



The Statistical Society of Australia News



THE NEED FOR SPEED: 2012 BELZ LECTURE

Victorian Branch News

The October meeting was the occasion for the Branch's annual lecture and dinner in honour of Maurice Belz, foundation Professor of Statistics at the University of Melbourne. This year's Belz lecture was given by Professor Chris Wild of Auckland University who spoke on 'The Need for Speed'. In his talk Chris described a rapidly increasing awareness of the so-called "data deluge": the explosion in quantities of data being collected, the explosion of settings in which it is being collected, and expansions in the conceptions and scope of what constitutes data. This is accompanied by advances in ways of visualising data, and it is consequently imperative to find ways to get students much further, much faster and with better comprehension – a quantum leap in ambition – and what can make this possible are some of the same things that gave rise to the deluge, computational power and clever software.

Chris proposed strategies that envisage maximising awareness and excitement about data and what it can do for you and only later back filling details. He discussed why this might be advantageous and noted principles involved in identifying what matters and what can, or should, be jettisoned. He also demonstrated two software projects aimed at helping enable such a future, by providing statistical insight and supporting visual inference.

Service Award Also at the October meeting, a Service Award from the Society was presented to Brian Phillips, a long-standing member of the Victorian Branch who served on the Branch Council for eight years including two as President. Brian was a key member of the local organising committee for ASC 2008, and involved also in the ICOTS (International Conferences on Teaching Statistics).

The award is in recognition particularly of Brian's role as initiator of the OZCOTS (Australian Conference on Teaching Statistics) and his involvement in its further development and integration with ASC, as well as of his other contributions, local and international, to the discipline of statistical education.

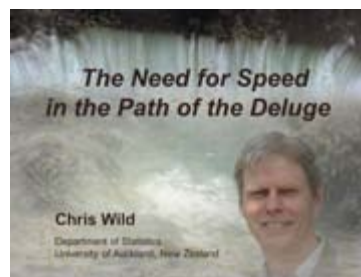
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Brian Phillips and Chris Wild

Michael Phillips



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SSAI

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

**DEADLINE FOR NEXT NEWSLETTER
10 February 2013**

EDITORIAL

The newsletter includes several full page advertisements about events coming up in 2013. As well as the International Year of Statistics and Mathematics of Planet Earth, the Australian Mathematical Sciences Institute runs various programs of interest to Society members. Please feel free to print off these ads and place them on noticeboards in your area; or email relevant pages to colleagues and save paper. Let's spread the word about these activities and generate some interest in our profession!

Do keep in mind the different ways in which the Society is now keeping in touch with its members. We're delighted with the number of reports of Branch meetings in this issue. They have been the traditional way for members in a single locality to meet and share knowledge and now that ASC is past and (in southern states) the spring weather is coming along, the Branch meeting calendar is pretty full across the country.

On the other hand the webinars are a way for members around the country, and the world, to share knowledge in a virtual meeting. Recent meetings have attracted between 30 and 50 registrations so you're not alone when you tune in. The newsletter will of course carry reports of these virtual meetings as well as the face-to-face ones.

The Society's blog at <http://statisticalsocietyaustralia.wordpress.com> offers you another way to express your views on matters statistical. Each month a question is posed – so far the Environmental Statistics Section started a debate about “How are statisticians engaging in the debate about climate change, in Australia and globally?”; the Surveys and Management Section asked “What are the issues and challenges in conducting surveys based on hybrid data collections and what can we do to address these?”; and the Statistics Education Section asked “What strategies or activities should the SSAI and the Statistics Education Section take to support and improve statistics education in schools and universities?”. Responses have been limited so far and it would be great to listen in to a lively discussion of these and other topics posed by other sections.

Finally at the end of another year, the Editors would like to take this opportunity to wish all Society members a happy Christmas, and a pleasant New Year. We would also like to thank all those who have contributed to the newsletter, whether by writing reports, taking photos or entering competitions. Thank you also to the organisations who have supported the activities of the Statistical Society and its members – your input into successful Society activities is much appreciated. In particular, we would like to thank the ABS for hosting the SSAI office in ABS House in Canberra.

Alice Richardson



and **Michael Adena**



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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

EVENTS

NEW ZEALAND MATHEMATICAL SOCIETY COLLOQUIUM

4 – 6 December 2012

Palmerston North, New Zealand

www.nzmathsoc.org.nz/colloquium/

AUSTRALASIAN APPLIED STATISTICS CONFERENCE (GENSTAT AND ASREML)

(Formerly known as the Australasian GenStat Conference)

4-7 December 2012, Queenstown, New Zealand.

STATISTICS IN PLANNING AND DEVELOPMENT: BANGLADESH PERSPECTIVE

27-29 December 2012, Dhaka, Bangladesh

For more information please contact arsikderbbs@yahoo.com

YOUNG STATISTICIANS CONFERENCE 2013

7-8 February 2013, Melbourne

NATSTATS 2013

12-14 March 2013, Brisbane

12TH NATIONAL RURAL HEALTH CONFERENCE

7-10 April 2013, Adelaide

THE 59TH WORLD STATISTICS CONGRESS

25-30 August 2013, Hong Kong, China

20TH INTERNATIONAL CONGRESS ON MODELLING AND SIMULATION (MODSIM2013)

1-6 December 2013, Adelaide

ASC 2014

7-10 July 2014, Sydney

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FROM THE PRESIDENT

Hello members

As I was travelling home on the City Cat yesterday evening, I gazed at the scenes passing on either side of the Brisbane River and thought how fortunate we are to be part of a profession that is able to be involved in so many important aspects of our daily lives and aspirations. In addition to contributing to fundamental knowledge in mathematical sciences, as statisticians we are integral to the success of infrastructure and dynamics of the city, health and medicine related to the hospitals, the ecology and quality of the urban environment, education in the schools, finance and economy, and diverse endeavours of the many businesses and government agencies.

Our Society plays a proud role in the community of statisticians in Australia. We aspire to be a professional society that furthers the advancement of the field of statistics in its broadest sense, and the appreciation and use of statistics. Equally, we aspire to support those working in the field of statistics. As our 50th year draws to a close, we can feel justifiably proud that SSAI is achieving these aspirations.

We have a healthy Society in terms of financial viability, high membership levels and a strong member focus. The life in the Society is evidenced by the many activities held at national, Branch and Section level this year, as highlighted in this Newsletter and on the SSAI website. In addition, during this past year we have critically reviewed and revised the SSAI Central, Branch and Financial Strategic Plans, developed vibrant social media and (soon) a new website, instituted a new SSAI Golden Jubilee Travel grant for student members, created a Meet Market blog for potential employees to connect with potential employers, (<http://statisticalsocietyaustralia.wordpress.com/2012/08/07/job-opportunities-for-statisticians/>) and commenced a series of monthly e-questions posted by our Sections to generate discussion among members (<http://statisticalsocietyaustralia.wordpress.com/2012/11/20/november-question/>). We are also finalising the 50 Year Timeline for SSAI, which will be posted on the website soon; if you have any interesting information that we could include (stories, photos, anecdotes, past activities or perspectives, etc), please send it urgently to eo@statsoc.org.au.

Of course, the continued health of SSAI relies critically on all of us as members. It is up to us to grow the Society at both Branch and national levels, and stay relevant to our profession and the wider community. To those members who have stepped up to take on key roles in the Society this year; thank you.

Looking forward, 2013 is already shaping up to be a very active year. Two highlights are as follows. First, on a national stage, the Young Statisticians Conference (YSC2013) will be held in Melbourne in February. This conference provides a unique opportunity for early career statisticians to meet and interact professionally and socially. If you are a Young Statistician (and the definition is quite broad!) and you haven't already registered for the conference, please consider attending. See the website <http://www.ysc2013.com/> for more details. Second, on an international stage, SSAI will be playing a major role in the Mathematics of Planet Earth and International Year of Statistics events. We will be holding activities through the Sections and Branches, and engaging with other Societies and Institutes to promote our profession. If you are aware of events that could be included in either of these endeavours, please let us know



Kerrie
Mengersen

so that we can share them with the wider community. I also welcome any comments that you might have about the Society in general, or its activities and endeavours in particular.

Finally, to all members I wish happy religious and New Year celebrations. Here's to the next 50 years of SSAI!

Kind regards

Kerrie

TERRY SPEED AWARDED VICTORIA PRIZE FOR SCIENCE AND INNOVATION

Congratulations to Terry Speed, Head of the Bioinformatics Division of the Walter and Eliza Hall Institute and leader of a research group at the University of California at Berkeley. Terry was awarded a 2012 Victoria Prize by the Victorian Minister for Innovation, Services and Small Business Louise Asher in November 2012.

His citation reads:

Professor Terence (Terry) Speed

Professor Terry Speed is a world leader in bioinformatics.

For over 20 years his research has focussed on helping to increase our understanding of infectious disease, the immune system, heritable human diseases and cancer.

In the last four decades, while working and teaching in universities in Australia, the UK and the USA, within CSIRO and more recently heading the Bioinformatics Division at Walter and Eliza Hall Institute in Melbourne, Professor Speed has built a record as one of the strongest statisticians Australia has ever produced.

For the past few years he has been the world's most cited mathematician and Australia's most cited researcher in his field.

Together with his students and colleagues, Professor Speed has developed methods of analysis now in daily use in research laboratories worldwide underpinning many of the recent advances in medical research.

His work has enabled scientists to accurately tell which genes are being turned on in a cell, how much each gene is being turned on and what sort of transcripts are being produced.

This work has helped to identify areas of the human genome that contribute to cancer, genes that are vital for embryonic development and pinpointing malaria proteins responsible for initiating infection in human red blood cells.

In many ways, Professor Speed has been a shield against bad science. Without rigorous and practical analytical methods, the data obtained from new genomic technologies can be meaningless. Incorrect statistical analysis can lead to research and trends for new treatments heading down the wrong road, leading to a waste of money and putting patients at risk.

He is a Fellow of the Australian Academy of Science, was awarded the NHMRC Achievement Award for Excellence in Health and Medical Research in 2007 and an Australian Fellowship in 2009. Most recently he was presented with the 2012 Thomson Reuter's Citation Award. According to his colleagues, he is a living Australian treasure.

For further details, including media coverage, see

http://www.wehi.edu.au/site/latest_news/solving_big_research_questions_with_statistics_wins_2012_victoria_prize and

<http://www.theage.com.au/national/gene-data-guru-and-stormwater-expert-win-top-prize-20121121-29q5v.html>

YSC2013

The countdown is on to the premier event on the YS calendar – YSC2013! Just a reminder that earlybird registration closes on 2nd January 2013, and poster abstract submission closes on the 18th January (notifications are being sent fortnightly). Thank you to everyone who has already submitted an abstract – the program is looking great! You may like to check out the website (ysc2013.com), or subscribe to the mailing list/twitter feed to stay up to date.

With the jubilee celebrations winding down, the focus turns to the future of Young Statisticians. I believe we will continue to be an integral and vibrant part of SSAI. Already, where there is an SSAI committee a YS member is on it! Additional benefits will be offered to early career members, particularly full paying members. We have some ideas in the pipeline, but please send any suggestions to either Marie-Louise or myself - we are constantly striving to improve membership value.

Finally, I would like to thank all the Young Statisticians that have selflessly given of their time and energy this year – the Branch YS reps, YSC2013 committee members, assistant section chairs and various committee members. Your efforts are so appreciated, and a lot of what makes SSAI great would not be possible without you!

Susanna Cramb





John Croucher



The Statistical Society of Australia wishes to join with Macquarie Graduate School of Management to congratulate Professor John Croucher, one of a select group of inspiring academics awarded a 2012 Citation Award for Outstanding Contribution to Student Learning by the Australian Government.

Announced on Monday, 17 September 2012, by The Minister for Tertiary Education, Senator Chris Evans, The Citation Awards recognise individuals from across Australia. They salute academic and professional staff for their roles in developing innovative programs, including new teaching models, to improve student experiences and learning.

Professor John Croucher was recognised for "outstanding leadership in the design and implementation of sustainable resources, curricula and services that greatly enhance the student experience."

This is the third time John has received a teaching award from the Australian Government along with another special award from the Federal Minister for Education. He has also previously received the Excellence in Education Award, Community Outreach Award, Distinguished Alumni Award and several outstanding teacher awards, including internationally. In 2011 he was awarded his third PhD, this time an honorary doctorate from Papua New Guinea for his "services to humanity" in that country.

Senator Evans Said: "These Citation Awards re-affirm the crucial role teachers and staff play delivering quality education and improving the student learning experience in Australian universities.

"A university education is about more than text books and exams, and these initiatives will improve the overall learning experience which is necessary for students to participate in higher education."

MODSIM 2013
20th International Congress on Modelling and Simulation

- Streams
- Plenary Speakers
- Organising Committee
- International Advisory Board
- Program Committee and Editorial Board
- Important dates
- Congress venue
- Accommodation options
- Contacts

asor DORS

Adapting to change: the multiple roles of modelling 1-6 December 2013 ADELAIDE, Australia

Welcome

We are pleased to announce that the **20th International Congress on Modelling and Simulation (MODSIM2013)** will be held at the Adelaide Convention Centre in Adelaide, South Australia, from Sunday 1 to Friday 6 December 2013.

ASOR (the Australian Society for Operations Research) and DORS (the DSTO led Defence Operations Research Symposium) will be joining us at MODSIM and running Streams in their topic areas.

The theme for this MODSIM2013 event will be **Adapting to Change: the multiple roles of modelling.**

Delegates are responsible for booking their **own accommodation** and should **book early** to avoid disappointment.

Recent news

Call for sessions: we are now calling for proposals for session topics for MODSIM 2013. Please send a title, one paragraph or more description along with your contact details to congress convenors John Boland and Julia Piantadosi (modsim2013@unisa.edu.au)

SOCIAL STATISTICS SECTION

This part of the year has seen more attention on statistics in society, with the election of Barack Obama for President of the United States for another term. Elections are always an exciting time for statisticians as the country or the world turns to watch our work with bated breath, but in this election analyst Nate Silver grabbed headlines and book sales by using Bayesian meta-analytic methods to interpret the results of polls more accurately than any veteran experts.

Locally, charities in Australia reported that more Australians than ever are below the poverty line, turning attention to how such statistics are calculated and calling on the statistical community to describe the social makeup of Australia with clarity and enthusiasm.

Several events are being planned to the 2013 SSAI calendar, so now is the time to submit ideas for workshops, lectures or professional development programs.

Jegar Pitchforth

CSIRO MATHEMATICIANS IN SCHOOLS PROGRAM

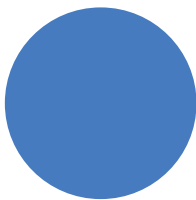
Throughout the Australian Statistical Conference in Adelaide this year, there were frequent references to the need for statisticians to reconnect with our communities, to communicate the relevance of our profession more effectively. The CSIRO Scientists and Mathematicians in Schools program represents an excellent opportunity to achieve this by providing a channel for us to work directly with the next generation of statisticians and scientists, and help them understand the importance of our research discipline.

The program is still in its infancy, and seeks to engage young students with mathematics and statistics as a discipline in its own right. Statistics researchers at all levels have something to offer the program, from a six week course to a simple hour-long lecture. In many cases young students have never been exposed to anyone working with statistics directly, and it can be inspiring to one's own work to see young people so excited about the methods we deal with daily.

So far the Scientists and Mathematicians in Schools program has seen fantastic success, with the federal government recently pledging an extra \$6 million toward its development. SSAI members have already been involved as volunteers and the Society is seeking to develop our relationship with CSIRO further through Mathematicians in Schools among many other initiatives.

If you are interested in becoming part of the "Mathematicians in Schools" program, email your local state representative, whose contact details are found at www.scientistsinschools.edu.au/contacts.

Jegar Pitchforth



BAYES ON THE BEACH 2012

At the beautiful beachside setting of Shearwater Resort, Kings Beach on the Sunshine Coast this year, we held Bayes on the Beach 2012, the 9th International Workshop for the Australasian chapter of the International Society for Bayesian Analysis (ISBA) and the annual meeting of the Bayesian section of the Statistical Society of Australia, Inc. (SSAI).

We received key note addresses on the following topics from renowned national and international keynote speakers:

Professor Dave Woods from the University of Southampton, UK reviewed the use of decision-theoretic design of experiments for model discrimination. The use of expected loss, and the Penalised Model Discrepancy criterion were presented and compared with existing approaches.

Professor Matt Wand from University of Technology Sydney, discussed the application of semiparametric regression involving flexible basis functions such as splines and wavelets, to data continuously collected in real time. Data were processed as it was collected and made immediately available online.

Professor Kim Anh-Do from MD Anderson Cancer Centre, Texas, US, presented an integrative Bayesian analysis of genomics (iBAG). This method uses a hierarchical modelling approach to integrate multiple platforms as well as the biological regulatory networks underlying them into one model to discover genes important to patients' clinical outcomes.

Contributed sessions were given by several other distinguished speakers over the three-day conference, and two poster sessions were a major component of the conference presentations. This allowed presenters from a wide range of backgrounds to cover diverse applications of Bayesian methodology. In addition, daily workshops allowed conference attendees to work in groups to brainstorm solutions to three different practical problems and to present their ideas to others.

The open, collegial atmosphere of the conference was heightened by a multitude of activities, including fine beachside cafes and dining, walks along the beach, swimming, pools, group games, bursts of singing and prize-giving sessions.

The conference was organised by the Bayesian Research and Applications Group (BRAG) at Queensland University of Technology. We thank and acknowledge our sponsors, including the Australian Mathematical Sciences Institute (AMSI), the Commonwealth Scientific and Industrial Research Organisation (CSIRO) and Queensland University of Technology (QUT).

Jannah Baker, Nicole White, Matt Moores, Dow Jaemjamrat, Kerrie Mengersen
Bayes on the Beach 2012 organisers



ANNETTE DOBSON AWARDED MOYAL MEDAL

We are very pleased to announce that long-term member Annette Dobson has been awarded the Moyal medal for 2012. The Moyal Medal is awarded annually by Macquarie University for research contributions to mathematics, physics or statistics, the areas of research of the late Professor José Enrique Moyal who was Professor of Mathematics at Macquarie University from 1973 to 1977.

Annette is Professor of Biostatistics in The University of Queensland School of Population Health and Director of the Australian Longitudinal Study on Women's Health, and is well known in the Australian biostatistics community and internationally for her contributions to biostatistical methodology, practice and education, including her involvement with the Biostatistics Collaboration of Australia from its inception. She was made a Member of the Order of Australia in 2010, for "service to public health and biostatistics as a researcher and academic, particularly through the collection and analysis of data relating to cardiovascular disease and women's and veterans' health".

The Moyal Medal was awarded at Macquarie University on 4 October 2012, where Professor Dobson delivered the Moyal Medal Lecture on "Statistical Challenges in Longitudinal Epidemiological Studies". The underlying theme of the lecture was causality – a subject also of interest to J.E. Moyal, who published an article "Causality, Determinism and Probability" in the journal *Philosophy* in 1949. The lecture used some fascinating examples from the Australian Longitudinal Study on Women's Health to illustrate the difficulties researchers face when trying to establish causality. The Statistical Society of Australia extends its warmest congratulations to Annette for this very well deserved award.

Sally Galbraith



Annette Dobson receiving the 2012 Moyal Medal from Professor Jim Piper, Deputy Vice-Chancellor Research at Macquarie University.

Photo courtesy of Christine Hale, Macquarie University.

CSIRO ANNOUNCES ITS NEW DIVISIONAL CHIEF OF MATHEMATICS, INFORMATICS AND STATISTICS (CMIS) – DR BRONWYN HARCH

Dr Bronwyn Harch has been appointed as the new Chief of CSIRO Mathematics, Informatics and Statistics, replacing Prof Louise Ryan who has taken up the post of Distinguished Professor in the School of Mathematical Sciences, University of Technology, Sydney.

Bronwyn joined CSIRO in 1995 as a Postdoctoral Fellow and during the past four years has been the Deputy Chief of CMIS and more recently the Deputy Director of the Sustainable Agriculture Flagship.



Bronwyn Harch

She holds a PhD in Statistics from the University of Queensland, is an Elected Member of the International Statistical Institute, an Accredited Member of the Statistical Society of Australia Inc., President-Elect of The International Environmetrics Society, Co-Chair of the Environmental Statistics Section of the Statistical Society of Australia Inc., Adjunct Professor at Griffith University and a Distinguished Research Professor at the Chinese National Administration of Surveying, Mapping and Geoinformation.

As Deputy Director of the Sustainable Agriculture Flagship, Dr Harch has managed multi-Divisional programs and a range of government and industry relations. Her main focus has been engaging the agri-environmental information sciences (maths, stats, informatics and ICT) into the outcomes needed by government and industry for increasing agricultural productivity whilst also minimising any associated environmental impacts.

As leader of the mathematical sciences in CSIRO, she looks forward to fostering relationships with fellow mathematicians and statisticians in academia, government and industry – both nationally and internationally. Bronwyn's career at CSIRO has combined her passion for the environment and agriculture with her mathematical sciences skills. She has had the opportunity to work on the big, high impact projects in these areas and beyond.

Her research focus has been on the statistical design of landscape scale sampling protocols and monitoring programs, as well as the statistical modelling of complex landscape systems. She has led a number of major statistical projects within large multidisciplinary landscape-based studies. More recently she has been working on impact evaluation – getting beyond the use of science citation metrics for tracking the benefits of research investment for government, industry and for building multidisciplinary scientific capability.

Dr Harch has been recognised outside CSIRO for her contributions, including receiving two separate points of recognition at the 2010 Women in Technology Awards.

She says it's an exciting time to be leading CMIS, the research division that serves as CSIRO's capability home for the mathematical sciences.

"Mathematical sciences provide key capability for addressing the critical issues facing Australia and its place in a global context, which is evident through the high level of engagement of the mathematical sciences across all the domain areas, as well as its science achievements and impacts benefiting industry, government and the information sciences community.

Bronwyn will be providing direction in areas including big data analytics, data visualisation, biological animation, fluid flow modelling, statistical modelling, as well as model-data fusion and says "while there is no question that CMIS proudly upholds our strong tradition of science and industry engagement excellence, we are acutely aware of the need to adapt and evolve in response to the rapidly changing world in which we operate".

Dr Bronwyn Harch commenced her new role as Chief of CSIRO Mathematics, Informatics and Statistics on 8 October 2012 and will be based in Brisbane at CSIRO's Ecosciences Precinct.

<http://www.csiro.au/Organisation-Structure/Flagships/Sustainable-Agriculture-Flagship/BronwynHarch.aspx>

SURVEYS AND MANAGEMENT SECTION

At the end of September, the Surveys and Management Section organised a workshop on Panel Survey Design, being the second in its Canberra series of "How to Get Value from Panel Surveys". Further sessions will cover nonresponse, data quality assurance, visualisation and integrating panel data into policy analysis.

The annual CSSM – ABS methodology seminar was held in mid-October. The seminar reviewed the analysis of panel surveys and was notable for the views of the new head of ABS Methodology on shifting the balance of production from survey to administrative sources.

The Section has begun talks with Canberra Branch on holding a two day national seminar on statistical methods in public policy the first half of next year. Section activity beyond Canberra is a priority in planning, and we are looking forward to views and interest on this point.

The Section maintains a web page, and produces a newsletter; both of which invite contribution from interested members.

Stephen Horn

LOOKING FOR A JOB?

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

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

Do you have a job to advertise on the website?

Email a position description to eo@statsoc.org.au. Listing is free!

Thinking Statistically

Elephants Go to School

A UNIQUE TEXTBOOK

By
Sarjinder Singh

Reviews:
Collins Carbno, *Technometrics*,
2007, 49(4), 496.
Marcin Kozak, *Statistics in
Transition*, 2006, 7(6), 1407-9.

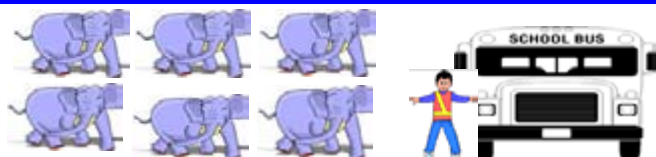
Forewords by
David Robinson
and
Stephen Horn

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Second announcement for The 2013 International Conference on Statistics and its Interactions with Other Disciplines (SIOD 2013)

HoChiMinh City, Vietnam, 5 – 7 June 2013



organized by
 Université de Moncton, Canada
 Ton Duc Thang University, Vietnam
 University of Science HoChiMinh City, Vietnam
 University of Economics and Law, Vietnam
 Can Tho University, Vietnam



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<i>Tran Ngoc Lien</i>	<i>Nguyen Duy Nhat</i>
<i>Le Thi Thanh Loan</i>	<i>Vo Van Tai</i>
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<i>Nguyen Van Nhan</i>	<i>Le Anh Vu</i>

The International Conference **STATISTICS AND ITS INTERACTIONS WITH OTHER DISCIPLINES (SIOD 2013)**, to be organized in HoChiMinh City, on June 5, 6, and 7 / 2013 will provide a forum for all researchers, as well as educators, working in the statistical science field itself, or in disciplines using statistical methods, to present their work, and get to know other researchers as well. Through direct contacts they will broaden their views of statistics, as a science and an art, in the spirit of the celebration around the world of 2013 as the International Year of Statistics. In particular, a section of the Conference will be devoted to Teaching Statistics. **SIOD 2013** is sponsored by **ISBA, ISBIS, Minitab, TD Bank**, and several other organizations.

LOCATION: SIOD 2013 will be held in HoChiMinh City, Vietnam.

WORKSHOPS AND OTHER ACTIVITIES: One pre-conference workshop in **Bayesian Statistics**, conducted by Prof. Christian Robert, Dauphine Univ., France and one post-conf. one in **Teaching basic statistics with a software** (Minitab), conducted by Prof. T. Pham-Gia, U de Moncton, Canada. Registration to either / or both of these workshops is required.

Also, a round table panel discussion on "**Teaching statistics to non-mathematics students**" will be held, organized by Prof. J. Borkowski(Montana State, USA), with a distinguished panel. Suggestions for other workshops, activities and special invited session are welcome, by writing to the conference chair. Details are provided in the Conference website.

A **Poster session** will be held during the last two days of the Conference.

TOPICS: Topics of interest include:

- | | |
|--|------------------------------------|
| Bayesian Statistics | Health and Medical Statistics |
| Bioinformatics | Image Processing |
| Theoretical Statistics | Nonparametric Statistics |
| Chemometrics | Portfolio Management |
| Computational and Graphical Statistics | Pricing and Hedging of Derivatives |
| Data Mining | Reliability |
| Design of Experiments | Sampling Techniques |
| Integrating Market and Credit Risk | Six Sigma |
| Multivariate Analysis | Statistical Modeling |
| Teaching Statistics | Statistical Process Control |
| | Didactic Approach for Statistics |

IMPORTANT DATES:

Registration begins on June 30/2012 and ends on April 15/2013. **PLEASE REGISTER EARLY**
Dec 1, 2012: Deadline for early bird registration **March 15, 2013:** Abstract submission deadline

REGISTRATION & ABSTRACT SUBMISSION: Registration for the Conference, as well as Abstract submission, must be made electronically by March 15, 2013, only via the SIOD 2013 submission system, at <http://siod.tdt.edu.vn>

SPEAKERS: Keynote and Invited speakers: **Christian Robert, Arjun Gupta, Yadolah Dodge, Thu Pham-Gia, Lanh Tran, Marc Hallin, Le Thi Hoai An, Arthur Dryver, Beatrice Laurent, Steven Gilmour, Timothy O'Brien, Benoit Truong**, and several others (cf. our website).

REGISTRATION FEE: Estimated fee is US\$200 (accompanying persons US\$50). The registration will cover conference materials, coffee breaks, a welcoming cocktail, a conference dinner and a city tour.

TOURS: Can Tho University will host a free tour of some "green places". Tours of the Mekong Delta, as well as of other parts of Vietnam (Halong, Hanoi, Hue, Nhatrang, Danang, etc.) are available. Please consult our website.

PUBLICATION: A CD giving all the abstracts of the communications, lectures and invited lectures delivered at the Conference will be handed out free of charge at registration. An extended version of your paper may be submitted in pdf (only), to be included in the CD.

Coming Soon

AMSI AGR National Seminar Series



AMSI, in partnership with the national mathematical organisations AustMS, ANZIAM, SSAI, ANZAMP and ASOR, is initiating a nation-wide seminar series over the Access Grid Network. The seminar series will feature eminent experts in their field from Australia and overseas. It will offer a range of accessible and very high quality seminars for the broader mathematical community in Australia.

Find out more:
www.amsi.org.au/AGR-national-seminar-series

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).

A collaboration of





The Maths of Planet Earth Australia Launch

and

SIMONS FOUNDATION

Public Lecture

Opening Address **Professor Ian Chubb AC**, Chief Scientist and
Public Lecture *The challenge of sustainability and the promise of mathematics*
by **Simon Levin**, Princeton University

5:45pm – 7:00pm, Tuesday 29 January 2013
Sidney Myer Asia Centre, The University of Melbourne

More information
www.mope.org.au/events/mpe-launch-and-simons-mpe-public-lecture/

International Year of Mathematics of Planet Earth

Scientific societies, universities, research institutes, and foundations from around the world have banded together and dedicated 2013 to the Mathematics of Planet Earth.

AMSI has partnered with societies and organisations across Australia to

highlight the role mathematics and statistics play in today's society.

The year will put Australian research on the global stage in a bid to answer and understand some of the world's toughest questions.

www.MoPE.org.au

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.





Call for bloggers

2013 marks the International Year of Maths of Planet Earth and the International Year of Statistics

We are looking for guest bloggers to help us get the word out about the beauty in and application of mathematics and statistics in the world around us! One blog or a series of blogs, whatever your time allows.

Do you model transport networks, analyse medical data, study extinction patterns in endangered species, use statistics for economic forecasting, predict weather patterns, look for patterns in gene sequencing...? Whatever

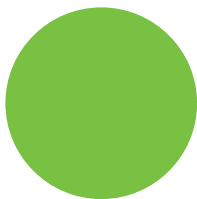
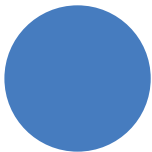
your application of statistics we want to hear from you.

A perfect opportunity to showcase your research or teaching. Demonstrate the limitless applications of mathematics and statistics; **Inspire the next generation.**

Interested, or want more information? Contact Simi: simi@amsi.org.au

Don't have time to write a blog post? But have a great idea for a post? Contact us.

www.MoPE.org.au



SSAI'S 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!

No one knows the benefits of membership with SSAI more than you, our members! Consider sharing your SSAI membership experience and get rewarded for doing so. Through the Member-Get-a-Member program, the SSAI will reward your efforts.

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 "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.

SCIENCE MEETS PARLIAMENT 2012

Back in September, I represented the SSAI at 'Science meets Parliament' in Canberra, organised by Science and Technology Australia. Attended by scientists from around fifty professional organisations, this two day workshop provided an insight into the working relationships between science, politics and the media. On day one, we heard from journalists about getting our science heard, followed up with a tutorial on the 'art of lobbying', by the Australia Institute's Richard Dennis. After a gala dinner attended by both scientists and MPs, day two was all about putting our new skills into practice, meeting with Parliamentarians to discuss our research. My group had the pleasure of meeting with Senator Alan Eggleston, and we discussed the importance of continued funding for health and medical research.

As an early career researcher, I found Science meets parliament a rewarding experience for professional development, and thank the SSAI for the opportunity to attend.

Nicole White



Nicole White



Science Meets Parliament





REGISTER NOW FOR THE NATSTATS 2013 CONFERENCE

The Australian Bureau of Statistics (ABS) invites you to attend the NatStats 2013 Conference, which will be held 12 – 14 March 2013 at the Brisbane Convention and Exhibition Centre.

It is expected that over 500 delegates will participate in NatStats 2013 bringing together an array of leaders and high profile commentators, researchers and policy makers from all levels of government, academia, community and business.

The overall theme for NatStats 2013 is “A better informed Australia: the role of statistics in building the nation”.

The conference will investigate this theme by exploring how big or turbo charged data (administration/transactional, web 2.0, international and emerging datasets) can be used to inform decision making in the social wellbeing, the economic and environment domains, as well as looking at the challenges in using big data. The conference intends to address these challenges and devise strategies to overcome them.

As a participant in the NatStats 2013 Conference, you will have the opportunity to contribute your ideas for improving the Australian statistical system.

NATSTATS 2013 EVENT DETAILS

Date Tuesday 12 – Thursday 14
March 2013

Venue Brisbane Convention and
Exhibition Centre, South
Bank

Cost \$1,100 Full Registration Fee
until 31 December 2012.
\$350 Student (does not
include social program)

Register now at

www.nss.gov.au/blog/natstats.nsf

For more information about the
conference, please email
natstats@nss.gov.au or visit the
NatStats 2013 website.

Speakers confirmed for NatStats 2013 Conference include:

- Mr Brian Pink, Australian Statistician
- Professor Jane Halton PSM, Secretary of the Department of Health and Ageing;
- Ms Serena Wilson, Deputy Secretary of the Department of Families, Housing, Community Services and Indigenous Affairs;
- Ms Lin Hatfield Dodds, National Director of UnitingCare Australia;
- Professor Ian Chubb AC, Australia's Chief Scientist;
- Mr Geoff Allen AM, Director of the Allen Consulting Group;
- Mr Clive Whincup, Chief Information Officer of Westpac;
- Mr Peter Harper, Deputy Australian Statistician at the Australian Bureau of Statistics;
- Mr Trevor Sutton, Deputy Australian Statistician at the Australian Bureau of Statistics; and
- Professor Barry McGaw AO, Vice-Chancellor's Fellow at The University of Melbourne and Chair of the Australian Curriculum, Assessment and Reporting Authority.

A SYNOPSIS OF PROF NOEL'S WEBINAR WITH SSAI



Noel Cressie

Uncertainty is the big issue in the real science in which we can't get the absolute measurement of the events. For example, in quantum physics, the uncertainty principle expresses the notion that we can't measure simultaneously the momentum and the position of a particle at the same time point. Albert Einstein is famously supposed to have said that 'God doesn't play the dice with the universe', an expression of his dissatisfaction with the apparently probabilistic description of nature embodied by quantum theory. Uncertainty still exists despite Einstein's dissatisfaction; we can't escape from it. The recent devastating climate event 'Hurricane Sandy' in the USA is a solid example of it and as resulted in losses of more than 50 billion dollars as well as lives. Therefore, the main question would be how to reduce uncertainty through the use of mathematical or statistical models.

Noel's recent webinar with SSAI was a useful presentation in understanding the uncertainty of climate behaviour. Prof Noel Cressie (born in Fremantle, Western Australia), world renowned applied statistician and author of around 250 refereed articles and of three books, has joined the University of Wollongong (UOW) and will help establish an Institute for Applied Statistics Research. In his career, he has been employed in various positions including lecturer and senior lecturer at Flinders University of South Australia; Distinguished Professor of Mathematical and Physical Sciences, and Director of the Program in Spatial Statistics and Environmental Statistics at The Ohio State University. Frequent participant and speaker at national and international statistics and multi-disciplinary conferences, Professor Cressie has received the Distinguished Scholar Award of The Ohio State University, the 2009 Fisher Award and Lectureship from COPSS amongst other awards. His current research interests are the theory and application of spatial and spatio-temporal stochastic models; Bayes and empirical-Bayes methods for hierarchical statistical models; and environmental statistics. His other research areas include spatial command and control, disease mapping, medical imaging, ice-stream dynamics, and air quality.

This webinar on "Hot enough for you? Uncertainty Quantification for regional climate projection in North America", was, in fact, an overview of climate models. According to his presentation, climate, one of the greatest environmental concerns of the 21st century, is the distribution of temperature, rainfall, air pressure and so on over long time scales. To formulate a statistical model, note that the deterministic outputs from RCM (Regional Climate Models; output: 20-50 km grid spacing) and GCM (General Circulation Models) models based on assumptions on physical principles are subject to various sources of uncertainty. To deal with those, the NARCCAP (North America Regional Climate Assessment Program) has proposed a statistical framework based on Uncertainty Quantification through Bayesian statistical inference including Bayesian hierarchical spatial analysis of variance (ANOVA) models. One of the climate outputs is average temperature. In NARCCAP study in phase I (1971 to 2000) and phase II (1971 to 2000), the seasonal and yearly average temperature difference between future and current period are subject to exploratory spatial data analysis. The average temperature differences are projected to be a lot warmer in winter than overall. In spring and autumn, the temperature increase would be around 20C to 30C. In summer, it would increase around 50C in the southern hemisphere. With the SPOT function plot (proportion of pixels decrease as average temperature difference increase),

it is revealed that the temperature increase doesn't going to be substantial in the southern hemisphere whereas in the northern hemisphere the increase would be substantial. The European Union defines 20C as a tolerable threshold.

Bayesian hierarchical statistical models can fit the data with few parameters, are better for predictive purposes, and their inference includes straightforward inference at unobserved locations, as well as better quantify uncertainty. They can be broken down into three levels comprising the data model, process model and the parameter (or prior) model. The process model incorporates the Spatial Random Effects model which allows spatial heterogeneity, massive environmental datasets and dimensional reduction from $n=94,080$ (11760 NARCCAP grid-points, times 4 seasons, times 2 RCMs) and yields optimum spatial predictors whose computations are scalable. The posterior point and interval estimates (the optimal predictor under squared-error loss) are obtained through the simulation process of the posterior distribution, which is the joint distribution of unknowns (process and parameters) in the model given the observed data. About two third of pixels have posterior 2.5th percentile greater than 20C threshold. Posterior probabilities in a map which is an inferential version of the SPOT functions shows is that the warming effects differ in areas and seasons substantially. The warming effects are much stronger in the northern hemisphere in winter, and they are stronger in the southern hemisphere in summer. For example, Hudson Bay would be getting warmer (6.20C temperature change) in winter.

In addition, whatever methods are used for analysis and prediction of climate behaviour, the question would arise whether we could escape the causality (i.e. impacts of the climate change) based on this prediction.

Liton Kumar Saha

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Cambridge University Press Australia is pleased to offer an exclusive 20% SSAI member discount off selected statistics titles. Please go to <http://www.cambridge.org/aus/catalogue/promotion.asp?nav=view&code=STATS11> to see the available titles.

To apply the discount, simply enter the promotion code STATS11 when prompted at the checkout stage of your order, and the prices will be automatically updated.

FROM THE SSAI OFFICE

It is that time of year again where you wonder where time has gone and how on earth you're going to get everything on your 'to do' list done before the end of the year. Things have been busy at the SSAI office but that's how I like it.

I recently attended a workshop on "Membership Fundamentals" with Belinda Moore of SMS (Strategic Membership Solutions). I am lucky that the Executive Committee of SSAI sees the benefit of sending me to events such as this one. Listening to association experts and exchanging ideas with other association representatives will help SSAI remain abreast of what is happening with associations generally and be aware of changes that will affect how we engage with our members. One of the main messages that we heard at the workshop was that most Baby Boomers will be retired by 2029. That means that over the next two decades our membership will consist more and more of people of Generation X and Y and they may see their association membership through different eyes compared to the Baby Boomers. It will be up to those at the helm of the Society to rise to the challenge and live up to their expectations.

We have also been negotiating with website providers and a final decision has been made. Cloud Computing Enterprises have been asked to implement our new website and online database. Their proposal involves integrating the new website with the member management CRM database application 360DEGREES and the social media application MemberFuse. I am very excited about this development and I can't wait to start working with the new technology. Thank you to the many people who have spent a lot of time studying the proposals and making an evaluation on which one would be the most suitable for SSAI.

With 2012 coming to an end, there are of course summer holidays planned. 20 December 2012 will be the last day that the SSAI office will be open in 2012 and the office will remain closed until 20 January 2013. From Monday, 21 January until Thursday 31 January 2013 I'll be working limited hours from home. The best way to contact me during that time is by email (eo@statsoc.org.au). From 4 February 2013 my office hours will be back to normal.

I look forward to another year of working with you in 2013. Have a wonderful Christmas.

Marie-Louise Rankin



Marie-Louise Rankin



Image provided by <http://christmasstockimages.com>

SSAI GOLDEN JUBILEE TRAVEL GRANT

to provide overseas travel funds to SSAI student members, who can prove consecutive SSAI membership for a minimum of two years.

To help celebrate SSAI's 50th anniversary, the SSAI has introduced a travel grant that offers limited travel funds to assist student members of the SSAI to attend overseas conferences at which they present a paper or poster.

A maximum of \$1000 is available per application, limited to a single trip during the course of the student's studies. Students will not be supported in their first year of study and will have had to be members of the Society for at least 2 years prior to the application deadline. Applications are required to be lodged in advance of travelling. In exceptional circumstances an application can be for post-conference support, but the application will then have to be made within 1 month of returning and the 2 year mandatory membership period prior to departure must still be met. Exceptional circumstances are limited to unforeseeable student out of pocket expenses arising from other funding sources not fulfilling their obligation or changes to the trip that could not have been avoided.

A complete application will consist of

- Information on the conference and its importance to student's work (2-3 lines)
- Details of the paper/s/poster student wants to present at the conference
- A list of other funds sought or promised, including student's home institution
- Student's out of pocket expenses expected
- Any other supporting material student feels is necessary
- A letter of support SIGNED by one of student's supervisors AND student's Departmental Head
- Student's CV

The application deadline is 31 March.

If successful the student member is required to produce original receipts for amounts of equal or greater value than the grant. These receipts will be returned to the student marked with how much has been reimbursed. The student will therefore still be able to use the receipts for proof of attendance or to claim any funding shortfall from other organisations. The student member will also need to supply a report of his or her involvement in the conference to be published in the SSAI newsletter. This report should confirm the actual travel details and papers presented.

Recipients of the grant are asked to acknowledge the SSAI's support in the presentations and in any published version of the paper.

One travel grant is available per year. Assuming that more than one application will be received per year, either the Executive Committee or a special committee would help with the selection process.

With this travel grant program the SSAI seeks to underline its objective to further the study, application and good practice of statistical theory and methods in all branches of learning and enterprise. It has been implemented to confirm to members that the SSAI is willing to support student statisticians and their budding careers.



SSAI BLOG

SSAI wants to promote the exchange of ideas between members (and non-members) and for this purpose we have created a blog page on WordPress.

To follow the current discussions and perhaps add your own comment, please go to:

<http://statisticalsocietyaustralia.wordpress.com/>

Our November question was provided by the SSAI Section for Bayesian Statistics:

What are the major challenges in modern Bayesian Statistics?

<http://statisticalsocietyaustralia.wordpress.com/2012/11/20/november-question/>

The question for September was submitted by the SSAI Section for Environmental Statistics:

How are statisticians engaging in the debate about climate change, in Australia and globally?

<http://statisticalsocietyaustralia.wordpress.com/2012/09/19/september-question/>

The August questions submitted by the SSAI Surveys and Management section is:

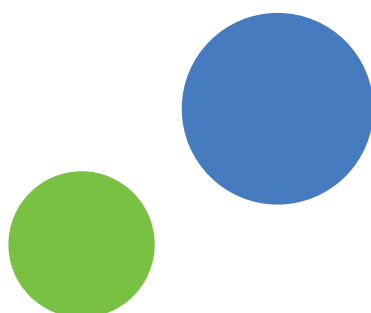
What are the issues and challenges in conducting surveys based on hybrid data collections (ie. where have your data really come from?) and what can we do to address these?

<http://statisticalsocietyaustralia.wordpress.com/2012/08/06/august-question/>

The June question asked by the SSAI Statistics Education Section was:

What strategies or activities should the SSAI and the Statistics Education Section take to support and improve statistics education in schools and universities? What do you think?

<http://statisticalsocietyaustralia.wordpress.com/2012/06/>





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1. Visit the [SSAI/Wiley Landing Page](http://au.wiley.com/WileyCDA/Section/id-410891.html) (and register if this is your first visit): <http://au.wiley.com/WileyCDA/Section/id-410891.html>
2. If this is your first time visiting Wiley online, you will need to register. Note that if you have opened a previous account with Wiley.com before the society discount offer was available, you will have to register using another email address to obtain the discount.
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7. Click on 'Continue Shopping', or 'Proceed to Checkout Now'.
8. The standard discount will be applied automatically and the special 40% discount can be activated by entering the promotional code HAP12.

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NSW BRANCH NEWS

The September meeting of the NSW Branch featured University of Sydney ARC Future Fellow Dr Jean Yang discussing challenges in the statistical analysis of proteomics data. She discussed two main areas, pre-processing and the identification of differentially expressed proteins. The pre-processing step involved taking raw peptide-sequence data and reconstructing proteins

from these. This is a complicated statistical/combinatorial problem in itself and is one of the main bottlenecks in the analysis. Jean discussed a new method called Refraction based on statistical learning techniques to increase protein identification, which she showed to have promising results.

The second aspect involved a case study examining simple missing value multiple imputation to enable selection of proteins with differential time profiles. Furthermore, an important general comment Jean made is that there is no "gold-standard" data we can use to compare the real performance of various techniques. After the talk a dozen or so of us joined Jean for an enjoyable Thai banquet.

The October NSW Branch meeting marked another memorable joint event for the year. The meeting was co-hosted for the very first time with the Sydney Users of R Forum (SURF)*, as part of NSW Branch's continuing initiative to develop closer links with other groups and associations that have a strong interest in statistics. (See previous newsletters for reports of these events.) The meeting was headlined by Dr Bill Venables (CSIRO, Mathematical and Information Sciences) [SEE IMAGE] who presented a talk entitled "O what a difference R makes... Reflections on "Regression Analysis", E. J. Williams, (1959)." Clearly entertaining the interests of both SSAI branch members and SURF, to a capacity crowd of over 50 attendees, Dr Venables explored three modelling examples from Williams' book, making use of the rapidly developing computational and graphical tools accessible within the R environment.

Dr Venables started the night off with a discussion of various models applied to what is known as the 'Janka Hardness' problem. The Janka hardness measures the force required to embed a steel ball halfway through a particular type of wood, and the problem that Williams explored in his book was to model the relationship between the density of various species of timber and their Janka Hardness. With the aid of built-in R functions such as `loess` (for polynomial fitting), `glm` (for fitting generalised linear models), and basic graphical commands, Dr Venables demonstrated how one can easily extract model parameters and effectively assess model diagnostics. The second example is an inverse estimation problem concerning the bleaching of wood pulp. As more than one independent variable was involved, Dr Venables showed how powerful trellis graphics (available in the package 'lattice') can be in facilitating our interpretation of the effects of a variable conditioned on the values of other explanatory variables. As they say, a picture tells a thousand words! Along with the third example, that of measuring the viscosity of liquids, Dr Venables' use of R functions such as `lme` (from package 'nlme') and `glmmPQL` (from package 'MASS') all enabled further investigation into the appropriateness of linear and generalised mixed effects models, rendering it so much easier and convenient in this day and age to fit, compare and assess models.

Last but not least, Dr Venables concluded his presentation by paying a heartfelt tribute to the revered mathematicians Edwin James George Pitman and Evan James Williams, for their contributions to the field of statistics.



Bill Venables

Both the NSW SSAI and SURF groups then enjoyed the refreshments and the opportunity to mingle and network. It was certainly an evening filled with jovial air and light-hearted conversations.

*SURF is a meetup group founded in June 2010, with 433 members to date. The group meets monthly in the Sydney CBD to "hear talks on R-related topics, share knowledge and experience, discover the power of R as a serious, general and industrial strength data mining, analysis visualisation and reporting tool and to meet experts in specific R packages, techniques and applications." The main SURF organiser is Eugene Dubossarsky (Partner, Prescient and Founder, Analyst First).

October also saw the second in the NSW Branch's series of Access Grid Seminars, intended to make the work of high-profile researchers from both Australia and overseas more accessible to both members and the wider statistical community. The talk was broadcast via the Access Grid/SeeVogh bridge, allowing users to participate in the event simply using their personal computers. Although there were a few technical glitches, many users both in Access Grid rooms and using SeeVogh were able to enjoy the talk and take much away from it.

The speaker was Dr Peter Green who now shares time equally between the University of Bristol and the University of Technology, Sydney (UTS). The title of the talk was "Emission tomography and Bayesian inverse problems" and indeed had something for everyone. Peter began by giving a general overview of linear inverse problems, pointing out that even when observations are made without error, in ill-posed problems a unique solution can only be found if some extra regularisation or penalisation is used. When noise is introduced, standard methods such as penalised likelihood can be interpreted as maximum a posteriori (MAP) Bayesian methods. Peter then gave very convincing reasons supporting the Bayesian approach in such problems, including coherence and interpretability of regularisation penalties. The main examples illustrating the methods were from medical imaging, in particular SPECT (single-photon emission computed tomography) and Peter provided an abundance of illuminating schematic diagrams and animations to illustrate how the technology works.

Peter then proceeded onto the theoretical section of the talk, introducing a class of models which include that used in the analysis of SPECT data: the GLIP or Generalised Linear Inverse Problem. These are much like GLMs except the usual equation linking the mean response and the covariates takes the form of an ill-posed linear inverse problem. The results presented were asymptotic in nature, specifically Bernstein-von Mises-type theorems measuring how quickly the posterior distribution concentrates on certain sets. The priors used on the covariates were quite exotic, what he called a "log-cosh" class of prior, a class which includes Gaussian and Laplace priors as special boundary cases. Indeed Peter gave a nice sketch of the ideas behind the proof using projective geometry, and the exotic asymptotic results were enough to interest even the most die-hard frequentist, with asymptotically normal and exponential random variables appearing, and different terms corresponding to interior and boundary points converging at different rates! For those interested, the slides are available at <http://www.stats.bris.ac.uk/~peter/USydney.pdf>.

The talk stimulated much discussion afterwards as a small band joined Peter for a cup of tea. Most interesting was Peter's discussion with Richard Cowan on the philosophy of the Bayesian approach, a debate which just seems to get more and more interesting!

Michel Stuart, Leanne Chhay and Scott Sisson

QUEENSLAND BRANCH NEWS

Queensland Branch held its annual Young Statisticians' Networking Event at the Guild Bar of the Queensland University of Technology on the 21st of September. The event was well attended with attendees encompassing a spectrum from honours students to post doctoral fellows all of whom were pleased with the opportunity to network with other young and early career statisticians.

Ben Fitzpatrick

Mathematical models of malaria: forest for the trees

The QLD Branch was relatively quiet over the winter months. October saw the first Branch meeting since the SSAI conference in Adelaide. Dr Laith Yakob, a Research Fellow from the Infectious Disease Epidemiology Unit in the School of Population Health at The University of Queensland, presented work on mathematical models of malaria.

Laith began with an overview of the disease, describing malaria as an infection by one of the *Apicomplexan* parasites from the genus *Plasmodium*, with five species known to cause malarial infection in humans: *P. falciparum*, *P. vivax*, *P. malariae*, *P. ovale* and *P. knowlesi*. The vast majority of human deaths are caused by *P. falciparum*, with most occurring on the African continent among children less than five years old. Using a diagram from the Centers for Disease Control (<http://www.dpd.cdc.gov/dpdx>), Laith illustrated the malarial parasite lifecycle and how the disease spreads via mosquito and human hosts.

Laith reported that mathematical models of malaria range in complexity from relatively simple logical models to complex simulation models. He presented a simple model which expressed the reproductive rate of malaria as a function of changes over time in the number of humans who are susceptible, infected, and recovered from disease and the ratio of mosquitoes to humans. Over the years models have grown in complexity to incorporate the influence of demographic, socioeconomic and environmental factors, with some models so compartmentalised it is increasingly difficult to see "the forest for the trees". Laith contrasted the fine scale of many mathematical models of malaria with the simple disease control strategies being implemented: insecticide treated bednets and spraying insecticides inside houses in malaria-endemic regions. He illustrated via a simple mathematical model how bednets and indoor spraying could control mosquito numbers and, disconcertingly, that combining the two strategies may not have the desired effect of reducing the rate of malarial transmission.

There was a lively discussion about the extent to which mathematical models informed public health decisions, the potential for genetic control strategies, and the future of a vaccine for malaria.

Elaine Pascoe



Dr Laith Yakob

SA BRANCH NEWS

August 2012 Meeting

Taking stock in health care: applying economics, statistics, and business processes to reduce waste and improve patient outcomes

Professor Jon Karnon from the School of Population Health at the University of Adelaide spoke to the South Australian branch on the 16th of August about the statistical issues that arose in his recent work on the economic evaluation of applied clinical services. Professor Karnon heads a group of health economists and health services researchers, who have been analysing linked, routinely collected hospital and population-based mortality data to identify significant differences in the cost-effectiveness of the services provided across South Australia's four main public hospitals.

The group have developed a framework for continuous improvement where the best (or most cost-effective) practices are identified first, then the procedures both within and between hospitals are compared to determine how they differ. Actions to improve performance are then to be discussed with stakeholders at the participating hospitals, and then after these changes are implemented the data is collected and process begins again by re-estimating the cost-effectiveness of the services provided across the hospitals. The analytic work is done during the first two stages.

The best practices are those that deliver the most quality-adjusted life years at least cost (or at a ratio of costs to QALYs that is deemed to be cost-effective). All patients with a similar initial diagnoses at the participating hospitals are identified; in Professor Karnon's example, the eligible population had been diagnosed as having an acute stroke. A wide range of confounding factors (for example, age, gender and medical conditions that increase the risk of stroke) were specified for each patient. Patients were then separated by intermediate events, such as recurrent stroke, death, and no events with one year of diagnosis; survival curves were fitted using Royston-Parmar spline models, for each intermediate effect. To determine the expected annual costs, logit regression was performed to calculate the probability that cost will be incurred by a patient and generalised linear models were used to find what these cost will be should they be incurred.

Having predicted the lifetime-costs and survival years for the different intermediate events, Professor Karnon's team then set about identifying which hospitals were performing better than expected. Using a genetic algorithm to match patients across the four hospitals, the cost-effectiveness of each hospital was compared. Bootstrapping was done to test the sensitivity of the comparisons. Having identified the Pareto dominant hospitals, those with either lower life-time cost or more life years gained, the hospital that gave the highest-probability of cost-effectiveness as a function of the value of the life years gained was easily identified. Having completed this analysis Professor Karnon's team intend to work with the hospitals to redesign their care, informed by process mining based analyses of the structures and processes at the most cost effective hospitals.

Professor Karnon's talk is available at: <http://prezi.com/fiw257kywdbb/continuous-improvement-in-clinical-practice-statistical-issues/>

Aiden Fisher

September 2012 Meeting

IAPA SA Chapter Launch – Analytics Adding Value to Large Organisations

In September, the SA Branch did not have its own meeting, but instead supported the launch of the South Australian Chapter of the Institute of Analytics Professionals of Australia (IAPA). The IAPA works to promote analytics and provide a networking hub for analytics professionals, and has over 2000 members across Australia. Regular IAPA events have been held in other states, but not previously in SA. The launch was held at the Adelaide office of Deloitte, one of the sponsors of the IAPA. Over 50 people attended the launch, including members of SSAI and the Australian Computer Society.

The main feature of the launch was a talk by Dr Inna Kolyshkina, who was the founding chair of the IAPA and recently moved to Adelaide. Dr Kolyshkina has 15 years of experience in analytics consulting, designing and delivering projects for a wide variety of clients including Westpac, ANZ, Woolworths, 7-Eleven, WorkCover NSW, Nestle, Coca-Cola and Kelloggs. Her talk was titled 'Analytics / Data Science adding value to large organisations; Case studies and lessons learnt'.

The talk started with an introduction to analytics, and a discussion of its importance. Analytics is the application of computational and statistical techniques to identify patterns in big datasets. If an outcome of interest in a dataset can be measured, then analytics can be used to indicate what influences that outcome, and to what extent. This allows organisations to take the guesswork out of their decision making, and improve their business performance. This is becoming more important as the amount of data available keeps increasing, so there will be a lot of demand for analytics professionals in future.

Analytics covers several different areas, including predictive analytics and data mining, but there are two main types of analytics methods. Supervised methods involve modelling an outcome of interest, for example determining what variables influence the sales of a product. Unsupervised methods involve describing data, for example determining which products tend to get purchased together. One of the advantages of analytics is that it is flexible enough to deal with a wide variety of big datasets, including noisy and incomplete data, as well as variables with a large number of categories.

Dr Kolyshkina then proceeded to discuss some examples of projects that she had previously worked on, where she had applied analytics to solve problems for various organisations. Due to the commercial sensitivity of these projects, she did not reveal the identities of the organisations involved. Two of the projects were for a bank and a telecommunications provider, both of whom wanted to predict the likelihood of their customers switching to a competitor. Both projects used data collected by the organisation to identify the risk factors that increased the chance of a customer leaving. The bank data was analysed using decision trees, while the project for the telecommunications provider used a text analysis on feedback to the company's call centre.

The other project that Dr Kolyshkina discussed was for a state government who wanted to predict the risk of traffic congestion in the capital city of that state. In the event of such an incident occurring, the government also wished to predict the length of travel times during that incident, and how long the congestion would last. Information was compiled from a number of different sources, including vehicle GPS data, traffic counts, and geographic data on the road network. A model to predict the risk of traffic congestion was constructed using

several methods, including decision trees, multivariate adaptive regression splines and generalised linear models.

After the talk, attendees were able to engage in an informal networking session with analytics professionals, over an excellent spread of refreshments provided by Deloitte. If anyone is interested in joining the IAPA (membership is free), or would like more information on the IAPA and its events, please visit the IAPA website at www.iapa.org.au.

David Hirst

October 2012 Meeting

Searching the parameter space for optimal conditions

It was a pleasure to have Professor Richard Jarrett as the speaker at the October meeting of the SA Branch. Richard is currently a Post-retirement Fellow at CSIRO Mathematics, Informatics & Statistics in Adelaide and is a life member of the Statistical Society of Australia. The talk titled "Searching the parameter space for optimal conditions" was an interesting story of how statisticians can influence projects. A combination of fractional factorial experiments and response surface designs appeared to be just the ticket. The tricky bit was: how to deal with the fact that there were two variables of interest?

The story started when Richard was asked to help CSIRO scientists who had spent two years experimenting with artificial corneal implants. The Vision CRC - Corneal Inlay project aimed at developing implantable contact lenses made from polymer to correct refractive error by changing corneal curvature. The implant is a relatively simple procedure and provides a permanent yet reversible solution to vision correction. Scientists were having difficulty balancing the need for the implant to be "clear" (easy to see through) and also "permeable" (to allow nutrients to pass through). After 2 years of testing, "Permeability" (measured by EWC) was satisfactory at about 50%, but "Haze" (lack of clarity) was far too high at around 10%. Attempts to push down "Haze" led to a sharp decrease in "Permeability".

There were difficulties with the past work. The experiments had been ad hoc – try this, then that. What was needed was to improve "Clarity" (reduce "Haze"), while keeping "Permeability" high. Richard reduced the measurements to two critical factors, Haze and Permeability, and used factorial experiments to move forward more efficiently. Richard's experiment identified used 7 different factors considered the most important and explored the "region" around the current best combination using a 3-step process:

Step 1: Use a relatively small design to explore "locally" and find the direction to go in order to make the most rapid improvement. A quarter of a 2^7 design was used to reduce 128 runs using a "Fold-over factorial design" to 32 runs, comprised of 4 blocks of 8. Measure Haze and EWC ($n=5$).

Step 2: Proceed along that direction and find the best point on that line.

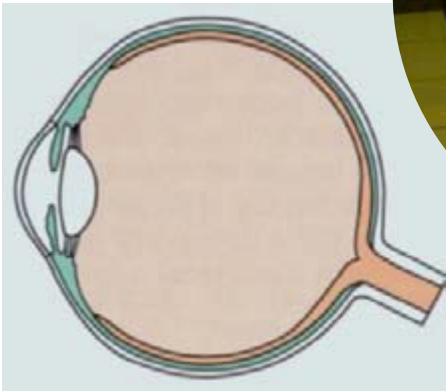
Step 3: Do another small experiment to check results and optimise further.

The results from Step 1 revealed that the main effects for "EWC" explained 98% of the variation! "Haze" varied from 3% to 28% and the main effects explained 88%. Step 2 would be to use the direction of steepest descent to reduce Haze, but that would worsen the Clarity. Instead this direction was projected onto the space where Clarity was constant. Moving in this new direction kept EWC constant at approximately 55, while significantly reducing Haze.

In 3 months and in 47 experimental runs, Haze was reduced by an order of magnitude while maintaining or slightly increasing EWC.

Richard explained that doing this stuff was great fun. What started as a simple factorial design led to some interesting research questions and it was a great buzz when the analysis popped out the results he had hoped for. The efficiency gains here were extraordinary – after 2 years, the scientists were absolutely stuck. In the first month after Richard and his team had started, they had got to a point they hadn't believed possible to produce artificial corneal implants.

These comments prompted some interesting discussion of the approach Richard had taken to introduce the scientists to the statistical concepts of experimental design via a short course prior to starting the project. The advantage was obvious to Richard who could see that there were differences in terminology that were bridged by giving the course, allowing both teams to use a common language.



VIC BRANCH NEWS

Report of July 2012 seminar, Victorian Branch, SSAI

At our July meeting, we heard three shorter talks from some of our young statisticians. Julia Polak is about to complete a PhD at Monash University and subsequent to the seminar has taken up a position in ViCBiostat, the newly established Victorian Centre for Biostatistics. Julia is known for using props with her talk, and this was no exception (see photo). She spoke about the research in her PhD thesis, which was motivated by the aim to make conditional kernel density estimation more useable. The key idea is to expand on the simple choice of a normal reference rule for choosing the bandwidth when estimating a density using a kernel; Julia's more sophisticated approach uses a reference rule that allows for the conditional distribution of \hat{h} to have a skew distribution, which accommodates variations in skewness and kurtosis, as well as location and shape. Julia described a simulation study that demonstrated the success of this approach.

Damjan Vukcevic did a DPhil at Oxford after completing his undergraduate training at the University of Melbourne. He now has a number of roles, including one in the recently-established Statistical Genetics group in the Murdoch Childrens Research Institute. He spoke at the seminar about "Disease model distortion in genetic association studies". He gave a commendably clear introduction to the genetics essential to his topic (especially helpful for your ignorant correspondent) and the statistical issues that arise in "genome-wide studies", which were not feasible until recent technology made them so. The essence of the approach, in looking for genetic causes of characteristics, especially diseases, is to compare cases (people with the disease) with controls (people free of the disease). This is consistent with conventional epidemiology, but the number of candidate predictors in this application is immense. The comparison made is the presence or absence of a given single nucleotide polymorphism (SNP), which is when a single nucleotide (A, T, C, G) in the genome differs in paired chromosomes. Damjan discussed why it is that an additive logistic model seems to fit well to the great majority of discovered associations.



Julia Polak with some babushka dolls to demonstrate varying distributions, at the July 2012 Vic Branch seminar.



The three speakers at the July 2012 Vic Branch seminar (left to right): Dr Damjan Vukcevic, Julia Polak and Steve Lane.

Steve Lane spoke on a topic that was a minor part of his PhD, done at the University of Melbourne; Steve had submitted the final bound copy the very day of the seminar! He now has a position providing statistical services to the School of Medicine at Barwon Health, stationed at the Geelong Hospital. His talk was entitled: "Population size estimation from capture-recapture experiments with continuous time-varying covariates", and described methods for using information (such as the weight of the animal) that may be recorded at successive captures in a capture-recapture study. Steve's method, involving functional data analysis, allows for the capture probability to depend on covariates such as the weight of the animal (which may change at different capture occasions) and can also accommodate data where the capture is recorded but the covariates (e.g. weight) are not.

The slides from these talks are available on the SSAI Vic Branch website: <http://www.statsoc.org.au/vic-branch-meetings.htm>

These three talks were first-rate presentations of high quality, from emerging, talented statisticians. More than one "veteran" at the seminar reflected that if the Branch, the Society and the discipline will be looked after by individuals such as Julia, Damjan and Steve, we will be in excellent hands in the future.

Ian Gordon



Prof. Peter Taylor

On Tuesday 28th August the Victorian branch of the society hosted a talk by Prof. Peter Taylor on "Queueing Theory and 'Ideal Hospital Occupancy'". Peter is the inaugural professor of Operations Research in the Department of Mathematics and Statistics at the University of Melbourne, and works principally in stochastic modelling, in particular with regards to queuing networks.

In 1999 Bagust, Place and Posnett, three health economists, wrote a very influential paper on bed occupancy in hospitals. They concluded: 'Risks are discernible when average bed occupancy rates exceed about 85%, and an acute hospital can expect regular bed shortages and periodic bed crises if average occupancy rises to 90% or more.'¹ The figure of 85% occupancy has become widely accepted. Indeed in 2004 the Australasian College for Emergency Medicine reported: 'Queueing theory developed by Erlang nearly 100 years ago tells us that systems are most efficient when they operate at 85% capacity. This applies to queues at the local bank waiting for the teller or at ticket booths at the MCG.'²

Modelling by Peter Taylor and colleagues, using Royal Melbourne Hospital data from 2001-5, showed that the most significant delays in emergency treatment occur not in the emergency department, but when patients must wait for subsequent admission to a hospital bed. Accordingly it is to be welcomed that hospital managers are aware that 100% bed occupancy is not a desirable target. Of course, it is ridiculous to think that 85% occupancy will always be optimal, and in 2010 Peter and co-authors wrote: 'It is true that the origin of queuing theory can be traced to Erlang, who published his first paper 100 years ago. However, no professional queuing theorist would support the ACEM statement quoted above.'³ They went on to explain that rather than seeing blocking probabilities – the chance that a patient does not receive treatment because no bed is available – as a function of average bed occupancy, it needs to be viewed as a function of the driving factors of patient arrival rate and the number of beds. (See for example the paper of Goronescu, McClean and Millard.⁴)

Unfortunately, the message gleaned from Peter's statement by some hospital managers was not that they need to tailor solutions to their own hospital, but rather that they didn't need to worry about keeping some beds free, and 100% occupancy was a desirable target after all. Peter concluded his talk by speculating that in this case it may be that the grossly simplistic recipe of Bagust, Place and Posnett is actually the right one for the audience that matters, as the correct recipe is too hard to follow for those who need to do so.

Owen Jones

- ¹ A. Bagust, M. Place and J.W. Posnett. Dynamics of bed use in accommodating emergency admissions: stochastic simulation model. *British Medical Journal*, 319 (1999), pp. 155-158.
- ² Access block and overcrowding in emergency departments. *Australasian College for Emergency Medicine*, April 2004, p. 5. http://www.acem.org.au/media/Access_Block1.pdf
- ³ C.A. Bain, P.G. Taylor, G. McDonnell and A. Georgiou. Myths of ideal hospital occupancy. *Medical Journal of Australia*, 192 (2010), pp. 42-43.
- ⁴ F. Goronescu, S.I. McClean and P.H. Millard. A queueing model for bed-occupancy management and planning of hospitals. *The Journal of the Operational Research Society* (2002) 53, pp. 19-24.

Young Statisticians Careers Evening

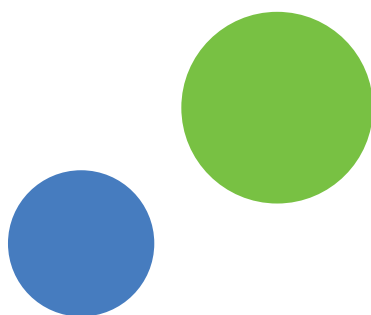
Following successful such events in previous years, Han Gan of the local Young Statisticians section organised an information evening on career options for statisticians about to enter the workforce.

Four very good speakers, representing the diverse workplace conditions and cultures of research, pharmaceutical corporations, government and finance sectors, presented information to the young audience on the nature and variety of the statistical work undertaken in each, and were available for extensive informal discussion after the talks. The event was informative and well received and we hope can be repeated.

Branch Incorporation

In alignment with the constitutional position of other SSAI State Branches, the Victorian Branch has now formally become an incorporated association.

Michael Phillips



WA BRANCH NEWS

At the September meeting of the Western Australia Branch, Professor Ross Taplin, from the Business School at Curtin University, presented a talk on "Visitor Surveys in Tourism and Recreational Management".

It is useful for managers of tourism and recreational venues to gauge how satisfied their visitors are so that they can continue to provide a venue where people will visit. At many venues visitors are asked to voluntarily fill out a survey rating different attributes such as staff service on a Likert scale. These visitor surveys allow each attribute to be rated on how satisfied the visitor was with that particular attribute (or how well it performed) as well as how important that attribute was to them. Current models use these visitor survey ratings of performance and absolute importance of different attributes of the venue. However, Ross suggested that these models were in a sense lacking and missed capturing some useful information for management. Ross showed that using relative importance rather than absolute importance provides more useful information since people answer on different scales.

Ross found Competitive Importance Performance Analysis (CIPA) was able to capture a greater understanding of visitors' satisfaction. CIPA looks at two comparable venues and asks visitors to rate the same attributes for each venue to avoid the bias from benchmarking one attribute against another. He explained that this is useful as it looks at how a tourism venue rates in comparison to its competitors.

Ross also explained how he investigated randomised experiments to allow for causality conclusions. Within his work he trialled a randomised experiment at Yanchep National Park with two interventions. The first intervention was the enhancement of toilets which had an outcome of improving visitors' satisfaction with the toilets compared to when toilets were not enhanced. However, this intervention did not show a significant difference in their overall satisfaction of the venue. The second intervention was providing more rangers around the park. The outcome of this intervention was that people not only gave responses that indicated they were happier with the presence of rangers but there were carry over effects as people also indicated they were happier with other attributes as well, including their overall satisfaction. Through Ross' example it was clear to see how managers could find randomised experiments useful to determine which attributes can provide improved outcomes for visitors' overall satisfaction.

Elyse Corless

