, Spain  
<http://www.bayesian.org/events/isba2010/index.html>

ISBIS-2010, International Symposium for Business & Industrial Statistics  
5–9 July 2010, Grand Hotel Bernardin, St. Bernardin Adriatic Resort & Convention Center, Portoroz (Portorose), Slovenia  
<http://www.action-m.com/isbis2010>

31st Annual Conference of the International Society for Clinical Biostatistics  
29 August – 2 September 2010, Montpellier – France  
<http://www.iscb2010.info/>

SSAI Workshop: Workshop on Causal Inference  
4-5 September 2010, University of Queensland  
<http://www.statsoc.org.au/CPD15Info/>

ALTC Workshop "Effective Teaching and Learning of Mathematics"  
30 September - 1 October 2010, University of Queensland, St Lucia  
<http://www.austms.org.au/ALTC>

### Bayes on the Beach

A forum for discussion on developments and applications of Bayesian Statistics with David Elston (Biomathematics and Statistics Scotland) and Scott Sisson (University of New South Wales)  
4-5 October 2010, Surfers Paradise, Queensland  
Email: [alice.currie@qut.edu.au](mailto:alice.currie@qut.edu.au)

International Biometrics Conference  
5 – 10 December 2010, Florianopolis, Brazil  
<http://www.tibs.org/Interior.aspx>

Australian Statistical Conference 2010  
6 – 10 December 2010, Perth, WA  
<http://www.promaco.com.au/2010/asc/index.htm>

Mapping Global Change  
23-25 March 2011 in Enschede, The Netherlands  
<http://www.spatialstatisticsconference.com/>

ICIAM 2011 – Seventh International Congress on Industrial and Applied Mathematics  
18-22 July 2011, Vancouver, Canada  
<http://www.iciam2011.com>

58th Session of the International Statistical Institute  
21-26 August 2011, Dublin, Ireland  
<http://www.isi2011.ie/> ■

# President's Message

## Introduction

**My last message covered some New Year aspirations for the society. This time I will reflect on progress and achievements. I should make it absolutely clear from the start though, that these are the achievements of the society and the members who keep on putting the effort in to make a difference for our profession, and for Australia, not mine personally.**

## Financial situation

The audited figures for 2009/10 are not yet available, but it is already clear that we have finished the 9/10 financial year in much better shape than we had hoped, even as recently as 6 months ago. We still have to be careful, but the demonstrated commitment of members has really helped improve the bottom line. We took out loans from each of the branches to ensure we had sufficient funds to continue to operate, with a plan to pay them back over 4 years. The Central Council last week agreed that the situation looked healthy enough that we could make advance payments next month, and providing all goes well financially with the conference in December we may be in a position to repay the complete amount by next year. That is a significant achievement and is due to all the members who have worked hard to keep the society strong and vibrant.

## Membership drive

Membership is a key issue for any society, and at the moment for SSAI it is crucial. There has been a steady and worrying decline in membership over a number of years. SSAI is not alone in this. Over the last year I have spoken with officers from several other statistical societies (the ISI, the RSS, and the ASA) and for all, trends in membership numbers are a concern. For the first time in several years, we ended last year with an increase in membership numbers, both in total terms, and in terms of full paying members, which was heartening. The majority of the difference between full paying and total membership is made up of student members. We have strong and active Young Statisticians Groups and quite a large number of

student members, which is pleasing. Numbers peaked late last year and have fallen since then in line with the annual renewal cycle. Central Office has an active process for reminding members when their renewal falls due, and each branch has or is developing a program of making personalised contact as well.

A relatively small proportion of student members take the option to transit to full membership when their studies are complete. Last week I came across a note from about a decade ago, when a colleague and I were discussing how we came to join the society. In the early stages of our careers we both felt overwhelmed by the knowledge and experience of the more experienced members of the society, and only joined the society because colleagues invited us to personally. Even then it was not until later in our careers that we felt comfortable contributing actively to the society. In hindsight, I should not have been overawed, rather I should have seen SSAI membership as a tremendous opportunity. I know now that the experienced and learned members would have been more than happy to advise and mentor young and eager entrants to a career in statistics, be it in academia, in government or in business. I would like members at all levels, and in every branch, to invite their younger colleagues along to branch meetings, to help introduce them to other members of the society, and to take an interest in their careers and professional development.

Membership is an investment in a society which provides services to members, and which promotes our profession, the proper use of statistics and the ongoing development of sound statistical methods in Australia. If your own membership renewal is due, I encourage you to take the time to renew promptly; if you have the opportunity talk to your colleagues and encourage them to consider membership.

## Conferences

### • ASC2010

The local organising committee over in the west has the preparations for the conference in Fremantle, from 6th - 10th December, well in hand. It is shaping up to be a great conference, and I hope to meet as many of you as possible over there.

### › Registrations

The important news for your diary is that registrations will be opening up soon, so keep an eye on the website, and be ready to get the earlybird rate.

## CENTRAL COUNCIL

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### Western Australia

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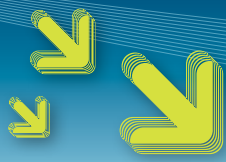
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Further contact details for Society Secretaries and Section Chairs can be obtained by contacting the Society on (02) 6251 3647.



## President's Message (Cont.)

Geoff Lee

*President's message cont. >>*

### • Program and workshops

The program is diverse, with many highly regarded keynote speakers. They will cover many different aspects of statistics, ranging from fundamental research through to major areas of application. All have reputations for giving interesting and engaging presentations, so there will be plenty of enjoyable opportunities to hear about aspects of statistics that are new to you, as well of course as attend talks closely related to your day to day interests.

Conferences are an opportunity for each of us to share our own work with colleagues, and get comments, feedback and suggestions. As well as getting your earlybird registration in, start thinking about the presentations you might give, and getting your abstracts ready to submit. If that's not enough to tempt you, there is a solid program of workshops being planned for the week before and after the conference. They give you the chance to learn, or brush up on some specific skills in a very hands on and interactive manner. Feedback from attendees at the workshops we ran last year, and will be running again this year has been overwhelmingly good, so if you can afford the time, and are interested in the ones which are associated with the conference in Fremantle, start planning now to be there.

### • Up to date details

The website address for the conference is <http://www.promaco.com.au/2010/asc>. Bookmark it now, and keep an eye on it for further details as the event gets closer.

### • Aussie stats booth at JSM

While on the topic of conferences, CSIRO has kindly sponsored an "Aussie Stats" Booth at the ASA JSM later this year. There is a separate article about this, so I'll just say if you are over there, check the details and see how you can help show the rest of the world what Australian statisticians can do.

## The future of Statistics in Australia

There's a fair bit of interest at the moment in the health and sustainability of statistics and mathematics as professions in Australia at the moment, and the SSAI, through the efforts of a number of dedicated members, has been active in putting forward our views.

### • National Schools Curriculum

I mentioned in my last newsletter the opportunity that we had been given to contribute to the development of a National Curriculum for Mathematics and Statistics in schools. The process has been more drawn out and tortuous than we had anticipated, so extra thanks are due to the small group who took on this task at very short notice. The K-10 curriculum is out for comment at the moment, and the Y11-12 one is due later this year. For various reasons, not all our suggestions made it through to the current version of the K-10 curriculum, but we have had opportunity to provide further comment during the current round of wide consultation, and we remain hopeful that the future national curriculum will be a substantial advance on what exists at the moment.

### • Statistical training for school teachers

Of course, a curriculum is only as good as the teachers who are implementing it, and there will be a need to consider the best way of educating those university students who will become the next generation of statistics and mathematics teachers. Moreover there are many teachers already working in schools across Australia, who will need support building their own skills to teach the newer (statistical) parts of the curriculum. The society could have a big role to play in helping plan how this might be supported, and even in contributing to it happening. The new curriculum will not be implemented straight away, so there is a little more time available than has been the case so far. There are several options for how we might develop an SSAI position on this, perhaps via our Statistical Education section, perhaps via branches, perhaps via a meeting at the upcoming conference, or possibly by a combination of them all. We need to give some thought to how we might approach this, and then set some mechanisms in place.

### • Other related activities

There is a separate article about the recently published Go8 review. One thing that struck me was the similarity to issues raised in the review the SSAI conducted in 2005. You can find the report from our 2005 review via our the website at <http://www.statsoc.org.au/StatsUnis>

The fact that the same issues are still around might seem discouraging, but we are having some success, and there is evidence from overseas that it is possible to turn trends around. During February I attended a talk arranged by AMSI (Australian Mathematical Sciences Institute) by Professor Celia Hoyles, former UK Government Advisor on Mathematics. It was a very engaging talk, with many ideas that had been implemented successfully in the UK. It was heartening as well, to see evidence (yes there was real data presented, which always makes the statistician in me a bit happier) that showed it is possible to turn around a downward trend in the numbers studying and graduating from statistics and mathematics courses. Her talk was videoed, and can be downloaded from the AMSI website at <http://www.amsi.org.au/index.php/news/87-general-and-outreach-news/382-prof-celia-hoyles-on-successful-strategies-in-the-uk> (or just go to the AMSI website and search for hoyles). It is well worth a look.

One key message was that the numerate sciences must "speak with a single voice" if they are to be successful at influencing governments, otherwise, even with the best intent, policy makers become confused about what is really needed and end up picking and choosing between different pieces of advice with suboptimal results. This does not and should not mean that that we should consider statistics and mathematics to be identical, because quite clearly they are not, but it does mean that when we are advocating changes to leaders in politics, government departments, or universities, we should focus as far as we are able on the common challenges the numerate sciences face, and the actions that will help us all.

## Conclusion

That is enough for now. If I had to sum up the state of the SSAI, I would say we have faced some significant challenges over the last year, we still need to be careful, but the signs are positive, and we are beginning to make headway on making a difference for statistics as a profession in Australia.

I'd love to hear from members on the topics I have covered, whether you agree or you have other ideas and suggestions to put forward. You can email me at [president@statsoc.org.au](mailto:president@statsoc.org.au) and I will be at the conference in Fremantle in December. It would be great to see you all there as well.

Geoff Lee

President SSAI

*Australian Statistical Conference 2010 cont. >>*

plenary speaker at the Australian Statistics Conference held in 1992 at the University of Western Australia. On that occasion he gave two lectures, the plenary lecture on "Geometric analysis of Markov Chains", and a public lecture on "The Search for Randomness".

Until that time people had long supposed that a few shuffles were sufficient to randomize a deck of cards - until 1992, when Diaconis and Columbia University's David Bayer proved that thorough mixing requires seven shuffles.

This time around though the venue is more exciting, and the proposed subject of his talk more conceptually sophisticated in "Estimating  $n$  parameters from a sample of size one: An Introduction to Random Networks", joint work with Joe Blitzstein, Sourav Chatterjee, Susan Holmes, Svante Jansson, and Alan Slyand. We may for sure be entertained no doubt by this seasoned presenter in the art of probability and statistics.

## WORKSHOPS AT ASC2010

A number of workshops will be offered with the conference and or associated with the conference.

A two day workshop on clinical trials will take place on the weekend prior to the conference, to be run by Dr. Scott Evans with the help of Rui Wang. Dr Evans is very high profile in the industry and has an impressive CV. See <http://www.hsph.harvard.edu/research/scott-evans/>

He is from the Harvard School of Public Health where he teaches clinical trials. He is on the FDA and serves on numerous scientific committees in the United States and internationally.

The Introduction to R Workshop offered by Martin Hazelton and Berwin Turlach was a great success when run in Perth a few years back. Martin and Berwin are skilled performers acting in tandem. This workshop is not to be missed should you wish to upskill in the statistical language R, the statistical language of the future.

There exist many problems which involve spatial statistics, and one of the best known presenters in the area is our own Adrian Baddeley. He has put together a marvellous workshop on spatial statistics. It is not to be missed should you delve into spatial statistics.

For those interested in capture-recapture models using Mark, Professor Ken Pollock from Murdoch University is putting on a four and a half day workshop prior to the conference. Professor Pollock brings years of wisdom in this area having taught previously in the North Carolina State University. He is supported by Dr Lyndon Brooks from Southern Cross University.

## Topics in Clinical Trials

**DATE: Saturday and Sunday 4th & 5th December 2010**

Scott Evans and Rui Wang will address several hot topic areas in clinical trials. The course will cover topics such as: (1) the design, conduct, analyses, and reporting of non-inferiority trials, (2) data monitoring committees and associated processes, (3) benefit:risk analyses and reporting, (4) using prediction to make more informed decisions during interim analyses, (5) the roles of the clinical trial statistician, (6) issues in clinical trial design, (7) subgroup analyses, and (8) meta analysis. This course will be lecture based.

## Introduction to R

**DATE: Friday 10 December 2010**

The course will consist of an alternating series of lectures and computer practicals. It is designed for statisticians and statistical practitioners who have little or no experience with R.

The course presenters are Martin Hazelton (Chair of Statistics, Massey University New Zealand) and Berwin Turlach (A/Professor of Statistics, University of WA). Both are experienced users of R, and use it in their research, teaching, and consulting.

## Analysing spatial point patterns in R

**DATE: Saturday 11 December 2010**

**Presenter:** Adrian Baddeley, CSIRO

Data which record the spatial locations of events (such as crimes, disease cases, meteorite impacts) or objects (trees, nests, galaxies, cells) can be regarded as a spatial pattern of points. This workshop presents statistical methodology for analysing spatial point patterns, and its practical implementation in the statistical package R. The workshop is based on 'spatstat', an add-on library for spatial statistics in R.

## Cover Story (Cont.) Brenton R Clarke



The workshop will feature theoretical presentations, software demonstrations and hands-on practical exercises. Participants should bring a laptop for the exercises.

Topics covered include:

- statistical formulation and methodological issues
- data input and handling
- exploratory analysis
- nonparametric intensity estimation
- distance methods and summary statistics such as Ripley's K function
- point process models (Poisson, Gibbs, Cox, cluster)
- likelihood, pseudolikelihood and Bayesian inference
- model validation
- simulation techniques
- multitype and marked point patterns

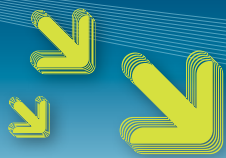
## Capture-Recapture Models Using Mark and other Software for Fisheries and Wildlife Research

**DATES: 1-5 December 2010**

**Presenters:** Professor Ken Pollock, Murdoch University and Dr Lyndon Brooks, Southern Cross University.

Kenneth H. Pollock has been appointed to a chair in Quantitative Methods in the Fisheries Center at Murdoch University. Previously he was a professor at North Carolina State University in Statistics, Biomathematics and Biology specializing in quantitative methods for fisheries, wildlife and conservation biology. He is an elected fellow of the American Statistical Association. The position is funded by FRDC, Western Australia Fisheries and Murdoch University. One component of this position is to develop and present workshops on quantitative methods for fisheries and other natural resource postgraduate students and professional scientists.

*Continued on page 6 >>*



## Cover Story (Cont.) Brenton R Clarke

*Australian Statistical Conference 2010 cont. >>*

### Introductory Analysis of Linked Health Data

**DATES: 29 November to 3 December 2010**

**Location:** School of Population Health,  
University of Western Australia

**Places limited to 36.**

This intensive five-day course, developed by Professor D'Arcy Holman, covers the theory and practical skills needed to analyse linked data from administrative, clinical and research databases at the introductory to intermediate level. In particular, it includes: i) an overview of the theory of data linkage systems and methods, ii) principles of epidemiologic measurement and methods

applicable to linked data covering disease trends and health care utilisation and outcomes, iii) minimising sources of measurement error, iv) statistical analyses on longitudinal linked health data, v) conceptualisation and management of large linked data files, and vi) writing computing syntax to prepare linked data files for analysis and production of results from statistical procedures in SPSS, SAS or Stata (the course supports all three).

For further information on any of the Workshops and or the conference see <http://www.promaco.com.au/2010/asc/>

**Brenton R Clarke**  
Chair Program Committee ASC2010

# Thinking Statistically

## *Elephants Go to School*

A UNIQUE TEXTBOOK

By

**Sarjinder Singh**

**Reviews:**

Collins Carbno, *Technometrics*,  
2007, 49(4), 496.

Marcin Kozak, *Statistics in  
Transition*, 2006, 7(6), 1407-9.

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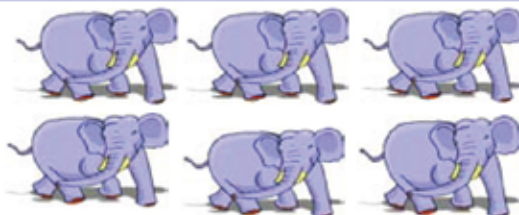
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## 2010 E.K. Foreman Lecture



Dr. Alan Zaslavsky.

**A key attraction of the Australian Statistical Conference 2010 will be the Ken Foreman Lecture. This lecture is sponsored by the Australian Bureau of Statistics (ABS) to commemorate**

**Ken Foreman's contribution to the development of survey methodology in Australia. In a career spanning over 30 years at the ABS, Ken introduced a wide range of statistical methods and processes that have long term impact on ABS's work. Every two years, the Ken Foreman Lecture is presented by an overseas survey methodologist / analyst and the series has been a regular feature of ASC's. Previous speakers include Professors Jon Rao,**

**Fiona Steele, Ray Chambers and Pedro de Silva. This year, the E. K. Foreman lecturer will be by Dr. Alan Zaslavsky.**

Alan. Zaslavsky is Professor of Health Care Policy (Statistics) at the Department of Health Care Policy at Harvard Medical School. He earned his B.A. degree at Harvard College, his M.S at Northeastern University, and his Ph.D. at the Massachusetts Institute of Technology. Dr. Zaslavsky statistical interests include surveys, census methodology, small-area estimation, official statistics, missing data, hierarchical modelling, and applied Bayesian methodology. His research in health care policy centre on measurement of the quality of care provided by health plans through consumer assessments and clinical and administrative data.

2010 E.K. Foreman Lecture  
Shane McNaughton



Among his current projects are the Consumer Assessments of Healthcare Providers and Systems (CAHPS) survey implementation for the Medicare system; methodology for surveys in psychiatric epidemiology, centered on validation of the CIDI-A (adolescent) survey in the National Comorbidity Study-Adolescent; and studies on determinants of quality of care for cancer, including the NCI-funded CanCORS (Cancer Care Outcomes Research and Surveillance) project. Alan's talk is likely to interest those who are involved with modelling of survey data, analysis of health care surveys and their policy implications.

Shane McNaughton 

## NatStats 2010 Conference

15-17 September 2010 Darling Harbour Sydney



The Australian Bureau of Statistics is pleased to announce that Dr Ken Henry, Secretary to the Treasury, will be providing the opening Plenary address at the upcoming [NatStats 2010 Conference](#).

Other key note speakers include Ms Martine Durand, Chief Statistician and Director of the OECD Statistics Directorate, and Mr Phil Lowe, Assistant Governor (Economic) of the Reserve Bank of Australia, who will be examining some of the changes we can expect to witness in the global economy over the next 50 years. The Hon. Dr Geoff Gallop AC, Director of the Graduate School of Government at the University of Sydney, will also deliver a presentation at the conference focused around improving the wellbeing of Australians.

NatStats 2010 is an initiative of the [National Statistical Service](#) and will be held at the Sydney Convention and

Exhibition Centre, Darling Harbour, from 15 - 17 September 2010.


NatStats 2010 will bring together an array of leaders and high profile commentators, researchers and policy makers from all levels of government, academia, community and business. The conference was initiated to assist in the development of a collaborative approach to national statistics. It focuses on various issues surrounding quantitative and qualitative research, which have been highlighted by key government initiatives.

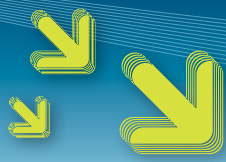
The overall theme of this year's conference is "Measuring what counts: economic development, wellbeing and progress in 21st century Australia". Delegates will discuss issues surrounding various topics including:

1. Challenges facing Australian society: issues, policy and information.

2. Australia in the global economy. Do we measure up?
3. Improving Australian's wellbeing.
4. Measuring progress: from theory to practice.

NatStats 2010 will build on the success of the first [NatStats conference held in 2008](#), where around 480 delegates attended. A major outcome of the 2008 conference was the tabling of a [statistical declaration](#) to guide the development of a national statistical strategy for Australia in the 21st century.

An exciting program is being developed and will address a range of issues regarding national statistics. If you would like any further information, please contact Annette Hants on (02) 6252 6936 or email [natstats@nss.gov.au](mailto:natstats@nss.gov.au). 



**Review of Education**  
Marie-Louise Rankin

## 25% DISCOUNT ON WILEY PUBLICATIONS!

The SSAI is delighted to announce that we can now offer our members a special discount of 25% on online purchases with **Wiley or Wiley-Blackwell** (<http://www.wiley.com/statistics>). To receive this discount, please go to the Wiley website and purchase you items.

After purchasing the items, you need to telephone the Wiley customer services department to claim your 25% discount.

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# Go8's Review of Education in Mathematics, Data Science and Quantitative Disciplines



**In March this year the Group of Eight's (Go8) "Review of Education in Mathematics, Data Science and Quantitative Disciplines", was released.**

(The Review is available at: <http://www.go8.edu.au/storage/go8statements/2010/Go8MathsReview.pdf>).

The Review, chaired by former University of Sydney Vice-Chancellor, Professor Gavin Brown, was commissioned by the Go8 Vice-Chancellors in 2009 because of serious concerns about the number and quality of students entering university courses requiring strong quantitative skills. It found that the state of mathematical sciences in Australia has deteriorated to a dangerous level, putting the burden on universities to provide additional maths enabling courses and to improve co-operation between education and maths faculties in future.

The Review highlighted concerns about the mathematics and statistics disciplines, as the numbers and quality of students majoring in them, and proceeding to higher degrees, decline. It found that increasing numbers of students are striving towards degrees in other disciplines critically dependent on mathematical skills, such as engineering. According to the Review, however, most students are inadequately prepared for or capable of those studies. The Review also questioned the general mathematical skill levels of the student population.

Of particular interest to our members the review made the recommendation that: "The Go8 should pay particular attention to Statistics, the ongoing consulting needs within the universities, the training of the next generation and the recovery of a strong research culture."

The SSAI was represented on the Reference Committee by President/Vice President William Dunsmuir.

Marie-Louise Rankin



# “Aussie Stats” booth at the 2010 Joint Statistical Meetings in Vancouver

“Aussie Stats”  
Marie-Louise Rankin and  
her communications team



The SSAI is delighted to be part of the ‘Aussie Stats’ booth, organised by Louise Ryan and her communications team of the CSIRO for this year’s Joint Statistical Meetings (JSM) in Vancouver. The aim of the booth is to promote the statistical research and education Australia offers. It will be a place where Aussie expats can gather, and it will provide a wonderful opportunity for networking and ideally for getting some new contacts for people overseas who might be interested in jobs back here. The booth will also be used to advertise visitor opportunities and we will make sure that there will be plenty of brochures laid out, advertising the ASC 2010.

JSM is the largest gathering of statisticians held in North America. It is held jointly with the American Statistical Association, the International Biometric Society (ENAR and WNAR), the Institute of Mathematical Statistics, the Statistical Society of Canada, and the International Chinese Statistical Association, and the International Indian Statistical Association. Attended by more than 6,000 people, meeting activities include oral presentations, panel sessions, poster presentations, continuing education courses, an exhibit hall, career placement services, society and section business meetings, committee meetings, social activities and networking opportunities. For

more information on the 2010 JSM, please go to: <http://www.amstat.org/meetings/jsm/2010/index.cfm?fuseaction=confinfo>.

If anyone attending the JSM thinks he or she might have some time to spare to “man” the booth for a while, please let the SSAI office know ([eo@statsoc.org.au](mailto:eo@statsoc.org.au)). Also, if you’d like to advertise your organisation or an event at the booth, please contact the SSAI office to obtain information on how to do this.

The SSAI would like to thank Louise and the CSIRO for this great initiative.

Marie-Louise Rankin and her communications team 

## Bayes on the Beach

October 4 – 5 2010 ♦ Surfers Paradise, Queensland ♦ Vibe Hotel

Bayes on the Beach provides a forum for discussion on developments and applications of Bayesian statistics

The format includes:

- ♦ seminars ♦ poster session
- ♦ tutorials ♦ workshops

Registration opens July 2010  
Fees: \$330 (regular), \$220 (student)  
Email: [alice.currie@qut.edu.au](mailto:alice.currie@qut.edu.au)

International keynote speaker

**David Elston**

*Biomathematics & Statistics Scotland*

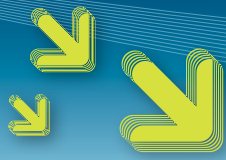
Australian keynote speaker

**Scott Sisson**

*University of New South Wales*



Photo copyright Adrian Ball 2010



Science meets  
Parliament 2010  
Scott Sisson

## Science meets Parliament 2010



Senator the Hon Kim Carr, Minister for Innovation, Industry, Science and Research welcomes Science meets Parliament delegates to a Gala Dinner at Parliament House. Photograph: Lorna Sim / FASTS.

**Scientists from across the country converged on Canberra on March 9-10th to participate in the 11th annual *Science meets Parliament (SmP)*. Organised by the Federation of Australian Scientific and Technological Societies (FASTS), the two day event brought together around 160 women and men working across all scientific disciplines for meetings with Ministers, Members and Senators. As described by Ms Anna-Maria Arabia, Executive Director of FASTS, "SmP gives scientists and politicians an opportunity for direct conversations about how science is addressing some of the major issues facing Australia. SmP brings Australia's scientific community right into the heart of government. Not only does it give politicians a chance to discuss issues of interest to them and their electorate, it also them to better understand how important science and innovation is economically, socially and politically." On behalf of both the Statistical Society of Australia (SSAI), and the Australian Mathematical Society (AustMS) I travelled to Canberra to deliver the message that high-level skills in mathematics and statistics are critical for Australia's future.**

The first day of SmP 2010 was a briefing day and was focused on delegate professional development. One stream of activities highlighted "the players, the system [and] who influences whom" in terms of the Australian political process, and featured guest presentations by both the Shadow Minister and the Deputy Secretary for Innovation, Industry Science and Research. The stream culminated in direct SmP delegate involvement in real "policy in action," through roundtable input into the government's Research Workforce Strategy, which was developed to address issues raised in the Cutler and Bradley Reviews. These issues included the anticipated future shortages in the number of research qualified people in various segments of the workforce, a perceived lack of clear career paths for researchers, and concerns regarding the extent to which the research training system effectively prepares students for varied career

outcomes. As might be expected, clear, but consistent opinions were expressed, and these were compiled and submitted as part of the process of consultation with key stakeholder groups.

A second developmental stream was concerned with the communication of science – a process that has received unprecedented critical attention recently due to the "ClimateGate" email debacle. This session clearly underlined the fact that depending on the target audience, different scientific emphases are required. For example, journalists [see image] need to market your science to both the general and informed public – but even then, the radio, television and print formats have different focuses for the same story. Similarly, when communicating with politicians, immediate practical (and political) importance is critical. Further, as politicians are also incredibly busy when Parliament is sitting, your message must also be concise and to the point. To stress this point, delegate "volunteers" were given very public practice in delivering their message in the time it takes for a sparkler to burn (around 45 seconds). While providing light-hearted entertainment, this exercise made clear that the window of opportunity to have an impact is very small, and that forward thinking and precision is critical in order to communicate effectively.

The first day concluded with a Gala Dinner for SmP delegates at Parliament House, with a welcome by Senator the Hon Kim Carr, Minister for Innovation, Industry, Science and Research [see image], and an opportunity to speak directly with Members and Senators over the relative comfort of the dinner table.

The second day was based in Parliament House, and revolved around face to face meetings with parliamentarians, putting into practice the advice given, and the skills developed in the previous day. While these meetings were scattered throughout the day, a varied parallel program of events was available for delegates to attend. Beginning at 7:30am, these included breakfast briefings on biodiversity and open access research, a public forum on health solutions using nuclear techniques, and a

## Science meets Parliament 2010 (Cont.)

Scott Sisson



*Meet the Press: (L-R) Alison Carabine (ABC Radio National), Mark Riley (Channel 7) and James Massola (Canberra Times) discuss what is needed to turn our science into news. Photograph: Lorna Sim / FASTS.*

televised lunch at the National Press Club addressed by Chris Mooney (author of *The Republican War on Science and Unscientific America*) on the global integrity and validity of science as a result of the climate change debate. The day was remarkably calm and organised considering that every meeting with parliamentarians had to be rescheduled (and even re-scheduled) at the last minute as a result of the Indonesian President's address to Parliament, which effectively removed several hours of each Member's day. That the day proceeded so smoothly was a great credit to the organisers.

My own meeting, along with two other SmP delegates, was with the Hon Peter Slipper, the Member for Fisher (no relation!) in Queensland. While sparklers were unfortunately not allowed, the meeting was nevertheless an interesting one. The topics of our conversation were fairly wide-ranging given the short length of our scheduled time. The science variously covered carbon sequestration techniques, photonics and, of course, the importance of mathematical

and statistical modelling as an enabling technology that underpins research across the whole of science. Non-scientific topics included academic pay scales as an attraction for overseas scientists, and the benefits of Australian citizenship for Australian scientists over permanent residency.

My overall impression after the meeting was a reinforcement of the importance of not only having a concise message, but in having a message that was both pertinent to the specific interests and focus of the recipient, and timely in its communication. For example, a misdirected message may be genuinely received with interest, but will unlikely to progress any further. Similarly, a poorly timed message will ultimately be put aside in favour of more pressing matters, and represents an opportunity missed.

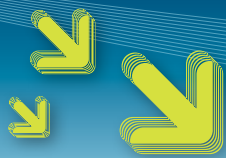
Given the very real importance of mathematical and statistical modelling to science and beyond, it is critical that the SSAI and AustMS continue to develop their strategies of engagement with both

the general public and policy makers alike. In the March 2010 edition of the SSAI Newsletter, SSAI President Geoff Lee highlighted the importance of statistics as being central to informed debate, and stated that more emphasis should be placed on the "promotion of statistics as a profession, with an important contribution to make to Australia's future."

The argument for such a proactive approach is clear. There are always topical matters covered in the media that, at their core, involve mathematical and statistical thinking, beyond the usual tabloid articles on the odds of winning the lottery. The global financial crisis, climate change and MySchool are only the most visible recent issues in a very long list of those on which the profession is qualified to offer advice. Arguably, for mathematics and statistics to appear relevant to Australia – and *appearance* here is the key, as the scientific case should stand on its own – mathematical and statistical professional societies should be prepared to strongly and directly engage with society and the media on contemporary issues, and through this communicate with the general public, and ultimately policy makers. Whether this takes the form of, for example, independent SSAI and AustMS commissioned reports on relevant matters in the public and policy domain, or in nominating an experienced, media-savvy spokesperson to provide expert professional opinion to the media at very short notice, is a matter for future discussion.

Overall I returned from Science meets Parliament 2010 positively energised and, if not quite motivated to switch profession and become a politician, then confident in the future contribution that our profession will make across a broad spectrum of Australian life. I wish to express my gratitude to the SSAI and AustMS for providing me the opportunity to attend.

Scott Sisson ■



## Statistics Sections

Scott Sisson  
& Ross Darnell

# Bayesian Statistics Section



Scott Sisson, Bayesian Section Chair.

**In the last few years, members of the Bayesian Statistics Section of the SSAI have experienced an outstanding program of Bayesian events within Australia, at both the national and international levels. These events, led by outgoing Bayesian Section Chair Kerrie Mengersen, have included a 3-day travelling workshop on “Practical Bayes for Beginners” as part of the SSAI’s personal development program, and a highly popular annual conference, which provides an excellent platform to communicate the best Bayesian research over the past year, and an informal atmosphere in which to give and receive feedback from other researchers.**

The stand-out, highlight event was the hosting of the 2008 bi-annual conference of the International Society of Bayesian Analysis (ISBA) on Hamilton Island in Queensland. The staging of this event provided a tacit acknowledgement of the strength of Bayesian statistics in Australia, while allowing local researchers and

students an avenue to showcase their research on the international stage. As the new Chair of the Bayesian Statistics section I would like to take the opportunity to thank Kerrie for the outstanding effort and contribution that she has made to Bayesian statistics in Australia, and in providing leadership for these events. It will be a challenge to follow in her footsteps.

The success of a Section is largely based on the support of its members, and so I would like to invite current and future members of the SSAI to contact the Section with ideas or requests for future Bayesian events that the Section can help organise and promote. In closing, I’d like to highlight an important upcoming event for your diaries: The 2010 Bayesian Section conference “Bayes on the Beach” (run jointly with the Australasian Society for Bayesian Analysis) will be held on 4-5th of October on the Gold Coast. More detailed announcements will be made at a later date.

Scott Sisson ■

# Environmental Statistics

**As you are aware, our ASC 2010 conference will be held in Perth in December and environmental statisticians should take note that several of the keynote speakers have been active in our area of interest. Professor Adrian Baddeley (University of Western Australia) was awarded the 2001 Hannan Medal for his outstanding work in spatial statistics. Professor Baddeley will be presenting a workshop “Analysing spatial point patterns in R” associated with the ASC 2010 conference. Please refer to the SSAI website for details.**

Another keynote speaker, Professor Noel Cressie, was born in Fremantle not far from the conference venue. He has an outstanding list of achievements in the field of environmental statistics. Professor

Cressie presented at a SSAI symposium titled Space-Time Modelling held in Canberra on the 14th December 2009 in Canberra sponsored by CSIRO’s Division of Mathematics, Informatics and Statistics.

Another workshop of interest to environmental statisticians is titled “Capture-Recapture Models Using Mark and other Software for Fisheries and Wildlife Research”. The presenters are Professor Ken Pollock and Dr Lyndon Brooks.

I encourage you to submit your abstracts for our 2010 conference. The submission deadline is Monday 31 May 2010! Please refer to the conference [call-for-papers web page](#).

Ross Darnell ■

# ANZJS Editors' Column for SSAI Newsletter – June 2010

ANZJS Editor's  
Column for SSAI  
Stephen Haslett



**The ANZJS editors held their annual face-to-face meeting in Melbourne on 22-23 February. It was the first time the current editors have met face-to-face and as expected it proved a very useful forum for issues that are hard to resolve by phone and email. It also allowed us to meet with the ANZJS publishers, Wiley-Blackwell, to discuss journal-publisher links and issues, and to link up with Neville Bartlett who is a member of the ANZJS Management Committee (which consists of people from both the Statistical Society of Australia, SSAI, and NZSA). Another major benefit is that the meeting allowed us all to test out ScholarOne Manuscripts, the new electronic submission system for submitted manuscripts, which is being adopted by ANZJS in 2010, and which has the potential to greatly improve the current paper tracking system.**

The meeting over the two full days covered a range of issues. These are listed, and in some cases detailed below.

Wiley-Blackwell provided a useful summary of their annual report on ANZJS, there was discussion of marketing plans, impact factors (the 2009 impact factor is not yet available), copyright, the new system at Wiley-Blackwell for publication of supplementary material for published papers on web, the joint venture between SSAI and NZSA for publication of ANZJS (which is separate from SSAI and NZSA, and for which finances are currently healthy), the publication contract renegotiations with Wiley-Blackwell, quality of papers in ANZJS, the need for clear direction for ANZJS, i.e. focused issues / invited papers / Australian and NZ content / good book reviews. Even the occasional special issue may be a possibility. New style guides, author instructions, and key words for editors and people submitting papers were discussed; all these will need to be finalised before ScholarOne Manuscripts can go on stream. Attracting more and better papers and where possible maintaining the distinction between Theory and Methods and Applications papers were also discussed. We also considered any new Associate Editor requirements, publication ethics, evening out flow of papers (which

will be a benefit of ScholarOne Manuscripts, as will being able to acknowledge referees), succession planning for the Editors, and whether ANZJS should include obituaries.

The ScholarOne Manuscripts session on the Tuesday included both training and discussion of a number of related issues including:

- consistency and assignment of paper tracking numbers
- point in process at which authors notified
- linking of editors paper progress information
- acknowledgements from editors to managing editor of receipt and choice of AEs
- acknowledgements from AEs of receipt (with reminders)
- names of referees from AE's
- knowing who has sent what to whom and when: AE loads overall
- monitoring turnaround times for reviewing papers - detail and overall
- acknowledgement of receipt process
- line spacing, font size, maximum length specifications
- reporting by AE's of paper receipt
- setting changeover date and notification to authors from ([anzjs@statsoc.edu.au](mailto:anzjs@statsoc.edu.au))

These developments are at present background ones in the main, but nevertheless I hope provide you with some sense of the editors' role and the direction in which ANZJS is moving.

**Stephen Haslett**  
Managing Editor, ANZJS  
[anzjs@statsoc.org.au](mailto:anzjs@statsoc.org.au)  
10 March 2010 ■

## LOOKING FOR A JOB?

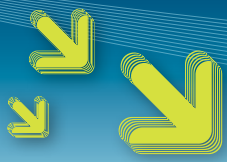
**For a listing of current statistical vacancies in Australia and New Zealand visit:**

<http://www.statsci.org/jobs>

Do you have a job to advertise on the website?

Email a position description to [eo@statsoc.org.au](mailto:eo@statsoc.org.au).

**LISTING IS FREE!**



## Workshop on Causal Inference 4-5 September 2010 University of Queensland Brisbane, Australia



**Most studies in the health and social sciences are motivated by questions that are not associational but causal in nature. Causal inference attempts to uncover the structure of the data and eliminate all non-causative explanations for an observed association. During the last decades a conceptual framework and a multiplicity of methods to make causal inference from observational or quasi-experimental data have been developed and are now well established.**

This workshop will provide an overview of the counterfactual, the structural equation and the causal graphical models. The set of causal assumptions under which it is possible to estimate causal effects from observational data or imperfect experimental studies will be examined. Some of the new statistical methods for estimating causal effects of time-varying exposures in the presence of time dependent confounders will be briefly introduced.

The workshop is aimed at applied statisticians and non-statisticians alike. No prior knowledge of causal models is expected, though it would be helpful if delegates had a basic knowledge of statistical and epidemiological concepts (such as the use of regression models).

This workshop will be presented by Liliana Orellana, chair of the Institute of Calculus, at the University of Buenos Aires. The Institute is a research centre focusing on Statistics and Applied Mathematics.

Liliana is the leader of the Graduate Diploma in Statistics for Health Sciences (University of Buenos Aires), a two year graduate program intended for healthcare professionals with a strong emphasis on applied statistics. She is also an Assistant Professor at the Faculty of Sciences where she lectures statistics courses at both undergraduate and graduate levels.

**To download the flyer with the program, please click [here](#).**

**For prices and details on how to register for this workshop please refer to <http://www.statsoc.org.au/CPD15Info>**

**Proudly organised by the SSAI Biostatistics Section and the SSAI Young Medical Statisticians (UQ)**



# Canberra Branch News

## April: A Robustness Sampler

Canberra  
Ray Lindsay



**The April meeting of the Canberra Branch was held at lunchtime, as some members had remarked that the usual evening meetings were less convenient. Prof Alan Welsh of the Centre for Mathematics and its Applications at ANU gave a talk titled 'A Robustness Sampler'. In the 1760s, apparently some argued that the best estimate of central tendency was a single "good" observation. Simpson showed that the best estimate was the mean of the observations. Outliers differ from the bulk of the distribution either because they are genuine (representative) observations from the extreme of the distribution, or indeed from another distribution, or are erroneous (gross errors). As an example where outliers were from a different distribution, Rayleigh discovered argon by noticing some different atomic weights in a sample of measurements of what he thought was nitrogen.**

It can be useful to think of outliers either in terms of a contamination model, or gross error model. Alan then presented arguments from the 1750s on how to deal with outliers, from never rejecting (Bessel) to explicit rejection rules. Results which depend on assumptions of normality may not be robust, so the elegance of optimality arguments may be invalidated by data containing outliers. Alan then motivated the goals of robust methods, as being insensitive to deviations from the assumed distributional shape, small deviations and rounding, and from dependence. With the aid of some quirky cartoons he demonstrated the concepts of breakdown point and sensitivity curve.

Alan described influence functions and their importance in robustness, leading to the very flexible 'M-estimators'. When modelling in the presence of outliers, one could detect and remove outliers, but

this may be non-robust. This leads to the concept of supermodels where the original model is embedded in a larger parametric model. However supermodels are not very flexible, and fitting these may require modelling features which are not important and about which there is little information.

On variance estimation, Alan outlined four paradigms, namely 'True believers', 'Nonparametric robustniks', 'Hardcore robustniks' and 'Pragmatic compromisers'. Alan pointed out that in survey sampling, it also all comes down to how you estimate the variance.

At the conclusion of the talk lunch was held at the Gods Café at ANU.

Ray Lindsay ■

## Bayesian Mixed Effects Model for Longitudinal Social Network Data

**Anton Westveld from the University of Nevada, Las Vegas, gave an engaging presentation in the March meeting of the Canberra Branch. The focus of the talk was a Bayesian approach to the modelling of longitudinal social network data, which are comprised of social interaction or relations data. In particular, his talk was concerned with data that arise from measurements made on ordered pairs (directed dyadic data), where every such pair within a group of actors is measured at regular temporal intervals, resulting in social network data for each point in time.**

The network and temporal dependencies are modelled through a random effects approach resulting in a stochastic process defined by a set of stationary covariance matrices. Anton's approach generalises work from previous authors in-so-far that it allows for an intra and inter temporal interpretation of network structures. He applied the methodology to two real world data-sets: (1) international trade, and (2) militarized interstate disputes.

The trade data consisted of the value of annual trade between 58 countries over the 20 year period from 1981 to 2000. The data

can be represented in a 'socio-cube' which is a 3 dimensional array with sender country on the first axis, receiver on the second and time on the third. The statistical model that Anton described incorporates linear covariates a separate random level effect for each sender as well as one for each receiver. The sender-receiver random effects along with the error random effects, account for five types of dependencies typically seen in network data. Both sets of random effects are assumed to independently have AR1 structures. Covariates in the model include the distance between the countries, a polity variable which measures the level of democracy and the GDP of the country. This is a generalisation of a 'gravity model' that has proven to be very successful in the past for such data.

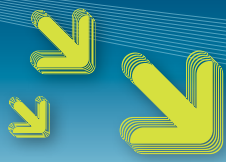
Anton discussed some of the challenges of fitting such a model using a MCMC algorithm. For example, considerable complexity is introduced into the algorithm by temporal dependencies. Some of the results, which Anton placed in practical context, included a decline over time in the importance of distance for predicting the amount of trade, due in part to reducing

costs of transport, GDP becoming less important, and polity becoming more important over time through increasing trade between democratic countries.

The militarized data was used by Anton to illustrate that the methods he has developed could also be used to model binary data (as well as any data typically modelled through a GLM framework), where in this case he was modelling the occurrence of conflict between countries in any particular year. A probit formulation was used in the model and the Gibbs sampler was used in the MCMC algorithm to update the latent response, the coefficients for the fixed effects, while a Metropolis-Hastings algorithm was used to update the temporal parameters. One of the interesting findings was that exporting countries are less likely to get involved in disputes than importing countries.

Finally, Anton mentioned some generalisations of the modelling framework he developed including the potential to include clustering through modelling 3-way dependencies over time.

Phil Kokic ■



Queensland  
Adrian Barnett

## Queensland Branch News



*At the March meeting of the Queensland Branch..*

**The March meeting of the Queensland Branch was kindly hosted by the ABS. Dr Martin Wolkewitz from Freiburg University, Germany, spoke about the tricky problems of the length bias and time-dependent bias when using survival analysis. Both biases were illustrated using a recent controversial example of the effects of winning the Oscar on life expectancy. Controversial because the first analysis of the data that ignored the length and time-dependent biases found that winning the Oscar significantly reduced the risk of death. Martin showed how multi-state models are ideally suited to cope with the two biases. Using a multi-state approach separate states are created for each important event. For the Oscar example the important stages are being nominated and winning. The ages at which people enter and exit these states are then used in the survival analysis. Models without the 'nominated' state make the mistake of assuming that the actor was nominated from birth. This means the actor is modeled as being at-risk from birth, when in fact it is impossible for them to die between birth and nomination (otherwise they would not have been nominated). This inflates the at-risk population, and so underestimates any true association between winning the Oscar and death. Models without the 'winning' state make the mistake of assuming that the winning time was equal to the nomination time. This increased the time that an actor was 'exposed' to winning the Oscar, and hence over-estimates any true association**

**between winning the Oscar and death. However, even after adjusting for both the length bias and time-dependent bias using a multi-state model the death hazard of winning the Oscar is 0.81, with a 95% confidence interval of 0.64 to 1.02. So there is some evidence that winning an Oscar does reduce the risk of death. Alternatively it could be viewed that not winning the Oscar increases the risk of death, and this is perhaps because of disappointed actors who were only nominated but never won being more likely to abuse alcohol or drugs.**

The length and time-dependent bias are remarkably common, as studies often do not recruit people from their very first day of risk, and because many important covariates are time-dependent. Martin gave a range of other examples including: the risks of heart transplantation on survival (where many people wait a long time before getting a transplant), the risks of taking drugs during pregnancy on birth outcomes, the risks of hospital acquired infection on length of stay, and a possible protective effect on life expectancy for older men who marry younger women (although he stressed that this last example has yet to be rigorously analysed).

For details interested readers should see the paper: Beyersmann, J., Wolkewitz, M., and Schumacher, M. (2008), The impact of time-dependent bias in proportional hazards modelling, *Statistics in Medicine*, 27, 6439–6454.

Adrian Barnett ●



## Queensland Branch News

### Seminar on Wheat Phenome Atlas at USQ

Queensland (Cont.)  
Professor  
Kaye Basford



**Professor Kaye Basford presented an invited seminar at USQ on “Construction and three-way ordination of the Wheat Phenome Atlas” on Thursday, 29 April in Lecture Theatre D303. The seminar was jointly sponsored by the Department of Mathematics and Computing and Australian Centre for Sustainable Catchments.**

The presentation was based on a joint work of a large team of experts in statistics and agriculture from different parts of the world. The co-authors of the paper are from Australia, Mexico and the Netherlands – V N Arief, P M Kroonenberg, I H Delacy, M J Dieters, J Crossa, and K E Basford. Professor Basford is the Head of School of Land, Crop, and Food Sciences at the University of Queensland, Brisbane.

The work involves analysing and interpreting very large data set on wheat breeding with particular focus on the marker, trait, and environment of breeding field. The three-way Phenome Atlas was constructed using principal component analysis to find the association among various markers and traits. Although the method is developed for wheat breeding it can be applied to other areas of multivariate analysis. When Kaye presented her paper at the 10th ISOSS conference in Cairo, Egypt in December 2009 it generated considerable interest among the participants.

The Statistics Group at USQ met with Kaye after the seminar to discuss the current state of statistical research, including development of theoretical/fundamental methods and wide range of applications. The meeting also covered aspects of honours and PhD supervision, and evaluation of dissertations. Recent developments on mathematics/statistics teaching and learning at tertiary institutions, and problems of attracting quality students, were shared.

Kaye is a biometrician. Her research has focussed on developing appropriate multivariate methodology for the analysis and interpretation of genotypic adaptation in large-scale plant breeding experiments. She has considerable international experience working with scientists in the United States, Europe and Asia, including those in the Co-operative Group on International Agricultural Research which focuses on food production in the developing world.

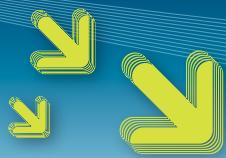
She is a Past President of the Statistical Society of Australia Inc and current President of the International Biometric Society. Kaye was recently appointed as a Commissioning Editor for *Crop and Pasture Science*. Her daughter is a USQ Graduate from the Faculty of Education.

#### Dr Shahjahan Khan

Statistics Coordinator, Department of Mathematics & Computing  
University of Southern Queensland



A section of the participants in the seminar. Front row from left: Christine McDonald, Kaye Basford, Shahjahan Khan, and Amirul Islam.



South Australia  
Julian Whiting

## South Australia Branch News

### April Meeting: The Estimation of Bayesian Networks in the Presence of Exogenous Variables

**The speaker at the April meeting of the South Australian branch was Dr. Jessica Kasza, who is currently doing postdoctoral research at the University of Copenhagen. Jessica presented a talk on her PhD research into the estimation of Bayesian networks and graphical models in the modelling of gene expression data.**

Jessica introduced Bayesian networks as a method for describing relationships in high-dimensional data, which have more observations than variables. A Bayesian network consists of an acyclic graph whose nodes are random variables and edges represent conditional dependencies. Conditional probability distributions specify the relationship between variables that are linked in the graph.


A range of possible approaches for identifying the relationships in a Bayesian network have been proposed. Jessica discussed score-based methods for the case when the data consists of independent and identically distributed samples. These methods associate a score metric to measure how well a network describes the sample data. Often the score metric is proportional to the posterior probability of the network, and so the focus of the estimation problem is the posterior distribution. It was shown how the acyclic nature of the graph is exploited to define an ordering for the variables in the network and then establish systems of recursive linear equations.

When the data does not contain independent and identically distributed samples the aforementioned score-based methods cannot be applied directly to the data. Jessica discussed the situation when the data are influenced by observable exogenous variables, resulting in data with a complex mean structure and additional components of variance. These exogenous variables can be incorporated into the system of recursive linear equations and it was shown how the variables can then be removed. The estimation technique described for removing the exogenous variables is like regressing the response variables on the exogenous variables, and

the method has been labelled the residual approach to the estimation of Bayesian networks. A feature of the procedure is that no assumptions are required on the distribution of the effect of the exogenous variables.

Bayesian networks have been used to study the complex relationships in gene expression datasets, which typically capture expression levels of a very large number of genes. Jessica discussed how she has applied the residual approach to the estimation techniques networks for modelling data on the gene expression of grapes. The exogenous variables included the vineyards of the grapes and the air temperature at various times of picking the grapes. Taking account of these variables removed many spurious dependencies in the Bayesian network and dramatically reduced the number of edges in the graph, providing a much more plausible structure to the genetic regulatory network.

Anyone interested in finding out more on Jessica's research can contact her at [kasza@math.ku.dk](mailto:kasza@math.ku.dk).

Julian Whiting 

# Victorian Branch News

Victoria  
Carol Soloff



## ANNUAL GENERAL MEETING

**The first Branch meeting for the year was the Annual General Meeting, held on 30 March 2010. Highlights from the report by the Branch President, Ian Gordon, included the fact that eight seminars and one workshop had been held during 2009, and that membership numbers were close to 200 at the end of 2009. The opportunity was also taken at the AGM to make a few minor amendments to the Branch's constitution and regulations, which were passed unanimously.**

Ian continues as President for another year, and Kym Butler, Sue Finch, Owen Jones, Karl Jackson, Brian Phillips, Michael Phillips and Carol Soloff all renominated for Branch Council. Lyle Gurrin was a new nomination. All nominations were elected for 2010.

Owen Jones was the guest speaker at the AGM – details of his seminar are included below.

## 2010 MONTHLY SEMINAR PROGRAM

This year's seminar program is shaping up well, with speakers lined up for almost every month. Meetings are generally held on the 4th Tuesday at the University of Melbourne. Victorian Branch members – please note these details in your diaries. The provisional program so far includes:

25 May	Andrew Mackinnon, Orygen Youth Health Research Centre - Trials on the edge: Can we really do randomized controlled trials of treatments in mental health?
22 June	[to be decided]
27 July	Matthew Taylor, Australian Institute of Family Studies – Longitudinally consistent spatial labour force status indicators

24 August	Presentations from a panel of young statisticians
28 September	Rob Hyndman, Department of Econometrics and Business Statistics, Monash University
26 October	Belz lecture (to be decided)
23 November	Nicole Watson, Melbourne Institute – Causes and effects of non-monotonic attrition in a panel study

Dates and speakers/topics will be confirmed nearer the time. Suggestions from SSAI members for seminar topics/speakers are always welcome – please contact any member of the Victorian Branch Council.

### March Seminar: Exploring decision-makers' use of price information in a speculative market - Are trackside betting markets efficient?

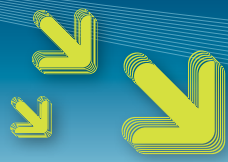
Dr Owen Jones presented our March seminar; Owen is from the Department of Mathematics and Statistics at the University of Melbourne. One of the main strands of his research is esoteric work in modeling self-similar processes: a recent publication is "Une nouvelle classe de signaux multifractals possédant une structure de branchement sous-jacente". Happily for us, he chose to speak on something more prosaic – horse-racing – and in English. The intriguing question his talk addressed is: Can you make money betting on horse-racing, by using only the information in the odds offered? This amounts to asking whether the betting market on horse racing is "weak form" efficient.

The data set available for investigating this issue contained the "price curve" of odds on all horses in 1200 flat horse races in the UK. The price curve is the time series of the best odds offered trackside, while the betting is open; both the times at which the odds changed, and the odds themselves, were available.



Mr Owen Jones.

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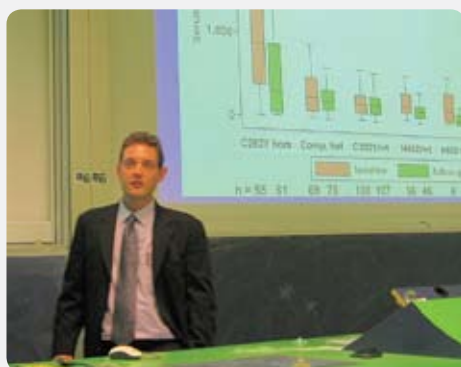
## Victoria (Cont.) Carol Soloff

Victoria Branch News cont. >>

The approach taken was a classic example of good applied statistics: blending applicable models with general background knowledge about how the betting market works in practice. Predictors were obtained as appropriate functions of the price curve. Conditional logistic regression was then used to model the chance of horse  $j$  winning race  $i$ . A model was found using orthogonal polynomial functions, with a roughness penalty to limit instability. The final model had several statistically significant predictors, and was a tangible improvement on using the final odds alone, demonstrating that there is meaningful information in the progress of the odds prior to the race.

The next question is: can this be exploited to make a profit? The answer to this needs to incorporate the bookmakers' margin. The model was fitted on a training set of 800 races. The estimated model was then applied to a test set of 400 races, using a "Kelly betting" strategy. In Kelly betting, the gambler bets a fraction of their current wealth in a way that maximizes the expected log pay-off; bets are only placed on horses with a positive expected return. Using this approach, the estimated profit in the test set was positive, with an associated P-value of 0.17.

While this may not be compelling evidence to abandon a statistical career and head for the racetrack, the conclusion from a practical point of view is tantalizing: what if we had a larger data set? From a statistical perspective, the analysis did indicate that



Lyle Gurrin.

the variables derived from the price curve, including some interactions, were doing a good job of finding usable information in the movements in odds, which may not be apparent to the participants (bettors and bookmakers) responsible for these complex movements.

After the seminar a coterie of members enjoyed a meal with Owen at a nearby restaurant.

### April Seminar: Statistics and the search for genetic modifiers of iron levels in hereditary haemochromatosis

This seminar was presented by Associate Professor Lyle Gurrin, from the Centre for Molecular, Environmental, Genetic and Analytic Epidemiology at the Melbourne School of Population Health. Lyle is co-principal investigator of the NHMRC and NIH funded "HealthIron" study of genetic and environmental modifiers of hereditary haemochromatosis, from which he drew material for this presentation.

Hereditary haemochromatosis (HH) is an inherited disease of iron overload which results in excess iron being deposited in a variety of organs (especially the liver) and can lead to arthritis, fatigue, diabetes and liver cirrhosis. HH usually results from defects in the *HFE* gene. More than 80% of patients with symptomatic iron overload-related disease have two copies of the C282Y mutation in the *HFE* gene, but not all so-called C282Y homozygotes have raised iron levels or develop symptoms of disease. Approximately 1 in 200 people of northern European origin are C282Y homozygotes, which is the most common monogenic disorder for people of this ancestry.

Although iron is essential for healthy living, it is toxic in excess, and there is no natural mechanism for excretion. Usually, iron is kept at reasonable levels by the *HFE* protein controlling absorption of dietary iron from the gut, but this does not happen for most C282Y homozygotes. Fortunately, HH can be both prevented and treated by removal of blood – so this is another good reason for being a blood donor!

There is emerging evidence from family data and recent genome-wide association studies that there are genes that influence iron levels after accounting for the effect of the *HFE* gene. To address the lack of population study data on these associations, a random sample of people of northern European descent in the Melbourne

Collaborative Cohort Study, stratified into 6 groups by *HFE* genotype (C282Y and H63D), were approached to participate in HealthIron.

A "candidate gene approach" was taken to investigate the genetic modifiers. This involved selecting (using expert opinion!) genes involved in iron metabolism that were plausible modifiers and then, for each gene, genotyping a series of single nucleotide polymorphisms (SNPs) in the selected HealthIron participants.

To determine which SNPs to genotype, use was made of the HapMap catalogue of common SNPs across the entire human genome to explore the correlation between SNPs over short genomic distances to choose a smaller set of SNPs that capture or "tag" most of the genetic variation. A hybrid algorithm was used to pick the SNPs – making use of the HapMap catalogue, but also making use of literature reports and their own research. Some genes have many SNPs and others only a few, so there is a trade off between redundancy and coverage.

Blood samples were processed for iron levels and genotyped for 476 genetic variants in 44 genes involved in iron metabolism. There were several choices of genetic models for the association between the SNP and the expected value of the outcome (outcomes predicted included serum ferritin, serum iron, serum transferrin and transferrin saturation). Typically one genetic model was used for testing with all SNPs, with adjustment made for confounders (sex and menopausal status (for women), and *HFE* genotype).

Analysis revealed a genetic variant in the *CYBRD1* gene that was a novel modifier of iron levels specific to people with two copies of the C282Y (so effectively a gene-gene interaction) that was associated with a three-fold decrease in iron levels for men, a five-fold decrease for women and accounted for more than 10% of the population variation in iron levels.

Lyle concluded his presentation by outlining his ideas to validate their discovery in a large cohort study in the USA and for future research into genetic modifiers and reminded us that this work has involved a large number of collaborators and institutions. After a number of questions, a select group joined Lyle for the usual post-seminar dinner at a local restaurant.

Carol Soloff

# Western Australia Branch News

Western Australia  
Alex Stuckey



**The April meeting of the WA branch was held at UWA and the talk was given by incoming branch President, Rohan Sadler. Rohan completed his PhD at the UWA School of Mathematics and Statistics under the supervision of past Branch President Martin Hazelton. Rohan is now Assistant Professor at the UWA School of Agricultural and Resource Economics and his talk covered work done with Ben White and others in that school. The work is part of the National Market Based Instruments Pilot Program.**

The project that Rohan discussed aimed to optimally design an auction of funding for conservation action. Land owners tender for funding to enhance biodiversity on the land. These tenders are judged by the future benefit of each to the biodiversity. The future impact on biodiversity must be predicted. This prediction has difficulties relating to availability of historical data and also the highly variable response to conservation action that different areas of bush exhibit. Some interesting methods are employed to deal with these challenges


Data available for this work are the Landsat remote sensing imagery data. These are satellite images available for the period 1988 to 2007. Ground level measures of biodiversity are then made by taking ground level photographs of areas of bush and having experts rate the level of biodiversity present. In a modelling exercise called ground-truthing the remote sensing imagery data are used to predict the ground level biodiversity ratings. This model has good predictive power and is then used to estimate the biodiversity for the same areas over previous years. The result of this is a dataset of estimated biodiversity ratings for a large area for the period 1988 to 2007.

The changes in biodiversity were modelled for different sites and functional principal components was used to create response classes that represent different patterns of change over time. The uncertainty associated with the predicted biodiversity was decomposed into assessment uncertainty, Landsat estimation and within-class variability, the last of which accounting for 61% of variability. The biodiversity condition estimates are

interpreted as a Markov transition matrix. Analysis of past observed data reveals a net loss of 18% between 1988 and 2007 in the highest quality fragments. Studying the long-term equilibrium point of the current trend in biodiversity condition change gives a prediction of a doubling in the proportion of poor quality fragments by 2100.

Predicted biodiversity ratings are then modelled as a function of numerous ecological covariates, giving a method for predicting the impact of proposed conservation action. The conservation auction was conducted according to the results of the analysis and improved conditions were observed within four years.

Rohan's talk gave an interesting insight into the methodological demands of allocating conservation funds in a way that maximises the benefit to biodiversity. Discussion on this topic and others continued over a Chinese banquet at a local restaurant.

Alex Stuckey 

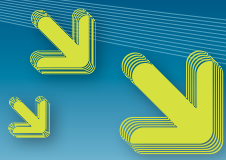
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