

Young Statisticians' Conference 2007

Although I have attended several conferences, this was the first one where there were so many people from my own age group – I wonder if the title “Young Statisticians’ Conference” had anything to do with it.

I learnt a great deal from some of the senior statisticians who spoke. I particularly found Michael Adena’s talk interesting, as I never knew about GStat and AStat accreditation before. Terry Neeman’s talk on “statistics and ethics” made me think about what I would do if I had to choose between compromising scientific principles and keeping a client happy. It is easy for me to think I have high moral standards, because I am single, but would I be able to keep this standard if I had a family that relies on my income?

Of course, I also enjoyed many of the talks given by young statisticians. I learnt that I should prepare for and expect the unexpected from Lisa Yelland, such as a blown up letterbox that contained filled-in surveys, or that one of your study participants may end up in jail. One of my favourite talks was Damien Kennedy’s talk on “Data Visualisation”, as this has always been an interest of mine. I was fascinated by the resources on the web and the quality of the dynamic graphics.

Of course, being a student I cannot forget to mention the conference dinner. Both the quality and quantity of food were excellent. Having finished my presentation before the dinner, I was able to relax and enjoy the food, with a few sips of wine every now and then.

Finally, I’d like to thank Jane Waslin and the conference organising committee for organising one of the best conferences I have ever attended. I would also like to thank the Canberra Branch for sponsoring me with a Student Grant.

Kevin Wang



Young Statisticians on their Sunday tour following the Young Statisticians' Conference 2007.

On the 13th and 14th of April, the Young Statisticians section of the statistical society held a conference at the Australian National University, Canberra. The theme of the conference was “We’re young and we count”. Exactly how important young statisticians are to the discipline was shown by the array of presentations given by participants.

Keynote addresses were made by some prominent statisticians, each showing the wide variety of interesting paths that are available to early career statisticians, and the genuine need for these skills in official statistics, research, and industry. These keynote speakers were the Australian Statistician Mr Brian Pink, Dr Amy Salter from the University of Adelaide, Mr Michael Johnson from Roche Products, and Mr Neville Bartlett from NR Bartlett consulting.

As well as the keynote speakers, participants were encouraged to present a ten minute presentation relating to the work that they do. Official statistics (both from the ABS, and Statistics New Zealand), Academia and Industry were all well represented, and the range of topics was huge. The prize for the best talk was presented to Jason Rabbitt from Data Analysis Australia who discussed his analysis of the water quality in the Cockburn Sound, where a desalination plant has been commissioned.

On the Friday evening, a conference dinner was held in University House, where we were all able to talk over a great dinner, and even have a go at making things from balloons. As well as the conference dinner, the following evening

continued on page 2

Young Statisticians Conference 2007

From page 1

we hit the streets of Civic for dinner and drinks at King O'Malleys. Both of these evenings proved to be a great opportunity to catch up with people we already knew, and also to get to know other people we had just met a bit better.

I would like to thank the organising committee who made sure that the conference was a huge success: Janice Wooton, Richard Hutchinson, Simon Bartlett, Theresa Nunan, Penny Bennett, Lisa Yelland, Pam McCaskie, Kevin Wang, Kris Jamsen, Liz Jermyn and Jane Waslin. Thanks also to the sponsors: ABS, CSIRO, Roche Products, Covance, and Data Analysis Australia.

In short, I thought that the 2007 Young Statisticians conference was a great success, and I hope that we can meet again in two years time for an equally successful conference. In the meantime, I hope that all early career statisticians get involved in the young statisticians section, because we are young, and we do count.

Stephen Bush

As a member of the organising committee for the Young Statisticians' Conference 2007, I would like to share some reasons for the success of the conference.

Jane Waslin (Executive Officer of the SSAI) and her assistant Liz Jermyn took care of all the administrative work in organising the conference from the SSAI's office in Canberra. Having Jane and Liz to contact and liaise with sponsors and keynote speakers, produce the poster and registration form, organise the venue, handle registrations, create and update the website, and all the other tasks I am sure I have missed, was invaluable as the rest of the organising committee had no experience in organising a national



Rhianon Marchant receiving her GStat Certificate at the conference.

conference of this size nor the time to do so (all are studying or working full time). Without Jane and Liz's help the conference would not have been as professional looking as it was (unless we had hired a professional conference organiser at considerable cost). We thank Jane and Liz for all of their effort.

Having Jane and Liz to handle the administrative aspects of the conference allowed the organising committee to put together a program and make other decisions in line with their expertise. The organising committee had representation from New South Wales, Victoria, Western Australia, South Australia and the ACT. Each representative promoted the conference in their state/territory through their local Branch as well as by putting the word out to key organisations, such as universities. At final count, there were 88 delegates from every single state and territory of Australia as well as New Zealand. This great turnout would not have been achieved without having committee members from right around Australia acting as local contacts.

Having the conference in Canberra was an advantage as we had easy access to many government employers of statisticians who sent staff to the conference and also came along and spoke at the careers session at no cost to us. At the careers session employers gave talks about their organisation and opportunities that exist. The feedback from this session was really good, especially from students, who really want to know about career options available. I would highly recommend having a careers session at the 2008 Australian Statistical Conference. On the downside of having the conference in Canberra there was some criticism that the conference did not have a large commercial presence. This is something we will keep in mind for next time.

The conference program over the two days was very full. We managed to fit in all the talks that were submitted before the deadline, but this meant that contributed talks could only be about 10 minutes. This was commented on as being quite short and rushed and it was suggested that next time we should have parallel sessions. It is nice to have this problem to think about as a result of so many people wanting to present.

Summing up, I think the Society should aim to have a Young Statisticians Conference every 2 years, during the ASC off-year. There was a lot of enthusiasm and energy from young statisticians during this year's conference and it would be nice to keep this momentum going.

On the Sunday after the conference a small busload of delegates toured Canberra for a few hours of sightseeing and networking.

Richard Hutchinson

richard.hutchinson@covance.com

In this issue

Young Statisticians Conference 2007	1	Environmental Statistics Section	8
Member News	3	Annual General Meetings Notice	9
Editorial	4	Obituary	10
President's Corner	5	Biometrics by the Beach	11
Statistics Undergraduate Vacation Program	6	CensusAtSchool International Workshop	12
Three Doors	8	Branch Reports	13

Member News

Eugene Seneta receives the Hannan Medal in 2007

Eugene Seneta has done much seminal work in probability and statistics in connection with Markov chains and non-negative matrices, branching processes, the history of probability and statistics, and in such diverse areas as slowly varying functions, Bonferroni type bounds on probabilities of unions of sets, on modelling of the price of a risky asset, and in the scaling of Higher School Certificate marks. The implications of some of his research are considerable. The variance-gamma finance model, proposed by Madan and Seneta in 1990 is in use on Wall Street. The algorithm which Seneta produced for scaling Higher School Certificate marks in the early 1980 was later used to determine the New South Wales Tertiary Entrance Rank. Seneta is a scholar of the highest international calibre and is very well known for his contributions.

The Hannan Medal of the Australian Academy of Science recognises the achievements in time series analysis of the late Professor E.J. Hannan, FAA. Because of Professor Hannan's broad interests in the mathematical sciences the award is made in one of three areas in turn at two-yearly intervals – Pure Mathematics; Applied and Computational Mathematics and Statistical Science.

Chris Heyde

Rob Hyndman receives the Moran Medal in 2007

Rob has made major contributions to a wide range of fields, especially to forecasting, time-series, graphical methods, and methodology based on conditional density estimation. In forecasting his research includes that in his 1997 article in the *Journal of the Royal Statistical Society*, challenging the appropriateness of the most fundamental of Bayesian forecasting models for exponential-family time series; and his seminal paper on state-space models for exponential smoothing, published in the *International Journal of Forecasting* in 2002. Both articles have very important ramifications for both statistical methodology and practical forecasting. Rob's research on graphical methods has produced (in the *Journal of Computational and Graphical Statistics* in

1996) an ingenious method for visualising conditional probability densities, and (in the *American Statistician* in 1996) a remarkably useful tool for data analysis—the “highest density regions” boxplot. The latter is used today in forecasting, when the forecast densities are multimodal (as can occur in nonlinear forecasting), and in Markov Chain Monte Carlo studies.

Peter Hall

New Fellows Day at the Australian Academy of Science

Science at the Shine Dome is an annual three-day event in early May celebrating the achievements and advancements in science by Australian scientists. These three days bring together newly elected Fellows of the Australian Academy of Science, early career researchers, science teachers, and current Fellows of the Australian Academy of Science for scientific seminars, professional training and award presentations. The highlight of the event is *New Fellows Seminar Day* when the 16 newly elected Fellows of the Australian Academy of Science, each of them distinguished in their respective fields, give short presentations on their life-time work. This year's series of ten minute talks were simultaneously short and profound, representing seminal contributions of the new Fellows in the fields of medicine, molecular biology, plant biology, climatology, chemistry, statistics, optics, nanotechnology and information science. It was no small coincidence that the first speaker and the final speaker of this fascinating lecture series were two of Australia's distinguished statisticians.

Today?” In his 30 minute address, Peter gave persuasive evidence that today's statisticians live in interesting times. New technologies have driven innovation in statistical methodologies. Computing power allow us solve much more complex problems than were possible 50 years ago, but also new technologies are creating new types of data which demand new statistical techniques. Units of data from olden times were predominantly single values, or small vectors of values. Today's data units include may be large dimensional vectors, functions and surfaces. Peter gave two examples of how technology has driven methodology. His first example was in the analysis of microarray data, which requires the consideration of thousands of correlated hypothesis tests. His second example was in the development of sensitive methods for detecting weak signals, such as testing for evidence of bioweapons in the atmosphere.



Alan Welsh and Luke Prendergast



Peter Hall (centre)

Professor Peter Hall, recipient of the 2007 Matthew Flinders Medal, opened the ceremony with his Matthew Flinders Lecture titled “What Excites Statisticians

Professor Alan Welsh, newly elected Fellow of the Australian Academy of Science, closed the *New Fellows Seminar Day* with some incisive comments on the modelling and analysis of clustered data. Clustered data arise in many contexts in both the experimental and the survey setting. Alan reviewed different possible models for clustered data, explored differences between them and discussed the implications of these differences. He closed with an example of the ecological fallacy of interpreting associations observed at the aggregate level as associations at the individual level.

Terry Neeman



PO Box 5111,
Braddon ACT 2612
Phone (02) 6249 8266
Fax (02) 6249 6558
Email: admin@statsoc.org.au
Society Web Page
<http://www.statsoc.org.au>

Editors

Alice Richardson, School of ISE,
University of Canberra,
PO Box 1, Belconnen ACT 2616

Michael Adena, Covance Pty Ltd
PO Box 5125, Braddon, ACT 2612

Correspondence

Please direct all editorial
correspondence to Alice Richardson.
Email: newsletter@statsoc.org.au

Disclaimer

The views of contributors to this
Newsletter should not be attributed to
the Statistical Society of Australia, Inc.

Subscriptions

The Newsletter of the Statistical
Society of Australia is supplied free to
all members of the society. Any others
wishing to subscribe to the Newsletter
may do so at an annual cost of
A\$30.00 for an issue of four numbers.

Advertising

Advertising will be carried in the
Newsletter on any matters which
the Editors feel are of interest to
the members of the Society. For
details of advertising rates, etc.
contact the SSAI Executive Officer at
newsletter@statsoc.org.au

Printer

National Capital Printing
22 Pirie Street, Fyshwick ACT 2609

**DEADLINE FOR
NEXT ISSUE:
10 August 2007**

Editorial

Once again this issue of the newsletter is a chance to celebrate the achievements of the people in the Statistical Society. Special congratulations go to Rob Hyndman, Eugene Seneta, Peter Hall and Alan Welsh, who have received awards and honours from the Australian Academy of Science. You'll also find reports from the organisers and attendees of the Young Statisticians Conference, who travelled from far and wide to Canberra in April; the final report from the outgoing President, Kaye Basford; and all the usual Branch reports, for news from close to home.

Also, this month let's celebrate the centenary of one of the fundamental tools of statistics, namely the table of the Normal distribution, and the Australian connection that goes with it. In June 1907, *Biometrika* printed an article entitled "Grades and Deviates: (Including a Table of Normal Deviates Corresponding to Each Millesimal Grade in the Length of an Array, and a Figure)." The author of the article is given as Francis Galton, but the section at the end entitled "Table of Deviates of the Normal Curve" is credited to W.F. Sheppard.

William Fleetwood Sheppard was born near Sydney in 1863 and went to Brisbane Grammar School followed by Trinity College, Cambridge. He met Francis Galton in Cambridge, and Galton encouraged Sheppard in his statistical endeavours.

The 1907 paper gives values, to four decimal places, of $|\Phi^{-1}(z)|$ for $0.000 < z$

< 0.999 in steps of 0.001. David (2005) reports that "Sheppard did a splendidly accurate job, apparently no errors ever having been reported." His figures form the basis of countless versions of tables of the Normal distribution, generally without any reference to the original. The work is clearly so fundamental that authors feel that it must have always existed!

Sheppard himself died in 1936 and obituaries were printed in several places, including the *Annals of Eugenics*. R.A. Fisher, editor of the journal, also contributed a note on Sheppard's work.

One hundred years of continuous use of $\Phi^{-1}(z)$ is a fine achievement indeed. Although many statisticians would now reach for an electronic solution to normal distribution calculations, the portability and "big picture" provided by a printed table of values surely still has a place in statistics teaching and practice.

References

David, H.A. (2005). Tables related to the normal distribution: a short history. *The American Statistician* 59, 309 – 311.

Galton, F. (1907). Grades and Deviates: (Including a Table of Normal Deviates Corresponding to Each Millesimal Grade in the Length of an Array, and a Figure). *Biometrika* 5, 400 – 406.

Wikipedia (2007). William Fleetwood Sheppard. [online] accessed 26/3/07. http://en.wikipedia.org/wiki/William_Fleetwood_Sheppard

Conferences

ISI 56th Session

22-29 August 2007, Lisbon, Portugal
<http://www.ine.pt>

ICAS-4 – Advancing Statistical Integration and Analysis, Fourth International Conference on Agricultural Statistics

22-24 October 2007, Beijing, China
<http://www.stats.gov.cn/english/icas>

IBS Australasian Region, 'Biometrics on the beach'

2-6 December 2007, Coffs Harbour, NSW
<http://www.biometrics.org.au>

BioInfoSummer07

ICE-EM Summer Symposium in BioInformatics
10-14 December 2007, Australian National University, Canberra, ACT.
<http://www.maths.anu.edu.au/events/BioInfoSummer07/>

President's Corner

In my previous newsletter contribution, I commented on the National Strategic Review of Mathematical Sciences Research in Australia which followed the Review on Statistics at Australian Universities. In the latter, the recommendations were broadly grouped around issues relating to the school programme, organization and funding within and among universities, and image and profile of statistics (including employer/university interactions). The recent review found that the mathematical sciences in Australia require an immediate and substantial capital injection to build a critical mass of research, education, industry and government interaction, and ensure we maintain our technical and problem-solving capability.

The outcomes of the two reviews were consistent and reinforced the way forward for statistics in this country. Hence, I am very pleased to report that these reviews have contributed to a major change in the way mathematics and statistics are viewed by those in government. In doing so, I shall quote from an e-mail message written by Professor Peter Hall, an eminent statistician and current President of the Australian Mathematical Society.

As many of you will have heard, the federal government's budget announcements last Tuesday promise to significantly improve the state of the mathematical sciences in Australia. The universities and CSIRO will benefit broadly from budgetary measures announced by the government, but more specifically, the fields of mathematics and statistics in Australian universities were singled out for special, positive treatment. Those discipline areas will be placed into a higher funding band, shared with computer science and resulting in an increase of a little over 50% in financial support per mathematics and statistics student. (Some of this increase is due to a general

improvement in funding, not just to the elevation to a higher band.)

This is an excellent result which will have a major impact on those statisticians working in tertiary institutions, with resulting positive benefits for their students. I would particularly like to thank all those who contributed to the reviews and assisted in the extensive promulgation of their recommendations.

Finally, I would stress (along with Peter) that we continue to strengthen the cooperative spirit that we have developed among those working across all levels of education (be it schools or universities), research entities, government institutions and private enterprise.

This will be my last President's Corner. By the time the next newsletter comes out, William Dunsmuir will have taken over. I have confidence that he will do an excellent job in leading our professional association and wish him all the best in that endeavour. It has certainly been an exciting and productive two years for me. Thanks for that honour and privilege!



Kaye Basford

E-mail: k.e.basford@uq.edu.au

Australian Statistical Conference 2008

30th June to 3rd July 2008, Sofitel Hotel, Melbourne



Main Themes and Organisers

- **Environmental Statistics**
Organisers: Bronwyn Harch, Geoff Laslett, Petra Kuhnert
- **Medical Statistics**
Organiser: John Carlin
- **Stochastic Modelling and Statistics in the Social Sciences**
Will include E.K Foreman Lecture and sessions on longitudinal surveys and data, survey sampling, census data enhancement, financial statistics and more.
Organisers: Ross Maller, Alan Herning, Geoff Lee, Veronica Rodriguez
- **Statistical Genetics and Bioinformatics**
Organiser: Sue Wilson
- **Young Statisticians**
Sessions will include one entitled 'experiences of early career statisticians' and another on 'potential career paths for statisticians'.
Organiser: Theresa Nunan
- **Statistical Methodology**
Organisers: John Maindonald, Michael Martin, Steve Roberts

Keynote and invited speakers will be listed in later announcements and on the ASC2008 web-site.

Conference web-site: Go via –
<http://www.statsoc.org.au/asc2008>

Program committee:
Ross Maller (chair)
Geoff Laslett
Bronwyn Harch
John Carlin
John Maindonald
Geoff Lee
Petra Kuhnert
Alan Herning
Veronica Rodriguez
Sue Wilson
Theresa Nunan

Michael Martin
Steve Roberts

Local organising committee:
Neville Bartlett (chair)
Kay Lipson
Brian Phillips
Katrina Scurrah
Derchie Hung
Jane Waslin

Conference organiser:
FoxEvents, Melbourne

The Statistics Undergraduate Vacation Program 2006/07: A Pilot Project

A new initiative tried in South Australia is proving to be a great success. The statistics undergraduate vacation program aims to give students real-life practical experience in the application and reporting of statistics. As the initiator of this program I would like to share my experience.

Background

I work as the senior statistician within the Food Safety Research Program of the South Australian Research and Development Institute (SARDI). In my position I work with R&D companies, such as Meat & Livestock Australia (MLA), government agencies and food companies on all kinds of food and food safety related projects.

During the university summer break of 2005/06 I was involved as a mentor/supervisor in MLA's undergraduate vacation program which aims to:

- Make professional undergraduates aware of opportunities within the Australian red meat industry
- Give companies access to the knowledge that professional people from many backgrounds can provide
- Give companies an opportunity to "interview" potential candidates in a real life situation over a three-month period.

Clearly, MLA has much greater financial resources than SSAI, which is reflected in the founding of vacation projects. Students are paid \$6,000 for 12 weeks of work, travel to and from the participating company (including a trip home at Christmas) and accommodation for two weeks. In addition, mentors are paid for their time and travel requirements to meet with students on a fortnightly basis. Consequently, total project budgets are typically about \$20,000-\$25,000 – funded half by MLA and half by the participating company.

I found the experience very rewarding and I believe that the company I was involved with made significant head-way in their understanding of the slaughter process. In addition, the student gained valuable industry experience. While the student has decided that he would like to pursue a research career in sports

statistics rather than food, the project has still given him an edge over other graduates without such practical experience.

This experience has made me think about my own career development and those of my colleagues. I was fortunate to work on an industry-sponsored honours project, which included work experience. I have since come to the conclusion the vacation work in the mathematical and statistical sciences is more of a novelty than the norm. In contrast, engineers and architects, for example, would be unlikely to gain employment without vacation work experience. In fact, some engineering courses included vacation work as a pre-requisite for graduation.

Getting the program off the ground

Consequently, when I was elected vice-president of the SA branch of the society in early 2006, I decided that it would be worth a try for the branch to take a lead role in organising a vacation program of some kind. After all, we've got members in many industries, government areas and universities, and most of them, I expect, would have some data sets which haven't been fully explored. However, in order to pilot the idea I didn't want to go too big to start off with. So, after initial discussions by the branch council, we decided on an approach which would help develop projects and facilitate the linking of students with projects, without taking a role of responsibility for the selection of applicants.

Once the design was sorted out, I got in touch with some of my personal contacts to investigate the opportunities for projects. Several indications of interest materialized into two projects. The biggest hurdle was the financial remuneration of students. My initial ideas, which were based on my MLA experience, were in the end substantially off the mark – the final amount was \$1500 (for 8 weeks).

We advertised the two projects, as well as the application process, directly to students by mid-October through lecturers at The University of Adelaide and the University of South Australia. The closing date for applications was set to 3 November (at the end of swot-vac) and students were called in for

an interview just after the examination period finished, for a potential start the following week. The participating organisations were flexible with respect to vacations that had already been booked by students. Two applicants were interviewed and both were offered one of the projects. Unfortunately, one student received a better vacation work offer and pulled out after initially accepting the offer.

Outcome and what we've learnt

Lu Li, a second year finance / statistics student, worked on a project to identify factors related to rheumatoid arthritis progression, jointly funded by the Early Arthritis Clinic (Royal Adelaide Hospital) providing the medical supervision, and SARDI Food Safety providing the statistical supervision. During the vacation work, Lu learned many important skills – statistical, project management, communication and presentation skills. In addition, she learned how important and time-consuming data cleaning can be; finalising a clean data set took about 50% of the project's allocated time. At the end of the project, Lu prepared a short project report and presented her results to researchers from the Early Arthritis Clinic. In addition, the SA branch invited Lu to present her experience with the vacation program at the 2007 AGM – her comments confirmed to me that this was a worthwhile endeavour.

While I think that the 2006/07 undergraduate vacation program was a success, there are of course things that I think we can do better. These include the following:

- Projects need to be identified and scoped much earlier. This will allow for earlier advertising of projects as well as better data cleaning prior to a student starting.
- Projects and associated data need to be ready when the student is ready to start. This will result in less time being wasted by continually having to clean data.
- Projects need to be advertised to students much earlier – before they make alternate vacation plans.

This will hopefully result in more applications.

- Students may need considerable encouragement in order to apply for a project – a question-and-answer session with students early in the application process may be useful for this. This will hopefully also result in more applications.
- Students should be required to submit weekly project reports to the branch representative. These reports should include what the student has done during the last week, what problems were encountered, and how the student is planning to address those problems. These reports will result in a record in the case of a conflict.
- Aim for projects to pay students more than \$1500 for 8 weeks. Greater remuneration will make statistical projects more attractive.

The advertising process has also highlighted that considerable support from lecturers is needed. They have direct contact with students and consequently are in an ideal position to push the value of such practical experience. Without their support, students are unlikely to be interested.

Also, from an organisation point of view, I now believe that a certain separation needs to be maintained between the program and projects. For the next iteration I am planning to be involved in overseeing the program, but I prefer not to be involved as a project supervisor – roles get muddled too easily.

Clearly, the idea of vacation work is by no means unique. Some of our universities have already invested resources in making similar programs happen. However, I think that our society, with its diverse membership, is in a unique and ideal position to take a leading role to develop and drive structured vacation programs aimed solely at statistics graduates. The potential benefits include:

- Statistical graduate students with real experience
- A better profile for the profession in general
- A linking between organisations and existing members which can lead to additional collaborative relationships
- A society which is seen as progressive and responsive to members needs

- A society which provides a real and tangible benefit to student members, which should ultimately help with member retention.

Where to from here?

This exercise in leadership, undertaken by the SA branch, has highlighted the effort required to bring together and coordinate all the players – students, lecturers, society members, organisations, potential funding bodies and possibly others. Some of the participants may not be experienced in dealing with each other, which can lead to a potential conflict in expectations. Since it is the society who initiates these collaborations, it is the society's role to be on top of potential conflicts so that they can be mitigated before getting out of control.

It is also important that we, as a council and as a society, recognise that the program aims to facilitate the process, but that we do not want to take direct responsibility for outcomes that should and are not controlled by us – all the fun without the responsibility. For example, I think it is reasonable for the society to help advertise the program, and maybe a councillor should even be part of the selection panel. However, the selection of a suitable candidate should ultimately rest with the funding organisation – they are putting up the money and they need to be comfortable with their choice. This, I hope, also reduces the amount of work required by council members.

The SA branch will be running the vacation program again this year – with some changes. We are trying to identify three to four projects for this year's vacation program much earlier – we are currently in the process of doing this. We are also planning to inform students about available projects much earlier – beginning of second semester – with the hope that more students will apply for the projects. In addition, I am aiming to visit some statistics classes to advertise the program personally, answer students' questions and encourage more students to apply.

I would be happy to discuss SA's experience with the program with any of the society's members. I am particularly interested if you have ideas of how to improve the program further or have a project for a student to work on during the 2007/08 summer period. You can contact me either via Kiermeier.Andreas@saugov.sa.gov.au or on (08) 8207 7884.

Society Secretaries

Central Council

President: Prof Kaye Basford
Secretary: Dr Doug Shaw
doug.shaw@csiro.au

Canberra

President: Ms Glenys Bishop
Secretary: Dr Ray Lindsay
ray.lindsay@netspeed.com.au

New South Wales

President: Ms Caro Badcock
Secretary: Dr Eric Beh
e.beh@uws.edu.au

Queensland

President: Ross Darnell
Secretary: Ms Helen Johnson
h.johnson@qut.edu.au

South Australian

President: Dr Andreas Keirmeier
Secretary: Dr Paul Sutcliffe
paul.sutcliffe@abs.gov.au

Victoria

President: Professor Mervyn Silvapulle
Secretary: Dr Ann Maharaj
ann.maharaj@buseco.monash.edu.au

Western Australian

President: Dr Brenton Clarke
Secretary: Ms Pamela McCaskie
pmccask@cyllene.uwa.edu.au

Section Chairs

Bayesian Statistics

Kerrie Mengersen
k.mengersen@qut.edu.au

Biological Sciences

Ari Verbyla
ari.verbyla@adelaide.edu.au

Environmental Statistics

Petra Kuhnert – petra.kuhnert@csiro.au

Industrial Statistics

Ross McVinish – r.mcvinish@qut.edu.au

Statistical Computing

Kuldeep Kumar
kkumar@bond.edu.au

Statistical Education (Co-Chairs)

Michael Martin
michael.martin@anu.edu.au
Peter Howley
peter.howley@newcastle.edu.au

Surveys and Management

Veronica Rodriguez
veronica.rodriguez@abare.gov.au

Young Statisticians

Janice Wooton
Janice.wooton@abs.gov.au

Social Sciences

Michele Haynes – m.haynes@uq.edu.au

Further contact details for
Society Secretaries and
Section Chairs can be obtained
by contacting the Society on
(02) 6249 8266

Three Doors with Borek Puza (Edition 10)

Welcome to the 10th edition of *Three Doors*. Last time I presented The Two Envelopes Puzzle and am now pleased to announce Terry Neeman as the latest winner of The Three Doors Prize, a cheque for \$60 as donated by the SSAI. We now present the solution, and the next puzzle follows.

The Two Envelopes Puzzle

Consider two envelopes such that one contains twice as much money as the other. The smaller amount in dollars was obtained by randomly drawing a number from the uniform distribution between 0 and 1000. You now randomly select an envelope and find \$100 in it. What is the probability that you have selected the smaller amount?

Solution to The Two Envelopes Puzzle

Let M be the minimum of the two amounts (in dollars), and let X be the amount in the selected envelope (with observed value $x=100$). Suppose the prior on M is *discrete uniform* with possible values $1/n, 2/n, 3/n, \dots, 1000n/n$, where n is a positive integer. Then by Bayes' rule the probability that you have selected the smaller amount is

$$\begin{aligned} P(M=x|X=x) &= P(M=x)P(X=x|M=x)/P(X=x) \\ &= P(M=x)P(X=x|M=x)/\{P(M=x)P(X=x|M=x)+P(M=x/2)P(X=x|M=x/2)\} \\ &= (1/(1000n))(1/2)/\{(1/(1000n))(1/2)+(1/(1000n))(1/2)\} = 1/2. \end{aligned}$$

Since this result does not depend on n , it would seem to also be true in the limit as n tends to infinity, which corresponds to the case in the puzzle where the prior on M is uniform from 0 to 1000. This suggests that the required probability is $p=1/2$.

However, it may be objected that the case of a *continuous* prior on M must be treated differently from the case of a *discrete* prior. To see this, observe that the two amounts are necessarily *rounded* values. Suppose that they were obtained by first drawing $R \sim U(0,1000)$ and then rounding *each* of R and $2R$ to the nearest multiple of some constant d which divides into 100 (e.g. $d=10, 1, 0.1$). Then $X=100$ implies either $A=\{100-d/2 < R < 100+d/2\}$ or $B=\{100-d/2 < 2R < 100+d/2\}=\{50-d/4 < R < 50+d/4\}$. Hence

$$\begin{aligned} p &= P(A|X=x) = P(A)P(X=x|A)/P(A)P(X=x|A)+P(B)P(X=x|B) \\ &= (d/1000)(1/2)/\{(d/1000)(1/2)+((d/2)/1000)(1/2)\} = 1/\{1+(1/2)\} \\ &= 2/3. \end{aligned}$$

However, it may be counter-objected that, with $d=1$ (say), the above logic allows for the other envelope to contain 50, 199, 200 or 201 dollars, in contradiction of the premise that one envelope contains twice as much money as the other. If we understand "twice" to mean "exactly twice", then it seems that R was first rounded to yield the smaller amount M , and then the larger amount was taken as *exactly* $2M$. But this logic leads us back to the discrete case and the solution $p=1/2$. Or does it?

In fact, there are an infinite number of possible solutions, since the nature of the rounding was not specified in the puzzle. For example, suppose that $R \sim U(0,1000)$ was rounded to the nearest unit if less than 100 and otherwise to the nearest multiple of 10, and then the result was doubled to yield the larger amount. Then $X=100$ implies either $A=\{M=100\}=\{99.5 < R < 105\}$ or $B=\{M=50\}=\{49.5 < R < 50.5\}$. So in this case,

$$\begin{aligned} p &= P(A|X=x) = P(A)P(X=x|A)/P(A)P(X=x|A)+P(B)P(X=x|B) \\ &= (5.5/1000)(1/2)/\{(5.5/1000)(1/2)+(1/1000)(1/2)\} = 11/13. \end{aligned}$$

Much has been written on this topic in the past, with some interesting twists along the way. For example, the logic we used to obtain $p=1/2$ was presented in Christensen and Utts (1992). But then it was pointed out in Blachman, Christensen and Utts (1996) (four years later!) that the 1992 paper "contains a serious error that was not noticed by the referees..." That error was to treat the case of a *continuous* prior on the smaller amount in the same way as the case of a *discrete* prior. Correcting this error led us to revise our solution of $1/2$ to $2/3$. But then we thought again and noted that $1/2$ might be the correct solution after all, *if* the two amounts are in the exact ratio 1:2 and *if* certain assumptions can be made about the rounding procedure.

The Largest Value Puzzle

If the largest value in a sample is removed, what happens to the sample variance?

For your chance to win a fabulous mystery prize, send your solution to newsletter@statsoc.org.au.

References

Blachman, N.M., Christensen, R. & Utts, J. (1996). Comment by Blachman, Christensen and Utts. *American Statistician*, 50, 98-99.

Christensen, R. & Utts, J. (1992). Bayesian resolution of the "exchange paradox". *American Statistician*, 46, 274-276.

Environmental Statistics Section

This newly formed section started its activities with a pub outing at Southbank in December last year, where a few Brisbane statisticians and ecologists got together for Christmas drinks. It was a great opportunity to meet others interested in environmental science and the statistics that goes along with it.

Our first formal get together for the year was on Thursday the 8th of March, where we held our first journal club meeting. This is where a member of the group discusses a paper of interest which

focuses on the environment and statistics in some respect.

I started off the journal club with a paper by Simon Ferrier and Antoine Guisan, which focussed on models for biodiversity at the community level. This 2006 Journal of Applied Ecology paper was quite topical for many of us working with multivariate response data.

We had a good turnout with twelve people (from The University of Queensland, Queensland University of Technology, Griffith University and

CSIRO) committing themselves to the morning discussion and continuing on through to lunch at a local Thai restaurant.

This journal club is set to continue with meetings held once a month at various locations around Brisbane. If anyone would like to be part of this club, feel free to contact me. Further updates of the meetings will be placed on the Statistical Society "Environmental Statistics Section" website. So stay tuned.

Petra Kubnert

NOTICE

The Annual General Meetings of The Statistical Society Of Australia Inc and The Australian Statistical Publishing Association Inc. will be held on Tuesday 31 July 2007 at 4.30 pm at the Australian National University, Canberra – room location will be posted to: <http://www.statsoc.org.au/WhatsNew/> by 30 June 2007.

SSAI Annual General Meeting – Agenda

1. Apologies and Proxies
Proxies must be given in writing as per form inserted in the June 2007 issue of SSAI Newsletter. Proxy forms must be received by the SSAI Executive Officer for passing to the Secretary no later than 24 hours before the time of the meeting.
2. Confirmation of the Minutes – Minutes of the meetings as circulated
3. Matters arising
4. Reports
 - 4.1 President
 - 4.2 Treasurer
 - 4.3 Branches
 - 4.4 Sections
5. Accreditation
 - 5.1 Report from Accreditation Committee
6. Conferences
 - 6.1 ASC 2008 (joint with NZSA)
7. Election of Section Chairs
Nominations for Section Chairs should be received at the SSAI office no later than 24 July 2007. Nomination Forms have been inserted in each copy of the June 2007 issue of SSAI Newsletter. All nominations require a seconder and a statement from the nominee that she or he is prepared to stand.
8. Appointment of signatories
9. Other business
10. Time and place of next meeting.

ASPAI Annual General Meeting – Agenda

1. Apologies and Proxies
Proxies must be given in writing as per form inserted with June 2007 issue of SSAI Newsletter. Proxy forms must be received by the SSAI Executive Officer for passing to the Secretary no later than 24 hours before the time of the meeting.
2. Confirmation of the minutes – Minutes of the meetings as circulated
3. Matters arising
4. Presentation of the Annual Report by the Editor of the Australian and New Zealand Journal of Statistics
5. Presentation of the Annual Report by the Newsletter Editors
6. Treasurer's Report
7. Appointment of signatories
8. Special Business
9. Other business
10. Time and place of next meeting.

APBG

Australian Pharmaceutical Biostatistics Group

Indirect Comparisons in Health Assessments Workshop

If the relationship between attendance and success is highly correlated, then March's workshop on Indirect Comparisons

could be considered a success. The workshop was attended by over 70 people from the pharmaceutical, government, health care and academic sectors. It included statisticians, health economists, health outcomes scientists and university lecturers. The topics ranged from a basic introduction of the concept of indirect comparisons and its applications to difficult issues like random effects models,

Bayesian approaches and the idea of double comparators. The lively discussions indicated the need for more development of these approaches and greater understanding to extensions of the topic, for example Mixed Treatment comparisons. Full details of the presentations can be found on the APBG website: www.apbg.org.au

Alan Brnabic

Obituary

Rupert Thomas Leslie 1916–2007

Rupert Thomas Leslie died in Glasgow, Scotland on Good Friday, April 6th 2007. He was ninety years of age, and had been in poor health for several months.

Rupert Leslie was born in Victoria on August 12th 1916, and received all of his education in Melbourne. He completed a BSc in Physics in 1938, and a BA in Mathematics in 1939, both at the University of Melbourne.

After a couple of years of teaching Physics in Melbourne (Melbourne Grammar) and Sydney (Cranbrook), he became in late 1941 an Assistant Research Officer in CSIR, initially in the Physics Section of the National Standards Laboratory in Sydney. His starting salary was £366 per annum. He held this position until 1944, then transferred to the Section of Mathematical Statistics. In 1945 and 1946 he was with the Mathematical Statistics Section located at the Division of Plant Industry and Economic Entomology in Canberra, where he worked with George McIntyre. In 1946 he returned to Melbourne, working as a Research Officer in the Mathematical Statistics Section at the Division of Forest Products with, amongst others, Evan Williams.

In 1950, he joined the faculty of Melbourne University, and, while there, was awarded an MA in 1951 for a thesis on “Mercerian Theorems”, and a PhD in 1958 for a thesis on “Statistical Treatment of Observer Effects in Scientific Experiments”.

One of Rupert’s stories was of being left alone with Fisher when the great man visited Melbourne University, and having to start a conversation. As Rupert told it, the interaction went something like this:

Leslie (*brightly*): I believe you knew Hardy, Professor Fisher?

Fisher (*huffily*): Yes. Wrote a book called “A Mathematician’s Apology”.

Don’t recall anyone calling for an apology!

End of conversation.

Rupert did spend a year at Cambridge in 1954, during which Fisher was his nominal supervisor. However, because of the nature of Rupert’s PhD research, he worked with Richard Gregory in the psychology school.



Rupert Leslie (centre) in 1968, with Doug Shaw (left) and David Culpin.

In 1960, Rupert re-joined the, by now re-named, Division of Mathematical Statistics in Sydney, becoming the Officer in Charge of the Sydney group. He consulted extensively with researchers in the Divisions making up the National Measurement Laboratory, and he was highly regarded within the Laboratory for his skill in producing practical solutions to statistical problems. He was also well aware of the human interaction aspects of consulting. Young statisticians in his group who were about to go and meet a researcher to discuss the researcher’s statistical problems would get a briefing from Rupert. This wouldn’t be about how to solve the statistical problem; it would be about the researcher’s interests (scientific and otherwise), his idiosyncrasies, his relationships with others in the laboratory, and so on – necessary background in establishing a relationship!

Rupert spent part of 1968 and 1969 on leave at the University of Kentucky, then in 1970 accepted a Chair at Strathclyde University in Glasgow. His decision to move to Glasgow may have been influenced by his two older children commencing musical careers in Europe at about that time. There was also some suggestion that his move from Australia was influenced by strong disenchantment with the Australian Government of the day.

Rupert continued to teach at Strathclyde until 1981; on his retirement he was awarded an Emeritus Professorship. However, teaching was in his blood, and he taught Applied Mathematics to final year students at a Glasgow Grammar School until 1994.

Rupert was a strong supporter of the Statistical Society in the 1960s. He was the first President of the NSW Branch in 1963 and 1964, after the formation of the Australian Society. He also put a great deal of effort and organisational ability into NSW Branch symposia. Lunchtime visitors to the Division’s office in Alpha House, Newtown would sometimes find Rupert and other staff members walking round and round the table tennis table, collating roneoed pages of symposium papers.

Rupert Leslie was an excellent applied statistician, and an active proponent of the discipline and the profession. He was also a superb mentor to a number of young statisticians who began their careers in the Division in Sydney in the 1960s.

Bobbie, Rupert’s wife since 1941, died in September, 2006. He is survived by his daughter Elizabeth (living in Glasgow), sons Michael (Munich) and Julian (now at Macquarie University in Sydney), and three grandchildren.

Biometrics by the Beach

The International Biometric Society Australasian Region (IBS AR) will hold its next biennial conference from Sunday 2 December to Thursday 6 December 2007 at the Novotel Pacific Bay Resort in Coffs Harbour, NSW.

With Biometrics “safeguarding our future: our health and our air, land and water” as its general theme, the program will feature invited speakers Jim Zidek (University of British Columbia, Canada), Peter Diggle (Lancaster University, UK) and Johns Hopkins University, USA), Nick Horton (Smith College, USA), Allan Donner (University of Western Ontario, Canada), Kerrie Mengersen (Queensland University of Technology), Russell Millar (University of Auckland), Ross Sparks (CSIRO Mathematical and Information Sciences) and Ari Verbyla (CSIRO Mathematical and Information Sciences and The University of Adelaide). Contributed papers or posters related to the conference theme or on other biometrical topics are welcome, with abstracts due by 3 August 2007.

On Sunday 2 December, the program will feature two or three short courses, preceding the conference welcome

reception that evening. One of the courses is on model-based geostatistics, presented by Peter Diggle and based on the recently published book by Diggle and Ribeiro. Full details of all courses will be included on the conference website as soon as they are finalised.

The conference centre at the resort is recognised as one of the most attractive and workable venues in Australia while the resort offers 4.5-star accommodation and facilities set amongst expansive landscaped gardens on Charlesworth Bay, with the beach just a short stroll from the conference centre. To make the most of the wonderful location, the program includes a break on Tuesday afternoon when delegates can take advantage of organised activities including a guided walk in Dorrigo National Park, a kayaking adventure or a visit to a local winery.

Please check the conference website www.biometrics.org.au/conf for further information on registration, the program, courses, the venue, accommodation and travel to Coffs Harbour. We look forward to seeing you there!

Melissa Dobbie

Member News

Foreman Prize

Janice Wooton is the eleventh recipient of the Ken Foreman award which was instituted in commemoration of the contribution made by Mr Ken Foreman to the Australian Bureau of Statistics over many years. Janice’s award is in recognition of her major contribution to improving the methodology for census tabular confidentiality, as well as her contribution to a range of projects on business surveys and microdata access. The award committee also noted the role she has played in the young statisticians section of the Statistical Society of Australia and her involvement in organising the 2007 Young Statisticians Conference.

The purpose of the award is to provide professional development opportunities in the form of overseas travel to a conference or short course. The award is open to Methodology Division staff within the ABS who would not normally have the opportunity to undertake a professional overseas trip. Applicants are assessed on their technical ability, their contribution to methodological work in the ABS, their contribution to raising the profile of the ABS as a professional organisation; and their potential for further development, particularly their potential to benefit from the proposed trip to be undertaken.

Ken Foreman was the founder of what is now the Methodology Division in the ABS. He joined the ABS in 1951 and retired in 1984. He is referred as “the father of statistical methods in the ABS” (Bill McLennan, 1996). He pioneered ABS work on sample design and estimation, development of statistical infrastructure, quality improvement and total survey design, time series analysis, econometric modelling and data analysis. He introduced area sampling for household surveys, generalised statistical processing systems, seasonal adjustment, the survey sampling training courses, and many other achievements which underpin much of the current ABS methodological environment.

A ceremony was held recently at ABS House in Canberra when Susan Linacre, Deputy Australian Statistician presented the award to Janice.

Looking for a job?

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

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

Do you have a job to advertise on the website?

Email a position description to mrobinson@wehi.edu.au. Listing is free!

This service is proudly brought to you by:



CensusAtSchool International Workshop

Report to the SSAI by John McKinlay

As many will know, Australia is currently facing a severe shortage of mathematical modellers and statisticians that will increasingly inhibit business, industry and government agencies alike. This was recently highlighted by an open letter to the Prime Minister signed by 113 international and 396 local academics urging action be taken on recommendations contained in the recent *National Strategic Review of Mathematical Sciences Research In Australia*.

It was against this backdrop that I had the pleasure of attending a recent international workshop on the CensusAtSchools program. Operating in several different countries, CensusAtSchools (C@S) is an initiative aimed to promote and encourage statistical literacy among primary and secondary students. Combining real data about students with stimulating teaching material, the program has the longer-term potential to increase interest and participation of tertiary students in the mathematical and statistical streams.

The workshop was held in Melbourne from March 26 to 29 and was sponsored by the Australian Bureau of Statistics and the SSAI. Brian Pink, the Australian Statistician, opened the conference and guest presenters included Professor Neville Davies (UK Royal Statistical Society), Dr Juana Sanchez (Director of the International Statistical Literacy Project, UCLA, USA), Professor Chris Wild (University of Auckland, NZ) and former Australian Statistician Dennis Trewin. Other participants came from national statistical organisations,

academia, education departments and statistical societies in France, Singapore, Canada and Australia.

The C@S program has a noble and simple objective: increase statistical literacy among schoolchildren and this will have positive, consequent flow-on effects for an adult population. Anticipated long-term outcomes include a general population who can think critically about statistics and a student population less reserved about undertaking further studies in statistics-related areas. The program has proved to be a successful strategy for introducing into school curriculum real data of interest to students. A feature of this approach is that statistical concepts and practices are being introduced and taught in a wide range of syllabus, not simply traditional mathematical areas, since data that are collected may be relevant to a range of subject areas. Workshop participants were keen to see this program expand to become a truly international project from which students could access data about themselves and their fellow students from across the world.

The aims of the workshop were to bring together countries currently operating C@S programs to establish a plan for each project to have an agreed set of internationally comparable data. With each country currently having its own unique set of questions, circumstances and imperatives, this turned out to be a tricky, but not impossible, undertaking. The meeting was successful in initiating the development of a common set of international questions and policies that might have to be

implemented for unifying international databases and output. Ideas about how the global project might be managed and evaluated were also discussed, as were the mechanisms that might be developed for implementing an international network for students. Significant progress was made towards achieving these aims and an action plan to further the work was established.

All delegates rated the workshop as valuable, stimulating and productive in progressing the goal of a truly international C@S project. The main outcome was the establishment of an international committee to oversee further growth in the C@S project in the international arena, with some initial work done on developing common questions and a single entry point for the project. Countries that do not currently run a C@S project will be offered assistance in setting up the program. A second international meeting has been scheduled for March 2008 in Los Angeles.

From a personal perspective, I was impressed by the enthusiasm and dedication of all participants, but particularly the delegates involved with teaching children in schools. Most of us who have been involved in teaching recognise that the difference between an enthusiastic student and an indifferent one is their exposure to quality teachers, people who not only teach but inspire. I left the workshop inspired, heartened that not all is lost in lower education with input from such dedicated and enthusiastic individuals. Now, does anyone have any ideas about how we can fix our universities.



Delegates from the CensusAtSchool International Workshop.

Branch Reports

NEW SOUTH WALES

March 21 saw us hold our first meeting in access grid rooms linking UTS and University of Wollongong. I would like to offer a vote of thanks to the people who provided us with technical support: Tony Maher and Corley Kinnane from UTS and the corresponding person at UoW (apologies for not remembering the name).

There could be no more auspicious occasion to test out the technology than for our AGM and Lancaster lecture. Although the technology was working pretty well (UTS had trouble understanding people talking at UoW but that wasn't too much of a problem as our guest speaker, Chris Heyde, was speaking at the UTS venue) the link decided to disappear while we were all enjoying pre-meeting refreshments! Technical support worked under extreme pressure, with us all looking over their shoulders to reconnect us. In addition to the technology challenges the seating arrangement at UTS was also interesting. Those who joined us had the opportunity of sitting in chairs along the back wall, chairs around the desks, a 3-seater lounge brought in to provide extra seating or the floor (lucky it was carpeted)! It was great to see so many people that all these seating options were required and I think added to the novelty of the event. Not unexpectedly our speaker handled all these challenges with aplomb and provided us with an entertaining presentation focusing mainly on climate change. Another pleasing outcome of this night was the number of young statisticians who joined us and subsequently joined the speaker for dinner. A very interesting evening all round!

Due to Easter and ANZAC Day the NSW Branch decided not to hold an April meeting but has still been working very hard on the program of events for 2007. I would like to remind everyone to check the website for the updated program. Our June speaker will be Adrian Baddeley with the venue probably being CSIRO or Macquarie University, both at North Ryde. Details of Adrian's talk will have been finalized while this article was going to press.

At this stage we are looking to have three events in July. On July 17-18 Kerrie Mengersen will be running her Bayesian workshop. July 25 will see us holding an inaugural afternoon workshop aimed at secondary school mathematics teachers and university lecturers interested in the teaching

of statistics with the aim to discuss how to increase statistical thinking in secondary schools. Finally, Anthony Davison, Professor of Statistics at Ecole Polytechnique Federale de Lausanne, Switzerland will be visiting Sydney towards the end of July and has agreed to do a joint presentation for UNSW and SSAI. His areas of interest include statistics of extremes, likelihood asymptotics, bootstrap and other resampling methods and statistical modeling so I am sure any topic he chooses to present on will provide us with much food for thought.

I am looking forward to seeing our members and visitors at one or more of these events. Feel free to come up and introduce yourself to me or one of the other Council members – we would love to meet you.

Caro Badcock
President NSW Branch

WESTERN AUSTRALIA

The seminar on April 17th was presented by Alex Stuckey. Alex is currently on leave from the ABS and is studying towards a PhD at UWA. Alex's talk, entitled "Single-index models for panel and spatial data", was based on his PhD studies to date.

Alex gave background information on the structure of panel and spatial data and also on semiparametric models, in particular the single-index model. The single-index model reduces the dimensionality of a nonparametric modelling problem by creating an index that is a linear combination of the explanatory variables. One then uses nonparametric techniques to model the response as a function of the index. Such methods are popular in the time-series and regression settings. Alex and his supervisors wish to extend these methods to panel and spatial data.

The methods were illustrated using simulated spatial data and an economic panel dataset. Potential applications in the field of climatology were also discussed.

The theme for the May branch meeting was "An Evening with Young Statisticians". Those attending were treated to a very interesting presentation by Tony Traylen, a recent graduate now working at the CSIRO. Tony was awarded the SSAI WA branch honours scholarship last year. Tony's talk, *Estimating spectral baselines in hyperspectral images*, first gave background on hyperspectral imaging and then focused on the problem of removing systematic noise from these images.

Hyperspectral images combine spatial and spectral information to record mixtures of different pure materials across an image. For each pixel in the image, the reflectance at many different wavelengths is measured, producing a spectrum at p wavelengths (p -spectrum). The goal of identifying pure materials and mapping their abundances across an image can be realised using the *Iterated Constrained Endmembers (ICE)* algorithm. The ICE algorithm fits a convex mixing model by minimising a goodness of fit measure with a penalty related to the distance between end-members (pure components).

Such imaging has applications in fields such as biology, environmental science, geology, industry and pharmacology. A biological example was given in which the ICE algorithm can be used to identify anomalies (for example, cancerous cells) in a tissue sample.

A problem often encountered when using the ICE algorithm is that of systematic noise. This can be introduced to the spectral data via physical causes such as changing sunlight or modeling causes such as nonlinearity in the mixing of end-members. To remove such systematic noise, Tony presented an extension to the ICE algorithm that includes the simultaneous modeling of spectral baselines. These baselines can capture the systematic noise and allow it to be removed from the hyperspectral image. Tony proposed a method for reducing the dimensionality of this augmented problem to allow model fitting.

Tony's talk was very well received and promoted some good discussion with the audience members. The audience then retired with the speaker to a local restaurant for a Vietnamese banquet.

Marty Firth

SOUTH AUSTRALIA

Analysing administrative by product data – is it worth the effort?

Following the Annual General Meeting in March, the outgoing President of the SA Branch, Margaret Swincer, gave a talk about her experiences working with administrative by product data. Sources of this type of data are varied and include taxation, unemployment, pensions, health systems and compensation. The data are collected to monitor and manage processes and to comply with legislation.

Working with administrative by product data is a challenge for the statistician. Typically the data are contained in multiple databases coming from different sources, so there is a need to first understand the complex data structure. The issue of changing technology is a problem, as data are often collected over time. The integrity of the data is often questionable and data cleaning is a major task. Due to the size of the data sets, statistical programming is required in a language which can handle millions of records, such as SAS, in order to extract the relevant data. Statisticians working with this type of data may have to deal with professional isolation and a lack of recognition of the need for professional development. However this is particularly important for statisticians in this field, as there is currently a lack of appropriate statistical methodology for dealing with this type of data. Data linkage has a major role to play, although there is the question of whether all data sources actually go together.

The talk concluded with a lively discussion about how statisticians can get across the importance of complex results to the relevant people, and to make them understand that statistics is more than just cross tabulations.

Lisa Yelland

CANBERRA

Statistics at the Department of Employment and Workplace Relations (DEWR).

The recent recruitment drive for statisticians and other quantitative analysts to the Department of Employment and Workplace Relations (DEWR) has brought a higher level of statistical thinking in the evaluation of back-to-work programs and other employment and education initiatives. Sepi Helali, senior statistician at DEWR, was our 1 May featured speaker. She discussed some of the current statistical work as well as some work planned for the future.

Statisticians at DEWR are mostly employed in the research and evaluation group. This group is responsible for the evaluation of government programs and government supported agencies who work to achieve greater workforce participation. There are programs tailored to a wide range of demographic groups: from young people just entering the workforce, to persons with disabilities, persons on long-term income support and mature age job-seekers. DEWR

“clients” are the program participants. Much of the statisticians’ work focuses upon evaluating the efficacy of these programs in achieving job placement for their clients.

One of the key tools at DEWR is a Star rating system which is used to compare the effectiveness of government-supported agencies in finding employment for their clients. They use logistic regression to model the expected probability of a client obtaining employment conditional on client characteristics, local area job availability and other social indices. These expected outcomes are compared with actual outcomes, and agencies are awarded stars from one to five (five being the best) based upon their ranking relative to their expected outcomes. Future funding of agencies may depend upon these ratings.

But it’s not only about the numbers. Sepi emphasised that qualitative research plays an important role in the evaluation process. Sometimes the numbers alone do not make sense, and direct client contact is needed to put a human face on the data. Sepi has done a good share of this qualitative research, traveling around Australia to interview clients and the agencies who serve them. This research, or “case studies” as she called them, is an important supplement to the data which have also enhanced her understanding of the data she analyses.

DEWR also aims to evaluate the net impact of back-to-work government initiatives by comparing employment placement of persons participating in these programs with employment placement in matched cohorts. Subject to the limitations of cohort studies, the results of these analyses indicate that the programs Customised Assistance, Job Search Training, Work for the Dole and Mutual Obligation have had a net positive impact on their clients gaining employment.

Another recent initiative DEWR has undertaken is a five-year longitudinal pathways survey to track cohorts of people on income support (including recipients who leave income support) and their job experiences over time. Data will be collected at six monthly intervals.

Sepi emphasised that DEWR is a great place for statisticians to work. The available data are rich and varied. DEWR statisticians have access to administrative data, survey data and program evaluation data. Moreover, there are many opportunities to apply statistical techniques in modelling data, designing and

analysing surveys, as well as opportunities to delve into qualitative research.

The evening concluded with a few bottles of wine, good conversation and a Turkish banquet for 15 people at a local restaurant.

Terry Neeman

Talk by Matt Wand

At the monthly meeting of the Canberra Branch of the Statistical Society on Tuesday 20 February 2007 Professor Matt Wand of the University of Wollongong (and recently of the University of New South Wales) gave a talk titled “Semiparametric regression and the computer science interface”. The presentation was followed by a free barbeque dinner to welcome new members of the Statistical Society.

Matt began his talk by summarising the field of semiparametric regression, with an illustration involving longitudinal data on the spinal bone mineral densities of individuals within certain racial groups. Referring to his book “Semiparametric Regression” (co-authored with D. Ruppert and R. J. Carroll), he discussed the generalised linear mixed model, its ability to readily incorporate longitudinal and spatial effects, and its ease of implementation in SAS, R, S-Plus and WinBUGS. Matt then related various facets of statistics with their counterparts in computer science (e.g. missing data methods with belief networks). This led on to a discussion of data mining, which he has been teaching - with an emphasis on business applications - for a number of years as part of the UNSW Master of Statistics course.

Data mining is concerned with the opportunistic discovery of previously unknown information from the data in data warehouses, with a focus on interpretation and support for decisions. There is much opportunity within data mining to apply statistical methods, in particular semiparametric regression. In turn there are many opportunities for computer science in semiparametric regression, for example in relation to the classification problem, wherein training data are used to guide the classification of future objects into two or more classes based on observed predictors.

A case in point is the problem of spam, namely: How do we teach our computers to figure out which e-mail is spam and which is legitimate? To answer this question, Matt referred to a recent study of his where he examined a large number of candidate predictors, for example the frequency of

certain characters and sequences of letters. The aim of this study was to come up with a classificatory mechanism which has all of the following: parsimony, interpretability, speed, and, of course, accuracy in classification. Such a mechanism can be provided by Laplace approximations of solutions to suitable logistic models with both linear terms and spline terms.

One of these models is called the KOW Algorithm (after Kauermann, Ormerod and Wand). This model determines the 'best' linear and non-linear components via Rao statistics and cyclically adds them into the model according to the marginal Akaike Information Criterion (mAIC), until the mAIC fails to decrease substantially. Matt illustrated the KOW algorithm by applying it to some contraceptive method choice data and then to some spam data. In both cases the algorithm quickly came up with a useful and parsimonious model. He then compared the algorithm with some other methods using simulated datasets and discussed a number of variants.

Borek Puza

VICTORIA

SSA VIC Listserver

A list of members of the Victorian Branch of SSAI has been created on a server at Monash University. Members can now post messages which will be received by all on the list. If you need to advertise an event relevant to the society's interests, such as a seminar, workshop or job vacancy, you are welcome to post to the list. The list address is:

SSA VIC-L@BusEco.monash.edu.au.

If you are not a member and wish to add your name to the list or if you are on the list and wish to have your name removed from it, email:

ann.maharaj@buseco.monash.edu.au.

Ann Maharaj

Annual General Meeting

The March meeting of the Victorian Branch was held at the Swinburne University of Technology on March 26 and was attended by about 30 people. It commenced with the Annual General Meeting. The outgoing President, Brian Phillips, gave a summary of the activities in 2006. These included seven monthly meetings held at a number of different locations (Swinburne, Monash and Melbourne Universities) plus a very successful workshop on Bayesian methods, given by

Professor Kerrie Mengersen. Among the highlights were the Belz lecture, presented by Professor Rob Hyndman, and a talk by Professor Clive Granger, 2003 Nobel Prize Laureate in Economics. The Branch also partially supported three Victorian young statisticians to attend the Young Statisticians conference in Canberra in April 2007. Brian thanked the Council for a very successful year, especially the efforts of Ann Maharaj as Secretary and Geoff Laslett as Treasurer.

All the activities of the branch are listed on the Branch website, which is regularly updated. See <http://www.statsoc.org.au/Branches/VIC/>. After noting that the Branch was in a healthy financial state, the Treasurer pointed out that 2006 was the first time in many years that the Branch had not financially supported any 'Statistical Events' (the 'About' page of the Branch website gives examples of events supported in the past). He implored members to put cases of worthy events (those that enhance the profile of statistics in the community, business, industry or academia) to the Branch Council for consideration.

The 2007 Branch Council was elected. It consists of:

President: Mervyn Silvapulle

Past President: Brian Phillips

Acting Secretary: Ann Maharaj

Treasurer and SSAI Newsletter Correspondent: Geoff Laslett

Council Members: Muhammad Akram, Lucy Busija, Kym Butler, Kris Jamsen, Kay Lipson, Debra Partington

The President thanked outgoing Branch Councillors Tristan Barnett, Ian Clark and Derchich Hung for excellent service over the last few years.

SSAI Service Award

After the Annual General Meeting, Geoff Bruton was presented with an SSAI Service Award by Geoff Laslett. Geoff Bruton joined the Society in 1970, and had two stints as a Victorian Branch Councillor, completing 11 years in total. He was Branch Secretary from 1995 to 1999, and Central Council Secretary from 2000 to 2002. Geoff has now semi-retired to Gallery 141 in Red Hill, well worth a visit if you are touring the Mornington Peninsula. He still teaches statistics part-time, partly to support his hungry (and, hopefully, grateful) herd of very cute alpacas!



*Geoff Laslett and Geoff Bruton (right)
Photo: Brian Phillips*

Developing probabilistic statistical thinking

The speaker after the Annual General Meeting and Service Award presentation was Professor Helen MacGillivray of the Queensland University of Technology. Helen currently holds a Senior Carrick Fellowship on the theme "The teaching and assessment of statistical thinking within and across disciplines".



*Professor Helen MacGillivray
Photo: Brian Phillips*

Helen's talk was titled "Developing probabilistic statistical thinking". Her slides had the sub-title "Using Data, Student Experiences and Collaboration in Developing Probabilistic Reasoning at The Introductory Tertiary Level."

Helen drew on her extensive experience to explain how the focus of probabilistic understanding has been mostly on its role in data analysis and inferential reasoning. She explained how, in recent years, statistical education has been data-driven, stating that the holistic "reform movement" has been influencing courses for "service", mathematics/statistics majors and schools. She said that it is time to apply those principles to probabilistic literacy and reasoning.

She described two introductory student contexts in which she teaches:

(a) Introductory data analysis courses, which are compulsory “service courses” in science, engineering and mathematics, as well as elective for others. Here “purposeful probability” (that is, only what is needed) is included.

(b) Introductory probability and distributional modelling, which are compulsory in all mathematics/statistics majors, where more extensive probability is taught.

She said that both types of courses emphasize doing and communicating and her classes are zone free of dice, coins, cards and balls in boxes. Her approach is to use purposeful and minimalist probability in introductory data analysis. This involves using examples from “field” research, introducing p-values through Chi-squared tests after a study of Exploratory Data Analysis, but before introducing any complications of sampling distributions. She claimed that interpreting “smallness” of chance is the big conceptual step. For confidence intervals she argues that the biggest hurdle is not probabilistic – rather it is understanding that the interval is for estimating a parameter, not for “most of” the individual values.

Helen gave examples from exercises and projects used in her courses. She emphasised the use of group project work and has continually modified her course over the years. Conditional probability and Markov chains are important concepts in her courses and she gave many examples her students used in their projects. These involved collecting data and investigating assumptions in situations chosen by the students. Examples included: the AFL grand final, queuing at Medicare, pedestrian traffic in a mall and occurrences of “Harry” in *Harry Potter and the Goblet of Fire*.

Helen presented some quantitative data illustrating the success of her methods. Since the introduction of group projects in 1999, there had been increased engagement. When data-based class activities and preliminaries were introduced in 2003, there had been a further increase in engagement and student approval. And there was a real buzz and high student approval after the 2006 tutorial group exercises were used. She claimed that the course has been the best predictor of performance in later courses. She gave a reason for the success of her programs: the students have gained generic skills, learning how to unpack the known, to analyse, extend and synthesize, to tackle real problems, to link with data, to carry out real investigations and

processes, and to consolidate and synthesize fundamental mathematical skills.

Following the talk there was a healthy discussion both formally in the lecture room, then less formally at a nearby restaurant.

Brian Phillips

QUEENSLAND

April Meeting

The AGM of the Queensland Branch of the Statistical Society of Australia was held on 3 April Gardens Point Campus, Queensland University of Technology.

Following on at the ordinary meeting, Professor Annette Dobson spoke on ‘Missing Data in Longitudinal Studies: experience from the Australian Longitudinal Study on Women’s Health’. The meeting was well attended and over 20 people were in attendance. Annette described how missing data can be a problem in large scale population surveys. Ignoring missing data by using a complete case analysis can produce biased results. Biases occur then participants providing complete data are systematically different from those with missing data. Longitudinal studies are especially susceptible to such bias as missing data accumulate over time due to item non-response, wave non-response and participant drop-out.

There is a growing body of literature and software for dealing with missing data, including weighted estimated equations, multiple imputation, likelihood-based methods and fully Bayesian models. While multiple imputation procedures are now becoming widely available and practical (especially using chained regression methods), there is much less work on the adaptation of these methods for longitudinal data.

In the Australian Longitudinal Study on Women’s health a particular problem is women’s reluctance to report their weight; yet weight is an important risk factor for chronic conditions. This talk illustrated the use of several methods, including fully Bayesian models, for handling missing data in a longitudinal analysis of the effects of weight and weight gain on the incidence of diabetes.

Miranda Mortlock

May Meeting in Toowoomba

On 8th May, the Queensland Branch of the Statistical Society met at the University of Southern Queensland (USQ), Toowoomba. A strong contingent from USQ and the

Queensland Department of Primary Industries and Fisheries (DPI&F) at Toowoomba joined with Brisbane-based statisticians for an enjoyable and stimulating evening. The evening began with guest speaker Dr Toshio Ohnishi speaking on ‘Estimating a common slope (of multiple strata) in the Tweedie generalized linear model using a conjugate prior’.

Dr Ohnishi is an assistant professor with the Institute of Statistical Mathematics, a Japanese governmental institute in Tokyo. He is also an assistant professor of the Graduate School for Advanced Studies (SOKENDAI), Kanagawa, Japan. He is now visiting the University of Southern Queensland until July under the sponsorship of SOKENDAI.

In his talk, Dr Ohnishi discussed the Bayesian analysis of the generalized linear model based on the Tweedie distribution. Tweedie distributions are a family of distributions in the exponential family with variance proportional to some power of the mean. (For example, gamma distributions have variance proportional to the square of the mean.) In particular, he focused on a special subset of the Tweedie distributions which are continuous on the positive real axis, plus a point mass at zero.

Dr Ohnishi considered the multiple strata problem, which has stratum-dependent intercepts and a common slope. Assuming a prior density on the intercept only, a density in the location family of distributions is proved to be conjugate for the model of interest when used with a logarithm link function (the most common choice for these models). He discussed the conjugate analysis for the intercepts and derived the optimal estimator. He also obtained the optimal estimating function of the slope under a criterion based on that of Godamba and Kale (1991) extended to the Bayesian framework.

Finally, he revealed an interesting relation between the optimal estimator and the optimal estimating function.

As the evening progressed, appetites were (eventually) whetted and conversation stimulated by a late evening at a local restaurant.

While in Australia, Dr Ohnishi plans to eat a lot of steak, improve his tennis skills, and work with colleagues in Toowoomba at USQ and Department of Primary Industries and Fisheries to apply the methodology espoused in his interesting talk.

Peter Dunn

University of Southern Queensland