



The Statistical Society of Australia News



SCIENCE MEETS PARLIAMENT 2016

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In February I was lucky to receive funding from SSA to attend the two-day event Science Meets Parliament held in Canberra. Organised by Science & Technology Australia, Science Meets parliament brought together 200 scientists to learn about research communication, the role of research in policy, and how to engage a politician. We heard from speakers such as Professor Ian Chubb, Professor Brian Schmidt, Paul Bonjorno, Alison Carabine, Professor Emily Banks, Dr. Subho Banerjee, and Senator Kim Carr.

Day one consisted of panel discussions on how to use science to shape policy, the National Innovation and Science Agenda, and how to deliver your science in 60 seconds. A Gala dinner was held that evening and scientists got to share a meal with the attending politicians. Day two was the most valuable of the event, as we had the opportunity to have a face to face meeting with a politician. On day two, there were also panel discussions with politicians and scientists on how science and politicians mix in the real world. Participants also had the option to attend the National Press Club, and Question Time in the House of Representative or the Senate.

The event was opened by Nobel prize winner Professor Brian Schmidt in great style by taking a selfie of himself in front of the audience. I asked him what advice he would give to himself when he was in his PhD. He said:

"Patience, and positivity: Patience, because good things don't come all at once, and you need to wait for them sometimes. Positivity, because if you stay positive, it is the best possible outcome. Always."

Very wise words, from a very good source.

Another personal highlight was the session on 'How to communicate science in 60 seconds'. Giving three steps for telling a story: "And", "But", "And therefore". A template might look like the following:

*Here's all the things we know and that lead to this and this
but we still need to know x, y, x.
Therefore we need to do ABC*

On the second day I met with the Member of Parliament for Griffith, Terri Butler. With me was Inge Koch from AMSI and Alfonso Garcia-Bennett from the Centre for Nanoscale BioPhotonics. This was my first time meeting a elected member of parliament face to face. I was struck by the breadth of Terri's knowledge of issues relevant to the residents of Griffith, and was again reminded that whilst we often hear negative things about politicians in the media, they are intelligent, hard-working people who care about their community. I've since emailed Terri a few times and have received replies shortly afterwards. I would highly recommend getting in touch with your local member.

> Continued on page 5



Nick Tierney
in his element
at Science
Meets
Parliament
2016

June 2016
Issue 155

SSA

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**DEADLINE FOR NEXT NEWSLETTER
10 August 2016**

FROM THE ACTING EDITOR

ASC 2016 is fast approaching; it will be held in Canberra in December. The conference is being held in conjunction with the Australasian Data Mining Conference and OZCOTS, and all indications are that it will be an excellent event. See the conference advertisement in this issue for more detail and for the link to registration. I hope to see you there!

In this issue, Nicholas Tierney reports on his attendance at Science Meets Parliament, organized by Science and Technology Australia. Nicholas provides very valuable insights into the interactions of politics, policy, the media and science. I'm sure he'd be happy to expand on his report if you asked him!

Also in this issue, we hear of two now-deceased members of the Society

- Frank Hansford-Miller, an eccentric individual with a love of statistics and what it could contribute to society. Frank left a substantial bequest to the Western Australian Branch of SSA – see the Branch's report.
- Joe Gani, who made significant contributions to statistics and the statistical profession in many ways, and who was, in any interactions I had with him, always a gentleman.

Reading about these two might make us ask ourselves "How would I like to be remembered?"

Doug Shaw
Acting Editor

EVENTS

INTERMEDIATE BAYESIAN STATISTICS

11-12 July 2016, Melbourne

5TH BIENNIAL ACSPRI SOCIAL SCIENCE METHODOLOGY CONFERENCE

19-22 July 2016, Sydney

AUSTRALASIAN APPLIED STATISTICS CONFERENCE 2016

28 November – 2 December 2016, Barragga Bay, NSW

AUSTRALIAN STATISTICAL CONFERENCE 2016

5-9 December 2016, Canberra

To have your event added to this list, please forward the event details in the above format to eo@statsoc.org.au

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<http://www.statsoc.org.au/about-young-stats.htm>

Further contact details for Society Secretaries and Section Chairs can be obtained by contacting the Society on (02) 6251 3647. If you are interested in applying for any of the vacant positions, please contact the Executive Officer (eo@statsoc.org.au).

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I got into research to help bridge the gap between policy and statistics. My knowledge of statistics is constantly growing, but my knowledge of policy and politics is much more limited. Science Meets Parliament taught me how to engage politicians and policy makers, explained the role media plays in both science and politics, provided me with practical tools for evocatively delivering my research, and gave me the opportunity to engage in an excellent networking opportunity. I highly recommend attending Science Meets Parliament, it was an incredibly well run event, and I would absolutely attend again. Thank you to the SSA for providing me with this great opportunity!



Scientists and Politicians at Science Meets Parliament 2016.



Some familiar faces at Science Meets Parliament 2016

Photographs courtesy of photographer Mark Graham and Science Meets Parliament 2016.

There was a lot of fantastic advice given over the two days. I have condensed my thoughts and notes down into a short list below.

Nick's Hot Tips On Politics, Science, Media, and Policy

On Politicians

- Never assume anything when talking to a politician.
- Know the issues that the politician thinks are important or challenging.
- A politician's job is stressful, make meeting with them a positive experience.
- Politicians are employed to care for their electorate, so your research findings need to be related to their electorate to be relevant to them.
- Email your local member to stay in touch about issues important to you.
- Build the momentum when getting involved with politicians. Email straight after meeting, again later that week, and be sure to stay in touch.

- If you want to engage politicians and create change, respectfully engaging your local member is one of the best approaches.
- Reaching out to your local member doesn't necessarily align you with their political party; you are reaching out to someone who is employed to help those in their electorate.

On Communication and Media

- Science isn't over until it's communicated
- Tell a story with your research. You want people to walk away with one critical piece of information.
- Fight the temptation to say "I'm not an expert on that topic". You might not be the leading expert in the world, but you are often the leading expert in the room. You can still give your professional opinion.
- As a scientist, don't wait for media to engage with you. Actively engage and seek out media coverage

On Policy and Change

- If you want to be involved with policy, stay engaged with the policy process, and ask your local member how to get started doing this.
- Changes happen when politicians, departments, and advisors converge on a topic.
- Big change from science takes three to tango: Government, university, and business. They all need to work together and agree on an idea.

Nicholas Tierney

QLD Branch

MANAGING EDITOR OF ANZJS

Alan Welsh has recently completed his term as Managing Editor of the Australian and New Zealand Journal of Statistics.

The Statistical Society of Australia is deeply grateful to Alan for his work as Managing Editor. He has led the Journal's editorial team to produce a journal of consistent high quality and excellent reputation. This has been achieved at a time when journals are facing many challenges, and there is much debate about future publishing models.

The Present Managing Editor of the Journal is James Curran, of the University of Auckland.



Alan Welsh

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8 - 9 APRIL
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MONASH UNIVERSITY

AMSI
WINTER
SCHOOL **16**

4 - 15 JULY
THE UNIVERSITY OF QUEENSLAND

**ERGODIC THEORY
& ITS APPLICATIONS**

18 - 22 JULY
THE UNIVERSITY OF SYDNEY

MODU2016

18 - 22 JULY
RMIT UNIVERSITY

AMSI RESEARCH

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EVENTS 16**

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WINTER OF
**DISCONN-
ECTEDNESS**

1 - 12 AUGUST
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GEOMETRY
→ A N U

15 - 26 AUGUST
THE AUSTRALIAN NATIONAL UNIVERSITY

TOPOLOGICAL MATTER,
STRINGS & K-THEORY

5 - 9 SEPTEMBER
THE UNIVERSITY OF ADELAIDE

A N I M A L
V E G E T A L
M I N E R A L ?

18 - 23 SEPTEMBER
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FOR APPLICATIONS**

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11 - 14 NOVEMBER
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CONFERENCE
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DIFFERENTIAL EQUATIONS**

28 NOV - 2 DEC
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AMSI
**BIOINFO
SUMMER 16**

28 NOV - 2 DEC
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**mathsfest
AUSTRALIA 2016**

3 EVENTS IN 1
CANBERRA 2016, 28 NOV - 16 DEC

WORKSHOP
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Ergodic Theory,
Hyperbolic
Dynamics &
Statistical Laws**

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AMSI RESEARCH



Joe Gani
1924-2016

Photo used with the
kind permission of
Miriam Gani.



It was with great sadness that we learned about the death of distinguished SSA member, Professor Joe Gani.

The following information was prepared by Sue Wilson and Alan Welsh of the ANU.

PROFESSOR JOSEPH MARK GANI

(15 December 1924, Cairo, Egypt – 12 April 2016, Canberra, Australia)

Joe Gani was born in Cairo, Egypt on 15 December 1924. He studied at Imperial College London, obtaining a BSc (hons) in 1947 and a DIC in 1948. Joe moved to Australia in 1948 and worked as a lecturer in applied mathematics at the University of Melbourne from 1948–1950. In 1953, Joe and his lifelong friend Ted Hannan became the first PhD students in Statistics at ANU; they both completed their PhDs under the supervision of P.A.P. (Pat) Moran, graduating in 1955. From 1953–1960, Joe was associated with the University of Western Australia. Joe was a Senior Fellow in Statistics at ANU in Pat Moran's department (in the Institute) from 1961–1964. He then went overseas, becoming a Professor in the Department of Statistics at Michigan State University from 1964–1965 and then Professor in the Department of Probability and Statistics at The University of Sheffield from 1965–1974.

Joe returned to Canberra to become Chief of the CSIRO Division of Mathematics and Statistics (DMS) from 1974–1981. From DMS, he became Professor of Statistics at the University of Kentucky from 1981–1985 and then a Professor in the Statistics and Applied Probability Program at the University of California, Santa Barbara from 1985–1994. Joe retired in 1994 and returned to Canberra as a Visiting Fellow in the School of Mathematical Sciences (now MSI). Joe remained active in MSI until early last year when a bad fall reduced his mobility.

Joe's research interests included applied probability, statistics, epidemic modelling, biological models, statistical linguistics and inference on stochastic processes. Joe was the founding Editor of the *Journal of Applied Probability*. Joe was elected a Fellow of the Australian Academy of Science in 1976 and awarded the Pitman Medal of the Statistical Society of Australia in 1994. Joe was made a Member of the Order of Australia (AM) in 2000. He was predeceased by his wife Ruth and is survived by his four children Jonathan, Miriam, Matthew and Sarah, and their children.

The transcript of the very interesting interview (with more details about Joe's life and insights into the kind of person he was) conducted by Eugene Seneta for the Academy of Science is available at <https://www.science.org.au/learning/general-audience/history/interviews-australian-scientists/interview-professor-joe-gani>

An earlier interview conducted by Chris Heyde is available at <http://www.jstor.org/tc/accept?origin=/stable/pdf/2246194.pdf>

<http://www.sciencearchive.org.au/scientists/interviews/g/gani.html>

Links

[Seneta interview at Academy of Science](#)

[Heyde interview on JSTOR](#)

[Joe's homepage at MSI, ANU](#)

[Encyclopaedia of Australian Science Trove](#)



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CANBERRA BRANCH

Agricultural Statistics in Tanzania: Canberra Branch February 2016

Sharyn Lavender spoke on her career in agricultural surveys in the US, Haiti and Tanzania. Sharyn recently moved to Canberra where she works for Datalytics. Sharyn's career at the National Agricultural Statistical Service (NASS), which is part of the US Department of Agriculture, spanned 15 years and a range of locations and roles including survey collection, data processing, publishing over 200 annual statistical reports, statistical methods, and working in the International Programs Office.

The focus of Sharyn's talk was a major project to develop Tanzania's agricultural statistical system. Tanzania suffers from both hunger and agricultural over-production (in some areas); improved agricultural statistics will help to solve this mis-match. The most important part of Sharyn's role was training the Tanzania National Ag Stats Team to build the country's statistical capacity, and enable them to develop statistical solutions, particularly an annual agricultural sample survey.

Challenges included:

- developing a frame;
- dealing with mixed cropping (multiple crops in each field) and double or triple crops per year;
- negotiating with village leaders, locating operators, lack of farm records, language and accessibility.

The final area-based sampling frame was based on classifying areas of 1-5 km² based on satellite data and aggregating these to continuous strata. Year 1 was a cognitive pre-test, year 2 was a pilot study, and year 3 will be a full survey (underway in 2016). Sharyn made many trips to Tanzania and the Tanzanian Project Team made a study tour to the US, to show them a mature system and to help them develop locally effective solutions away from their usual day to day commitments.

Sharyn also spoke about work rebuilding Haiti's statistical infrastructure following their devastating earthquake.

There was a long and lively question and answer session following the presentation, which was at ABS House. Quite a few new faces were at the talk. For more information about Canberra Branch activities for 2016, follow the link from <http://www.statsoc.org.au/branches/canberra/can-branch-meetings/>

All speakers for 2016 have been finalised and we are looking forward to continuing the excellent programme of presentations launched by Sharyn, and culminating in the Australian Statistical Conference in December.

Robert Clark

Canberra Branch President

The resurrection of time as a continuous concept in biostatistics, demography and epidemiology

Dr Bendix Carstensen from Steno Diabetes Center, Copenhagen, Denmark gave an insightful Knibbs lecture in the November meeting of the Canberra branch. The focus of the talk was to consider time as a continuous concept in biostatistics, demography and epidemiology. As an alternative to the Cox model, Bendix presented the age-period-cohort (APC) model for modeling cause and age-specific mortality rates and estimating survival probability after diagnosis of a disease. The age-specific mortality rate at a given time period can be modeled in an additive model consisting of smooth functions of age, period and cohort. This can be expressed as

$$\log(\lambda(a,p)) = f(a) + g(p) + h(c),$$

for three functions, f , g and h .

Due to the identifiability issue (cohort = period – age), one can extract the linear trends from the age, period and cohort parameters from a factor model by regressing age parameter on age, period parameter on period and cohort parameters on cohort, and then present the residuals as age, period and cohort effects (see also Holford, 1983 and Carstensen, 2007).

To model smooth functions of age, period and cohort, it seems natural to model their effects by parametric smooth functions, for example splines, i.e., 1st, 2nd, 3rd degree polynomials, constrained to have identical values and derivatives at interval boundaries (knots). Illustrated by the Danish testis cancer data, Bendix showed the advantages of the APC model for estimating survival probability since diagnosis. The advantages are that it presents a parametric form of time effects, which allows direct implementation of probability theory and the philosophy of the Lexis machinery for representing multistate data on different time scales; with a parametric function of cohort, it is possible to let the model reflect the information available in different cohorts.

Bendix noted that testis cancer patients are rare, so the associated mortality rates can be accurately calculated as the number of deaths divided by the population exposure. This ratio may not be that accurate when one analyzes diabetic-related mortality rates, since it is a common type of disease.

Finally, Bendix introduced an R package, called Epi, for implementing the APC model, in particular the core function `apc.fit`. An interesting question arose from one member of the audience about classifying the diabetic patients into different categories, which will bring additional model complexity.

Han Ling Shan

References

- Holford, T. R. (1983). The estimation of age, period and cohort effects for vital rates. *Biometrics*, 39, 311-324.
- Carstensen, B. (2007). Age-period-cohort models for the Lexis diagram. *Statistics in Medicine*, 26, 3018-3045.

Young Statisticians Workshop October 2015

The Canberra branch of the SSA hosted a Young Statisticians' Event on the 13th of October. After a game of Icebreaker Bingo, the attendees listened to Dr. Damjan Vukcevic share his thoughts about what key skills are needed by today's data scientists to shape the data analysis projects of the future. Damjan characterised "big data" as requiring either more than 1 computer, more than 1 piece of software, or more than 1 analyst (sometimes all 3!). He discussed his career which has included significant scientific work in statistical genetics at Oxford, web analytics at Experian Hitwise, and statistical genetics and biostatistics at the Murdoch Children's Research Institute. The project he was part of at Oxford involved 20 statisticians/analysts over 4 institutions and a full time programmer, and resulted in doubling the number of genetic associations known to science, from 12 to 24.

Damjan argued that our profession's future in data science requires engagement with analysts from other disciplines, the embrace of projects beyond our traditional domains, and reformation of undergraduate statistical curricula. His advice to aspiring statistical data scientists was to learn software engineering skills, seek out good mentors, get experience with real data, and cultivate a wide network (including the SSA!). Damjan's slides are at <http://damjan.vukcevic.net/wp-content/uploads/2015/10/2015-10-13-Our-future-in-big-data-science.pdf>, and his blog is at <http://damjan.vukcevic.net>.

The energising presentation was followed by pide for dinner, and networking with other students and members of the SSA. There was a large audience including many students, some of whom have since become SSA members.

Robert Clark
Canberra Branch President





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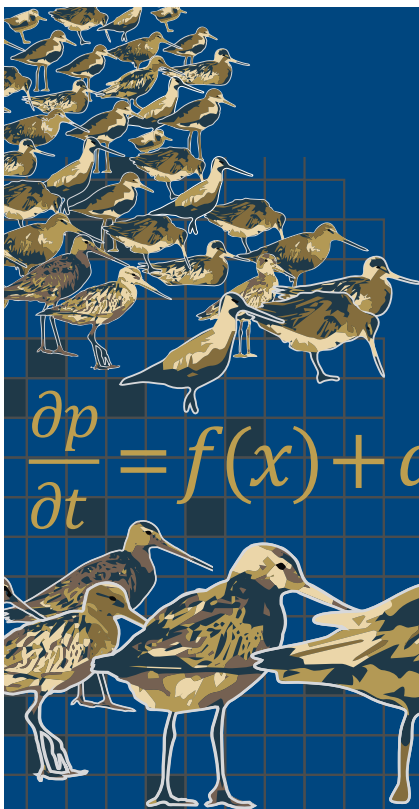
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AMSI RESEARCH



NSW BRANCH

68th Annual General Meeting of the NSW Branch

On the 22nd March 2016, the 68th Annual General Meeting of the NSW Branch of the Statistical Society of Australia Inc. was held at the University of Technology Sydney. Following the traditional formalities including presentation of the 2015 Annual Report, the branch Council for 2016 were presented. On this occasion, we had several exciting changes with many roles swapped and traded. In an event that happens only every second year, the Vice President and President officially swapped roles. Out going President Professor Louise Ryan handed the reins to Vice-President Dr Michael Stewart. With Michael no doubt having grand plans for the Branch, he enthusiastically accepted the role and shortly after launched straight into the Henry Oliver Lancaster lecture. To complete the meeting, auditors were set, and further announcements were made. Next up was the newly appointed President's lecture.



NSW Branch
incoming President
Dr Michael Stewart



Dr Michael Stewart delivering
the H. O. Lancaster lecture
and discussing some of the
finer points relating to bivariate
density estimation.

Mixture Detection: some theory and applications

H. O. Lancaster Lecture delivered by Dr Michael Stewart, 22-03-2016

If you read the nerdy parts of the Internet, including many of the stats related blogs, you may find that mixture models, or even framing your problem into a mixture model, seem to be all the rage. Like most, and having dabbled with finite mixture models in the past, I was very much looking forward to hearing about the state-of-the-art, and learning some new applications beyond my prior experience. Michael did not disappoint and presented many exciting developments and applications.

The talk kicked-off with describing the basic notation and features of mixture models. The classic mixture of Normals was presented and discussed to solidify the concepts and to tease the unfamiliar with how flexible the framework can be. Depending on the application/problem at hand, Michael demonstrated that the different parts of the mixture model might be of direct interest, including estimating the number of components, or determining the shapes of distributions forming the mixture. Additional classic, yet surprising results were mentioned including a reframing of the negative-binomial distribution as a Gamma-Poisson mixture, and a quick outline of Hartigan's testing problem.

Michael presented an impressive array of applications of mixture models. Ranging from ion channel opening/closing physics applications, to the reliability or lifetime analysis of manufactured components, there was something in the talk for everyone. An application that stood out to me was using mixture models to identify species archetypes. The main application was to model the probability of a given species appearing at a certain site depending on a set of characteristics or environmental factors. These multivariate species modeling problems are complicated, but may be simplified by grouping species into archetypes using mixture models. Preliminary results were promising and pretty plots were shown! Using the same approach, applications beyond species abundance modeling could be very exciting.

In all, 40-50 people attended the lecture, and I am sure that everyone learned something new. The Branch continues to have a lot of success in advertising our monthly events on the Meetup.com website. As this website reaches all types of statisticians including theoretical, applied, and in-hiding, the post-lecture questions were great and on-point. Following the lecture, dinner and celebratory 'here-is-to-a-new-year' drinks were had in a nearby restaurant.

Stephen Wright

Symbolic Data Analysis: Representing and Analysing Data with Variability

Associate Professor Paula Brito, University of Porto, 05-04-2016

For our April NSW Statistical Society Branch seminar we had Paula Brito, a visitor from the University of Porto, present on the topic of Symbolic Data Analysis. Symbolic Data Analysis is an emerging field in statistics that analyses aggregated data sets into intervals or distributions, which accounts for variability inherent in the data.

Under the guise of an introduction to Symbolic Data Analysis, many example data sets were presented. One was a data set where the macro-data were flight records at a particular airport, and the micro-data were flights aggregated by airline. This aggregation was then transformed into a mixture of interval and distribution-valued variables. Paula also mentioned the case when data is recorded in the symbolic form, the example being temperature ranges over monthly periods for numerous meteorological stations across the USA.

After numerous data examples, Paula outlined the summary statistic methods developed in SDA, with sample means, variances and covariance being developed for both interval and distribution-valued variables. Of particular note was her mention of work by Lynne Billard, who will also be presenting on the topic of Symbolic Data Analysis to the NSW Branch for the May seminar.

To complement her introduction into Symbolic Data Analysis, Paula presented her work with Pedro Duarte Silva on modeling interval data. In this work, each interval was represented by a midpoint and its range. This micro-data lead to multiple variance-covariance matrix representations upon which maximum likelihood and analysis of variance methods were considered.

To further emphasize the possibilities of Symbolic Data Analysis, the talk was concluded by the quote, "Distributions are the numbers of the future.", attributed to Schweizer in 1984. After a number of questions, a subset of the talk attendees continued a statistical discussion over Cuban-style burgers for dinner.

Alan Malecki

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Associate Professor Paula Brito (University of Porto) delivering the NSW Branch April Seminar on Symbolic Data Analysis.



QUEENSLAND BRANCH

February Queensland branch meeting

On February 2, 2016 the QLD branch held its monthly meeting where Professor Benoit Liquet from the French Universite de Pau et Pays de l'Adour gave a presentation on Group and Sparse Group Partial Least Square approaches applied in genomics contexts.

Professor Liquet is affiliated with ACEMS (Centre of Excellence for Mathematical and Statistical Frontiers), Queensland University of Technology. Throughout his career he has extensively worked in developing statistical models mainly to provide novel tools to analyse clinical, health and biological data arising from epidemiological studies. His main research interests have focused on model selection, multi-state models, survival analysis, multiple testing problems, dimension reduction methods and big data. More recently he moved to the field of computational biology and generalised some of these methods so that they scale to high throughput ('OMIC') data.

Benoit introduced methods to deal with complex omics data. Partial least squares (PLS) is a multivariate statistical method that reduces the original data to produce a smaller set of uncorrelated components. PLS performs well in situations where the original variables are highly correlated and there are more independent variables than observations. Sparse PLS allows identification of variables that contribute to prediction and the reduction of components in one step.

Professor Liquet proposed two PLS extensions called group PLS (gPLS) and sparse group PLS (sgPLS). His algorithm enables the examination of relationships between two different types of omics data (e.g., SNP and gene expression) or between an omics dataset and multivariate phenotypes (e.g., cytokine secretion). These extensions allow the independent variables to be broken into blocks to allow for biological relationships within the data. The approach is implemented in a comprehensive R package called sgPLS available on the CRAN.

Lee Jones

Dose response in field trials

On 16th February, Dr. Sue Welham, VSN International Ltd, Hemel Hempstead, UK spoke on "Finding the optimum: interaction between statistical and logistical issues in dose-response field trials" at UQ, St Lucia. The talk was on joint work with Roger Sylvester-Bradley, Daniel Kindred, Liz Hudson, Susie Roques (ADAS UK Ltd). Sue Welham is an applied statistician, currently working on algorithms for linear mixed models at VSN International (UK). She started her career at Rothamsted Research, working as a consultant statistician with Rothamsted scientists and writing a front-end to the REML algorithm in GenStat. She did a PhD on mixed model splines at the London School of Hygiene and Tropical Medicine during 2000-2003 then returned to Rothamsted to head the group of statistical consultants. During this time, the group developed a training program in practical statistics for scientists that led to the publication of "Statistical Methods in Biology" by Welham, Gezan, Clark and Mead (2014). Sue moved to VSN in 2012 to resume her interest in computational algorithms for REML estimation, and also retains some collaborations with scientists at Rothamsted and ADAS.

Sue gave an interesting overview of practical and statistical considerations around the increasing use of precision farming equipment for small-plot experimentation. This has given rise to alternative approaches to standard variety trials which measure yield and quality traits for a range of varieties. To achieve "sustainable intensification", researchers want to identify varieties that give maximum yield for minimum input. This requires dose-response trials to identify optimum doses for varieties, by testing at several doses of standard inputs (here nitrogen), which greatly increases the number of plots and trialling costs. In addition, the large plot-to-plot variation associated with field trials can make small differences in optima hard to detect. Taken together, these factors make wide-scale testing of dose-response curves impractical and so varieties with efficient nitrogen-use properties may never be identified.

ADAS UK introduced the concept of OptiPlot trials: a range of doses applied in increasing order within a standard field plot, with varieties replicated across field plots. The dose-response trial can then be undertaken on the same scale as a standard variety trial, with the added benefit that dose comparisons take place in close proximity and should be more precise. As originally defined, this concept ignores the statistical principle of randomization, and gives the possibility of confounding between any underlying spatial trend and the nitrogen response. Sue described the evolution from the original OptiPlot concept into one that provides a practical compromise between good statistical practice and logistical constraints. The role and limitations of simulation studies in the evaluation of candidate designs was also be discussed.

Peter Baker

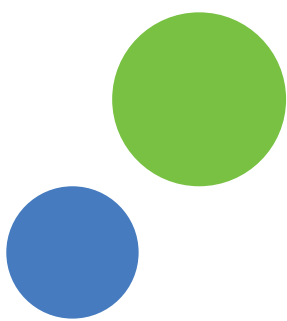
Advanced Bayesian regression

In a joint meeting between the Griffith Social and Behavioral Research College and the Australian Statistical Society on the 17th of February, Professor Murray Aitken gave a presentation on advanced Bayesian regression.

Professor Aitken is currently an Honorary Professorial Associate at the University of Melbourne, in the Department of Mathematics and Statistics. In a previous role Murray was the Chief Statistician at the American Institutes for Research, Washington DC and advisor to the National Centre for Education Statistics, US Department of Education. His qualifications include: BSc, PhD and DSc, Sydney University in Mathematical Statistics. He held lecturing positions at UNSW and Macquarie University. These were followed by research professor positions at Lancaster University (UK Social Science Research Council) and the University of Western Australia (ARC).

Professor Aitken's career has focused on statistical methodology, primarily in social sciences, and he gave an insightful talk on how Bayesian statistics can be used as a universal multinomial. Murray outlined that although the multinomial distribution is mainly used for discrete data, an extension of this model proposed by Hartley, Rao and Ericson recognizes that all recorded data has a finite measurement precision. Each of these distinct recorded values would define a bin and could be assigned an unknown bin probability. This innovation provides the basis for fully distribution-free Bayesian regression analysis. After the talk a small group enjoyed a Turkish meal where new friends were made and old friendships were renewed.

Lee Jones



Queensland Branch AGM at QUT Gardens Point

On 5 April, following the SSA QLD Branch Annual General Meeting, Dr. Alan Huang, UQ, spoke on vector regression without specifying marginal distributions or association structures. Dr Huang is originally from Sydney, where he also did his undergraduate degree at the Uni of Sydney. He worked at the Australian Bureau of Statistics in Canberra before getting a PhD from the University of Chicago. He is currently a Lecturer in Statistics at the University of Queensland.

Alan discussed a flexible yet parsimonious framework for vector regression based on nonparametric multivariate exponential families. The key feature is that the underlying exponential family can be left completely unspecified in the model and can be estimated nonparametrically from data, along with the usual regression coefficients. He provided an interesting overview of the area and demonstrated his methods on several data analysis examples, and in particular for GDP and Fertility rates from UN data and a Sorbinil eye trial dataset

Peter Baker

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SA BRANCH

South Australian Branch SSA February 2016 Meeting

2016 Census - bigger Australia, smaller Census

The topic of the February meeting of the South Australian Branch was the preparations for Australia's 17th Census of Population and Housing, to be held on August 9 2016. The two speakers from the Australian Bureau of Statistics were Duncan Young (head of the Census Program) and Lisa Moutzouris (Director of Census in South Australia).

The talk focused on how the data collection process for the 2016 Census will differ from previous Censuses. The data collection innovations impact both the duties and procedures followed by field collection staff, and how Australian households will engage with the Census.

Perhaps the most significant innovation is that in many regions in Australia, field collection staff will not be required to drop off Census materials. Around 80 per cent of households will receive a letter in the post containing instructions on how to complete the Census online. Households which respond promptly will not have any contact with Census field staff. To cater for those households unable to participate online, instructions are provided on how to request a paper form. Additionally, 2011 Census data has been used to identify those areas where the new collection strategy may result in poorer response rates. These areas will be receiving the paper form and a reply paid envelope in the post.

Lisa explained that from the perspective of households, the 'digital first' approach used to design the questionnaire will improve the user experience of online completion. For example, the layout of the Census form will be responsive to the device screen size of the device (e.g. handheld device, tablet or PC). The more extensive use of text substitution and 'answer-based sequencing' will make the Census form easier to complete and improve data quality.

The innovations will also provide a far more cost efficient operation. The number of field collector staff will be significantly smaller than for 2011 Census, and the amount of paper used will reduce by more than 300,000 kilograms. The efficiencies provided in the collection process are being used to better target resources for the collection from regions and subpopulations which prove to require greater effort. Duncan discussed how statistical models have been developed to predict how different geographic regions will compare with respect to the proportion of online response and the amount of field effort required for follow-up. These predictions have helped the planning of field collection resources.

The Australian public will also see efficiencies in dissemination of Census outputs, as the release date of initial Census data will be earlier than for previous Censuses.

Julian Whiting

Goodness of fit for non-canonical binary regression models

A small but enthusiastic audience listened to the presentation of Dr Steve Quinn, who is an applied statistician at Flinders University.

Steve set the scene by discussing the need for goodness-of-fit statistics in the logistic regression context, and reviewed several statistics that have been advanced that could assess model adequacy in this setting. The most widely used statistic to assess logistic regression model adequacy today is the Hosmer-Lemeshow goodness of fit statistic, which is available in almost all software packages today. Nevertheless, it has its limitations. For example, partitioning the predicted probabilities into ten groups is somewhat arbitrary and used in this form the statistic has been recommended for use only with small datasets with less than one thousand observations. There is also the problem of ties.

His talk focussed on ascertaining model adequacy for two non-canonical forms of binary regression: log-binomial regression (with a log link) and complementary-log-log regression. Three statistics were compared: the Hosmer-Lemeshow statistic, the Hjort-Hosmer statistic and the normalised unweighted sum-of-squares statistic. Steve showed that the latter two statistics have better performance than the Hosmer-Lemeshow statistic.

The talk generated some lively discussion with many comments and questions. Afterwards, several members and the speaker adjourned for a meal at a nearby restaurant.



Dr Steve Quinn

Shahid Ullah

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WA BRANCH

The Frank Hansford-Miller Fellowship

The WA Branch of the SSA was privileged to welcome Professor Adrian Bowman of the University of Glasgow to its last meeting of the 2015 calendar year. Adrian is the second recipient of the Frank Hansford-Miller Fellowship. This fellowship was made possible by a generous bequest made to the WA Branch of the SSA by Frank Hansford-Miller, who died in 2008 at the age of 91. It is perhaps pertinent to therefore write some words about Frank.

Frank's working life was in the UK. According to Frank's nephew "His love of mathematics and education took him into teaching and later he became a mathematics advisor to the Inner London Education Authority. He was fascinated by statistics and saw their practical application as a means of benefitting society. He was a lifetime fellow of the Royal Statistical Society and also a member of the Statistical Society of Australia."

On retirement from his full time job in London he and his wife Phyllis emigrated from the UK to Perth, Western Australia, to be closer to his wife's sister and her family which included three sons. Frank got involved on a regular basis with the WA Branch, and, apart from occasional sojourns back to his other home in Kent, England, made himself known through regularly attending Branch Meetings. He also took up part time tutoring in statistics at the University of Western Australia, Curtin University, and Murdoch University, the latter being where I initially met him in 1984.

Frank had a sincere underlying love of his homeland and the Royal Statistical Society. He was fascinated by the part that Applied Statistics had to play in the health and wellbeing of the community and all aspects of political and cultural life of the country. He also did his very best to assimilate into Australian society and took part in a wide range of activities. In a letter dated 2006 from the then Premier of Western Australia, Alan Carpenter, Frank was congratulated on the success he achieved at the City of Joondalup Eisteddfod where he had gained first place for his Drama Solo titled 'Out Looking for my Dad' and his speech therein 'My Vision for Australia'. After his wife died Frank's extrovert and eccentric character took him to nightclubs to meet other people and he even produced a CD under the name of Frisky Frank. He also learnt to play the didgeridoo.

Frank's bequest to the WA Branch of SSA probably resulted from his childless state and his desire to perpetuate his line in some way. He was obviously affected by the fact that he and his wife had no children, and after his wife died he even went on our own ABC television show Catalyst saying that he wanted to be cloned. We never knew what Frank might do next or where he might appear.

Frank's academic life was not plain sailing. Frank prided himself on his University studies for both a Masters and a PhD and even showed me a copy of his PhD thesis at the University of London. This and the use of the title of doctor, led me to believe he had been awarded a PhD. However, not all is as it seems and I have discovered since Frank's passing that this was not the case.

Recently, I have been in correspondence with Sir David Cox about Frank Hansford-Miller and he wrote amongst other things:

"Was he fraud? To the best of my knowledge almost certainly not! He was an old-style English eccentric who had a very raw deal from the University system."

Frank left a one sixteenth part of a sizeable estate from the sale of homes in England and Australia to the WA Branch of the SSAI for the purposes of bringing a UK statistician to Perth on a biennial basis. He stipulated that the society organize a medal and prize to be known as the "Frank Hansford-Miller Human Statistics Bequest". The Branch has carried out his wishes with the selected statistician on each occasion receiving the Frank Hansford-Miller Fellow Medal, sufficient funds for travel from the UK and accommodation and meals in Perth for two weeks. In Adrian Bowmans's case his visit was coordinated with the Australasian Branch of the Biometrics Society so he could also speak at their biennial conference.

The original amount of Frank's bequest remains untouched as visits by the first two Fellowship winners have been funded through interest earnings. The statistical community in Australia and, in particular Western Australian statisticians, will have an enduring link between the UK statisticians and themselves. We have much to be thankful for to Frank Hansford-Miller.

Brenton R Clarke

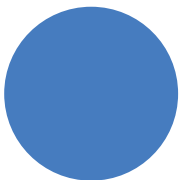
Chair Frank Hansford-Miller Fellowship Committee

Summary of the November Meeting of the SSAI WA Branch

Professor Adrian Bowman from the University of Glasgow delivered a seminar titled "Visualising the environment: data, models and graphics" on Tuesday 17th November, 2015. Most SSAI members would know of Adrian from his classic book on smoothing techniques (Bowman and Azzalini, 1997), but fewer might know that he also has a strong interest in statistical education and is an active researcher in developing dynamic and interactive displays for illustrating key statistical concepts. More recently, he has combined his longstanding interest in nonparametric techniques, visualisation, and environmental problems to develop flexible models that allow the evidence for the presence of effects to be assessed quantitatively and expressed visually in innovative ways, and these interests formed the core of his SSAI seminar.

After remarking on the contrast between the warmth of sunny Perth (Western Australia, not Scotland!) and the dampness of an overcast Glasgow, Adrian began by asking the audience two questions about visualisations: what really effective examples could we think of, and what recent statistical visualisations had been most successful in terms of impact? He showed a few of his own favourites, including a striking and informative image of flight patterns across the continental US and a well-known and beautifully flowing New York Times graphic entitled 'The Ebb and Flow of Movies' showing box office receipts over time at US cinemas. A few more examples led Adrian to two main messages of his talk: (a) visualisation is not just for data, but also for models and uncertainty, and (b) although many useful tools are available—animation, shading, and 3D—statisticians could be making better use of them. For example, density strips (Jackson, 2008) are a contemporary twist on widely-used boxplots that use the capabilities of modern graphics displays and printers: they are nothing more than shaded monochrome strips whose darkness at a point is proportional to the probability density of the quantity at that point.

After a few additional examples, some of which can be reproduced using rpanel, an R package that Adrian has developed with colleagues at Glasgow, he discussed three environmental examples in which static and dynamic visualisation was used not only for data, but also to illustrate model





Brenton Clarke with the recipient of the Frank Hansford-Miller Fellow Medal, Adrian Bowman.

Photo courtesy of Mario D'Antuono

structure and uncertainty in results. A particularly complex example was the distribution of nitrates in the River Tweed and its many tributaries. Adrian and his colleagues constructed a spatiotemporal model over a riverine network, and he used dynamic graphics to illustrate the model as well as the results of the spatiotemporal modelling.

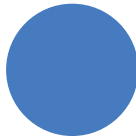
The discussion about all matters visual continued over several glasses of wine, and pizza, at a local Italian restaurant, where Adrian was joined by several members of the WA Branch.

Aloke Phatak

Bowman, A.W. and Azzalini, A. (1997). *Applied Smoothing Techniques for Data Analysis. The Kernel Approach with S-Plus Illustrations.* Oxford University Press: Oxford.

Jackson, C.H. (2008). Displaying uncertainty with shading. *The American Statistician*, 62 (4), 340–347.

Bowman, A., Crawford, E., Alexander, G. and Bowman, R.W. (2007). rpanel: Simple interactive controls for R functions using the tcltk package. *Journal of Statistical Software*, 17 (9), 1–18.



FROM THE OFFICE

Since our March edition was published the branches had their AGMs and the new branch councils are a mix of old and new branch officials. I would like to thank the new branch council members for putting their hand up to take on the sometimes challenging task of running an association. I hope you will enjoy your time on the branch council and the insights you will get into the processes and idealism that make the Society what it is. And perhaps you will be able to take advantage of this opportunity to bring in your own ideas of what a professional association could offer. It's important to keep in mind that not every idea will be an instant success, but much worse than having the odd flop would be not giving new ideas a go!

I'd also like to thank all former members of branch council. With some of you I have worked pretty much since I started to work for SSA and I will miss you. It's always comforting to know that you will hear a familiar voice at the other end of the line when you call with a question. I am always amazed and impressed how you find the hours in very busy schedules to volunteer for this society. Thank you.

Peers helping peers – this is what our volunteers do and I hope they get much satisfaction from it. I'm impressed by a mindset which does not just ask what benefits you get from your membership, but what you can actually give to your association – your network of peers.

Still on the subject of volunteers: The members of our Accreditation Committee have been working hard to get through a higher than usual number of AStat accreditation applications. The spike in AStat applications was triggered by the offer of the half price AStat application fee, which runs out on 30 June. If you want to get your application in without having to pay the full fee now is the time!

And lastly – if you would like to contribute an article to this newsletter about something newsworthy with a statistical context, we'd love to hear from you. Perhaps you attended a conference that you found interesting, or you have just discovered some software that no statistician should be without? We want to know about that – preferably with some colourful photographs or other images. Just email your contribution to eo@statsoc.org.au and you may find yourself in the next newsletter!

Marie-Louise Rankin
Executive Officer



Marie-Louise Rankin

Would you like to contribute to the SSA newsletter?

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