



The Statistical Society of Australia News



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PRESIDENT'S COLUMN

As we enter the half-way mark of 2012 and our 50th year of SSAI, I would like to update you on some of our current and planned activities aligned with the following five strategic issues.

1. Promote our Profession. We are very close to 'Celebrating 50 Years of the Society' at ASC 2012, to be held in Adelaide in July. I look forward to seeing you there! Information about keynote speakers, registration etc is available at the conference website via the SSAI homepage (<http://www.statsoc.org.au>) or go to <http://www.sapmea.asn.au/conventions/asc2012/index.html>.

Our Young Statisticians Section is doing a great job planning for the YSC 2013, which will be held in February in Melbourne. This will be one of many activities that the Society will be undertaking as part of the "International Year of Statistics".

2. Review and revise the SSAI Strategic Plan and Financial Plan. The working party charged with reviewing the SSAI Strategic Plan has been meeting regularly and has made good progress to date. Now we need your input. Please see the Strategic Plan Issues article in this Newsletter and send your comments to our Executive Officer, Marie-Louise (eo@statsoc.org.au). You will find a copy of the current Strategic Plan on the SSAI website (<http://www.statsoc.org.au/about-ssai.htm>). We hope to have a draft revised Plan for dissemination and comment at ASC2012, with a view to finalising the Plan by the end of the year. We will also be progressing an SSAI Financial Plan and Branch Strategic Plans in the second half of 2012.

3. Support and promote the Society's groups. Our newly appointed Assistant Chairs for each Section and our new Media Officer have been working hard, with initial activities including updating of the Society's webpages, and communication with members. Remember that the input of all members is warmly welcomed in Section and Society activities: if you have any information that you think would be of interest, or if you have some good ideas about engagement with Sections or the Society's members in general, please contact the SSAI Office (eo@statsoc.org.au).

4. Expand and consolidate linkages between SSAI and other professional societies within Australia and internationally. As described in the last newsletter, SSAI is planning to engage in two major international events in 2013: the International Year of Statistics, and Mathematics of Planet Earth 2013. IYStat is being organised by the International Statistical Institute (ISI) as a global partnership of societies and organisations to promote the importance of statistics; see <http://isi-web.org/news/2013-international-year-of-statistics-iyestat> for further details. MPE2013 is an initiative launched by the North American Mathematical Sciences Institutes; see <http://www.mpe2013.org> for further details. In collaboration

> continued on page 3



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Advertising will be carried in the
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the Editors feel are of interest to the
members of the Society.

For details of advertising rates, etc.
contact the SSAI Executive Officer at
eo@statsoc.org.au

**DEADLINE FOR NEXT NEWSLETTER
10 August 2012**

EDITORIAL

The Editors of the newsletter are pleased to be able to present a paper copy of this issue to all Australian Statistical Conference delegates. The newsletter is a quarterly online publication that documents activities of the Society's Branches, Sections and individual members. It also carries contributed items of broad interest to Society members.

Wikipedia will tell you that a conference is "a meeting of people who confer about a topic". In academia, this is typically "a formal event where researchers present results, workshops, and other activities".

The biennial Australian Statistical Conference cycle began in 1971 (once every two years; I don't think the organisers would thank us for proposing bi-annual conferences, every six months!). The Editors thank Doug Shaw for producing the table below, listing all the events and locations. It is perhaps a shame that the term conference was chosen rather than symposium: the history of a symposium goes right back to the drinking parties of Socrates and Plato, and may have led to a completely different focus for the activities during such a gathering! Nonetheless the conference as a way of sharing ideas and information has been a feature of learned society life for many years.

Take a moment to think about the Statistical Society conferences you have attended. How good was the food? How comfortable were the chairs? How inspiring were the keynote speakers? How long did the conference satchel last? If you have no store of memories such as these, make 2012 the year to begin your collection! The organising committee look forward to seeing you in Adelaide in July and the Editors look forward to reporting on a great event in the next issue.

**Alice Richardson and
Michael Adena**



SSAI CONFERENCES

CONFERENCE	YEAR	VENUE	COMMENTS
1st	1971	Sydney	
2nd	1973	Perth	
3rd	1976	Melbourne	
4th	1978	Canberra	
5th	1980	Sydney	
6th	1982	Melbourne	
7th	1984	Brisbane	
8th	1986	Adelaide	
9th	1988	Canberra	Part of National Maths Sciences Conference
10th	1990	Sydney	Also 2nd Pacific Statistical Conference
11th	1992	Perth	
12th	1994	Melbourne	
13th	1996	Sydney	Sydney International Statistical Congress (SISC 96)
14th	1998	Gold Coast, Qld	
15th	2000	Adelaide	
16th	2002	Canberra	
17th	2004	Cairns, Qld	Joint with IBC
18th	2006	Auckland, NZ	Joint with NZSA
19th	2008	Melbourne	
20th	2010	Perth	Held in December
21st	2012	Adelaide	

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Young Statisticians' Network

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

with AMSI, our colleague Societies, universities, CSIRO and business and government sectors, we are developing a comprehensive programme of research activities, courses, theme days, seminars and so on. If you have any ideas, or if you know of events that could be included in the programme in 2013, please let us know via the SSAI Office.

5. Review and revise what we deliver as a Society to our members and how members engage with the Society. We have initiated our webinar series and have a spectacular programme of national and international speakers on 'big picture topics' of wide interest to our members. We hope that you can join us, and we would appreciate your feedback on these events.

Finally, we have been successful in nominating a statistician, Professor Christian Robert, for the annual AMSI Lecture Tour for 2012. Professor Robert, a computational Bayesian statistician from the Université Paris Dauphine, will be an invited speaker at ASC2012 and will then visit a number of Branches, universities and other organisations during July and August. If you would like any further information about Professor Robert's schedule, please contact the SSAI Office.

Kerrie Mengersen
(SSAI President)

SSAI CENTRAL COUNCIL

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Western Australia

President: Berwyn Turlach
Secretary: Ryan Admiraal
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EVENTS

SURVEY MICHIGAN

at the 65th annual Summer Institute
in Survey Research Techniques
4 June-27 July 2012

INTERNATIONAL STATISTICAL ECOLOGY CONFERENCE 2012

3-6 July 2012, 40 minutes outside of Oslo, Norway

AUSTRALIAN STATISTICAL CONFERENCE 2012

9-12 July 2012, Adelaide, SA
Celebrating the SSAI's 50th anniversary!

8TH WORLD CONGRESS IN PROBABILITY AND STATISTICS (JOINTLY ORGANISED BY THE BERNOULLI SOCIETY AND IMS)

9-14 July 2012, Istanbul, Turkey

INTRODUCTORY ANALYSIS OF LINKED DATA

Presented by Professor C.D'Arcy J. Holman
13-17 July 2012 in Adelaide

XXVITH INTERNATIONAL BIOMETRIC CONFERENCE

Organized by the Biometric Society of Japan
26-31 August 2012, Kobe, Japan

AUSTRALASIAN APPLIED STATISTICS CONFERENCE (GENSTAT AND ASREML)

(Formerly known as the Australasian GenStat Conference)
4-7 December 2012, Queenstown, New Zealand.

YOUNG STATISTICIANS CONFERENCE 2013

7-8 February 2013, Melbourne

NATSTATS 2013

12-14 March 2013, Brisbane

THE 59TH WORLD STATISTICS CONGRESS

25-30 August 2013, Hong Kong, China



Australian Statistical Conference

9 – 12 JULY 2012

Adelaide Convention Centre

celebrating 50 years



To register your interest please visit our website:

www.sapmea.asn.au/asc2012



REGISTRATION NOTICE

ASC 2012

The 21st Conference of the Statistical Society of Australia (<http://www.sapmea.asn.au/conventions/asc2012/index.html>) will be held at the Adelaide Convention Centre from 9 – 12 July 2011 and the 8th Australian Conference on Teaching Statistics (OZCOTS 2012) will be held at the same venue July 12-13. The theme for the ASC, Celebrating 50 Years of the Society, provides opportunities for presentations on a wide range of topics and recognises the role that statistics plays in all areas of modern life. The OZCOTS 2012 theme is Statistics Education for Greater Statistics and covers all aspects statistical education.

ASC 2012 is concerned with all aspects of statistical theory, methodology and applications and will include an outstanding program of invited talks featuring keynote addresses by:

- Professor Anthony Davison, Ecole Polytechnique Federale de Lausanne
- Professor Christl Donnelly, Imperial College London
- Professor Peter Donnelly, Oxford University
- Professor Sophia Rabe-Hesketh, University of California, Berkeley
- Professor John Storey, Princeton University
- Professor Roderick Little, U.S. Bureau of Census

OZCOTS 2012 will include a program of contributed papers and forum discussions as well as keynote addresses by:

- Professor Kaye Basford, University of Queensland
- Professor Jessica Utts, University of California, Irvine

REGISTRATION

The registration brochure and online registration process is available at <http://sapmea.asn.au/conventions/asc2012/roi.html>

CONFERENCE ORGANISERS

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 Web: www.sapmea.asn.au/conventions/asc2012



Adelaide Convention Centre
Photo: Ramin Mazaheri



ASC 2012 – Australian Statistical Conference
Celebrating 50 years
 9th – 12th July 2012, Adelaide Convention Centre

www.sapmea.asn.au/asc2012



THE INTERNATIONAL YEAR OF STATISTICS (STATISTICS2013)

The International Year of Statistics ("Statistics2013") is a worldwide celebration and recognition of the contributions of statistical science. Through the combined energies of organizations worldwide, Statistics2013 will promote the importance of Statistics to the broader scientific community, business and government data users, the media, policy makers, employers, students, and the general public.

The goals of Statistics2013 include:

- increasing public awareness of the power and impact of Statistics on all aspects of society;
- nurturing Statistics as a profession, especially among young people; and
- promoting creativity and development in the sciences of Probability and Statistics

ACTIVITIES ACKNOWLEDGING THE INTERNATIONAL YEAR OF STATISTICS

January 2 - 5, 2013	International Indian Statistical Association meeting, India
January 6 - 10, 2013	ISBA Regional Meeting and International Workshop/Conference on Bayesian Theory and Applications, Banaras Hindu University, India
February 7-8, 2013	Young Statisticians Conference 2013
February 21 - 23, 2013	ASA Conference on Statistical Practice, New Orleans, LA, USA
February 22 - 23, 2013	2013 Spring Undergraduate workshop, SAMSI, Research Triangle Park, NC, USA
March 10 - 13, 2013	ENAR Spring Meeting, Orlando, FL USA
March 14 - 15, 2013	Tunisian Association of Statistics and its Applications, Fourth meeting on Statistics and Data Mining (MSDM 2013), Hammamet, Tunisia
April 22 - 25, 2013	Eastern Mediterranean Region-IBS Conference, Tel Aviv, Israel
May 13 - 17, 2013	Undergraduate Modeling workshop, SAMSI, Research Triangle Park, NC, USA
May 26 - 29, 2013	41th Annual Meeting of the Statistical Society of Canada, Edmonton, Alberta, Canada.
July 15 - 23, 2013	Industrial Mathematical and Statistical Modeling Workshop for graduate students (IMSM), SAMSI, Research Triangle Park, NC, USA
July 20 - 25, 2013	29th European Meeting of Statisticians, Budapest, Hungary
July 29 - August 2, 2013	36th Conference on Stochastic Processes and their Applications, Boulder, Colorado, USA
August 3 - 8, 2013	Joint Statistical Meetings, Montréal, Quebec, Canada

- August 25 - 30, 2013 World Statistics Congress of the International Statistical Institute, Hong Kong, S.A.R. China
- September 22 - 25, 2013 10th Applied Statistics International Conference, Ribno(Bled), Slovenia
- October 15 - 16, 2013 International Conference Ars Conjectandi 1713-2013, Basel, Switzerland
- October 16 - 18, 2013 Swiss Statistics Meeting, Basel, Switzerland
- December 20 - 23, 2013 ICSA International Conference, Hong Kong Baptist University

STUDENT-MEMBERS!

Are you aware that student members of SSAI are entitled to one year of Transitional Membership when they start employment, before converting to a full membership? Transitional membership is available at half the cost of full membership, so you only pay \$110!

Post Graduate Internships
Build a better, faster future

Post graduates....
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take the next step?

Be an AMSIIntern
4-5 months paid industry experience
available at www.AMSIIntern.org.au



An Innovative University and Industry Collaboration



Mathematics of Planet Earth 2013

In 2013 AMSI will run a four-week national event with the theme Mathematics of Planet Earth, the event will be hosted by AMSI members around Australia. In support of this event AMSI will call for proposals for events and programmes in any branch of the mathematical sciences, AMSI encourages cross-disciplinary proposals (*round open and close date to be announced*).

AMSI will co-ordinate the Australian program for the year of the Mathematics of Planet Earth. Events will be run in conjunction with the Australian Mathematical Society, the Australian and New Zealand Applied Mathematics Society and the Statistical Society of Australia.

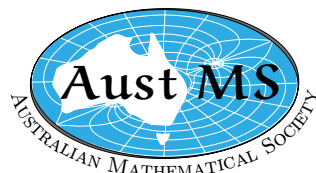
The theme Mathematics of Planet Earth will also run through 2013 AMSI flagship events in Australia: Summer School, Graduate School, Vacation Research Scholarships and BioInfoSummer.

More information:

www.amsi.org.au/MPE2013.php

Enquiries:

[Simi Henderson \(simi@amsi.org.au\)](mailto:simi@amsi.org.au)



National Collaboration in the Mathematical Sciences

The Australian Mathematical Sciences Institute (AMSI) is a national facility based in Melbourne, Australia. AMSI is a collaborative enterprise comprising of universities, societies and government agencies throughout Australia, its mission is to improve the mathematical sciences capacity and capability in the Australian community.

AMSI runs workshops, supports lecture tours, sponsors events, hosts an annual series of schools and events aimed at undergraduate, honours and postgraduate students, offers quantitative industry internships, produced a suite of school text books and teacher support material and promotes mathematics and statistics careers through numerous outreach programs. **For more information see:** www.amsi.org.au



YSC2013

Celebrating significance

Young Statisticians Conference

7-8 February 2013

Trinity College, University of Melbourne

Keynote speakers

Peter Hall (University of Melbourne)

Rob Hyndman (Monash University)

John Croucher (Macquarie University)

Ray Chambers (University of Wollongong)

Submit your abstract today

www.ysc2013.com



YOUNG STATISTICIANS NETWORK

The year was 1996. SSAI had been operating for 34 years. I was a high school student and unknown to me, a momentous event was occurring – the Young Statisticians Network (originally Section) was born. Within just 16 years the YSN has become a key focus of SSAI's activities. Providing opportunities to assist in developing Australia's next generation of statisticians is at the heart of SSAI, and on every committee, council and section formed, Young Statisticians are represented.

I would like to thank all the Young Statisticians who serve in these roles, and particularly acknowledge the Branch Council YS representatives for the new term: Han Gan (Victoria), Garry Khemka (ACT), Nate Wichitakorn (NSW), Ben Fitzpatrick (QLD), Lyron Winderbaum and Aiden Fisher (SA), and Elyse Corles (WA). If anyone would like to offer suggestions for events in your region, please contact your local YS representative, or myself.

The key event in the Young Statisticians calendar is the Young Statisticians Conference (YSC), which is held in alternate years to the Australian Statistical Conference. YSC2013 "Celebrating significance" will be an incredible celebration of our research and profession during 7-8th February 2013 at Trinity College, University of Melbourne. There will be world class keynote speakers, a stimulating program, prizes for student presentations and fantastic social events. Abstract submission and registration is now open, so please visit www.ysc2013.com for further details. I would like to thank the organising committee members who have been working tirelessly on making this an exceptional event: Damjan Vukcevic, Sandy Clarke, Andrey Kostenko, Han Gan, Stephanie (Xixi) Chen, Elisa Young and Chris Brown. Important input has also been provided from our assisting committee members: Fiona Beer, Ryan Defina, Geoffrey Brent, Garth Tarr, Mark Griffin, Murthy Mittinty, Helena Mitev, Tania Patrao, Catram Nguyen and Partha Gopal. Thank you all – your effort is appreciated!

2013 will be an important year in the statistical world, with recognition of the "International Year of Statistics" and "Mathematics of Planet Earth". What better way to start it than by attending YSC2013 – Celebrating significance. I hope to see you there!

Susanna Cramb



BAYESIAN STATISTICS SECTION

Introducing the Bayesian Statistics Section of SSAI

The Bayesian Statistics section encourages the development and application of Bayesian methodology in a variety of fields, and inter-disciplinary collaboration. There has been growing interest in Bayesian methods, as modern simulation software packages make these methods computationally feasible and they have several advantages over classical methods. Throughout history, Bayesian methods have helped solve complex problems that were unsolvable by other means¹:

- During World War II, they were used to decode the German Enigma cipher and turn the tides of war
- The US Navy used them to search for a missing H-bomb and locate Soviet subs
- Insurance actuaries used them to set insurance rates
- They were used in court to demonstrate the innocence of Captain Dreyfus
- RAND corporation used them to assess the likelihood of a nuclear accident
- Harvard and Chicago researchers used them to verify the authorship of the Federalist Papers
- In medicine they were used to first establish the link between smoking and lung cancer

Currently, 300 SSAI members (43% of all SSAI members) are subscribed to the Bayesian Statistics section and the associated *bayes-info*² mailing list, which we use to post updates regarding Bayesian events and news. The webpage for the section is regularly updated, and contains links to upcoming events, latest news, Bayesian forums, useful Bayesian resources, and members' publications (to be compiled). We'd like to hear from section members with a list of their publications, and also Bayesian resources they found useful, to add to our resources page. Along with the other sections of SSAI, we will occasionally pose a question on the website to promote discussion among members. Updates will also be posted on the Facebook and Twitter sites of the SSAI.

To join the section or add input to the section website, please email the Section Assistant Chair, Jannah Baker (jannah.baker@qut.edu.au). We look forward to hearing from you!

Scott Sisson (Section Chair)

Jannah Baker (Section Assistant Chair)

References:

1. A History of Bayes' Theorem. URL: http://lesswrong.com/lw/774/a_history_of_bayes_theorem
2. <http://web.maths.unsw.edu.au/~scott/bayes-info.html>

THE SSAI STRATEGIC PLAN: THE WAY FORWARD

Dear colleagues

The working group charged with reviewing and revising the SSAI Strategic Plan has met a number of times over the past few months. Our considerations have included (but have not been limited to) the following:

- review of the existing Strategic Plan, identifying what has been achieved and what is still to be addressed
- discussion about the strategic model for SSAI, in light of changes in society and our profession
- recognition of the need to increase awareness of SSAI in the wider national and international community
- critical appraisal of the Branch structure of SSAI, with an acknowledgement of the value of Branches, but the need for closer collaboration between Branches, and between Branches and the central body
- critical appraisal of the structure and function of Sections, with the acknowledgement of the value of Sections but the need to energise them to improve relevance and value to SSAI members
- confirmation of the importance of accreditation, training, networking, conferences, the newsletter and the journal
- reiteration of the need to promote and increase membership of the Society
- acknowledgement of the concomitant need to listen to the members about what they want from SSAI and how they might be engaged in the Society.

As part of the review of the strategic direction of SSAI, we wish to canvas the SSAI membership about the following three issues. We welcome your written feedback before 30th May. Our aim is to take these comments into consideration and present a draft new Strategic Plan at the Australian Statistics Conference in Adelaide in July. The issues, and our proposed position on these issues, are as follows.

1. What is the overall model for our Society?

Societies can operate under a range of models:

- a retail service provider whose main purpose is to deliver products and services directly to members
- a co-operative or mutual society whose main purpose is to networking and knowledge distribution
- an employment guild whose purpose is to advance and protect the profession of its members
- a lobby group whose purpose is to advocate on behalf of members to major employers, governments etc
- a learned society whose purpose is to further the advancement of a field of knowledge, its appreciation and use
- a public voice on statistical issues, which enters into and even initiates public debate on statistical research findings of importance (especially where there may be misunderstanding, misinterpretation or misuse of the statistics).

The working group proposes that the primary model for SSAI is a learned society with a stronger public voice, with objectives that embrace the other models, including training, networking, knowledge distribution, and advancement

and protection of the profession. The working group seeks confirmation from members that this is an appropriate model.

2. What are the strengths, weaknesses, opportunities and threats for our Society?

An evaluation of these aspects will assist us in defining our future needs and strategies.

The working group has developed a draft SWOT analysis, shown below, and is seeking input from members.

Strengths: Enormous body of goodwill from members; The natural peak body for statistics ; Branch structure and regular meetings; Accreditation system for individuals; Strong organisational structure – central and branches; Active Continuing Professional Development (CPD); Sections

Weaknesses: Seen by many as being a society of academic researchers only; Divided membership – academic versus professional; Uneven support from senior members of the profession; Statisticians not visible – go under too many different names; Grumbling about fees being high; Declining membership; Finances only now recovering; Many members not engaged with Society; Accreditation of courses not widely accepted; Sections

Opportunities: More data becoming available; Need to extract information from very large amounts of data (e.g., the Square Kilometre Array if it happens); Australia needs to move to a knowledge economy

Evidence based decision making/medicine etc; Big problems such as climate have a large statistical component - Society could offer advice to government; Increasing recognition by peak mathematical sciences and science and technology bodies

Threats: Non-statisticians taking our patch; Not sufficient number of statistics graduates; Statistics seen as irrelevant; Declining membership of Society; Statisticians fail to communicate; People doing statistical work don't identify themselves as statisticians; "Statistics" has a poor public image; Teaching of statistics to non-statistics majors is generally poor.

3. What are the ten big things that our Society can do in the next 5-10 years?

These should be feasible, given funds and personnel, and should make a real difference to our Society and our community. We can then develop concrete plans for achieving them.

The working group has considered a number of suggestions including

- addressing the 'big data' issue, perhaps by creating a shared data repository on the SSAI site;
- improving statistical literacy in our community, eg among politicians and decision makers
- advocacy and engagement in 'hot topics', perhaps by creating specialist groups or forums, in collaboration with SSAI Sections
- promotion of SSAI as a leader of statistics-related societies in Australasia.

Comments on these and other suggestions are sought from members.

**Kerrie Mengersen, SSAI President
on behalf of the SSAI Strategic Plan Working Group**



AMERICAN STATISTICAL ASSOCIATION

On behalf of the American Statistical Association, I congratulate the Statistical Society of Australia on its 50th anniversary. Professional societies serve a vital role in the life of a discipline. By establishing a code of conduct, by providing meetings and the journal, by supporting branches that provide key networking opportunities, by rewarding excellence, by accrediting members, and by other means, the SSAI declares clearly that statistics is indeed a job for professionals.

Further, the SSAI is working in collaboration with other statistical societies to advance the profession worldwide. The ASA is proud and honored to be a partner with you in this effort.

We wish you all the best during your 50th anniversary year, as you develop a new strategic plan, as you prepare for the Australian Statistical Conference, and as you reflect on the accomplishments of your first 50 years. We especially wish you much success in your efforts to nurture young statistical professionals, because they are the people who will ensure the good health of the society and the profession for the next 50 years.

Again, congratulations, and best wishes from your friends and colleagues at the ASA.

Sincerely,

Ron

Ronald L. Wasserstein,
Executive Director, ASA

<http://www.amstat.org/>

A MESSAGE FROM THE ROYAL STATISTICAL SOCIETY

The Royal Statistical Society based in London sends its warmest congratulations and best wishes to the Statistical Society of Australia on its 50th anniversary. We are very supportive of the excellent work that you do, and look forward to collaborating closely with you in what promises to be the 'century of data' to ensure statistics helps us build a better world. Next year is the International Year of Statistics and we hope it makes a fitting start to your next fifty years!

Valerie Isham,
RSS President



25% Discount for Members of SSAI!

Wiley-Blackwell is pleased to offer members of the Statistical Society of Australia Inc a 25% discount on a wide range of books published by John Wiley & Sons. The range of books on offer includes titles from Wiley-Blackwell's extensive list of statistical publications, as well as titles from our brands Frommers, Capstone, Dummies, Jossey-Bass and many more.

How to Register and Purchase Books:

Members within Australia and New Zealand:

1. Click on the link to your Online Book Discount Program Landing Page
<http://au.wiley.com/WileyCDA/Section/id-410891.html>
2. Register if a first time visitor, or start purchasing if a return visitor (note that if you have opened an account with Wiley.com before this discount offer was available, you will have to open another account (Register) using another email address to obtain the discount);
3. Click on the Wiley logo at the top of the page, or the subject link next to the SSAI logo to browse books, or select titles on the Landing Page;
4. Select titles and then click 'Add to Cart';
5. Click on 'Continue Shopping', or 'Proceed to Checkout Now'.

Note: When completing your purchase members in Australia or New Zealand DO NOT need to enter a promotional code.

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Complete steps 1-4 as above, and enter the promotional code as shown on the Book Discount Program Landing Page, before clicking Checkout Now.

MEMBERS
REFLECT ON
THEIR 50 YEARS
WITH THE
SOCIETY

Geoff Yeo – SSAI Member since 1960

What inspired you in 1960 to join the Statistical Society of Australia?

I was a M. Sc. student at UWA in 1960. My supervisor, Joe Gani, recommended joining the Stats Society and the RSS (and the Aust. Maths. Society early on). He got me reading around to think more for myself. He gave me an excellent start in ideas and research.

What path has your statistical career taken?

After a Ph. D. from ANU in 1963, I spent a couple of years each in USA, UK and Denmark before 7+ years in Statistics at Melbourne University. Then I was about 12+ years in Denmark before returning to Perth (Murdoch University), retiring from there in 2003. Since then I have been a visiting research fellow at UWA.

My main interests have been in applications of probability, with some other statistical problems. My early work was mainly in storage and queueing theory, more recently in applications to ion channels, with other interests including characterizations of distributions and the secretary problem. My publications are listed on my home page at UWA (maths.uwa.edu.au/~yeo).

What have been some of the highlights of your time as an SSAI member?

I have served on State branches in Victoria and WA. There have been some very good SSAI conferences over those 50 years and have met a lot of interesting people through the society.

Is there any message you would like to pass on to current or intending members of the society?

Enjoy and make the most out of the contacts you make through the society, and give back some of what you get out of it. The Society has a lot to offer.

Alan Stark – SSAI Member since 1961



I joined ABS in 1957 with essentially no knowledge of statistics and in 1961 took up the newly-created position of consultant statistician to the CSIRO Marine Laboratory in Cronulla, NSW. Thus I became part of the Division of Mathematical Statistics whose Chief was then Dr. E. A. Cornish. So it was natural to look to the existing Statistical Society in Sydney for additional professional support. During this period I completed an M.A. in mathematical statistics, by research, under the principal supervision of Professor J.B. Douglas.

After about eight years I was appointed Senior Lecturer (Medical Statistics) in the then School of Human Genetics of the University of NSW. I remained in this position until formal retirement in 1997. Because the School's main focus was medical genetics, including classes to students of the Faculty of Medicine, I considered I should gain some knowledge of population genetics. Accordingly I chose this field for a PhD under the joint supervision of Professor R. J. Walsh, first (and only) Head of Human Genetics and Professor C. A. McGilchrist. Around 1975 the name and focus of the school was changed to "Community Medicine". However, I retained a strong interest in and teaching commitment to medical genetics, a choice which is thoroughly vindicated by the importance of genetics in medicine and biology generally. Since retirement I have enjoyed collaboration with Professor Eugene Seneta on studies of prominent Russian and other European scientists, including A. N. Kolmogorov and S. N. Bernstein, in fields allied to genetics.

There have been many leaders of SSAI and I have mentioned some who were especially important to me. I should include also the late Professor H. O. Lancaster, a giant in the fields of medical statistics, mathematical statistics and the history of both. He was a prime mover in the formation of the Society, first in NSW and later in the whole of Australia, and founding editor of the Journal.

Newcomers to statistics in Australia are fortunate in having outstanding leaders in a wide range of disciplines. My advice to them is take advantage of the Society's many activities, such as conferences, thereby making contact with members who can help them.

Alan Stark, May 9, 2012.

Helen Nicol – SSAI Member since 1961

What inspired you in 1961 to join the Statistical Society of Australia?

I was a brand new graduate, just started a job as a Biometrician with NSW Dept of Agriculture.

The chief Biometrician urged me to join what was then NSW statistical Society.

What path has your statistical career taken?

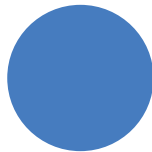
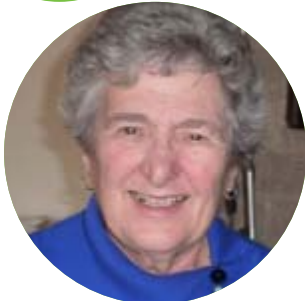
Biometrician in NSW Agriculture (Sydney based), WA Agriculture, NSW Agriculture (Orange). Last 10 years a private Consultant working often with USyd (Orange)/ CSU (Orange campus). Dip Stat Aberdeen University (1964-5)

What have been some of the highlights of your time as an SSAI member?

President of WA Branch 1973-4, ran a national conference in Perth in 1974. Increase in the number of female members.

Is there any message you would like to pass on to current or intending members of the society?

The society is a broad church: find the sections and conferences that interest you.



AMSI-SSAI Lecturer 2012



Christian P. Robert Université Paris-Dauphine

Professor Christian P. Robert's research areas cover Bayesian statistics, with a focus on decision theory and model selection, numerical probability, with works centering on the application of Markov chain theory to simulation, and computational

statistics, developing and evaluating new methodologies for the analysis of statistical models. He has written or co-written eight books on Bayesian statistics and computational methods, as well as over 150 research papers in these areas and their applications.

Talks

- AMSI Public Lecture: Simulation: an ubiquitous tool for modellers
- Approximate Bayesian computation for untractable likelihoods
- Bayesian model choice with insufficient statistics
- Rao-Blackwellisation of sampling schemes
- Abstracts will be posted to the website soon.

Lecture tour dates starting in July can be found at:

www.amsi.org.au/robert.php

For enquires email Anne Nuguid on anne@amsi.org.au



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PROFESSIONAL INDEMNITY

INSURANCE FOR SSAI MEMBERS

Professional Indemnity Insurance for members of SSAI is now available. Insurance Advisernet Australia Pty Ltd (IAA) have brokered an exclusive arrangement with Chubb Insurance Australia Ltd, who are a market leader in specialty insurance coverages, which are uniquely designed for specific industries. IAA currently administer a successful Professional Indemnity Insurance facility for Mortgage Brokers and Financial Advisers. This Facility is also underwritten by Chubb. If your current insurance policy is about to expire or if you have to take out insurance for the first time, please contact the SSAI office by email (eo@statsoc.org.au) or telephone (02 6251 3647).



SSAI WEBINARS

SSAI members can now look forward to a whole program of monthly webinars under the heading 'Statistics: making a significant difference', planned for the upcoming twelve months. With this series, which features speakers from Australia and overseas, the SSAI wishes to contribute to the "International Year of Statistics 2013" and the "Maths of Planet Earth" initiative by AMSI.

The June talk "Global Food Security" will be presented by Bronwyn Harch, Deputy Director, Sustainable Agriculture Flagship, CSIRO on 12 June 2012 at 1pm*.

Other speakers who have already confirmed their willingness to participate are

- Ian Chubb, Professor and Chief Scientist for Australia (5 July 2012, 1pm*)
- Ben Farrell, UNHCR Canberra (28 August 2012, 1pm*)
- Adrian Smith, Director General, Knowledge and Innovation, Department for Business, Innovation and Skills (BIS), UK
- Alan Gelfand, J.B. Duke Professor of Statistics and Decision Sciences, Duke University, USA
- Chris Green, Professor of Economics, McGill University, Montreal
- David Elston, Director, Biomathematics & Statistics Scotland
- Louise Ryan, Chief of CSIRO Mathematics, Informatics and Statistics
- Marie Davidian, ASA President-Elect and the William Neal Reynolds Distinguished Professor of Statistics at North Carolina State University as well as the director of NCSU's Center for Quantitative Sciences in Biomedicine
- Noel Cressie, Professor of Statistics, University of Wollongong and The Ohio State University
- Ron Sandland, Ron Sandland, ex-Deputy Chief Executive of CSIRO
- Terry Speed, Professor, Walter and Eliza Hall Institute of Medical Research
- Virginia Whewey, Environment, Health and Safety Director for Boeing Australia

* Canberra Time.

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OVERSEAS STATISTICIANS VISITING AUSTRALIA

We have an "Overseas Visitors" page on the SSAI website (<http://www.statsoc.org.au/OverseasVisitors>). The aim of this page is to provide a public database with the names of overseas visitors, giving other organisations the opportunity to benefit from the visit as well. If you or your organisation think that they would like to work with one of the visitors listed on the website, simply send an email to the SSAI office, explaining the details of your proposal, and the office will forward your email to the visitor in question.

If you know of statistical experts from overseas planning a visit to your organisation, please advise the SSAI by sending an email containing the name, details and travel dates of the visitor to eo@statsoc.org.au. We would also need the visitor's email address (not to be published on the website), so that we can ask for his or her permission to put their name up, as well as the name and details of a contact person in Australia.

NOTICE

The Annual General Meetings of The Statistical Society Of Australia Inc. and The Australian Statistical Publishing Association Inc. will be held on 10 July 2012 at 5:30pm at the Adelaide Convention Centre in Adelaide.

SSAI ANNUAL GENERAL MEETING - AGENDA

1. Apologies and Proxies

Proxies must be given in writing as per form available on the SSAI website. 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 previous meeting are available on the SSAI website.

3. Matters arising

4. Reports

4.1 President

4.2 Treasurer

5. Conferences

5.1 ASC 2012

5.2 ASC 2014

6. Election of Section Chairs

Nominations for Section Chairs should be received at the SSAI office no later than 5 July 2012. Nomination Forms are available on the SSAI website. All nominations require a seconder and a statement from the nominee that she or he is prepared to stand.

7. Appointment of signatories

8. Other business

9. Time and place of next meeting.

ASPAI ANNUAL GENERAL MEETING - AGENDA

1. Apologies and Proxies

Proxies must be given in writing as per form available on the SSAI website. 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 previous meeting are available on the SSAI website.

3. Matters arising

4. Presentation of the Annual Report by the Editor of the Australian and New Zealand Journal of Statistics

5. Treasurer's Report

6. Appointment of signatories

7. Other business

8. Time and place of next meeting.

Nomination Form—Section Chairs—2012-13



Name: _____ is hereby nominated for the position of Section Chair
for the _____ Section.

Nominator: _____ Address: _____

Seconder: _____ Address: _____

I, _____ of _____

agree to my name being put forward and I agree to carry out the duties as Chair of the _____
Section of the Statistical Society of Australia Inc for 2012-13 if elected to the position.

(Signature)

(Date)

FAX TO
Marie-Louise Rankin, Executive Officer, SSAI:
Before 2.00 pm (AEST) Thursday, 5 July 2012—(02) 6251 0204

Central Council Meeting, 10 July 2012



Appointment of Proxy

I, _____ of _____
(full name) (address)

being a member of the Statistical Society of Australia Inc, hereby appoint:

_____ of _____
(full name of proxy) (address)

Being a member of the Statistical Society of Australia Inc, as my proxy to vote for me on my behalf at the Annual
General Meeting of the Central Council of SSAI to be held on the 10 July 2012, and at any adjournment of that
meeting.

(Signature of member appointing proxy)

(Date)

Note: A proxy vote may not be given to a person who is not a member of the SSAI.

FAX TO
Marie-Louise Rankin, Executive Officer, SSAI:
Before 2.00 pm (AEST) Thursday, 5 July 2012—(02) 6251 0204

SOCIAL STATISTICS

WELCOME TO 2012

This year has already been interesting, with a number of Social Statistics questions being hotly debated throughout the country both in homes and in Parliament. We have seen passionate public discussion of issues such as the effects of new environmental policies on socioeconomic factors, as well as an increasing public interest in 'closing the gap' between Indigenous and non-Indigenous Australians in education, health and employment.

We have been building our membership and emailing list over the year through recruitment at meetings and workshops held by our members, and have seen the mailing list grow steadily. This is excellent to see, as the Social Statistics branch is still relatively young and needs the support of statisticians and social scientists to maintain its pulse. Make sure you join the list to find out about conferences, workshops and presentations and other news related to social statistics.

We are currently planning meetings and workshops to take place in conjunction with major conferences around Australia, as well as arranging opportunities for social statisticians to meet outside the conference setting. Keep your eye on the email list to find out more about these events as they are posted.

On the Social Statistics page of the SSAI website, you will find a reading list of useful social statistics methodology research. Feel free to browse through, or to suggest a paper that has not been included.

We look forward to seeing you on the mailing list, and at the next Social Statistics event.

Michele Haynes

Chair

Jegar Pitchforth

Assistant Chair

LOOKING FOR A JOB?

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

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AMSI workshop funding rounds

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The Scientific Advisory Committee reviews and approves sponsorship by AMSI of a diverse range of symposia, workshops, theme programs and lecture tours.

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**2012
rounds close:**

**15 June
7 September
1 December**

See: www.amsi.org.au/proposals.php



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CANBERRA BRANCH

Using Bayesian Mixture Models to Better Understand Parkinson's Disease

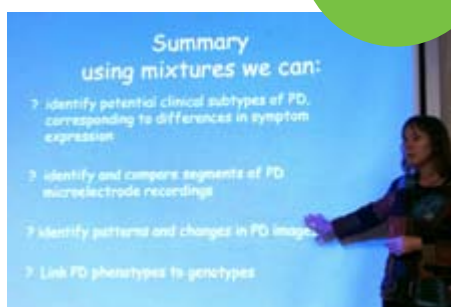
On April 24, the Canberra Branch learnt about the recent research by our Society President, Prof. Kerrie Mengersen, through her lecture entitled "Using Bayesian Mixture Models to Better Understand Parkinson's Disease (PD)."

A very interesting aspect of Prof. Mengersen's lecture was this: four different statistical research problems arose from the common scientific phenomenon of PD, and the methodological common thread was mixture modelling. Of course, each of the four statistical problems was associated with a specific type of data. For Prof. Mengersen's team, the respective data-type-specific research questions were: (1) How to identify patient clusters according to their PD symptoms? (2) How to describe the wave forms of microelectrode brain signal data from PD patients, identify segments of these wave forms, and compare segments among patients? (3) Given PD patients' brain scan images, how to quantify the difference among various regions of a patient's brain, and among patients? (4) How to infer PD patients' genotypes based on their phenotypes?

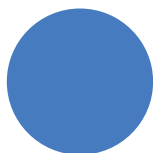
While mixture modelling methodologies were tailored to these four research questions, they have also led to new statistical tools for applications beyond PD research. For (1), Prof. Mengersen's team compared patient clusters inferred using two different modelling approaches, respectively based on finite mixture models and Dirichlet processes. Through this comparison, the team identified "emerging" clusters whose characteristics are not yet prominent but potentially so as the disease evolves. For (2), Prof. Mengersen's team unified the principal components analysis approach with Dirichlet process modelling through a Bayesian hierarchical framework. For (3), the team developed new spatial mixture methodology that employs Gaussian Markov random fields, as well as new procedures to improve standard reversible jump Markov chain Monte Carlo algorithms. Finally, for (4), the team developed a new approach to average goodness-of-fit criteria through mixture modelling. These new tools are definitely not restricted to PD research.

On the less technical side of things, Prof. Mengersen started her lecture with a quick visual overview of the history and popularity of the Bayesian paradigm. Guess which, according to her, is more popular at present: Bayesian or frequentist?

Grace Chiu



Prof. Mengersen in action



NSW BRANCH

March Meeting



Scott Sisson

The first event on the NSW branch calendar for 2012 was the annual AGM and H. O. Lancaster Lecture, held in March in the Refectory beneath the Main Quadrangle at the University of Sydney. Outgoing President Richard Gerlach warmly welcomed incoming President and Lancaster Lecturer Scott Sisson, Associate Professor and QEII Fellow from the University of New South Wales.

The lecture this year concerned some recent developments in the use of Approximate Bayesian Computation (ABC) in high dimensions. Scott firstly pointed out that ABC-based methods have become quite popular in a broad range of applied fields for attacking problems with intractable likelihood functions. He pointed out however some limitations, that computational complexity increases exponentially as accuracy increases and that the curse of dimensionality bites particularly hard for standard ABC-based methods. He discussed a regression-based adjustment which can be used to alleviate somewhat the first problem and which also has an interesting connection to Bayes Linear Analysis (BLA). He also explained in some detail a clever strategy for attacking the second problem, partly suggested by BLA, whereby marginal adjustment arguments borrowed from the density estimation literature can be used to improve estimation of univariate marginal densities and recover lost accuracy.

The NSW Branch provided light refreshments after the talk (rather than the customary dinner at a nearby restaurant) which kept a large contingent there for some time, discussing technical issues and just catching up in general. It was an informative and warm start to the year's activities.

April Meeting



Dr Robert Clark

The ABS Corporate Event, the second of corporate events to be hosted by the NSW branch, took place in April, where the branch invited keynote speakers to speak about Methodology in the Australian Bureau of Statistics (ABS), as well as their overall experience working at the ABS.

The Event started off with a warm introductory speech by Frank Yu (Head of Methodology and Data Management, ABS), who spoke about the mainstream areas of methodological work, as well as significant projects currently taking place in the ABS. This was followed by a brief talk from Ryan Defina (Survey Methodologist, ABS), whom being based in the Sydney ABS office, introduced us to the local ABS methodology team, as well as giving us details regarding the ABS Graduate Recruitment Program.

Our next speaker was Dr Robert Clark (Associate Professor, University of Wollongong), who shared with us his experiences at the ABS, commencing as a cadet and continuing to work at the ABS due to his interest in certain research projects (including the Monthly Population Survey Redesign), during which he also completed his PhD at the University of Wollongong. Robert then made the decision to pursue his academic career, to which he spoke about how the skills and knowledge he obtained during his time at the ABS had assisted him in his research work, and that he has continued to maintain links with the ABS due to the nature of some of the research problems he was working on (such as optimisation of cluster sizes in multi-stage surveys, variable choice in weighting).

Our last guest speaker was Chris McKendry (Survey Methodologist, ABS), who gave a rather passionate talk about his work at the ABS, having commenced as a cadet and recently finishing the Graduate Program. He enlightened the audience with the benefits of the APS (Australian Public Service) Flextime system,



Chris McKendry

reinforcing the work-life balance aspect that is promoted within the ABS. He also spoke about the support given as a graduate, with access to training in areas such as economic statistics, survey and time series methodology, SAS programming and project management. Chris concluded the presentation with his work on the ABS published Hours Worked seasonally adjusted series, which is a key economic indicator used by the RBA and the Treasury. The problem at hand was to derive seasonally adjusted estimates by their various cross-sectional splits (such as state/territory, sex and job status) and ensuring their additivity to the national aggregate seasonally adjusted estimate (note that the seasonal adjustment process itself is not linear). A formulation of the reconciliation algorithm based on a 3D aggregation structure was produced which enabled all the constraints to be met, whilst also maintaining the properties of the original data.

With the presentations coming to an end, the Event concluded with an enjoyable dinner at the Red Oak Café. Once again, we thank Robert and Chris for offering their heartfelt sharing and career advice, especially to those university students and academic members contemplating an academia to industry career move, or vice versa in the future. We also thank the ABS for the use of their site as the Event venue, as well as the helpers who assisted with the running of the Event, which accommodated for an audience of 40. It was a great success!

Michael Stewart, Murray Cameron and Leanne Chhay

1st Grid Seminar

The NSW Branch has decided to initiate a series of research seminars that use internet technologies to allow remote participation. The aim is to allow more people to see seminars and to encourage interaction and collaboration between people from different institutions. Our initial motivation is to connect groups across Sydney and NSW, but the only limit to the range is the speed of the internet connection.

The role of the SSAI is to act as encourager and coordinator and the seminars – speakers and technology - will be organised by research organisations, notably universities and CSIRO. The seminars will (at least initially) be broadcast using Access Grid Rooms and also the EVO software. Access Grid Rooms have been installed in a number of universities with financial support from the Australian Mathematical Sciences Institute (AMSI). Information about these can be found either at the Australian eResearch Collaborative Services website (www.arcs.org.au) or on the SSAI website. Unfortunately, it seems that these facilities are only available at the moment to research organisations.

The first seminar in the series was presented by Professor Peter Diggle from University of Lancaster who was visiting CSIRO Mathematics, Informatics and Statistics. He spoke on "Partial Likelihood Analysis of Spatial-Temporal Analysis". The motivation for the work was the real-time monitoring for potential outbreaks of disease and the development of control strategies for future epidemics. He advocated the use of partial likelihood for estimating the parameters of models and gave examples of model structures that could be used to describe spatial and temporal dependence.

The seminar participants were in 3 Access Grid Rooms (UNSW, University of Newcastle and Macquarie University) and 10 computers running EVO (ANU, CSIRO sites and individuals). While there were some technical glitches which made the experience less than perfect for EVO users – notably the positioning of cameras – the event demonstrated that we can make this work very successfully and more seminars will be presented in this way.

Upcoming events

Speakers for talks later in the year include Jake Oliver from UNSW with a statistical take on mandatory bicycle helmet legislation; Professor Paul Embrechts from Zurich in a joint SSAI/CSIRO/Sydney Financial Mathematics Workshop speaking on extreme-quantile tracking for financial time series; Glenn Stone from UWS speaking on doping in sport. Also keep an eye out for more Access Grid/EVO SSAI seminars!

QUEENSLAND BRANCH

Queensland Branch, March 2012, On Akaike and likelihood cross-validation criteria for model selection. Associate Professor Benoit Liquef, University of Bordeaux.



Benoit Liquef

The February meeting of the Queensland Branch welcomed Associate Professor Benoit Liquef from the University of Bordeaux. Benoit explained how the popular Akaike Information Criterion (AIC) does not work when comparing models with different likelihoods, even though they may have the same aim. The example was predicting hypercholesterolemia in a new subject based on a cholesterol reading above 220 units using either: i) a logistic model, ii) a linear model. The AIC cannot be compared between these models even when using the "smallest-sigma field" to make the models more comparable (which in the example case involves dichotomising the predictions from the linear model). Benoit also pointed out that the AIC is a statistic, but the variability in the AIC is rarely mentioned. Benoit discussed a new model selection criterion based on the Kullback-Leibler risk and using leave-one-out cross-validation. A simulation study based on a three-state survival model examined two situations: where there was a true increase in risk, and where there was no true increase in risk. The new criterion worked well in both situations whereas the AIC did not. This work has been published in the *Scandinavian Journal of Statistics*. Benoit then discussed model selection for joint models. The example was a repeated biomarker over time for prostate cancer combined with the time to cancer recurrence. These outcomes were linked using a latent class. Again the AIC does not work for these models, but Benoit demonstrated how a cross-validated criterion did make good choices using a simulation study. In a real example the best model choice depended on time, with a model with just two latent classes being preferred for later times, and models with 3 or 4 classes for earlier times. This work is available via the R package "lcmm".

Adrian Barnett

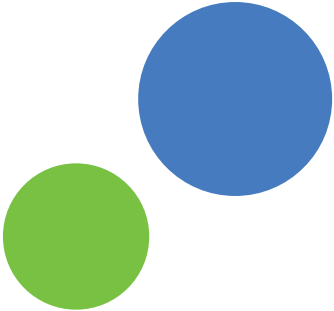
Hidden stochastic death processes for modelling neurological decline



Gareth Ridall

The April meeting of the Queensland branch was held at the Gardens Point Campus of the Queensland University of Technology. Gareth Ridall, visiting from Lancaster University (UK), gave an interesting talk on stochastic modelling of neurological decline in patients with motor neurone disease. During motor neurone disease, functioning motor units responsible for the contraction of muscles are lost in an irreversible process that lasts from six months to several years. There is no cure for the disease and the cause of disease and the mechanisms underlying disease progression are unknown. The talk was based on joint work with Tony Pettitt from QUT and focussed on stochastic models capable of describing the progressive death of neurons.

Electrophysiological data (neuro-muscular responses to electrical stimulation measured as a series of electrical currents) were obtained from nine patients with amyotrophic lateral sclerosis, the most common type of motor neurone disease. Data were collected over the period of each patient's neurological decline and modelled in two stages. In the first stage, the number of functioning motor units within a single muscle was estimated from the electrophysiological data using reversible jump Markov Chain Monte Carlo sampling, a method developed by Ridall et al. (2007) to obtain the posterior distribution of the number of motor units supplying a muscle. Multiple estimates were obtained



for each patient and these typically showed progression of disease (declining number of motor units) over time. In the second stage, outputs from the first stage were analysed using Bayesian state-space models to estimate the rate of death of motor units. Four models were considered: the one hit (exponential) model which assumes the death of neurons is caused by a single, independent and cataclysmic biochemical event; the accelerated ageing and cumulative damage (Gompertz) model implying the cell death rate increases with time; the heterogeneous (mixture of exponentials) model which allows the rate of death to vary across motor units; and the multi-hit model which explains cell death as a multi-step biochemical cascade consisting of a sequence of necessary events. Importance sampling from the prior distribution of the model parameters provided the basis for comparing models. This method does not require convergence diagnostics and an unbiased estimate of the marginal likelihood can be obtained to allow model comparison using Bayes factors. There was mild support for the heterogeneous model and this was robust to choice of prior distribution.

Audience discussion focussed on the timing of disease onset and whether this coincided with the commencement of data collection. Earlier disease onset would allow the possibility that motor units decay logistically and this should be investigated.

Elaine Pascoe

 Australian Government
Australian Institute of Health and Welfare

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SA BRANCH

Local grade inflation and local proportion of withdrawals

Alan Branford is an Associate Professor in the School of Computer Science, Engineering and Mathematics at Flinders University. As the outgoing president he obliged by giving a presidential address at the SA Branch AGM in March. Alan's talk focused on the identification of local grade inflation, which is essentially a form of favouritism.

An administrative data file from the American Midwestern University contained data on students, instructors and courses from fall 1998 to fall 2007. This study was based on a single dataset of 7,500 grade distribution records (11 main categorical explanatory variables) distilled from the student, instructor and course section datasets. In this dataset there was nesting of the explanatory variables (i.e. courses, subjects, instructors, gender, and instructor job). The response variables are Local Grade Point Average (LGPA) and Local Proportion of Withdrawals (LPW). Statistically significant categorical explanatory variables for LGPAs are compared and contrasted with statistically significant categorical explanatory variables for local proportions of withdrawals (LPWs).

Based on the coefficient of determination, and for both LGPA and LPW, course is the most influential explanatory variable; instructor is also strongly influential; subject, department and academic course level are each moderately influential; year, semester and class time period, instructor gender, job and qualifications are each weakly influential. Instructors and interactions are highly significant variables in two-variable LGPA-dependent models. The closest fitting two-variable LGPA-dependent models are the ones where instructor (I) is paired with one of course, academic course level, year, class time period and subject.

There was evidence for local grade inflation. Analysis showed that any particular course and instructor a student takes, much more than any of the other variables, determines how well they will perform in a class and whether they will withdraw or not. The LGPA increases for increasing academic course levels, whereas LPW decreases for increasing academic course levels.

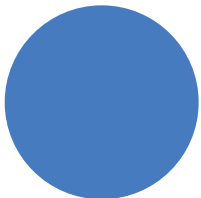
Paul Sutcliffe

"Assessment of model performance in disease risk prediction: out with the old and in with the new?"

The presenter for the April meeting of the South Australian Branch was A/ Prof Richard Woodman, Director of the Flinders Centre for Epidemiology and Biostatistics in the Discipline of General Practice, Flinders University.

Richard began his presentation with a definition of the Concordance (C-) statistic, and how it is commonly used in assessing the utility of new risk markers for a particular condition or disease. For a binary outcome, the Concordance (C-) statistic is the area under the receiver operating characteristic (ROC) curve.

Quantification of the added usefulness of new measures in risk prediction has traditionally relied upon significance tests from regression models and increases in the C-statistic. However, significant model predictors often cause only minor increases in the C-statistic suggesting limited utility of the new measures in improving risk prediction. Moreover, the C-statistic has been criticised as it is



Richard Woodman

difficult to interpret clinically, is not a true prognostic indicator, and does not assess the risk of re-classification.

More recently, other discrimination measures have gained in popularity amongst researchers, spawning several 'improved' risk re-classification measures. The Integrated Discrimination Improvement index (IDI) measures the difference between the change in the mean predicted risk of an event occurring for those who had the event, and the change for those who did not have the event. The Net Reclassification Improvement index (NRI) quantifies the percentage of subjects correctly re-classified in terms of risk. Richard presented examples of the calculation of these newer re-classification measures based on some large published observational studies. Richard also showed how the category-free NRI and category-dependent NRI can be calculated, and that these two measures behave quite differently and can lead to different conclusions.

In the second part of his talk, Richard described some joint work in which the aim was to predict whether patients would have a short (< 72 hours) or long hospital stay. This work arose from a collaboration between Richard and Campbell Thompson, Susan Kim and Paul Hakendorf (of the University of Adelaide, Flinders University and Flinders Medical Centre, respectively).

Predicting the length of stay of hospital patients is an important issue in the delivery of health services in the acute setting, as incorrectly predicting patients as short-stay would overfill short-stay hospital units, and potentially prevent the most appropriate treatment for long-stay patients. Using data from 1457 general medicine patients, a logistic regression model was used to predict risk of long hospital stay. Significant predictors were age, blood pressure, heart rate, respiratory rate, mobility, white blood cell count, cardiac failure and the need for supplemental oxygen. Using the predicted probabilities for long stay, Richard assessed improvements in the C-statistic, the IDI (%) and the NRI (%) after the addition of each variable after patient age was included in the model. The NRI was assessed using predicted probability cut-points for long-stay of 50% and 57% (i.e. the overall prevalence of long-stay patients). The category-free NRI was also calculated for the range of fitted models. Richard outlined how the various measures could be calculated using commands in Stata and presented examples of how this could be done for the hospital stay data set.

Richard's presentation concluded with a summary of the advantages and disadvantages of the different measures, and some caveats concerning their appropriate use.

Lively discussion continued when Richard and other statisticians adjourned to a local restaurant (Café Amore) after the talk.

Lynne Giles

VICTORIAN BRANCH

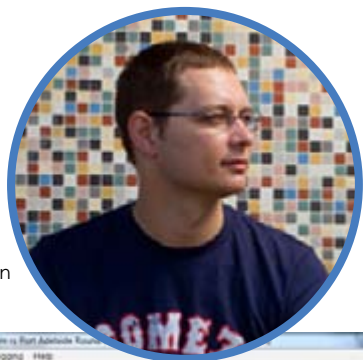
Data Analysis in the Australian Football League

The 2011 Victorian Branch seminar season closed with Karl Jackson's insider view on statistics in the Australian Football League (attendance - 21). Karl is a statistician with Champion Data, a Melbourne-based company that provides official AFL statistics to AFL clubs, the media, live broadcasts and on the internet. The AFL clubs, for example, use weekly reports from Champion Data to evaluate performance on key indicators.

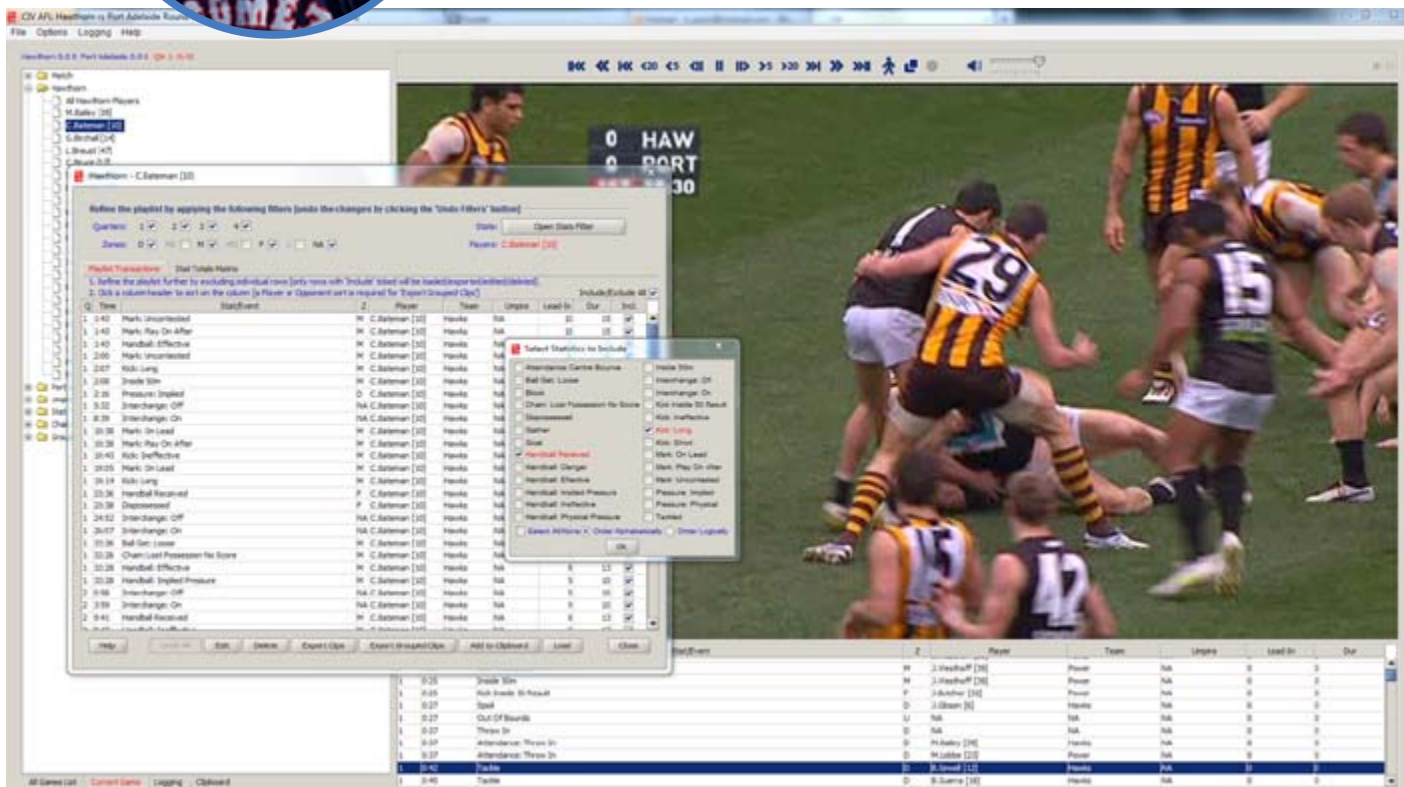
AFL fans will know that there is a vast amount of information available about AFL games. The data are collected live on game day by a team of ten highly trained people – 5 at the ground and 5 in the office. The main caller at the ground calls 3 to 4 thousand events per game – about one every two seconds. Other staff record information about interchanges, match-ups, locations of the called events, and off-ball action.

The resulting data includes information about at the match level (e.g. the result), the level of a chain of possessions (e.g. type of start to the chain), and at the transaction level (e.g. what type of event was it?). Additionally there is rich data about kicks, disposals, scores and so on. The data are stored as an R database.

After the match, AFL teams can access a range of resources that provide summaries and graphical displays of the data. The data can be linked with vision of the game for detailed analysis of individual players. AFL teams can be provided with detailed reports of the plays of upcoming opposition to help in planning match tactics. Teams can assess their strengths and weaknesses, and evaluate if they met their game plan.



Karl Jackson



For the most part, the AFL data are used descriptively, and good understanding of the data relies on good knowledge of the game. There is little formal statistical modelling involved. An important application of the data is in reviewing the state of the game. For example, a new substitution rule was introduced in 2011 where there are three bench players plus one substitute rather than the four bench players. The intention was to improve the efficiency of the game; changes in clearance rates, player fatigues and scoring were observed in the 2011 season. Analysis of this kind can reflect trends in the way the game is played at the elite level.

Karl has worked with the AFL to develop new approaches to analysis and new measures. Former AFL player and coach, Ross Lyon, described three phases in a game – contest (winning the ball), offence (using the ball) and defence (winning the ball back). Karl discussed the tailoring of measures and analyses to these different phases. He had developed an “advanced kicking measure” which assesses whether a kick hits the intended target and accounts for various features of the kick and play that reflect the difficulty of the kick.

Assessing the pressure applied by a team is important in the defensive phase. As there are many aspects to applying pressure in a game, measuring pressure is tricky; four different aspects, including application of physical pressure, are recorded. The differential between opposing teams in terms of measures of pressure can be examined to determine which team performed best in a particular phase of the game.

Karl's talk gave a fascinating insight into the world behind the statistics that are an integral part of watching an AFL game, and the understanding of the value of data in informing real world decisions. Mick Malthouse (ex-Collingwood coach) said “[data] provides us with the bridge between theory and reality. It is an integral part of our football analysis”.



Professor James Hanley

Sue Finch

Life expectancy after surviving the Titanic

The first meeting of the year initially seemed to be much the same as the past, with a speaker talking about another interesting topic, “A finely stratified log-rank test with effectively-infinite-size comparison groups”. Or if one preferred, the subtitle, “How long did their hearts go on? Survival analysis of the Titanic Survivors”, a fitting subject given the upcoming anniversary of the sinking of the Titanic. However this time around, the Victorian branch veered slightly away from the traditional seminar format, opting to have not one, but two speakers, who offered contrasting methodologies for the task at hand.

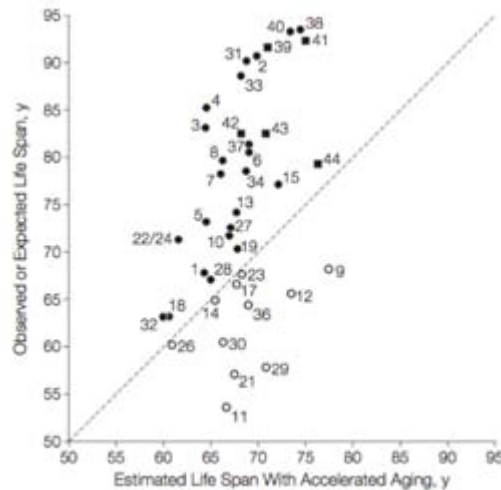
The first speaker was Professor James Hanley from McGill University in Montreal. Using a complete data set of all the passengers, with factors; gender, age, socio-economic class and survival status, the question to be answered was, did the survivors from the sinking of the Titanic have shortened life spans?

The first problem that needs to be addressed is, if you want to test for decreased life spans, decreased compared to what? The comparison group used by Hanley was a matched group of white Americans alive in 1912. To achieve this, he converted current cross sectional life tables into cohort life tables.

The first step of the analysis was, as always, to draw a graph. Hanley plotted the survival functions of the comparison groups against the the Titanic survivors, for the group as a whole, and also when taking into account the socio-economic classes and genders. To construct the survival function from the Titanic

population, Hanley first took the Heaviside survival function for each individual. That is, a function of time that is 1 until the time of death, and 0 afterward. Then by adding up all these Heaviside functions, and rescaling, you end up with the empirical survival function.

Once the survival functions were graphed it became clear that to the naked eye there is no discernible difference between the survival rates of the Titanic survivors and comparison groups. In fact, on average, Titanic survivors lived longer than the general population of the United States by 1.7 years. In addition to this, despite their higher socioeconomic status, first class male passengers did not live longer than similar age males in the general comparison groups.

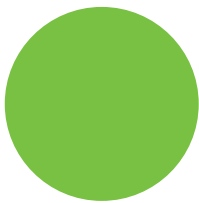
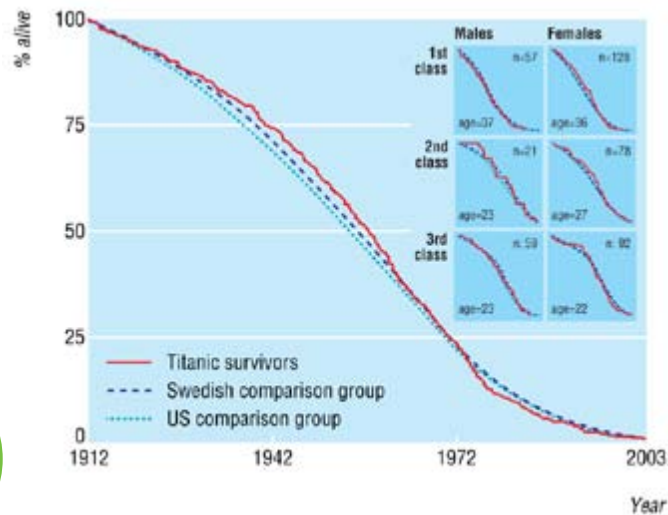


Following the graphical comparisons, Hanley also presented how to apply a stratified log-rank test to analyse the dataset. In conclusion, although unable to get a perfect comparison group, it appeared that Titanic survivors did not have noticeably different life spans to the general population.

Hanley also analysed the effect of a term of American Presidency on lifespan. There's a quote that says "The typical president ages two years for every year they are in office." The hypothesis being obviously that the stress of the job produces much wear and tear on the body resulting in premature aging.

Again the first step needed is to choose a reference population with which to compare US presidents. Hanley used life tables from France due to the reliability of the data during that era, and the fact that longevity of men in France and the United States is likely to be similar. Simple examination of the expected life expectancies compared to average observed values seem to show no noticeable difference in life spans after bearing office.





For a more analytical approach, Hanley applied a simple a simple model where the survival is essentially a product of hazard rates, and compared the empirical data with the comparison group. Overall the results seemed to show that for 8 years in office, the life expectancy did fall by approximately 3.2 years, far fewer than the hypothesised 8.

At this point Hanley finished his talk, and then came what I mentally titled the 'counter-talk'. Bendix Carstensen from the University of Copenhagen stepped up to offer a different methodology for analysing the Titanic data.

Firstly Carstensen discussed the merits of Lexis diagrams over regular life tables, and then began discussion about how to use a Lexis approach on the data at hand. He proposed to use a Standardised Mortality Ratio model, simply modelling the mortality rate of a Titanic survivor as constant multiplied by the mortality rate from the comparison group. Or equivalently, modelling the total lifespan as a function of covariates common to both groups, and then additionally multiplying this by another function of covariates if the person in question is from the Titanic.

Both methodologies have their relative merits and it was interesting to see two different speakers offer contrasting views on approaching the data set.

Han Gan

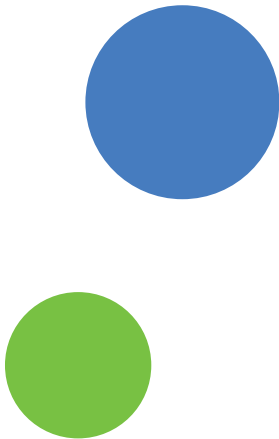
Characterising patient motion using hierarchical Bayesian modelling

In April Alan Herschtal, Senior Biostatistician from the Biostatistics and Clinical Trial Group at the Peter MacCallum Cancer Centre in East Melbourne, spoke about "Characterising patient motion using hierarchical Bayesian modelling: Finding the optimal statistical model to describe target motion during radiotherapy". Cancer patients who require treatment with radiotherapy (RT) must first undergo a "planning stage" during which the tumour volume position is defined relative to observable markers such as skin tattoos, and the contour of the radiation beam is adjusted to fit the tumour. During the "treatment phase" (every day for several weeks – each day is called a "fraction" of treatment, hence a "fractionated course" of radiotherapy) patients are placed on a couch and aligned relative to the previously positioned markers. However due to anatomical changes that occur from day to day, the position of the markers relative to the tumour may change. Hence to increase accuracy of

treatment, internal gold seeds known as fiducial markers are placed inside the tumour before treatment planning, and an OBI (On Board Imaging) device is used to determine the position of the fiducial markers – and hence the tumour – each day. This information can be used in order to re-align the patient relative to the radiotherapy treatment beams so that the treatment beams are aligned relative to the fiducial markers rather than relative to the external markers. The size and direction of the realignment can serve as a record of the amount of misalignment that would have occurred had alignment been to the external markers only, as was traditionally the case, rather than the internal fiducial markers. This generates a dataset of tumour misalignments, or position uncertainties. Alan further explained that to account for tumour position uncertainty, it is usual to place a margin for error around the tumour site. This presents an optimisation problem: A narrow margin results in parts of the tumour being under-dosed, and a wide margin results in healthy tissue being unnecessarily over-dosed. Obviously the size of the margin required to optimise treatment depends on the size of the misalignments. Several margin formulae or “recipes” have been published, designed to optimise the trade off the risks of under-dosing the tumour with the risks of overdosing the healthy tissue. These formulae generally decompose the uncertainty in patient position into two components: i) the preparation or systematic error (intuitively thought of as the standard deviation of the patient mean offsets) and ii) the treatment or random error (the mean of the standard deviation of patient offsets).

Early approaches to characterising errors in target displacement assumed that the underlying fraction-to-fraction variability in target displacement – i.e. the patient specific random errors – could be regarded as constant across patients. More recent approaches have modelled target displacement allowing for differences in the magnitude of the random error between patients. Until recently it has not been feasible to compare rigorously the goodness of fit of alternate models for random error, because the large volumes of real patient data necessary to distinguish between alternative models have only very recently become available. Alan presented the results of his analysis of displacement data collected from 365 patients undergoing radical radiotherapy for prostate cancer to compare five candidate models for target displacement. The simplest model assumes constant random errors across patients, while other models allow for random errors that vary according to one of several candidate distributions, including the log-normal, log-logistic, gamma and inverse gamma. Alan described a hierarchical normal model implemented using Markov Chain Monte Carlo simulation of the model parameters (in particular Gibbs sampling and the Metropolis algorithm) and methods to compare the goodness of fit of the homoscedastic and heteroscedastic models. There was strong evidence from the data that the heteroscedastic model provided a better fit to the data than the homoscedastic model, and the inverse gamma prior distribution for the variance parameters proved superior to other choices. The hope is that these results will facilitate more accurate margin recipes and correction strategies. The speaker outlined during questions the implications of his work for clinical practice.

Lyle Gurrin



WA BRANCH

In the first two meetings of 2012, the Western Australia Branch heard two engaging talks. At the AGM in March, Dr Ryan Admiraal from the School of Chemical and Mathematical Sciences at Murdoch University presented a talk entitled "Assessing the Consistency of Ego Reports of Dyadic Outcomes with Applications to Fertility and Sexual Partnerships." This talk examined a common problem in the analysis of demographic surveys—men and women are commonly queried about mutual events such as children or sexual partnerships, but descriptive statistics suggest significant disparities between men's reports and women's reports on these shared events.

Ryan presented a small number of possible reasons for these disparities. These included sampling variability, sampling bias (e.g. sampling from overlapping but non-identical populations) intentional misreporting (e.g. males inflating number of sexual partners, females underreporting number of sexual partners, males failing to report on certain children because of failure to pay child support), and different approaches to counting. He then presented a loglinear modeling approach that can be used to assess whether or not there are inconsistencies in male and female reports of shared outcomes and, if so, where these inconsistencies occur so that researchers can more easily determine where further investigation into the reasons for this will be most productive. This approach modeled a "mixing matrix" of counts of partnerships (or children) between men and women of certain characteristics (such as age, race, education level) in terms of the characteristics and interactions with the sex of the individual. A reparameterisation of this model could then be used to immediately highlight where inconsistencies were evident (e.g. between males and females of certain races, certain ages, certain ages of certain races, etc.).

Because such methods are typically applied to survey data where stratified sampling and cluster sampling are commonly employed, Ryan explained how sample weights could be incorporated into analyses for both stratified and cluster samples. This required the use of replication-weight methods to produce correct variances for parameter estimates. He rounded out the talk with two applications, one assessing the consistency of male and female reports of sexual partnerships by race in the 1992 National Health and Social Life Survey, and the other assessing the consistency of male and female reports of number of children by birth years of the mother and father in the 2002 National Survey of Family Growth.

During April's meeting Dr Alethea Rea, a Consultant Statistician at Data Analysis Australia, gave a fascinating talk entitled, "Statistical Phylogenetics with Nets and a LASSO". She began by explaining to the non-biologists in the audience that phylogenetics is the estimation of evolutionary relationships between a set of taxa based on genetic data, using the diversity in species today to answer questions in the past. Initially she took a biologist's standpoint, asking how one might discover which species are most closely related. She then demonstrated how statistics can be used to help answer such questions, using a case study to show the phylogenetic relationships between robins and tomtits.

A typical approach for statisticians is to adopt trees to represent the evolutionary relationships of a set of taxa. The case study used a sample of the DNA of 19 robins and tomtits to build up a phylogenetic tree of the birds, which clearly showed a separation of the two species, although they were quite closely related. This raised the interesting question that Alethea posed, "If endangered species are closely related to another species that is not, are they really worth the time and effort of saving compared to species with no close living relative?"



Wonderful West Wittering - Happy Couple
Photo: Gareth Williams

After showing us the typically used tree to represent the relationships between robins and tomtits, Alethea highlighted that trees assume that evolution is simply a branching process, whereby species are constantly evolving into new and separate species. However in reality, it is possible for genetic material to recombine. It is for this reason that the idea of a 'network of life' rather than a 'tree of life' is becoming increasingly popular.

Phylogenetic networks can be seen as a mixture of trees and can capture information on recombination that trees cannot. Alethea presented the Neighbour-Net technique also using the robin and tomtit case study, which highlighted the powerful visual information provided in terms of taxa groupings, the distances between the groups and the uncertainty in the data. She took the audience through the steps in creating a network (which used a nearest neighbour clustering approach to create splits between taxa) and also how to interpret them.

Alethea also demonstrated how a positive LASSO approach to regression could be used for inferring split networks and how increasing the number of splits used can reduce the sum of square of the residuals, although after a point no further improvement is seen in the model fit. Alethea went on to show how these techniques can be extended to other interesting application areas using examples of linguistics and financial markets.

Hana Sakai and Ryan Admiraal



Robin - Titchwell Marsh North Norfolk
Photo: Trevor Hannant

SSAI'S NEW MEMBER-GET-A-MEMBER CAMPAIGN

SSAI's 'Member Get a Member' program offers an outstanding financial incentive for existing members of SSAI to introduce new full members. With each new full member you introduce, you receive a 25% reduction on your next year's membership: introduce four new full members and your membership next year will be free!

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Every time you recruit a new member, you strengthen the SSAI. A vital and growing SSAI means greater recognition of the statistical profession, improved educational and networking opportunities for all members, and the advancement of statistics worldwide.

There are several ways you can help the SSAI grow:

You can simply provide us with the name and contact details of the potential member and we'll send them a membership information package.

You can print out a membership application and give it to the prospective member. Please note your name in the "Referred By" space before you hand over the form.

You can direct them to the SSAI website where the prospective member can join online right away!

Tips on recruiting new members

- Invite a prospective colleague/student to attend a Branch meeting to experience first-hand the professional benefits of SSAI membership.
- Start a discussion about your SSAI membership, emphasising the benefits and value. If you think a brochure might be helpful, the SSAI office can provide you with some leaflets.
- If you receive the Australian and New Zealand Statistical Journal in hard-copy, keep some issues on display to attract the eyes of potential new members.
- Publish an article in your organisation or university publications explaining how SSAI helped you.
- Post announcements of SSAI meetings/conferences/workshops/webinars.
- When discussing membership with a prospective member, listen for clues as to what they look for in a professional society. Stress those member benefits that meet their needs.
- Coordinate an event at your place of employment with the administrative support of SSAI.

The SSAI would like to thank Michael Adena and his team at "Datalytics" for sponsoring the printed version of the newsletter. Their generosity is much appreciated.