




STATISTICAL SOCIETY OF AUSTRALIA INCORPORATED NEWSLETTER

 June 2011
Number 135

SSAI Member Scott Sisson awarded the Moran Medal by the Australian Academy of Sciences in May 2011

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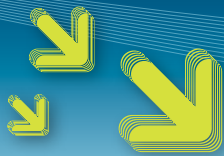
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Dr Mark Tanaka, left, and Dr Scott Sisson, right with their Moran Medals

At the awards ceremony held in at the Australian Academy of Sciences in Canberra on May 4-6, 2011 Dr Scott Sisson from the School of Mathematics and Statistics and Dr Mark Tanaka of the School of Biotechnology & Biomolecular Sciences at the The University of New South Wales were jointly awarded the Moran Medal. Both are currently ARC Queen Elizabeth II Fellows. Scott Sisson is well known to many in the Society being the Chair of the Bayesian Statistics Section and has served for a number of years as a Councillor of the NSW Branch where he is currently Vice-President.

The Moran Medal recognises the contributions to science of the late P.A.P. Moran, FAA who was Foundation Professor of Statistics at the ANU from 1952 until 1982 (see <http://www.science.org.au/fellows/memoirs/moran.html> for detailed biography of Professor Moran). Its purpose is to recognise outstanding research by scientists under 40 years at the closing date in one or more of the fields of applied probability, biometrics, mathematical genetics, psychometrics and statistics. The award is normally made every two years and has been awarded to a distinguished group of Australian statistical scientists since its inception in 1990. >> pg6



June

Editorial



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Advertising will be carried in the
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Contact the SSAI Executive Officer at
eo@statsoc.org.au

DEADLINE FOR NEXT ISSUE:
10 August 2011



Alice Richardson.

The Census of Australia's population and dwellings is just around the corner, and represents one of the key moments when statistics is brought to the attention of ever single Australian.

In this issue there are items about the Australian Census, and we hope that there are no disruptions to the data collection and analysis process. This is no empty wish, as it has been widely reported that the New Zealand Census this year was cancelled due to the earthquake in Christchurch early in the year. What sort of statistical techniques will be required to deal with the gap in the series? What will be the impact upon electoral boundaries, local government funding in the next five years? The Editors would be happy to receive letters or articles commenting upon issue such as these.

Turning to other content in this issue of the newsletter, we are reminded that the sections of the Society are one of the ways you can add value to your Society membership. Subgroups of like-minded individuals within the Society keep in touch with one another and share ideas. Sections also organise events both within the two-yearly cycle of Australian Statistical Conferences and outside that regular cycle.

In this issue the Editors are delighted to present an article from the Society's newest sections, on International Engagement. Have you thought of joining a section? Make it a priority when you renew your membership! Have you thought of creating a new section? Speak to your Branch Council and see what degree of support you can attract!

Alice Richardson
Alice Richardson
Editor

Michael Adena
Michael Adena
Editor

EVENTS

The Second Institute of Mathematical Statistics Asia Pacific Rim Meeting
Tokyo, Japan, 4th-6th July 2011

Graphical Modelling of Observational Data
A Short Course with Joe Whittaker, University of Lancaster, UK
22-24 June 2011, Brisbane

For more information about this course, please click [here](#).

Missing Data in Longitudinal Studies
30 June-1 July 2011, Adelaide

For more information please click [here](#).

International Conference for Health Statistics in the Pacific Islands
5-8 July 2011,
Tanoa Plaza Hotel, Suva, Fiji

Short Course: Instrument Design and Testing
A 2-Day course presented by Dr. Pamela Campanelli from the UK7 - 8 July 2011, Sydney Business School and Centre for Statistical and Survey Methodology, University of Wollongong

Survey Sampling and Data Collection
12-13 July 2011, Brisbane
For more information about this workshop, please click [here](#).

Missing Data in Longitudinal Studies
16-17 July 2011, Brisbane
For more information please click [here](#).

Australasian Applied Statistics Conference (GenStat and ASReml)
(formerly Australasian GenStat Conference)
12-15 July 2011, Palm Cove, North Queensland, Australia
Contact: Carole.Wright@deedi.qld.gov.au,
Conference Secretary

Young Statisticians Conference 2011
14-15 July 2011, Brisbane

ICIAM 2011 - Seventh International Congress on Industrial and Applied Mathematics 18-22 July 2011, Vancouver, Canada

NZSA 2011 Conference
28-31 August 2011, Auckland

58th Session of the International Statistical Institute
21-26 August 2011, Dublin, Ireland

The 3rd International Workshop on Internet Survey Methods

"Expansion of the Internet Survey and a Paradigm Shift for Statistical Production"

7-8 September 2011, Statistical Center of Statistics Korea, Daejeon, South Korea
To read more about the Call for Papers, please click [here](#).

For more information, please click [here](#).

Optimal Design of Experiments - Theory and Application

International Conference in Honor of the late Jagdish Srivastava
25-29 September 2011, Vienna

Biometrics Society Australasian Region meeting: Biometrics by the Kiama Blowhole
4-8 December 2011

"The Sebel Harbourside" in Kiama, NSW

Statistics for Strategies in Development
11th Islamic Countries Conference on Statistical Sciences (ICCS-11)

18-21-December 2011, Amman, Jordan

8th World Congress in Probability and Statistics (jointly organised by the Bernoulli Society and IMS)
9-14 July 2012, Istanbul, Turkey

Australian Statistical Conference 2012

9-12 July 2012, Adelaide, SA

More information to follow.

President's Column

Dear Members

Just a short note from me this quarter. My Statistical Society time has been mostly spent on routine matters rather than major new initiatives. While they are essential to the smooth running of the society, I'm sure you don't want to read about them.

As I write I am in the final stages of wrapping up the financial and administrative arrangements for the ASC 2010 held in Fremantle last year. The outcome is good and the conference has made a very valuable contribution to securing the future of the society. I would like to publicly record thanks on my behalf and on behalf of all SSAI members for the hard work of all the committee members who organised and ran such a successful event. Jane Speijers chaired the Organising Committee, and Brenton Clark lead the Program Committee, and they were ably assisted by Alex Bremner, Marty Firth, John Henstridge, Anna Munday, Katia Stefanova and Nihal Yatawara.

The conference organising company, Promaco, also performed well and met all our requirements. The Executive Committee took an especially close interest in the financial arrangements and I'm very grateful to Jane for her helpful and "can do" approach throughout.

Looking ahead, the Young Statisticians are in the final stages of planning their conference in Brisbane on 16 and 17 July. The Organising Committee for ASC 2012 in Adelaide is moving ahead strongly. 2012 will be the 50th anniversary of SSAI and that will form one of the themes for the conference.

We are currently exploring how the sections of the SSAI can play a stronger role in each ASC, so if you are interested and involved in one of the sections, there is an opportunity here to be seized. Feel free, indeed encouraged, to get in touch with the section chair and pass your ideas on.

Ian Marschner has been co-opted to the Executive Committee, to enhance the mechanisms for linking each section with the broader SSAI and we are beginning to

see how the Executive can help the sections pursue their interest and role in the SSAI better. (For those who don't know, Alan Branford has been playing a similar role for some time now with the branches, keeping information and ideas flowing between Branch Presidents and the Executive, in between the less frequent and more formal meetings of Central Council).

Had I more time I could talk a bit about the Journal and the newsletter (both in good shape), about seeing how our website could support sections and branches better, about the work on the National School Curriculum and teacher education, about working with AMSI (Australian Mathematical Societies Institute) and FASTS (Federation of Australian Science and Technology Societies) to lobby on behalf of statistics, about the Accreditation Committee, about our ambition to do more on public awareness of statistics and statistical issues, about our professional development workshops, about a workshop we may hold to explore an institutional membership concept, and more....but I won't.

Geoff Lee ■

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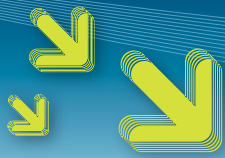
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Young Statisticians' Network

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



ISI 2011

58th Congress - Aug 21st - 26th

DUBLIN



www.isi2011.ie

The ISI has held biennial Congresses since 1853 and recent sessions have attracted over 2,500 delegates. Participants include academics, government and private sector statisticians and related experts from various institutes.

The Central Statistics Office, Ireland, invites you to participate in the 58th World Statistics Congress of the International Statistical Institute (ISI) which will be held in Dublin from 21st to 26th August 2011.

The Scientific Programme of the 58th Congress will offer delegates innovative and stimulating topics with well-balanced presentations. A key feature of the 58th Congress will be the special Theme Day to be held on Wednesday 24th August, where papers will be devoted to statistical issues relating to Water and Water Quality.

The 58th Congress will be held in the Convention Centre Dublin (CCD), Ireland's new world-class, purpose-built international conference and event venue. The CCD is located in Dublin's city centre, on the banks of the River Liffey.



2011 Young Statisticians Conference

Learners Today, Leaders Tomorrow!

July 14-15, 2011 University of Queensland, Brisbane

Call for Papers

The 2011 YSC aims to cover a wide range of topics in both applied and theoretical statistics. It can be any topic from your Honours/PhD study to simple ideas that interest you in your research.

Three prizes will be awarded for best presentations and one prize will be awarded for best poster.

The call for abstracts is now extended to 13 May 2011. The deadline for posters is: 10 June 2011. For instructions on poster submissions and guidelines for presentations, please visit our webpage below.

Conference Objectives

- To provide a forum for networking and the exchange of information for young and early career statisticians from around Australia.
- To promote the interests of young statisticians to the broader community.
- To learn statistical methods not taught in class.

Keynote Speakers

- Prof. Dongseok Choi: "Clustering methods for high-dimensional genetics data"
- Prof. Kerrie Mengersen: "An introduction to Bayesian statistics"
- Dr Ross Darnell: "Statistical models for marine and freshwater ecosystems"
- Prof. Mike Daniels: "Missing Data in Longitudinal Studies"

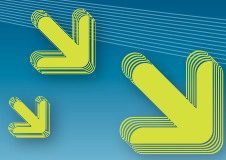
Pre-Conference Workshop

Dr Justin Fisher, an eminent statistician with a long background working for the United Nations, will present a satellite workshop entitled "Survey Sampling and Data Collection" on 12-13 July. For details, please visit www.statsoc.org.au/ysc.htm.

For any inquiries, please contact Frank (frank.liu@anu.edu.au) or Mark (m.griffin@uq.edu.au).

Organised by Young Statisticians Network,
Statistical Society of Australia Inc.





Moran Medal award story cont.



Mark Tanaka.



Scott Sisson.

The award in 2011 is the first time the Moran Medal has been awarded to two recipients and recognises both the joint work that Scott and Mark have collaborated on as well as their individual research contributions. Scott Sisson was cited for "making highly significant contributions to computational statistics and extreme value modelling. His research in approximate Bayesian computation has enabled researchers at the leading-edge of many scientific disciplines to examine realistic models and hypotheses, rather than be forced to use simpler, less credible alternatives. His research on extreme value modelling has enabled improved inferential procedures and highlighted the dangers of poor statistical modelling. In applying these techniques to challenging problems in other disciplines, Scott has had a very positive impact on furthering scientific research in a wide range of applications." Mark Tanaka was cited for "research concerning the evolution and population biology of microorganisms. He uses mathematical and statistical methods

to study the dynamics of bacteria and viruses. A particular focus of his research is the transmission patterns of infectious diseases. He has investigated key parameters in the epidemiology of tuberculosis in published research which has led to conclusions with public health policy implications that were hitherto unavailable. Tanaka's research is highly original and excellent, judged by the highest international standards."

Fittingly, for their award presentation at the Academy, they chose to jointly make a presentation on the topic "Advancing model-based statistical inference for contemporary scientific research".

Congratulations to Scott and Mark on this major achievement!

William Dunsmuir

(School of Mathematics and Statistics, University of New South Wales). ■

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The SSAI is delighted to announce that we can now offer our members a special discount of 25% on online purchases with Wiley or Wiley-Blackwell (<http://www.wiley.com/statistics>). To receive this discount, please order your books by telephone and quote the code SSA25.

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

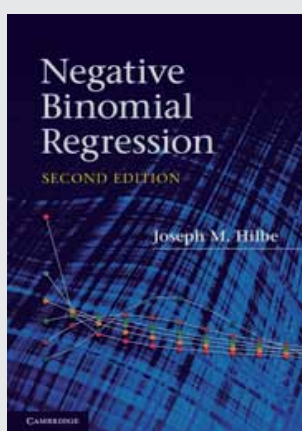
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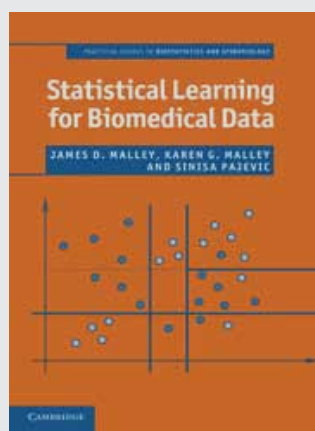
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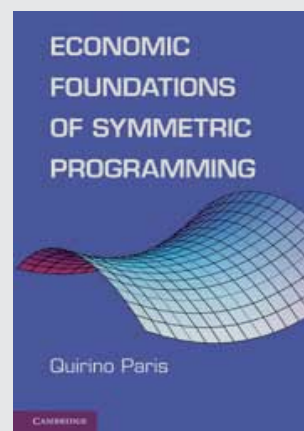
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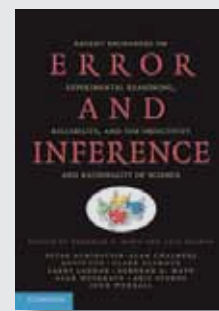
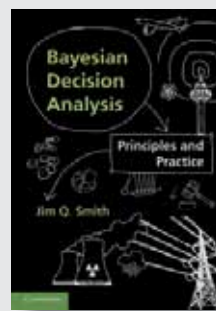
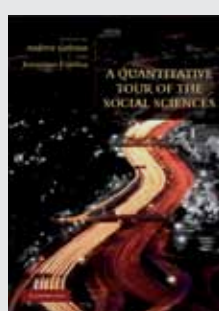
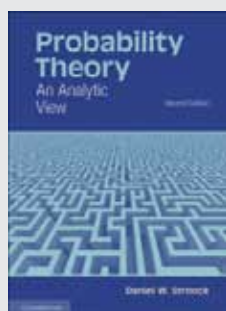
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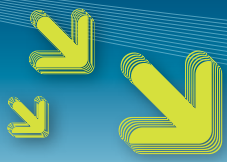
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AMSI workshop funding rounds *2011 now open*

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

Prof. Jon Borwein (The University of Newcastle) is Chair of the Scientific Advisory Committee with a membership of eminent national and international mathematical scientists.

Applications for workshop sponsorship up to \$10,000 are open to academics from AMSI member departments.

**2011
rounds close:
2 September 2011
1 December 2011**

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



National
Collaboration
in the Mathematical
Sciences

Missing Data in Longitudinal Studies

30 June-1 July 2011, Adelaide
16-17 July 2011, Brisbane

Missing Data in Longitudinal Studies

Strategies for Bayesian Modeling, Sensitivity Analysis, and Causal Inference

This course provides a survey of primarily Bayesian approaches to handling missing data in longitudinal studies, and illustrates the use of newly-developed methods for model selection, sensitivity analysis, incorporation of prior information, and causal inference. The emphasis is on Bayesian approaches but the models and methods discussed can be implemented in non-Bayesian settings as well. The course will be roughly divided into five parts: Part 1 course will include a brief review of models for longitudinal data and the basics of Bayesian inference; Part 2 will focus on formal classification of dropout and missing data mechanisms, describe classes of models that can be used to adjust for biases caused by dropout, and the logistics of model fitting and model selection and Bayesian proper

imputation; Part 3 will deal with specification and fitting of models to handle non-ignorable (informative) dropout, with emphasis on the role of sensitivity analysis and informative prior distributions for encoding key assumptions; Part 4 will focus on causal inference in the context of incomplete longitudinal data; Part 5 will discuss approaches for handling missing time-varying and baseline covariates. Integrated into the course will be six case studies that illustrate many of the concepts introduced during the course. We will build on each case study to illustrate progressively more complex analyses (e.g. progressing from analysis under MAR, to analysis under MNAR, to use of informative priors and sensitivity analyses).

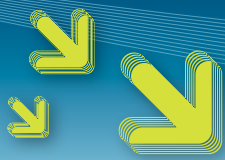
8:30-9:00	Registration
9:00-9:45	Motivating Examples
9:45-10:15	Regression for longitudinal data
10:15-10:45	Key concepts in Bayesian inference
10:45-11:15	Coffee Break
11:15-12:15	Missing data mechanisms in longitudinal studies
12:15-12:45	Bayesian approaches to model selection and checking for incomplete longitudinal data
12:45-1:45	Lunch
1:45-3:15	Models and methods for ignorable Missingness
3:15-3:45	Coffee Break
3:45-4:15	Proper Bayesian multiple imputation
4:15-5:15	Models for handling nonignorable missingness

Sunday, July 17

9:00-10:30	Sensitivity analysis and informative Priors (part 1)
10:30-11:00	Coffee Break
11:00-12:30	Sensitivity analysis and informative Priors (part 2)
12:30-1:30	Lunch
1:30-3:00	Causal inference and missing data in longitudinal studies
3:00-3:30	Coffee Break
3:30-5:00	Missing covariates

Target Audience

- Professional statisticians working in applied environments where missing data is a key issue and where formal, well justified approaches are needed for making informed inferences; e.g. academic centers running large clinical trials, statisticians working in the pharmaceutical industry, statisticians working for regulatory agencies
- Researchers and students from statistics and related fields who are interested in the topic as an area of research. The necessary background is a working knowledge of linear and generalized linear models and basics of likelihood-based inference. This would include individuals with graduate degrees in statistics, biostatistics, econometrics and related fields, and advanced students in programs offering these degrees.



About the Instructor

Michael Daniels is Professor and Chair in the Department of Statistics at the University of Florida. Mike has published extensively in the statistical literature on methods for (incomplete) longitudinal data with articles appearing in *Biometrics*, *Biometrika*, *Biostatistics*, *Journal of the American Statistical Association*, and *Statistics in Medicine* and has had continuous research funding from the U.S. National Institutes of Health (NIH) since 2001. He recently completed a book, coauthored with Joe Hogan, titled "Missing Data in Longitudinal Studies: Strategies for Bayesian modeling and Sensitivity Analysis" published by Chapman & Hall/CRC Press. He has taught a graduate-level course on incomplete longitudinal data at the University of Florida several times and has given several short courses on missing data and dropout at national and international conferences and government agencies.

There are separate regression costs depending upon whether the delegate is a full-time student, and a member of the Statistical Society of Australia. Registration includes a complete set of course notes, and full catering (lunch, morning and afternoon tea) throughout the workshop. To register for this workshop please click [here](#) for the Adelaide workshop and [here](#) for the Brisbane workshop.

	Student members	Student non-members	Members	Non-members
Early Bird (before 16th June)	\$AUD320	\$AUD425	\$AUD625	\$AUD850
Regular (after 15th June)	\$AUD370	\$AUD475	\$AUD675	\$AUD900

**Proudly organised by the
SSAI Biostatistics Section and the
ASA Friends of Australasia
and the University of Adelaide**



Symposium to Honour Ken Brewer

David Steel



Ken Brewer, JPS.



Ken Brewer (centre) with symposium group.

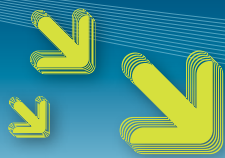
A symposium to honour Dr Ken Brewer on the occasion of his 80th birthday was held in Canberra on March 16 2011. The meeting recognised the significant contributions to the discipline and profession of statistics in Australia and internationally that Ken has made over a career spanning 60 years. He has developed innovative theory and practical methods in sample design and estimation, time series methods and the foundations of statistics inference. His career includes major appointments at the Australian Bureau of Statistics, Australian Bureau of Agricultural and Resource Economics and the Australian National University. Ken has also made long term contributions to the Statistical Society of Australia.

Papers were presented by: Professor Murray Aitkin, Department of Mathematics and Statistics, The University of Melbourne, *Bridging the gap – Bayesian contributions to survey sampling inference*; Professor Alan Welsh, Centre for Mathematics and its Applications, The Australian National University, *Behind*

the elephants; Professor Alastair Scott, Department of Statistics, University of Auckland, *Pseudo-likelihood methods for survey data*; Associate Professor Robert Clark, Centre for Statistical and Survey Methodology, University of Wollongong, *Sample design using imprecise design data*. These speakers developed interesting connections between their papers and Ken's work.

The symposium was attended by over 50 people and organised by the Centre for Statistical and Survey Methodology at the University of Wollongong and the Canberra Branch of the Statistical Society of Australia.

David Steel 



Stephen Horn

New Techniques and Technologies in Statistics 2011



Report from attendance

In January 2011 a paper I proposed, drawing on work within my department, was accepted on the programme of the 5th Eurostat New Techniques and Technologies in Statistics (NTTS) conference, held from 22 – 24 February 2011. The paper presented a payments system health (PSH) framework as a novel approach to combining data sources in management of social policy.

The recurring NTTS conferences bring together official statisticians, researchers and policy experts around setting the agenda for a new round in the construction and innovation of the European Union's system of statistics. The meeting allows final reporting on previous round projects, some assessment of their value for policy, and discussion on the shape of future research to improve the evidence base for European policy making.

Sessions were organised under three headings: *Collecting and producing*; *Publishing and analysis*; and *Use and influence*.

Key note addresses encapsulated 60 years of progress in official statistics, from its foundations in survey theory and methods, through consolidation in nationally organised systems, to present engagement with a rich informatics environment and with supranational policy making.

My presentation was included in the second of two sessions on integrating multiple data sources. Other talks in these sessions covered: statistical matching and micro integration; combining survey and administrative data sources for poverty measures at local level; inconsistencies in multiple register based data sources; new technologies for mobility surveys; responding to calls on a corporate data warehouse; and

improvements in quality of accounts data.

Several sessions dealt with a concern that methods innovation was having little influence on policy; and the reverse problem of poor access to administrative data for constructing and testing the next generation of methods. In both cases statistics as a discipline was being challenged by rival disciplines – informatics, engineering, physics and biology – to harness the exploding connectedness and cascading flows of data.

On the other hand, social policy in the face of the transformations of the economic environment has had difficulty emerging from the positivism of the previous age, where growing prosperity in one jurisdiction was seen as heralding a general advance in society – in one country and by extension to groups or clusters of countries.

In one way or another, the meeting reflected the consequences for the architecture of official statistics of these demands, mediated by shifts in technical capacity, governance, and reception. In a similar way official statistics as a body of methods practised by national statistics institutes has passed from the vanguard of informatics to a collection of suboptimal solutions using second hand theory and loose consensus on standards. The confrontation between theory (as taught) and methods (as practised) may be fruitful – that is the premise in any case.

Implications

Rather than an extended response to developments across portfolios for better management of business intelligence, alternatively an echo of generalised interest in quality of life and progress measures, PSH should be seen as a singular pursuit of greater accountability in social policy, driving

renovation in official collection support to the emerging social inclusion agenda – in Europe if not in Australia. No longer is it appropriate to partition an external social indicators frame from an internal administrative information base. Neither is adequate on its own to capture the working of the transfer system, although each has reached a high degree of refinement in contrast to still statistically underdeveloped synthesis of sources to yield a suitable foundation to modern social security policy.

The conference brought together some of the loose ends in this synthesis, drawing on technical developments to harness often borderless connectivity in raw data toward national and comparative supranational ends. Both data integration and policy support are preoccupations among European official statisticians and their academic collaborators, and much work is already underway. The breadth and direction of this work supply useful touchstones for improving the social policy evidence base in Australia; and lends support for strengthening its statistical foundation to monitor current expenditure and guide policy innovation.

Stephen Horn works as a statistician in a major government department in Canberra; the views and observations above remain however his own.

Stephen Horn



Instrument Design and Testing

7 and 8 July, 2011

Short Course



Sydney Business School and Centre for Statistical and Survey Methodology, University of Wollongong are offering a 2-day course on Instrument Design and Testing, presented by Dr. Pamela Campanelli from the UK.

special issues faced in writing factual, non-factual and sensitive questions, for both interview and self-completion modes, and also includes an introduction to various methods for testing survey questionnaires. For more detail see <http://cssm.uow.edu.au/events/UOW101844>

Location: Sydney Business School, Gateway Building, 1 Macquarie Place, Circular Quay, Sydney.

Duration: This is a two day course. The course begins with registration from 9.00am and formal teaching begins at 9.15am and ends at 4.30pm. On the second day, the course runs from 9.15am and ends at 4.30pm.

Fees: \$1100 per participant including GST.

Morning and afternoon coffee and light lunch is included in the course fee.

Places are limited so please contact Anica Damcevski on 02 4221 5435 or email anica@uow.edu.au to obtain a course nomination form. ■

Summary of Course

Have you ever discovered too late that your questions did not deliver useful or useable data? Learn how to write effective survey questions and combine them into a meaningful questionnaire. This course combines suggestions from the research literature on questionnaire design with a very practical approach. It covers the

Please note

The instructor will be available for one-to-one sessions on your questionnaire during breaks, lunch, and after the course each day.

This course does not cover the design of multi-item scales based on psychometric principles.

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

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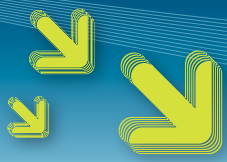
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Canberra Branch News

Mathematicians/Statisticians in Schools Program

Rohan Baxter



The place of mathematics in society is the subject of much discussion in this Newsletter and elsewhere. February's talk was all about a practical initiative to help plant mathematical inspiration in school communities with the idea it will grow into a wider societal knowledge and appreciation of mathematics.

Conan O'Brien, Project Officer at CSIRO Education, provided an overview of the Mathematicians in Schools (MiS) program. The program provides an opportunity for mathematicians, statisticians and other mathematical professionals to collaborate with school teachers, helping to engage and inspire our children. Conan recounted the now familiar statistics around the participation decline in advanced maths in high schools over the last 15 years (1995 to 2009, from 27% to 20%). He then described the who and what of the Mathematicians in Schools program. The "Who" covered a range of mathematical professionals. The inclusion of accountants in the mathematical professions list received a reaction from the audience (perhaps because of the possible reinforcement of the stereotype that maths led only to careers in accountancy and engineering). Conan emphasised that help from all quarters was welcome for the program and would help overcome the narrowness of mathematical career perceptions. The type of participation and the time commitment required was flexible. Conan gave examples on different styles: presentations and demonstrations to children (and parents and teachers), joint projects and

investigations (building interesting shapes e.g. the truncated isohedron, analysing house price data in Perth investigating relative merits of median/mean), excursions and field trips. Other options included mentoring, long-distance interactions, involvement in extension or remedial groups and in various math/science challenges (i.e. MCYA, Statistics Poster competition).

Dr David Lovell of CSIRO Mathematics, Informatics and Statistics and Belle Cook of O'Connor Cooperative School then talked about their joint work in a Year 2 classroom. David first registered his interest on the website, and Conan, as program coordinator, then got in touch with him. Belle, as a Year 2 class teacher, had registered with the Program after she found she had three boys who were way ahead of their peers (in one case, assessed to a Year 11 maths aptitude and beyond as a seven year old). The boys were bored by the class maths and Belle contacted the Program thinking a mathematician may help provide challenges and guidance beyond what they were achieving by their self-study from books.

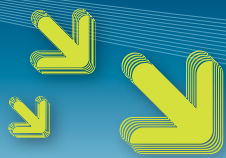
David volunteered a Friday afternoon a fortnight. He started in the class with a team lesson on measurement, looking at arm length and weight and their relationship. He also worked in a small group with the boys. He brought protractors to class and worked on measuring angles with them. Belle and David mentioned the new tools led to curiosity and exploration amongst others in the class and not just the three boys. David mentioned how rewarding

it was to share a view of the world with the boys different from the one they gleaned from their books (and he also learnt from understanding more of the boys' current view of maths) and to share approaches like its ok to learn by making mistakes at first.

Belle mentioned that the boys really looked forward to David's visits. One boy who was home sick on a visit day, made a special effort to come in just for David's visit. There was a discussion around CSIRO and University administrative issues around staff visiting schools. John Maindonald mentioned his experience with the program with a Year 11 class. Conan finished up with tips about what makes good MiS partnerships: good communication between mathematician, teacher and himself (harder than you may think due to school class time and busy professionals), good planning (schedule around conference trips etc) and good imagination (aiming for synergy where all participants contribute and learn something).

The Mathematicians in Schools website is: <http://www.mathematiciansinschools.edu.au/>
It is a sub-program of <http://www.scientistsinschools.edu.au/>

Rohan Baxter ■



Helen Thompson

Queensland Branch News

Queensland's April ordinary meeting saw Karen Smith give a presentation on interrupted time series applied to suicide research. Karen is the Principal Statistician at the University of Leicester Clinical Trials Unit and kindly agreed to finish her hectic two week schedule in Brisbane by giving an enlightening seminar to Queensland branch members.

Interrupted time series is useful when there is a change at a particular point in time, and offers and improvement over the before vs. after analysis that are often conducted. Karen's application of interrupted time series looked at the withdrawal of co-proxamol, a prescribed analgesic used to treat arthritis, from the market, with the withdrawal date being the "interrupted" component of the time series. This particular type of analgesic has a narrow therapeutic window and was thought to be an opportunistic prescribed drug linked to both accidental and intended suicide. Karen clearly demonstrated the benefits of an interrupted time series approach in investigating the impact of withdrawal on suicide rates over a simple pre-withdrawal vs. post-withdrawal analysis and highlighted the practical difficulties involved in sourcing the relevant data. It was apparent that the audience was engaged by both the technique and application with lively questions and discussion both during and following Karen's presentation.

Karen's slides from her talk will be made available on Queensland Branch's website.

Helen Thompson ■

20% SSAI Member Discount Promotion!

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.

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South Australian Branch News

Paul Sutcliffe



South Australian April Meeting

2011 CENSUS: 111 DAYS TO GO

The speaker at the April South Australian Branch meeting was Caroline Deans, manager of the South Australian Census Management Unit, at the Australian Bureau of Statistics (ABS). The Australian Population and Housing Census will be conducted on Tuesday 9th August 2011 and is now 111 days away. The Census is often described as Australia's largest peace time operation, costing \$440 million over its five year cycle and employing 43,000 people.

In opening her talk Caroline noted that this year's Census will be the 16th National Census and a hundred years since the first Census. The Census is a massive logistical management. In the field phase there are 2,300 collectors and 300 area supervisors just in South Australia.

Historically the Census enumeration methodology has been a method which requires the collector to deliver to every household a questionnaire and to return to collect completed forms (drop-off and pick-up). However, more recently in 2006 and again in 2011 development of an eCensus enables households to 'return' their questionnaire by completing a web-based version. This has an advantage over the physical collection method since no agreed return time needs to be made, resulting in less intrusion for the householders and reduced cost of collection.

There are procedures in place to avoid over counting (e.g. duplication etc) in the Census. Under counting in the Census is measured in a follow-up survey (post-enumeration survey) which 'checks' the number of people at households at the time of the Census. Discrepancies can be analysed and an assessment of the overall undercount is published after each Census.

A key Council of Australian Government (COAG) requirement is to get the indigenous count right. In response, the ABS has developed a northern Australian collection strategy to co-ordinate the collection of forms from indigenous communities.

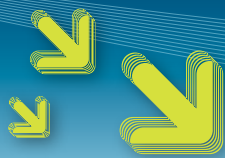
From the number and type of questions after the talk it is obvious that the Census is an interesting topic. For researchers some key points were raised:



- Meshblocks are small geographical areas which are combined to form collector workloads, and although limited data will be released at the meshblock level, customised aggregations won't be available.
- There is a change in standard geography which analysts should be aware. The Census will be output at the SA1 level (approximately equivalent to CD level).
- Questions in the Census generally remain the same, and some, such as the question on religion are voluntary.
- The ABS encourages statistical users to use the table builder functionality for basic tables.
- For more in-depth analysis the 1% sample unit record file when it becomes available can be purchased. For researchers at universities there is an agreement which arranges organisational approval so access may be available through this means.

A very interesting and informative talk was followed by a meal at the Union Hotel.

Paul Sutcliffe ■



Julian Whiting

South Australian Branch News cont.

For its first meeting of 2011, the South Australian Branch was pleased to welcome Liliana Orellana from the University of Buenos Aires. Liliana gave a talk titled “Estimating the optimal dynamic treatment regime from longitudinal observational data”, which was a topic part of her PhD work. Liliana’s current research focuses on methods for drawing causal inferences from longitudinal studies.

Liliana began the talk by discussing dynamic treatment regimes and the concept of the optimal treatment regime. Dynamic treatment regimes are treatments tailored to an individual based on the patient history of a defined set of variables. Throughout the talk Liliana used the example of finding the most appropriate time to prescribe highly active antiretroviral therapy (HAART) to asymptomatic subjects infected with HIV. The dynamic treatment regime could be a decision rule which uses the patient’s CD4 cell count history to determine when to commence HAART. The optimal decision rule is the one which maximizes the expected benefit measured as some utility function of the patient history.

Liliana explained the nature of the observational data which is available to assess dynamic regimes and defined the algebraic framework for the data and the analysis. Inverse Probability of Censoring Weighted methods can be applied to these data to make valid inferences about the performance of the treatment regimes. The methods assign a weight to each observation for each subject, where the weight depends on the regime being assessed. For estimating the performance of a particular treatment regime, observations are assigned a non-zero weight only until that point in time point when the subject can no longer be considered to be following that regime. For the time points beyond, the subject is censored and at the censored time points other subjects with similar prognostic factors are given increased weight. The weighted mean of the utility function for the observations estimates the expected value of the utility for the regime.

Liliana discussed how she has used a parametric model for the expected utility to choose the treatment regime which is optimal from a large number of candidate regimes. This modelling approach is favoured over a non-parametric approach which chooses the regime which has the highest utility, because such estimates are typically subject to high variance.

The observational data available for analysis can arise from either interval cohorts where patients are observed at regular time intervals, or clinical cohorts where the timing of visits depends on the clinical evolution of the patient. Liliana finished the talk with a discussion of the additional challenges when using clinical cohort data. If it is assumed patients are advised by their doctor the latest possible date for the next visit, an optimal treatment plan can be estimated. Liliana highlighted how the optimal treatment plan in this case depends on the visit plan of patients.

In March

Following the Branch Annual General Meeting, Chris Brien from the University of South Australia gave a talk on principles in the design of multiphase experiments with a later laboratory phase.

Chris started the talk with a discussion of some general experimental design principles for single-phase experiments and illustrated the value of factor-allocation diagrams. The diagrams represent the factor-allocation description of a design by showing the factors and their nesting relationships. Further, they help with the identification of the experimental units and the derivation of a skeleton ANOVA table to show which factors can be estimated from the design. Chris advocated using a skeleton ANOVA table to evaluate designs irrespective of whether the data is analysed by ANOVA.

The factor-allocation description was contrasted with the popular single-set design description. The single-set description uses a single set of factors sufficient to uniquely index observations.

Chris discussed how the single-set description will typically result in models that contain all the effects that can be estimated, but the factor-allocation description more accurately represents the sources of variation and the confounding of effects.

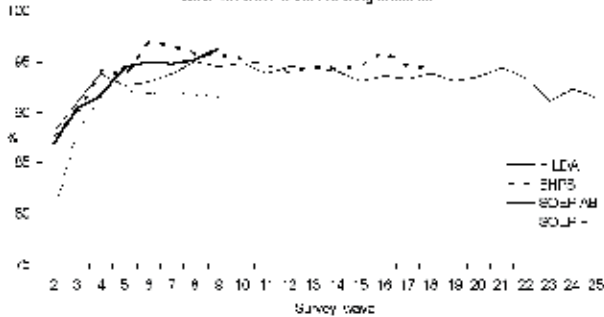
Eight experimental design principles specific to orthogonal multiphase designs were presented in the context of a two-phase experiment in which a laboratory analysis constitutes the second phase. Two principles concerned replication and allocation at the laboratory phase. Chris discussed the importance of replicating the laboratory analysis of first phase units if laboratory variation is significant, as well as strategies for the allocation of the first-phase replicates in the laboratory phase. Fundamental to some of the principles is the relative size of the sources of variation. For example, one principle is to confound big first-phase sources with big laboratory sources, provided there is no confounding of treatments with first-phase sources.

Throughout the talk Chris illustrated how his principles applied to an athlete training experiment where a range of training conditions are investigated by applying them to tests undertaken by a small number of athletes. The outcome of the single-phase experiment was a heart rate measurement. The multi-phase extension involved a laboratory phase to analyse blood specimens from the athletes to measure free haemoglobin. A proposed design involved taking duplicate samples from each blood specimen and analysing one sample from each specimen in the same round of laboratory analysis.

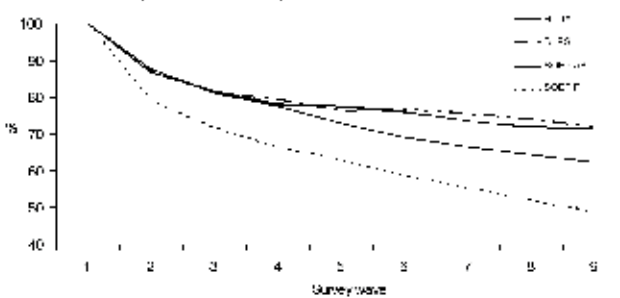
Julian Whiting ■

Victorian Branch News

Wave-on-wave interviewing success



Proportion of Wave 1 respondents interviewed each wave



Nicole Watson

over the previous two years.

The AGM was followed by a presentation from Nicole Watson, Melbourne Institute of Applied Economic and Social Research at

the University of Melbourne, on **Re-engaging with survey non-respondents: evidence from Australia, Britain and Germany**. Nicole has worked on the Household, Income and Labour Dynamics in Australia (HILDA) Survey for the last 10 years, first as Survey Manager and now as Deputy Director, and her research has arisen from her work on the HILDA Survey.

Nicole noted that previous research into the correlates and determinants of non-response in longitudinal surveys has focused exclusively on why it is that respondents at one survey wave choose not to participate at future waves. This is very understandable if non-response is always an absorbing state, but in many longitudinal surveys, and certainly most household panels, this is not the case. Indeed, in these surveys it is normal practice to attempt to make contact with many non-respondents at the next wave.

So this analysis differs from previous research by examining the process of re-engaging with previous wave non-respondents. The research draws on data from three national household panels – HILDA Survey (which commenced in 2001), the British Household Panel Survey (BHPS, 1991) and the German Socio-Economic Panel (SOEP, two samples – A/B, 1984 and F, 2000).

All three surveys have similarities – in their first wave a nationally representative sample was selected, they aim to interview all adults in the household face-to-face, households are interviewed annually, and the surveys

are managed by academic organisations with fieldwork undertaken by market research companies.

Initially Nicole compared the wave-on-wave response for the first nine waves for each of the surveys. As the following graph shows, the three surveys show similar wave-on-wave response, although the new German panel does have lower response. Nicole noted that HILDA wave 10 wave-on-wave response was similar to the Wave 9 response – very pleasing!

Nicole also displayed the following graph which shows the proportion of Wave 1 respondents interviewed each wave. Australia and the UK have very similar trajectories, but the German panel has considerably lower response. Nicole stated that this was most likely due to stricter rules into following-up some refusals.

Previous research has focused primarily on the time until the first drop-out, non-response following response, within-wave response conversion, and patterns of attrition, but nothing on converting previous wave non-respondents.

Nicole was however particularly interested in the group that leave but then come back. She modeled survey re-engagement using logistic regression, controlling for fixed individual characteristics (at Wave 1), and time varying characteristics. What was particularly interesting was the influence of the interviewer – especially as this is a characteristic over which the survey managers can have some control. In all countries an experienced but different interviewer increased the likelihood of re-engagement. These results have important implications for fieldwork, although Nicole noted that it can be difficult to organize for different interviewers to visit, due to geographic considerations.

Nicole summarized her presentation by stating that although non-response is unavoidable and accumulates over time, non-respondents do need to be persuaded to re-engage.

Nicole had welcomed questions during her presentation, and more were asked at the end of her very accessible seminar. A number of us then joined Nicole for dinner at a local restaurant.

Carol Soloff ■

The first meeting for 2011 was the Annual General Meeting of the Victorian Branch, held on Tuesday 22 March at the University of Melbourne.

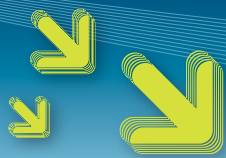
About twenty people attended and heard the outgoing President, Ian Gordon, provided a summary of the previous year's activities, highlights of which were the nine seminars presented. We had 60 new members joining, with a net membership gain over the year of almost 30. Owen Jones presented the Treasurer's Report – we continue to be in a sound financial position.

Nine nominations were received for Branch Council, with two members of the previous committee not re-nominating (Brian Phillips and Karl Jackson), and a student representative recruited shortly after the meeting. Ian acknowledged the contribution of both retiring members, and made special note of Brian's long term membership and active participation in Council and the Society over many years.

The members of the 2011 committee are: Michael Phillips (President), Ian Gordon (Immediate Past President and Vice-President), Geoff Adams, Kym Butler, Sandy Clarke, Sue Finch, Han Gan, Lyle Gurrin, Owen Jones and Carol Soloff. Other Branch Council positions will be decided at the next Council meeting.

At the end of the AGM, thanks were recorded to Ian Gordon for his outstanding leadership





Ryan Admiraal

Western Australian Branch News

In the first two meetings of 2011, the Western Australia Branch was treated to two engaging talks. At the AGM in March, Stephan Lewandowsky from the School of Psychology at the University of Western Australia presented a talk entitled “Data, Statistics, and Human Cognition.” In his talk, Stephan explored the role of human cognition in statistical data analysis, emphasizing that appropriate data analysis is not sufficient. We must also understand how people filter and perceive the data and results.

To illustrate his point, Stephan used several examples. As a starting point, he wanted to better understand why it is that global warming skeptics have been able to gain traction. In part, it is due to conveniently choosing outlier hot years to suggest a decreasing trend when compared with subsequent slightly cooler years. However, it is also due to how people perceive data. Stephan surveyed people in the Perth CBD to see how well they could forecast time series, asking them to extrapolate what they believed they would see in terms of trends in the future. Unbeknownst to these people, he was using climate data. He found that those who did well in their forecasts focused on the overall trend, whereas those who did poorly focused on the last several time points. Interestingly, extrapolated slopes were significantly positive, even for people who denied climate change, although it was clear that there was trend damping, as people did not predict quite as extreme of a trend as the recent trend.

In addition to investigating how people perceive data such as time series data, Stephan examined whether it was more effective to use multiple indicators instead of just one indicator to help people better recognize overall trends. For example, multiple climate indicators may be more effective than simply focusing on average daily temperature over time. He also touched on the difficulty people experience in understanding accumulation

processes and non-linear time lagged effects, using as an example carbon emissions where the effects of carbon do not kick in immediately, and the effect on temperature may be non-linear. His conclusion was that people struggle to understand complex systems, so the presentation of results must take this into consideration and address how people will perceive the analysis and results.

In April, Prof. Henning Omre from the Department of Mathematical Sciences at the Norwegian University of Science & Technology presented a talk entitled “Bayesian Closed Skew Gaussian Inversion of Seismic Data” in which he described the closed skew Gaussian distribution and some of the properties that may make it more attractive than the multivariate Gaussian distribution in Bayesian models. He specifically considered this in the context of Bayesian inversion. Bayesian inversion is commonly used for inverting seismic data into elastic material properties, such as p-wave velocity, S-wave velocity, and density. In such problems, the likelihood model links the seismic data to these elastic properties and is typically specified as a linearised approximation with additive Gaussian errors. As a matter of mathematical convenience, a multivariate Gaussian distribution is then used to represent the prior distribution of the log-transformed elastic properties, as this produces a multivariate Gaussian posterior.

While the use of the multivariate Gaussian as a prior in this context may be attractive because it is a conjugate prior, in most cases it is not appropriate because the marginal distributions of the log-transformed elastic properties are not Gaussian. To address cases where non-Gaussian marginal distributions are simply due to skewness, Henning suggested using the closed skew Gaussian distribution. The closed skew Gaussian distribution allows for skewness in the marginals, is closed under conditioning, and is a conjugate prior when the likelihood is closed skew Gauss-linear

likelihood. Thus, it shares the nice mathematical properties that motivated using a multivariate Gaussian prior with a Gauss-linear model, and, in fact, the closed skew Gaussian model generalizes the multivariate Gaussian model. To round out the talk, Henning provided several examples comparing Bayesian Gaussian inversion and Bayesian closed skew Gaussian inversion for synthetic data, demonstrating the greater flexibility of the closed skew Gaussian distribution.

Ryan Admiraal ■

From the SSAI Office

Marie-Louise Rankin



Our new Executive Officer, Jenny Rintala, will commence a hand-over with me on 2nd June 2011. I will be around the office, tidying up loose ends and being available for Jenny if she has any questions until 23rd June 2011. After that, my family and I will take off on an overseas holiday to reconnect with relatives and friends in Germany and England.

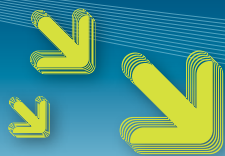
I'd like to take this opportunity to wish Jenny all the best in her new role as the Executive Officer of SSAI and to thank the Executive Committee and all SSAI members for their kindness and patience the last three years. Meeting many of you in person at the different SSAI conferences was certainly one of the highlights of my time with SSAI. I would especially like to thank Doug Shaw and Stephen Horn for having given me the opportunity to work for SSAI in the first instance. I've thoroughly enjoyed my employment with the Society and gaining a little insight into the world of statistics.

The members of the different committees of SSAI, Central Council, the Branch Council members, section representatives, newsletter editors, workshop organisers and the members associated with the publication of the ANZJS are all indeed amazing. You all have very busy "day jobs", but the manner in which you donate your precious time to the SSAI is truly an inspiration.

Please support Jenny in the same way you have supported me over the last three years.

Best wishes to all of you.

Marie-Louise Rankin ■



Short Course on Graphical Models

The School of Population Health, University of Queensland and the Statistical Society of Australia, Inc. are hosting a two day introductory course and an advanced day on Graphical Modelling of Observational Data in Brisbane, to be presented by Professor Joe Whittaker, Lancaster University.

Guest Lecturer: Professor Joe Whittaker
Department of Mathematics and Statistics,
Lancaster University, UK



- I. **Introduction to Graphical Modelling of Observational Data using R (2 days)**
9:00am–5:00pm, Wednesday & Thursday 22-23 June 2011
- II. **Advanced Topics in Graphical Modelling of Observational Data (3rd day)**
9:00am–5:00pm, Friday 24 June 2011

Location: Room 434, Public Health Building, University of Queensland, Herston Campus.

A particular problem of statistical data analysis is to model the inter-dependencies among a set of response variables. Graphical models, based on conditional independence, provide a powerful and informative toolbox for unravelling manifest interactions and associations.

This course discusses undirected graphical models, describing their properties and their statistical analysis. The course is not mathematical but sometimes phrased in mathematical notation, for example $X \perp Y$ denotes that X and Y are independent. It updates the material in *Whittaker, J (1990) Graphical models in applied multivariate statistics*, Wiley. Many examples of successful analyses drawn from the social, biological and physical sciences are given.

Novel features of this course are the emphasis on weighted independence graphs, a review of modern search methods and a survey of R packages useful to graphical modelling. Using R from inside Microsoft Excel and statistical packages such as stata, SAS and SPSS will also be briefly outlined.

This will be a lecture course with software demonstrations and some hands-on practicals. Sessions will be roughly 90 minutes long and most sessions will include short practicals.

Participants will be expected to have R and appropriate graphical modelling packages installed on their own laptop. Details and help with installations will be provided to participants prior to the course.

Participants are encouraged to bring a data set of their own to explore during the course.

