ORSNZ NEWSLETTER

August 2009

Operational Research Society of New Zealand, Inc.
PO Box 6544, Wellesley St. Auckland, New Zealand, www.orsnz.org.nz

Contents

The newsletter is published three to four times per year, regular dates are March, June, September, and December. Submissions deadline is the 15th of the month for the following month's issue. Send contributions by email to the Newsletter editor, Matthias Ehrgott, at newsletter@orsnz.org.nz.

The President's Column

Thanks to all of you who responded to our constitutional postal vote. The results are: 22 votes for, and 0 votes against, giving us the two-thirds majority required under our Constitution to adopt the proposed changes. As a result of updating our constitution, I am pleased to announce that we have been registered as a charity, effective from 30 June 2008. This makes us one of 23,010 such charitable organizations, and gives us tax and other benefits, including tax deductions for

companies donating to us. Perhaps the most visible result of the new constitution is our new official name, Operations Research Society of New Zealand. We will be slowly updating our documents to reflect this change.

In my last column, I mentioned that Andy Philpott and Graeme Everett were selected as one of 6 finalists from 200 entrants in the international INFORMS Franz Edelman competition for their work with the international pulp company Norske Skog. Andy, Graeme and the Norske Skog team presented their work in April at the INFORMS Practice Conference in Phoenix.

Although they missed out on the prize (which was won by Hewlett Packard), their work was reported in the New York based BusinessWeek magazine, which then resulted in Andy speaking on Radio NZ's Nine-to-Noon slot and being interviewed on TVNZ's Morning TV program. Visit www.orsnz.org.nz/Prizes to view & hear Andy in action. Well done, Graeme and Andy, for such outstanding work on the national and international stage.

Andy Philpott on Morning Business. © TVNZ

Andrew Mason, President

ORSNZ09

44th Annual Conference of the ORSNZ

http://conference.orsnz.org.nz

3–4 December 2009

Held at the University of Canterbury, Christchurch, New Zealand

The Management Science Group at the University of Canterbury is pleased to host the 44th Annual Conference of the Operational Research Society of New Zealand, ORSNZ09, on Thursday and Friday 3–4 December, 2009.

Call for Papers

We welcome papers on any aspect of operational research or management science, especially practical applications. Submissions from students and practitioners are greatly encouraged. Please email your abstract, of 200 words or fewer, to the conference organisers at: conference@orsnz.org.nz.

The submission deadline for abstracts is Monday 5th October, 2009.

Following acceptance of your abstract, we shall invite you to submit a full-length paper for publication in the conference proceedings. A copy of the proceedings will be given to every attendee at the conference and all members of the ORSNZ. An alternative to a conference paper is to submit an extended abstract.

Full papers and extended abstracts must be submitted by email in PDF format to the conference organisers. The full paper and extended abstract submission deadline is 30th October, 2009.

Conference registration forms, guidelines for the preparation of full papers and extended abstracts, and further conference information will be available on the conference website: http://conference.orsnz.org.nz

Student Travel Assistance

Full-time students, who are members of ORSNZ, and plan to present a paper at the ORSNZ conference, are eligible for travel assistance from ORSNZ to attend the conference. Applications should be made using the conference registration form (available from http://conference.orsnz.org.nz), and should be signed by the student's supervisor or Head of Department to confirm that the applicant is enrolled in a full-time university course. The completed registration form, together with an abstract of the planned paper, should be sent to the conference address above by 30th October, 2009. Grants will be payable at the conference only upon production of a GST receipt for the travel expenses. The value of the grant is determined by the number of eligible students applying.

Young Practitioners' Prize (YPP)

OR practitioners, students and others who will be under 30 years of age on 3 December 2009 are invited to compete for the ORSNZ Young Practitioners' Prize. Condition for entry is the presentation of a paper at the 44th Annual Conference of the ORSNZ. Apply by email with your abstract submission, before the abstract submission deadline. Entrants must provide proof of their eligibility (forms will be available from the conference website). The total prize money awarded will be $1,000, split between the authors of the best papers at the judge's discretion.

This year there will be a limit of 10 paper presentations in the YPP sessions. If there are more than 10 entries, preliminary judging will determine which entrants will be eligible for the prize. Entrants who have never won the YPP and previously entered no more than once are most likely to be eligible for the prize. All papers entered will be presented at the conference regardless of eligibility.

Shane Dye on behalf of the ORSNZ09 Organising Committee

Chapter News

Auckland News

Greetings. Operations research continues to be strong in Auckland. This year in Engineering Science we had more requests for part 4 OR projects than the numbers offered by the staff, even though some staff members like, Cameron Walker, offered 7 projects! We are looking forward to keeping some of this great crop of students on as postgraduates. With this welcome increase of student projects, the arrival of Andrea Raith as a new lecturer comes at the right time.

Ziming Guan finished his PhD and graduated in May. The title of Dr. Guan's thesis is Strategic Inventory Models for International Dairy Commodity Markets and his PhD supervisor was Andy Philpott. Congratulations to Ziming and Andy.

In other news, this September EPOC is holding its 7th winter workshop on the modelling issues arising from Frank Wolak's report on market power in the New Zealand electricity market.

Several of the Engineering Science department staff members and graduate students are also planning on attending the upcoming ISMP and INFORMS conferences which are to take place in August (Chicago), and October (San Diego) respectively. Golbon Zakeri is on sabbatical leave and will be visiting Shmuel Oren at the IEOR department of UC-Berkeley September-December this year.

Late October we will receive a visit from Dennis Huisman. Dennis was a member of the Dutch Railways team that won the prestigious Edelman prize (2008) for their work entitled ``The New Dutch Timetable: The OR Revolution". Dennis is visiting David Ryan and he has already submitted an abstract for a seminer to be organized in Engineering Science early November!

Finally, having sent around an email asking for news about her colleagues and not receiving an answer, your correspondant was tempted to make up some news. Although she has refrained from doing so in this issue, she can't promise that such an event will not occur in the issue!

Golbon Zakeri

Canterbury News

Peter Jackson has presented his PhD proposal to the department. Peter is a past student of the university and the department, completing a BSc (Hons.) in Economics in 1992 and an M.Com in Management Science in 1994. Under the supervision of Grant Read and Shane Dye, Peter's research aims to investigate the impact of risk on investment incentives in generation capacity in deregulated electricity markets, with particular emphasis to be placed on strategic risks and entry deterrence practices. Peter hopes to determine implications for supply security and dynamic efficiency, as well as consider the role market structures could play in amplifying or dampening the impact of risk on investment decisions.

Antonio Pinto R. is a PhD student at the Department of Management, University of Canterbury. Antonio is an Agricultural Engineer from Universidad de Concepcion and M Sc. in Agricultural Economics and Natural Resources from Pontificia Universidad Catolica de Chile. His research, under the supervision of Dr. John F. Raffensperger, Dr. Shane Dye and Dr. Grant Read, Department of Management, and Dr. Tom Cochrane, Department of Civil and Natural Resources, will focus on developing a design for a smart market to control problems of runoff and sediment discharge. The market will encourage users to face and to internalize social costs of their runoff and sediment discharge, avoiding the problem of the commons. Thereby, the market mechanism would create incentives to improve individual site-specific management to avoid damage of flooding and sedimentation, especially near environmentally sensitive areas in rural and urban places. Additionally, the smart market study will consider the stochastic nature of rainfall, and will analyse the regulator problem about how to adjust initial quota or adjust grandfathering schemes when the catchment is over-allocated.

Stephen moved from the UK in April 2007 and has worked in industry for the majority of the last eleven years. Throughout this period Stephen has studied Part Time, completed a B.Eng(Hon's) through the University of Manchester in 2001, he then attended Lancaster University Management School completing a Post Graduate Certificate (2003), Diploma and MSc in Project Management in Practice in 2006. His work based practice has involved a considerable length of time working on major water industry programmes and projects, and his achievements have seen him being recognized as a chartered engineer, a professional project manager and a chartered water and environmental manager. Stephen hopes to develop an optimisation model for a heavily constrained urban clean water system, such that the prices may not only value water supply in real time, but also guide investment decisions based on the numerous complex transport constraints, storage facilities and water processing plants.

Our Water Market Research Group is quite active, with a new postdoc (hosted in Civil Engineering), Becky Teasley. Becky is working on studying markets for the combination of surface water and ground water. Congratulations to Antonio Pinto on completing his PhD proposal. He is studying smart markets for impervious cover. Congratulations to Ranga Prabodanie on her presentation at MODSIM, "Simulation-Optimization Approach for Trading Point and Non-point Source Nutrient Permits."

Fritz Raffensperger is working with the Wetland Initiative in Chicago, on a grant from the U.S. EPA to study a smart market for nutrient run-off, and examining the issue of incentivising wetlands. He has been working with Lincoln University in developing an ecological trade-off model for Lake Ellesmere, and also with AgResearch in studying the value of a surface water market. Fritz will be attending ISMP, which is organized this year by his alma maters, Northwestern University and the University of Chicago.

Grant Read

Wellington News

Stefanka Chukova reports that preparations are under way for the 4th Asia-Pacific International Symposium on Advanced Reliability and Maintenance Modeling (APARM 2010) to be held at Victoria University of Wellington, December 2-4, 2010. The website http://msor.victoria.ac.nz/Events/APARM2010/ has all the details. We hope to see many of you there.

Mark Johnston is on research and study leave at the University of Southampton working with Prof Chris Potts on combinatorial optimisation problems. In July, Mark gave a talk at the EURO conference in Bonn, Germany. It was a huge conference, with more than 2500 attendees and up to 45 sessions in parallel. Mark's wee boy Hamish celebrated his very first birthday and is loving hanging out with his grandparents again.

Frank Kane (Head of Mathematics at Onslow College in Johnsonville) is spending the year on a New Zealand Science, Mathematics and Technology Teacher Fellowship, hosted by the School of Mathematics, Statistics and Operations Research at Victoria. Frank has been attending a lot of lectures on Operations Research and has written a nice piece on OR in the New Zealand secondary school curriculum his on his blog http://www.where-is-this-stuff-used.blogspot.com/.

It looks as though we will have 3 visitors in Oct/Nov Klaus Moeller, Mike Pidd, Harvey Brightman. We are organising talks/seminars by each of them so we will have a busy time for local OR folk.

Mark Johnston

People

Ziming Guan

Ziming completed his PhD entitled "Strategic Inventory Models for International Dairy Commodity Markets". He reports on his experience.

I commenced my Doctor of Philosophy in the Department of Engineering Science at the University of Auckland in year 2003. My PhD research was supervised by Professor Andrew Philpott, and supported by a Bright Futures Enterprise Scholarship sponsored by Fonterra. I developed a suite of inventory models for maximizing expected earnings in international dairy commodity markets under uncertainty in milk supply. I also studied the strategic behaviour of other agents in the market using game-theoretic models.

The international market for dairy commodities is competitive, requiring dairy companies to optimize the profit from production and sales to ensure their survival. Fonterra faces uncertain milk production in planning, mainly due to uncertainty in weather, and also faces uncertain behaviour of other agents in the dairy commodities market. In this environment, uncertainty can lead to large losses unless some account is taken of it in production planning.

I developed computer models to enable Fonterra to make good decisions in the face of uncertainty. For production planning with uncertain milk supply, I developed a set of optimization models that produce policies that maximize expected earnings and compared the policies with existing policies using simulation. I developed a new algorithm to solve these models and gave a mathematical proof of the convergence of the algorithm. The policies computed by the algorithm demonstrated in computational experiments that they were a substantial improvement over existing policies. To study the uncertain behaviour of other agents in the market, I used game-theoretic models to compute the inventory policies that emerge in a Nash equilibrium of the problem. I performed computational experiments to assess the importance of strategic considerations for suppliers to the European dairy market.

During my PhD study I developed an interest and expertise in production planning and global trade. I am currently working as a Research Assistant in the University developing optimization models for the New Zealand hydro-electricity multi-reservoir system, and I am also actively seeking employment in a corporate environment.

At the autumn graduation in Auckland we had the rare event of three Operations Research students graduating with PhDs. Ziming Guan (left), Richard Lusby (middle) and Oliver Weide (second from right) with Matthias Ehrgott (second from left) and David Ryan (right).

Andrea Raith

Andrea Raith received a Bachelor of Science in Mathematics from the Technische Universität Darmstadt, Germany, in 2002 and the degree of Diplom Mathematikerin (MSc) in 2005. As part of her MSc, she wrote a thesis titled 'Bicriteria optimisation of synchronous generators for wind power plants' in collaboration with the Department of Electrical Engineering and Information Technology. After the completion of her thesis, she continued working at the department and developed an extension of the bicriteria optimisation method to the multi-objective case. This was used in consulting work for a major manufacturer of wind power plants.

Before her appointment as a Lecturer, Andrea came to Engineering Science as a PhD candidate, and has just submitted her thesis titled 'Multi-objective Transportation and Routing Problems'. Her main research interests are algorithms for bi- and multi-objective network optimisation problems such as the shortest path problem, network flow problems, and the transportation problem.

Furthermore, Andrea currently applies bi-objective optimisation in the context of the so-called traffic assignment problem, which models the route choice of network users in traffic networks. These techniques can be applied to transportation planning, and especially when modelling the effects of road tolling.

Conference Announcements

Western Decision Sciences Institute

Thirty-Ninth Annual Meeting, April 6-9, 2010 Hyatt Regency Lake Tahoe Resort Lake Tahoe, Nevada Submission Deadline: October 1, 2009

You are invited to submit a paper for presentation at the conference, lead a workshop etc. Presentations may be based on refereed research papers, or on extended abstracts. The complete Call for Papers can be found on the conference website at:

http://www.wdsinet.org

We look forward to your submission following the guidelines and instructions contained in the Call for Papers, and available on the website.

Global Conference on Power Control and Optimization PCO2010

2 – 4 February 2010 Gold Coast, Queensland

It is our great pleasure to announce the third Global Conference on Power Control and Optimization PCO 2010, which will be held in Courtyard Surfers Paradise Resort, Gold Coast, Australia from 2 to 4 February 2010. The Conference is technically sponsored by AIP, WSEAS and Springerlink, and organized by School of Engineering, Curtin University, Malaysia, and the Middle East Technical University, the **Institute of Applied Mathematics (IAM)**. Scope of the conference is contemporary and original research and educational development in the area of electrical power engineering, control systems and methods of optimization.

Submission of Full Papers

Notification with Peer Review

Camera-ready Paper

Registration with Full Payment

Registration fee covers three day sessions, program booklet, CD proceeding, lunches, tea breaks, and banquet dinner. The fee is unique and identical for all delegates. The registration form must be submitted by email before the deadline to: icpco.20@gmail.com

New Book

``Evolutionary Multi-Criterion Optimization. 5th International Conference, EMO 2009, Nantes, France, April 7-10, 2009'' published as volume 5467 in Springer's Lecture Notes in Computer Science. Ehrgott, M.; Fonseca, C.M.; Gandibleux, X.; Hao, J.-K.; Sevaux, M. (Eds.) 2009, XV, 586 p., Softcover, ISBN: 978-3-642-01019-4

This book constitutes the refereed proceedings of the 5th International Conference on Evolutionary Multi-Criterion Optimization, EMO 2009, held in Nantes, France in April 2009. The 39 revised full papers presented together with 5 invited talks were carefully reviewed and selected from 72 submissions. The papers are organized in topical sections on theoretical analysis, uncertainty and noise, algorithm development, performance analysis and comparison, applications, MCDM track, many objectives, alternative methods, as well as EMO and MCDA.

Meetings Calendar

New Zealand

44th Annual Conference of the Operational Research Society of New Zealand
Christchurch, New Zealand
3 – 4 December 2009
www.conference.orsnz.org.nz

Asia Pacific

8th International Symposium on Operations Research and Its Applications
Zhangjiajie, China
20 – 22 September 2009
www.aporc.org

APORS-2009 Ninth Conference of the Association of Asia Pacific Operational Research Societies
6 – 9 December 2009 Jaipur, India
www.apors2009.com

Global Conference on Power Control and Optimization PCO2010
2 – 4 February 2010, Gold Coast, Australia
http://www.pcoglobal.com

International

ISMP 20th International Symposium on Mathematical Programming
23 – 28 August 2009, Chicago, USA
http://ismp2009.org

5th International Vilnius Conference and EURO-Mini Conference "Knowledge-Based Technologies and OR Methodologies for Strategic Decisions of Sustainable Development" (KORSD-2009)
30 September – 3 October, Vilnius, Lithuania
www.mii.lt/KORSD-2009

1st International Conference on Algorithmic Decision Theory
21 – 23 October 2009, Venice, Italy
events.math.unipd.it/adt2009/

INFORMS Annual Meeting
11 – 14 October 2009, San Diego, USA
meetings.informs.org/SanDiego09/

Western Decision Sciences Institute
6 – 9 April 2010, Lake Tahoe Tahoe
http://www.wdsinet.org

See also http://meetings.informs.org/ for extensive listings of conferences.

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To apply for membership or buy subscriptions, see the application form on our web site, and mail it to: Membership Secretary, ORSNZ, PO Box 6544, Wellesley Street, Auckland, NZ.

Use MATLAB® to Build Your OR Models

MATLAB has all the tools you need to handle OR problems of any depth. It will let you use the pre-packaged tools easily, and you can modify the code used if you wish.

Accessing data – Connect to live data services or ODBC.

Optimisation - Functions for linear programming, quadratic programming, nonlinear optimisation, nonlinear least squares, solving systems of nonlinear equations, multi-objective optimisation, and binary integer programming.

Statistics - Functions and interactive tools for modelling data, analysing historical trends, simulating systems, developing statistical algorithms.

Econometrics techniques – NEW! Functions for modelling economic principles and behaviour, with a focus on volatility modelling.

Financial analysis - Optimise portfolios, estimate risk, analyse interest rate levels, price equity derivatives, and handle financial time series.

Graphical data presentation - 2-D and 3-D plotting functions, 3-D volume visualisation functions, tools for interactively creating plots, and the ability to export results to all popular graphics formats. You can customise plots by adding multiple axes; changing line colours and markers; adding annotation, LaTeX equations, and legends; and drawing shapes.

Algorithm development - Program and develop algorithms faster than with traditional languages because you do not need to perform low-level administrative tasks, such as declaring variables, specifying data types, and allocating memory.

Object-oriented programming - Define classes and apply standard object-oriented design patterns in MATLAB that let you
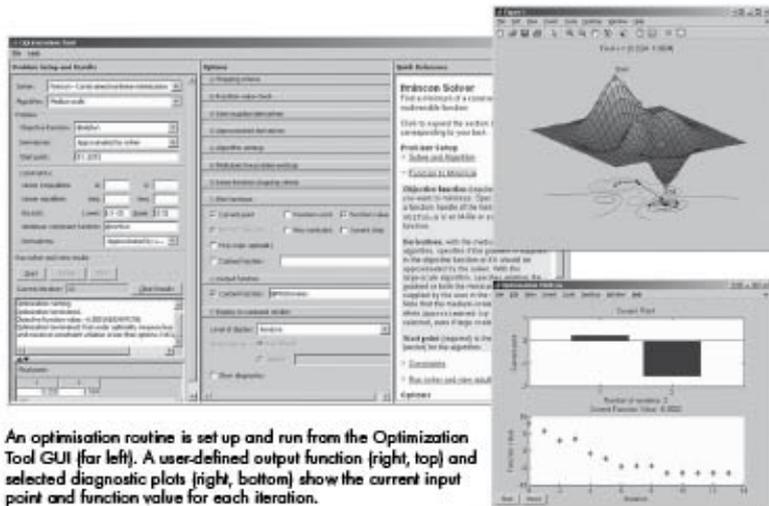
An optimisation routine is set up and run from the Optimization Tool GUI (far left). A user-defined output function (right, top) and selected diagnostic plots (right, bottom) show the current input point and function value for each iteration.

benefit from code reuse, inheritance, encapsulation, and reference behaviour without engaging in the low-level housekeeping tasks required by other languages.

Distributing compiled applications - Share your MATLAB application as an executable or a shared library using a royalty-free runtime engine provided with MATLAB. Build graphical user interfaces within MATLAB. Package your application to work within Excel so your users see a familiar interface.

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