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SSAI newsletter

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International Conference on Statistics, Combinatorics and Related Areas

Calyampudi Radhakrishna Rao, one of the giants of twentieth century statistics and arguably the world's best known living statistician, accepted an invitation to be the first Visiting Professorial Fellow of the Institute for Mathematical Modelling and Computational Systems at the University of Wollongong. He visited from mid December to mid February.

Prof Rao presented the Occasional Address at the afternoon ceremony for the Faculty of Informatics December 2001 graduation at which he was also awarded an Honorary Doctor of Science degree. In the accompanying photo he is pictured with the Chancellor, Mr Michael Codd AC; and the Vice-Chancellor, Professor Gerard Sutton.

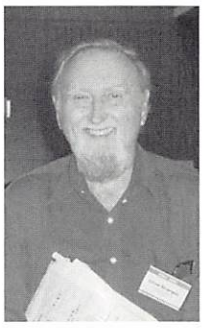
Mr Michael Codd, Professor Rao and Professor Gerard Sutton.

Professor Rao was one of many international figures who attended the International Conference on Statistics, Combinatorics and Related Areas and the Eighth International Conference of the Forum for Interdisciplinary Mathematics, held between December 19-21, 2001 at the University of Wollongong. The invited speakers included Joe Gani (Australia), Clive W.J. Granger (USA), Christopher C. Heyde (Australia), Bryan Manly (USA), P. K. Sen (USA), and J.A. (Nye) John (New Zealand).

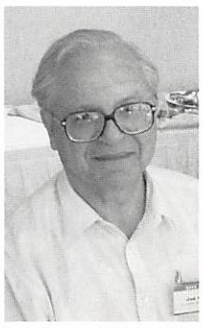
More photos can be viewed at http://www.uow.edu.au/informatics/maths/statconference/files/photos/photos.html

Professor Rao gave a series of lectures between 9 January and 15 February. Abstracts of his talks are available at http://www.uow.edu.au/informatics/maths/immacs/activities/index.html

John Rayner



Clive Granger



Joe Gani

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DEADLINE FOR NEXT ISSUE: 20 July 2002

General Meeting of SSAI Central & ASPAI Council

Summary report

For the first time, a Central Council meeting was held by telephone hookup, in order to save the Society money, and to save time for the attendees.

The meeting was held on Friday 8 March, 2002, from 2.00pm to 3.30pm EST.

Main outcomes:

1. Council noted with regret the death of Professor H.O. Lancaster.
2. The SSAI Executive will examine what procedures need to be in place to make the web site secure for money transactions to the society.
3. Council has endorsed supporting the jobs network fully, until such time as a way can be found to fund it.
4. Council was briefed by the President on progress with developing a Public Awareness strategy, to promote the benefits of a professional approach to statistical practice, and the benefits of Professional Accreditation.

   Branches have been requested to run Focus Groups in order to obtain more Statistical Success and Disaster stories, particularly Australian ones.
5. The ANZJS Editor, Chris Lloyd, is assembling a task force to examine some of the issues associated with Web publishing.
6. Eden Brinkley has expressed a desire to stand down, after many years as Editor of the SSAI Newsletter. The Executive is to look into possible alternative arrangements for how the Editor's job might be handled, with more involvement from Branches.
7. Conferences.

   ASC 2002, scheduled for July in Canberra, is shaping up as an excellent conference.

   ASC 2004 will be held in conjunction with the International Biometrics Conference in Cairns.

   ASC 2006 will be run jointly by the SSAI and the New Zealand Statistical Association in Auckland.

   The 2005 Session of the International Statistical Institute will be held in April in Sydney. The SSAI is planning a satellite meeting on Business and Industrial Statistics in Cairns, following the ISI Session.
8. Election of Vice President and Secretary. Dr Neville Bartlett was elected as the incoming Vice-President, and Mr Geoff Bruton will continue as Secretary.

NOTICE of the ANNUAL GENERAL MEETINGS of the STATISTICAL SOCIETY OF AUSTRALIA INC and the AUSTRALIAN STATISTICAL PUBLISHING ASSOCIATION INC

The meetings are to be held on Sunday, 7th July 2002, National Convention Centre, Canberra at 3pm

AGENDA FOR THE SSAI ANNUAL GENERAL MEETING

1. Apologies and Proxies

Proxies must be given in writing as per enclosed proforma. They must be given to the Secretary no later than 24 hours before the time of the meeting.

2. Confirmation of the Minutes.

Minutes of the meetings as circulated

3. Matters arising

4. Accreditation

4.1 Report from Accreditation Committee

4.2 Report on Public Awareness campaign

5. Reports

5.1 President

5.2 Treasurer

5.3 Branches

5.4 Sections

6 Conferences

6.1 ASC 2002

6.2 ASC 2004 / IBC 2004

6.3 ASC 2006 (joint with NZSA, in Auckland)

6.4 SSAI involvement in ISI 2005 (Sydney)

7. Election of Section Chairs

Nominations for Section Chairs should be with the Secretary no later than 26 June, 2002. All nominations will require a seconder and a statement from the nominee that she or he is prepared to stand.

8. Appointment of Auditor and Signatories to operate the accounts

9. Any other business

8.1. Centralizing SSAI administration

10. Date and place of the next meeting

AGENDA FOR THE ASPAI ANNUAL GENERAL MEETING

1. Apologies and Proxies

Proxies must be given in writing as per enclosed proforma. They must be given top the Secretary no later than 24 hours before the time of the meeting.

2. Confirmation of the minutes

Minutes of the meetings as circulated

3. Matters arising

4. Australian and New Zealand Journal of Statistics Editor's report

5. Newsletter Editors' Report

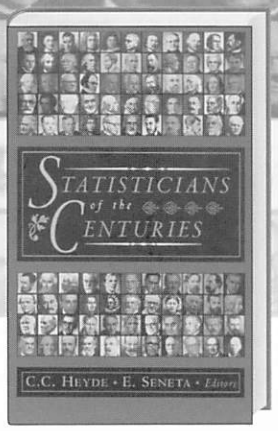
6. Treasurer's Report

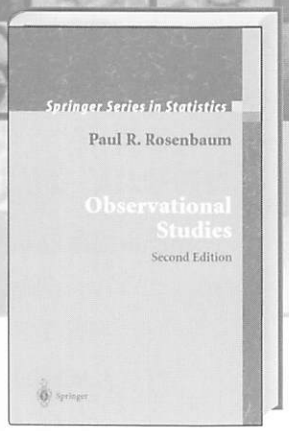
7. Appointment of Auditor and Signatories to operate the accounts

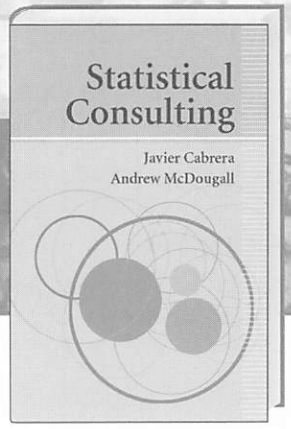
8. Any other business

9. Date and place of the next meeting

Springer *for Statistics*







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The volume arose through the initiative of the International Statistical Institute (ISI).

P.R. Rosenbaum

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"A fascinating book which combines elegant theory with good practical advice on applications, including in-depth discussion of many interesting examples from diverse fields."
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VICTORIA

Detection of Recombinant Human Erythropoietin (r-HuEPO) abuse in athletes

Our February meeting was salvaged when Dr Ken Sharpe agreed, at very short notice, to present this talk following the cancellation of Prof. C. R. Rao's talk. Unfortunately, Prof. Rao had to return urgently to India, but members were well served by Ken's repeat presentation of a recent OZCOTS talk.

Ken discussed recent work he had completed for drug testing of athletes at the Sydney 2000 Olympics. Ken was asked to develop a suitable test for detecting the use of recombinant human erythropoietin (r-HuEPO). The difficulty with r-HuEPO is that it is a naturally occurring substance. Therefore, simply testing for the presence of r-HuEPO in the athlete's blood is not sufficient. Rather, Ken had to develop an indirect test, based on the observed effects of r-HuEPO treatment.

The test was based on the concentration of red blood cells in a sample of the athlete's blood. Once r-HuEPO treatment begins, a dramatic rise in this concentration is observed. When the treatment stops, the concentration also falls rapidly, but will actually fall below the normal level. This provides an opportunity to statistically determine that a subject has been using the r-HuEPO treatment, even if they have recently stopped the treatment. The benefits of r-HuEPO remain for up to two weeks after the treatment ends, so it is supposed that by the time of competition, someone who has been using the treatment will have recently stopped. Of course, the test must also determine if the subject is still currently using the treatment.

In order to develop the test, Ken had access to blood cell concentrations for a control group, and a treatment group. The treatment group were, of course, asked to undertake the treatment and aware that the effects of the treatment were being monitored. This sort of "laboratory" data was necessary for the design, as it is very difficult to identify users in "real-life" circumstances, let alone take blood samples without influencing their treatment! However some weaknesses of the design data were acknowledged. In particular it is suspected that the treatment group were maintaining higher dosage levels throughout the trial than may be maintained by the typical user. The hypothesis is that after a few days of treatment, it is possible to cut back to a lower "maintenance level" of dosage and still retain the same benefits as a full dosage.

As the Olympic Games is a very high profile event, it was necessary to make the risk of a false positive test result extremely low. Ken was asked to set this risk at 1 in 10,000. This risk level was chosen as there are approximately 10,000 athletes competing at the Olympic Games. The necessity of an extremely low significance level meant that the resulting power of the test was fairly low, at least by the standards that statisticians may normally accept. Ken estimated the power of the tests at 25%-30%. These power levels were quite acceptable to the client – they observed that even a 25% chance of being caught out should be enough to deter potential r-HuEPO abusers.

Bruce Fraser

Statistical Issues in Gene Expression Microarray Experiments

On Tuesday 26 March Dr Gordon Smyth of the Walter and Eliza Hall Institute presented a talk to the Victorian Branch of the Society on statistical issues in gene expression microarray experiments. The essential class of problem investigated in these experiments is to determine which genes are actually doing something (the jargon is 'being expressed') in which situations.

In these experiments we have a slide, or slides, with 10,000 to 40,000 positions. At each position we obtain the quantitative response to one treatment for one gene. Typically we have an experiment with few treatments, relatively few replications, but many (tens of thousands) of response variates. Each gene considered produces a different response.

For a treatment contrast, a t-statistic can be calculated for each gene. These statistics are likely to be correlated in a complicated manner because responses on different genes are likely to be correlated. The ordered t-statistics (one for each gene) are then calculated, and the ones that are sufficiently large are identified as having a response (ie are expressed). The statistical problem is to determine which genes have a t-statistic that is large enough so that it could not have happened by chance. The fundamental assumption that allows the possibility of solving this problem is that for the vast majority of genes there is no response for any given contrast, but for a small proportion (which may still be a large number) there could be a comparatively large response.

The solution is a massive simultaneous hypothesis testing problem, which is solved by resampling techniques. Further

complications are caused by the variability in response being different for different genes, and their relativities unknown. This means that the variance cannot be considered to be the same for each gene response, and hence large t-values can be caused by either a large response or a (by chance) small estimated variance. This means that shrunk estimates of parameters are needed in calculating the t-values.

Dr. Smyth gave a summary of how these problems are being tackled. The reader is referred to the website www.statsci.org/micrarra/index.html that was compiled by Dr. Smyth.

Kym Butler

Signal Matching of Rail Track Monitoring Data

Those who took advantage of a balmy Melbourne autumn evening to attend the April meeting of the Victorian Branch were treated to a polished presentation from John van der Touw. John has been an officer with CSIRO all his professional life (28 years). Last year he was jointly awarded the CSIRO Chairman's gold medal for his contribution to a timber research project that won, for its principal investigator, the Marcus Wallenberg Prize, forestry's equivalent of the Nobel Prize. John's Branch talk maintained the gold medal standard.

John, with his CSIRO colleague Dr Alan Veevers, solved a challenging problem for the Rail Infrastructure Corporation. Maintenance engineers regularly survey rail tracks with a special train that electronically logs and stores track measurements along the line. For each log entry, the data file contains the distance from a starting point, the gauge width, track elevation and curvature. Comparison of data from successive surveys should indicate where the track needs maintenance. However, the records usually do not match well because the distance measurements are out of alignment. The misalignment can vary along the line from being, say, 5 metres out in one direction to being 20 metres out in the other direction over a distance of 1 kilometre. John described an algorithm that finds a smooth transformation that brings the data sets into alignment.

Similar problems occur in many fields. For example, successive remote sensing images may need to be aligned so that the spread of surface soil salinity can be mapped accurately, and dynamic time warping is used in speech recognition to match speech records. Consequently, there is a vast number of solutions to the signal matching problem in the scientific literature. In the rail matching case, lengths of the track may be repaired between surveys, and the chosen algorithm must be able to cope with sections that have changed substantially due to repair. John investigated the suitability of eleven of the published methods for the rail matching problem, and eventually settled on the Viterbi algorithm for its speed and robustness.

The Viterbi algorithm starts with a discrepancy matrix between measurements at the log points of the two surveys. The obvious discrepancy measure is the arithmetic difference between measurements. The Viterbi algorithm finds the connected path through the matrix that minimises the sum of squared discrepancies. This path immediately tells you how to transform the distances in a repeat survey so that the data match those in the initial survey. John modified the discrepancy measure to include a non-diagonal penalty and a maximum cut-off. These changes render the Viterbi algorithm robust to the repaired section problem. John showed us how to choose the penalty and cut-off values by simulating data similar to the real data. Finally he illustrated the performance of the algorithm on some real data. The ability of the method to align the data sets and to detect repaired sections was very impressive. John provided his clients with a Graphical User Interface linked to his software that allows the maintenance engineers to select and compare surveys themselves and graphically display the alignment transformation and the aligned data.

Kay Lipson and Geoff Laslett

QUEENSLAND

Bayesian selection of nonlinear time series models

At our March meeting, Dr Eddy Campbell provided us with a lively presentation on "Bayesian selection of nonlinear time series models". Eddy is the group leader of Environmetrics at CSIRO Mathematical and Information Sciences Floreat Park, WA. Managing the group keeps him pretty busy, but he also finds time to dabble in some interesting applied statistical research.

Nonlinear time series is a rapidly expanding field of research, with much attention in the past fifteen to twenty years on modelling frameworks. Eddy's interest in such methods was sparked by involvement in a study of climate variability in south-west Western Australia. As background about the benefit of the research, Eddy pointed out that an annual $6B variation in agricultural productivity is driven primarily by climate. He noted that wheat profitability in Qld increased by 7-10% by

the application of seasonal climate forecasting.

The research outlined in the talk was part of The Indian Ocean Climate Initiative, which was set up primarily as a collaboration between CSIRO and the Bureau of Meteorology, funded by the WA State Government. The aim was to increase understanding of WA climate systems and provide more informed decision support systems. It was evident from even a cursory study of the data arising from climate processes that nonlinear processes and process interactions are the norm, rather than the exception. Identifying influential predictors is a key question in climatology.

Despite the rapid expansion of research in nonlinear time series, relatively little work has been reported in the literature on model selection. Eddy examined some issues in Bayesian selection of threshold autoregressive (SETAR) models. In particular, he proposed novel algorithms, including partial updates, for reversible jump MCMC for Bayesian analysis of SETAR models.

Studies, both on simulated and real data sets, so far indicate that the approach works well. However, methods to choose the number of thresholds appear to be clumsy and so this is potentially an area for future research.

AGM and missing values in regression models

At the SSAI Qld Branch Annual General Meeting, which was held in April, elections were held for members of Branch Council. The successful office bearers are Tony Swain (President), Peter Baker (Secretary), Charis Burridge (Treasurer) and Councillors Bronwyn Harch, Allan Lisle, Ky Mathews, Walter Robb, Tony Sahama, Cheryl Swanson, Joanne Walker and Rodney Wolff (Past President). After the elections, Branch President, Tony Swain, presented Ron Webster with his GStat Certificate.

Following the AGM, Ross Darnell of UQ spoke on missing values in regression models. Ross is currently lecturing and consulting at UQ after completing a PhD with Murray Aitkin at the Department of Statistics, University of Newcastle, UK. Previously, Ross has lectured at USQ, Toowoomba, and worked as a statistical consultant at QUT and NSW Agriculture.

Ross began by outlining the problem that missing observations in regression analyses have created for many years. Beginning with the nonparametric approach used by Aitkin (1996,1999) and Lawless, Kalbfleisch and Wild (1999), Ross discussed a more general technique to analyse generalised linear models with data that has missing covariate values. The method assumes the missingness is at random but allows for implicit selection models. The regression estimates obtained by this approach were compared with other methods. Results of these comprehensive simulation studies indicate that the proposed method works well and often better than the alternatives.

Finally, Ross noted that further work is progressing with Murray Aitkin and Yan-Yan Shieh on the information matrix, both exact and approximate for normal regression models with randomly missing covariates using the Louis approach.

Files from both Ross' and Eddy Campbell's presentations are available at the SSAI QLD Branch Web site http://www.maths.qut.edu.au/ssaqld/.

Peter Baker

CANBERRA

Crime and Justice Statistics for Policy Purposes

At the February meeting, the Canberra Branch enjoyed a talk given by Toni Makkai from the Australian Institute of Criminology (AIC). She talked about the range of data the institute uses and some of the questions they aim to answer by analysing this data.

The AIC focuses on policy relevant research in the criminal justice field and written dissemination of this research in an accessible form. The crime statistics and data are the basis of the research. However, the AIC is not a statistical collection agency even though they collect some data. The Australian Bureau of Statistics collects some of the data they use.

The AIC runs crime and justice monitoring and evaluation programs, like the homicide monitoring program and the stolen property market in the ACT project. They also run a 'Communities and Crimes Analysis Program' and public policy and drugs programs, to mention some.

Toni then focused on a specific question: 'How much crime is directly attributable to illicit drugs?' She said that a common knowledge or thought answer for this question will be about 80 per cent of crime is related to illicit drugs. She mentioned the different data types they have available to answer this question and the issues raised by these datasets.

One source of data they use is administrative data; these are official statistics most often from records kept by state institutions collected as a management tool. This data has access-ethical and reliability problems. Some examples of administrative data are from police, crime records,

court reports and prison census. This type of data cannot answer the question, there is no reliable measure of the "causal" nature of the relationship and it is no reliable measure of drug use. However this data is useful to show what agencies are doing providing a mechanism for accountability and it also provides indicators of level of crime at certain levels.

Another source of data that Toni mentioned was survey data. Some issues she mentioned about this data were sample size not knowing the population size, reliability on self-reported drug use, access privacy considerations and specific issues in criminology like dealing with illegal activities, getting informed consent, interviewer safety etc.

Toni concluded that crime is about housing, education, employment, mental health, drug use, family background, etc and in addressing policy relevant issues it is very important to link the data. What looks like a very simple question is very hard to answer with the AIC's data sources.

Colorectal cancer screening: applying mathematical modelling to policy development

Dr Chris Stevenson from the Australian Institute of Health and Welfare (AIHW) gave a talk at the Canberra Branch March meeting. Chris talked about using microsimulation modelling to examine the benefits and costs of screening for colorectal cancer and to derive an optimally cost-effective screening protocol for various combinations of the available screening tests.

Cancer screening is carried out on asymptomatic people with the aim to detect early cancer, when treatment is easier, more effective and cheaper; or to detect precancerous conditions, in which case the cancer might be prevented. Chris said that the issues in screening are whether to screen annually or biennially, newer screening tests, target age range, incorporation of high-risk groups and cost-effectiveness of screening relative to other health interventions. In Australia, at the moment, there is no organised mass colorectal cancer screening program.

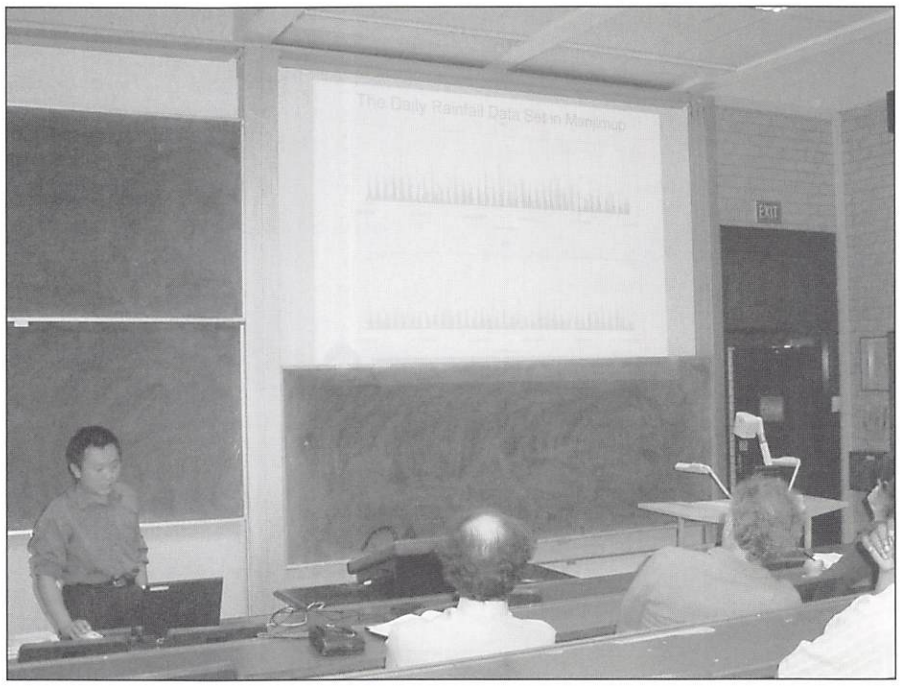
Then Chris asked: "Why use a model?" He answered by saying that randomised controlled trials or pilots projects are expensive, time consuming, benefits do not appear for many years and cannot test all possible screening options; while a model can combine information from different sources, compare different screening options and it is possible to generalise from specific RCT's/trials to Australian populations.

To construct the disease/screening model, they develop a simplified disease natural history, derive equations to mimic it and add equations to mimic the screening process. There are three screening tests considered in the model:

- Faecal occult blood test (FOBT), which is low cost, low sensitivity, moderate specificity and self-administered
- Sigmoidoscopy, which is moderate cost, high sensitivity over part of colon, small risk of perforation, includes biopsy and is administered by health professionals.
- Colonoscopy, which is high cost, high sensitivity over all of colon, small risk of perforation, includes biopsy and removal of polyp and it is administered by specialist physicians.

The screening program for average risk was FOBT and colonoscopy follow up of positive tests.

Chris included in the model measures of benefit like deaths prevented and years of life saved. The model's simulated mortality rates are quite close to those published from studies run in Minnesota, Funen and Newcastle. In comparison with other screening programs, the



Yun Li presenting extreme rainfall data at the WA March branch meeting.

cost per year of life saved is in the same order of magnitude as breast cancer screening and about one third of the cost of cervical cancer screening.

Finally, Chris said that the future directions are to get better costs estimates and focus on newer FOBT tests that are more sensitive and more specific.

I would like to thank Chris for giving me the slides of his presentation.

Veronica Rodriguez

At the Canberra Branch Annual General Meeting, which was held in March, elections were held for members of Branch Council. The successful office bearers are President: Geoff Lee, Secretary: Anna Poskitt and Treasurer: Terry Neeman. Alice Richardson is the Immediate Past President. The Councillors are Ray Lindsay, Ian McDermid, Mark Westcott, Ann Cowling, Veronica Rodriguez and Terry O'Neill has been co-opted to the Council

WA

A Case Study of Extreme Rainfall in the South West of Western Australia

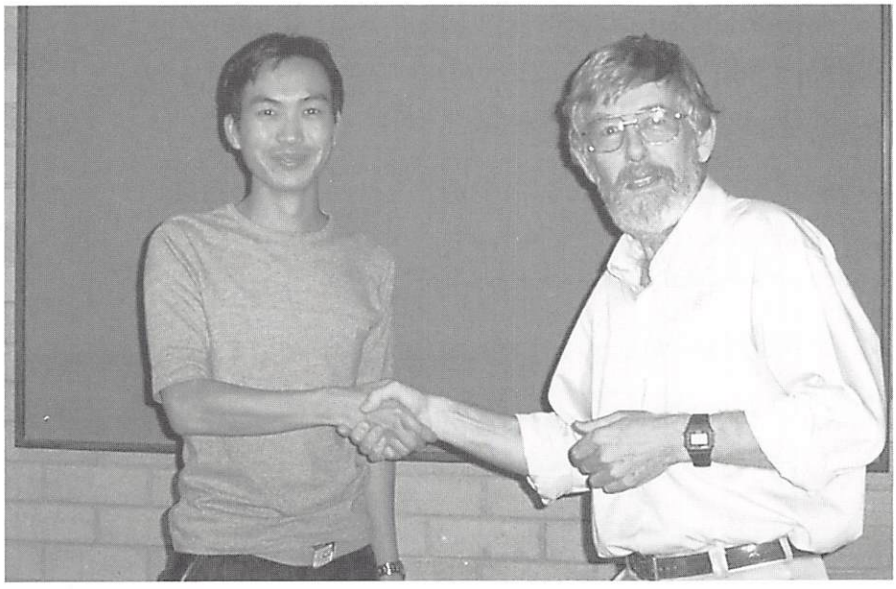
At the March 2002 meeting of the WA Branch, Dr Yun Li, of CSIRO's Environmetrics Group, presented his recent study "Extreme Rainfall In The Southwest Of Western Australia". This considered daily rainfall recorded at Manjimup, a high quality weather station in the south west of Western Australia, and was motivated by suggestions that the rainfall in the region had declined during the past 25 years. (This was a key finding of the Western Australian Government funded Indian Ocean Climate Initiative, which is supporting Yun's work). In particular, it was suggested that heavy rainfall events had declined in both frequency (the number of events) and intensity (the amount of rain in each event). This is a major concern for investigations of climate change.

The two elements of the approach taken were the "peak over threshold" method that isolates the upper tail of the distribution, and fitting the upper tail using the Generalised Pareto distribution (GPD). Estimation of the GPD is straightforward, while more recent work by Davison and Smith (1990) was used to optimally choose the threshold. Yun demonstrated some graphical techniques relevant here. With time series data such as rainfall there is an additional issue of dependence from one day to the next.

Perhaps the most interesting problem was the estimation of the time of change. While previous work had suggested that this occurred around 1975, the current analysis suggested it could have been as early as 1966. The GPD was fitted to the tail distributions of daily rainfall in the two time regimes 1930-1965 and 1966-2001, respectively, and the two estimated tail distributions are significantly different at the 1% level based on a log-likelihood ratio test. Yun was also able to quantify heavy rainfall based on the quantile and the expected heavy rainfall. Finally Yun illustrated the application of these techniques to other areas such as estimating the "value at risk" in insurance risk management.

The discussion continued well into the evening at a local restaurant.

Presentation of Graduate Statistician Certificate of Accreditation



At the March 2002 meeting of the WA Branch, Tarn Duong was presented with his Graduate Statistician certificate of accreditation by outgoing Branch President, Dr Robin Milne. Tarn is currently undertaking Ph.D studies in Statistics at the University of Western Australia, and has a keen interest in the development and promotion of young statisticians.

Statistical model for a multi-source coal stacker-reclaimer

Dr Clive Hunt, who has worked as an independent statistical consultant to the mining industry in South Africa for the last 25 years and is now resident in Perth, presented an interesting talk at our April meeting on a problem encountered by SASOL, a large company in South Africa which produces petrol and diesel from coal. After the requisite joke about the South African cricket team, our speaker described the problem: to estimate the variance of %ash in slices of coal taken from a stockpile which is built from coal of different quality coming from 5 mines. There is a penalty to SASOL if the variance in %ash in coal taken from the stockpile is high. The mean level of %ash is of less concern.

Coal from each mine is spread consecutively onto the stockpile by a stacker, resulting in a homogenised stockpile with about 70 layers. The shape of the stockpile is rather like a Toblerone which Dr Hunt duly produced. Percentage ash from each mine is continuously measured on a conveyor belt using X-ray technology. Depending on the conveyor belt, measurements are based on coal samples of between 170 and 240 tonnes leading to differing levels of support for the measurements. These sample sizes are much bigger than the slices of coal being taken from the stockpile, so estimates of the point variogram at distances close to zero are very important. Dr Hunt modified the usual change of support estimation procedure in this region of the variogram.

An interesting aspect of this work was that the people who had previously worked on the problem had not recognised the effect of sample size and had underestimated the point variogram and therefore the variance of the final product. Dr Hunt's model could not be verified at the time - due to plant scheduling complexities - but an exercise to do so was planned.

The meeting finished with a discussion about the structure of the stockpile, the difference between blending and homogenising and an invitation to join Dr Hunt for dinner to share his Toblerone.

Jodie Thompson

CLUNIES ROSS NATIONAL SCIENCE & TECHNOLOGY AWARD

The Ian Clunies Ross Memorial Foundation is pleased to announce that the Clunies Ross National Science & Technology Award 2003 is now open for nominations.

Since 1991 these Awards have honoured sixty-seven people from every state and territory for their successful application of science and technology for the economic, social or environmental benefit of Australia.

Please note that nominations close on Friday 26 July 2002.

Award recipients will be announced and presented with a silver medal at a formal ceremony and dinner to be held March 2003 in Melbourne.

Nomination forms are available from the Ian Clunies Ross Memorial Foundation:

Tel: (03) 9854 6266

Fax: (03) 9853 5267

Email: info@cluniesross.org.au or visit our web site at www.cluniesross.org.au

Australasian Conferences

Effective Data Mining

18 – 20 March, 2002
Massey University, Palmerston North, NZ or
24 – 26 June, 2002
Massey University, Albany NZ

3-Day Workshop

Information: http://www-ist.massey.ac.nz/dmworkshop/
email: s.ganesh@massey.ac.nz

16th Australian Statistical Conference,

8-11 July, 2002
National Convention Centre, Canberra.

The themes will be bioinformatics, surveys, design of experiments and trials, medical statistics, financial statistics. A tribute to Richard Tweedie will also be given.

Information : www.statsoc.org.au/asc16
Enquiries asc16@con-sol.com

International Clinical Trials Symposium

21 – 23 October, 2002
Sydney Convention and Exhibition Centre, Sydney

Hosted by the NHMRC Clinical Trials Centre, University of Sydney

Information: ICTS Secretariat, ICMS Pty Ltd, Tel: +61 2 9290 3366, e-mail: trials@icms.com.au. www.ctc.usyd.edu.au

Australasian Genstat Conference 2002,

4 – 6 December, 2002
Abbey Beach Resort, Busselton, Western Australia

Information: http:/www.agric.wa.gov.au/biometrics/genstat2002 or email genstat2002@agric.wa.gov.au

Fourth Conference on Statistics in Ecology and Environmental Monitoring Population Dynamics. The Interface between Models and Data

9 – 13 December, 2002
Dunedin, New Zealand; and

Pre-Conference Workshop on Matrix Population Models

4 – 6 December 2002, Dunedin, New Zealand

Information: http://maths.otago.ac.NZ/SEEM4/or email igoodwin@maths.otago.ac.nz

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Overseas Conferences

7th Valencia International Meeting on Bayesian Statistics

2-6 June 2002
Canary Islands, Spain.

Information and updates at conference web site, http://www.uv.es/valencia7, and its US mirror site, http://www.stat.duke.edu/valencia7

Hawaii International Conference on Statistics

5 – 9 June 2002
Sheraton Waikiki Hotel, Honolulu Hawaii, USA.

Sponsored by: University of Hawaii – West Oahu; and College of Tropical Agriculture and Human Resources-University of Hawaii.

Web address: http://www.statistics.hawaii.edu
Email address: stats@hawaii.edu

22nd International Symposium on Forecasting

23-26 June 2002
Department of Statistics, Trinity College, Dublin, Ireland.

Information: www.isf2002.org

The Sixth International Conference on Teaching Statistics, ICOTS-6

7-12 July 2002
Durban, South Africa.

Theme: 'Developing a statistically literate society'

Organised by the International Association for Statistical Education (IASE) and the South African Statistical Association (SASA).

Option of full refereeing of papers.
Proposals invited for contributed papers and posters.

Information: Brian Phillips, E-mail bphillips@swin.edu.au or see website http://www.beeri.org.il/icots6/

International Conference on Applied Statistics, Actuarial Science and Financial Mathematics

17 – 19 December, 2002
University of Hong Kong and The Hong Kong Polytechnic University.

Organised by The Hong Kong Polytechnic University, The University of Hong Kong and the Co-organisers are Commonwealth Scientific and Industrial Research Organisation, Peking University and The Chinese Academy of Sciences.

Information: //web.hku.hk/~icaaf/ content.htm

8th Islamic Countries Conference on Statistical Sciences (ICCS-V111).

21 – 24 December, 2002
University of Bahrain, Bahrain.

Conference Theme: "Business, Population, Environment and IT Strategies of the Islamic World"

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