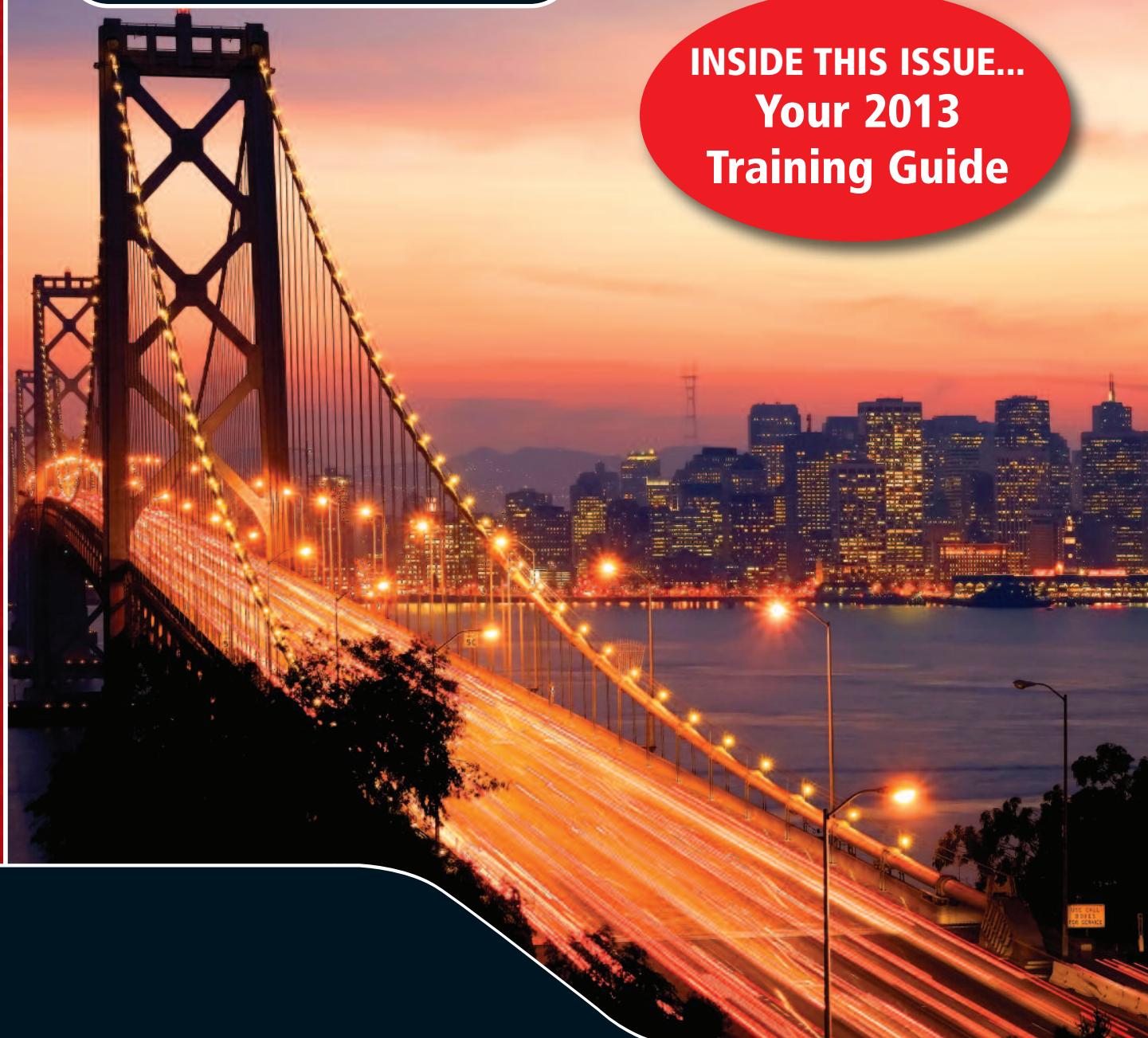


THE SCIENCE OF BETTER AT THE HEART OF ANALYTICS

INSIDE O.R.

DECEMBER 2012 NO 504

INSIDE THIS ISSUE...
Your 2013
Training Guide



HOW O.R. MAKES A DIFFERENCE IN ENERGY MODELLING

:: INSIDE THIS MONTH :: :: :

O.R. ACADEMIC AWARDED NOBEL PRIZE

60 YEARS OF O.R. AT BRITISH AIRWAYS

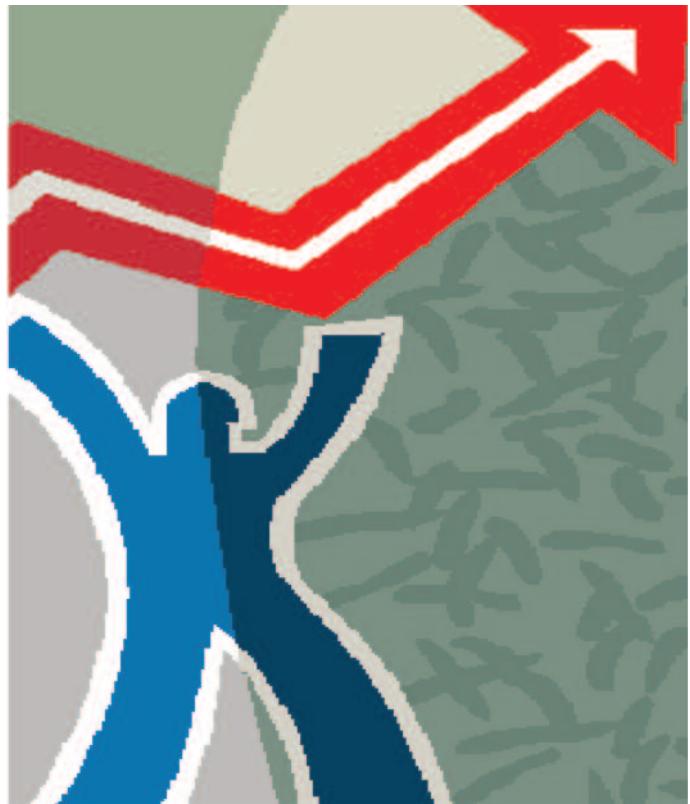
IS PREDICTING THE FUTURE FANTASY OR GOOD MATHEMATICS?

YOU'RE SO 'DATA SCIENTIST' AND YOU DON'T EVEN KNOW IT!



THE OR SOCIETY

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ADVANCE YOUR CAREER PROSPECTS

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The OR Society's accreditation scheme enables members to enhance their career prospects by providing credible certification of their achievements in the field of Operational Research.

There are three categories of accredited membership:

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EDITORIAL

JOHN CROCKER

For many years (probably at least 64) the OR Society has been debating the definition of Operational Research.

John Hopes in his fascinating, historical, autobiographical and amusing 'Leader' discusses the long relationship between financial modelling and O.R. and how it has acted as a bridge between accountants and O.R. practitioners. Do accountants with a knowledge of O.R. make better financial modellers than operational researchers with a knowledge of accountancy?

With the Festive Season nearly upon us we thought you might like to read a one act play for two actors set in a pub not far from a university (see OR minus 30). In these days of liability claims and health and safety, I feel it might be prudent to warn anyone who decides to play the part of the student not to take it too literally, please.

Nigel has done some more sterling work in finding another series of articles largely on an analytics theme. This month we see how it has been used to develop LinkedIn, identify young children at risk of abuse, predict the impact of pandemics, terrorist activities and much more. He has also written a report on the plenary session given by Chris Dent on Energy Systems given in Edinburgh at this year's Conference.

Next month we hope to have the first of a series of reports from the charitable projects being funded by the OR Society, a report on an extraordinary meeting of the Publications Committee convened to discuss the way forward with respect to Open Access and as many Christmas Cracker type jokes as we can print from those which you send in on an O.R. theme. To get you started, here is a couple from Mike Pidd at the Gala Dinner, OR54 on the theme of introductions at the Secret Policeman's Ball – Butler loudly to all present, 'Mr and Mrs Sticks and their son Hugh Rick [Sticks]; Mr and Mrs Litticks and their daughter Anna [Litticks]'. (They were much funnier when Mike said it – 'it's the way you tell 'em'!)

At the risk of being politically incorrect, may I wish you all a very Merry Christmas and a Happy and Prosperous New Year from all at *Inside O.R.*

<OR>

BOOKS FOR REVIEW

If you would like to review a book, please contact Jim Chilcott at:

JORS-bookreviews@sheffield.ac.uk

Economic Time Series - Modeling and Seasonality

William R Bell, Scott H Holan, Tucker S McElroy (Eds)

Handbook on Semidefinite, Conic and Polynomial Optimization

Miguel F Anjos & Jean B Lasserre (Eds)

Modeling Dynamic Economic Systems 2nd Edition

Matthias Ruth & Bruce Hannon

Multilevel and Longitudinal Modeling Using State - Volume I: Continuous Responses and Volume II: Categorical Responses, Counts, and Survival 3rd Edition

Sophia Rabe-Hesketh & Anders Skrondal

Stochastic Optimization Methods in Finance and Energy

- new financial products and energy market strategies

Marida Bertocci, Giorgio Consigli, Michael A H Dempster (Eds)

An Introduction to Exotic Option Pricing

Peter Buchen

Applied Operation Research with SAS

Ali Emrouznejad

Option Valuation: A First Course in Financial Mathematics

Hugo D Junghenn

Quantitative Problem Solving Methods in the Airline Industry - A Modelling Methodology Handbook

Cynthia Barnhart, Barry Smith (Editors)

<OR>



OPERATIONAL RESEARCH CLASS OF 1966 REUNION

GEORGE REAH

In 1965, at the start of the University's second year, a group of young men joined the Operational Research Department, which was then located in Skein House in central Lancaster. They were postgraduates on the MA in Operational Research course; some had recently completed undergraduate degrees at much older universities but others had worked for a few years and were being sponsored by their employers.

After completing their degrees the sixteen went their separate ways (although five initially stayed in Lancaster to complete doctorates in the Department) but most stayed in touch with at least one or two others from the year group. Several subsequently worked overseas and three now live abroad permanently (in the USA, Canada and South Africa).

Having missed celebrating the 25th anniversary of our entry to the Department, an enterprising trio (Alan Amphlett-Lewis and Philip and Sally Sutton) arranged for us to meet in Lancaster in 1997 for a weekend, organised around a dinner attended by past and present staff, to celebrate 32 years. There was universal agreement that we should 'do it again' but with our respective commitments to work and families it was some time before the idea resurfaced.

Then in 2009 the Department organised a networking event in London and a few of us, now retired, took the opportunity to attend to have dinner together afterwards. This was followed up by an enjoyable lunch in London last year, which concluded with agreement that we should aim to get together on a regular basis.

Hence it was that we met on 10th October for a private lunch at No 4 Clifton Village, Bristol. The date was chosen to enable Julian and Sadie Cutland from South Africa to attend. On this occasion 13 were present (Keith and Angela Aldred, Julian and Sadie Cutland, Alan and Norma Halder, Peter and Pam Hewson, Martin and Kineeta Mitchell, George Reah, Philip and Sally Sutton). Several of those who were unable to attend had sent good wishes. The conversation flowed and it was after 4pm when we eventually rose from the table.

Our plan is to continue to meet regularly. And if all goes well we will celebrate our 50th anniversary with a weekend in the Lancaster area in 2015 - perhaps an opportunity to revisit one of the Morecambe hotels, the Headway (where many of our course lectures were held) or the art deco Midland (where the Department held dinner dances).

Article reprinted courtesy of George Reah and Lancaster University Management School.

<OR>



From left to right: George Reah, Martin Mitchell, Norma Halder, Philip Sutton, Peter Hewson, Pam Hewson, Julian Cutland, Sadie Cutland, Kineeta Mitchell, Angela Aldred (behind Kineeta), Keith Aldred, Sally Sutton, Alan Halder. Photo © George Reah.



WANT TO ATTEND YOUNGOR18 FOR FREE?

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

Simpson Scholarships are designed to enable one or two outstanding young operational researchers to attend the OR Society Young OR Conference, and to encourage them to present papers on their work in O.R.

The scholarship covers the conference registration fee, (including lunches, teas/coffees and other meals) conference accommodation and reasonable travel expenses incurred in attending the conference.

To be eligible you must have been in O.R. for less than 10 years. This period needs to include at least two years' working experience, based in the United Kingdom, of Operational Research in industry, commerce, government, or in a University teaching or research post. In the case of multiple authorship of a submitted paper, all of the authors must meet these conditions, although only one of the authors will receive the award.

To apply please send an extended abstract of the paper which the author(s) intend to present at the conference. You also need to

supply the names and contact details of two independent referees, one a member of the Operational Research Society, the other a client unless inappropriate, who are in a position to testify as to the accuracy of the submission and the fact that the work described was done by the candidate(s). A detailed curriculum vitae is required for each candidate, and in the case of multiple authorship of a submitted paper, the submission must also include a statement detailing the contribution that each author has made to the work described. Submissions should be sent by email to Gavin Blackett, Secretary & General Manager of the Society, email gavin.blackett@theorsociety.com. The closing date is 31 December 2012.

<OR>



Secure the future of our nation

Maritime Analyst

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This is your chance to broaden your experience by working on a range of projects in a variety of areas. Breaking down problems to understand where they fit into the bigger picture, you'll analyse each one from different viewpoints and communicate your findings to colleagues and customers, providing sound scientific reasoning.

Dstl research and develop scientific and technological solutions that save lives and give our armed forces the edge. Join us and you'll investigate the challenges faced by our Naval Systems Department (NSD) and influence decisions made about the future of the nation's maritime defence capabilities. To succeed, a degree in a scientific or numerate discipline is essential, as is post-graduate experience in a scientific, technical or analytical role, and competency in maths.

Job reference: 24166. Closing date: 4 January 2013.

All our vacancies are listed on the Civil Service jobs website <https://jobs.civilservice.gov.uk/company/nghr/jobs.cgi>

In 'Job Search', look under 'Department' for Defence Science and Technology Laboratory. Email a completed application form in MS Word format to dstlrecruitment@dstl.gov.uk quoting the vacancy reference in the subject line.

Defence Science and Technology Laboratory – Maximising the impact of science and technology for the defence and security of the UK.

www.dstl.gov.uk/careers



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Ministry of Defence



TEN YEARS OF KMRP

JOHN EDWARDS

Come and celebrate at KIM2013, 4-5 June 2013

Join us at KIM2013 in Warwickshire next June and help us to celebrate ten years of our Knowledge Management Journal, *Knowledge Management Research & Practice (KMRP)*. KIM2013 is the spiritual successor to the KMAC conferences that started in 2000 which, together with *KMRP*, demonstrates the OR Society's continuing commitment to helping improve knowledge management.

One element of the KIM2013 conference in June will be a celebration of the tenth anniversary of *KMRP* which will complete its tenth volume with the publication of the December 2012 issue. *KMRP* is the first knowledge management (KM) journal to gain an impact factor and has established its reputation as one of the world's top KM journals.

The genesis of the journal came in the interest of a group of people in the relationship between O.R. and KM. The feeling was that O.R. could make two types of contribution. One was specifically O.R. type work in knowledge management, which we might broadly sum up as being model-based analysis. The other was that KM clearly overlapped several disciplinary areas, some of which were already fighting a turf war for the 'territory' of KM, and O.R.'s interdisciplinary approach had much to offer in unifying and integrating the different perspectives. This chimed in very closely with the growth of work in mixed methods in O.R. at the turn of the century (gosh, that sounds such a long time ago...).

**KNOWLEDGE MANAGEMENT
RESEARCH & PRACTICE**

Editor: John S. Edwards, Aston University, UK

Regional Editors: Sven Carlsson, Jönköping International Business School, Sweden (Europe, the Middle East and Africa)
Meliha Handzic, University of New South Wales, Australia (Asia Pacific)
Mark Nissen, US Naval Postgraduate School, USA (North and South America)

- A source of high-quality, peer-reviewed articles on all aspects of managing knowledge, organizational learning, intellectual capital and knowledge economics
- A single focus for this rapidly evolving and multidisciplinary field
- A bridge between research and practice – a broad global perspective
- Published in conjunction with The OR Society

www.palgrave-journals.com/kmrp

KMRP launch flyer

However, the real story goes much further back than the first issue of *KMRP* in July 2003, even allowing for the lead time to obtain papers and reviewers, get the reviews done and publish a journal issue.

In my own case, in the early 1990s, I was working on expert systems and knowledge-based systems. My first exposure to KM - at least by that name - was in 1994,

**palgrave
macmillan**

We are delighted to announce, in conjunction with The OR Society, the launch of a prestigious new international, peer-reviewed journal.

**Knowledge Management
Research & Practice**

Editor John S. Edwards, Aston University, UK
 Regional Editors: Meliha Handzic, University of New South Wales, Australia (Asia Pacific)
Mark Nissen, US Naval Postgraduate School, USA (North and South America)
Palgrave Macmillan (Europe and North America) and the International Academic Board

Known as: Knowledge management is a term that has evolved in step with the maturing of both academic and business arenas since it was first coined in the 1980s. Interest has increased rapidly during the last decade and shows no signs of abating. The core estate of knowledge management fields that it encompasses has expanded greatly over time.

- Managing knowledge (creating, acquiring, sharing, retaining, storing, using, updating, reusing)
- Organizational learning
- Intellectual capital
- Knowledge economics

While it is true that there is a knowledge management literature that addresses issues relating to technology, people, culture and psychology, there is a knowledge management that addresses issues relating to technology, people, culture and psychology.

Refuge as a consequence of this diversity, the knowledge management literature is at present fragmented. Many of the most influential articles on knowledge management appear in journals in fields as diverse as information systems, management science, organization development, strategic management, and marketing. In addition, other effects, somewhat independently, presents the subject as split. Current examples of these 'splits', which should cause concern, include the following. In the United States, the journal *Journal of Knowledge Management* (published by the American Society for Training and Development) and the journal *Journal of Knowledge Management* (published by the International Institute for Knowledge Management). In Europe, the journal *Journal of Knowledge Management* (published by the International Institute for Knowledge Management) and the journal *Journal of Knowledge Management* (published by the European Institute for Knowledge Management).

Given the importance of high quality, peer-reviewed articles on all aspects of managing knowledge, organizational learning, intellectual capital and knowledge economics, this journal will not just reflect on the organisational and practical aspects, and especially the relationship between the two. There will be a particular emphasis on theoretical and methodological issues, as well as practical applications (e.g. cultural or educational) issues. Rigorous contributions from both academics and practitioners are welcomed.

Articles may be empirical research papers, theoretical papers, conceptual papers, case studies or surveys. Articles will still be needed for a journal specifically concentrating on knowledge management that maintains the highest standards of quality. This journal will be a major outlet for peer-reviewed work within conceptual integration from those currently published in existing outlets.

Call for Papers

Issue 1 Call for papers



The next few years saw the beginnings of specifically 'O.R.' and indeed OR Society activity in knowledge management.

The first of the KMAC (Knowledge Management Aston Conference) series of conferences at Aston took place in 2000, and later that year there was no less than a triple stream on knowledge management at the OR42 annual conference in Swansea. Special issues of EJIS and JORS followed, and the OR Society and Palgrave Macmillan had by then had the foresight to set up a journal specialising in knowledge management - *KMRP* was born! The rest, as they say, is history. Many people helped to achieve that, but listing all of them would probably fill up this whole edition: they know who they are, and my personal thanks to every one of them.

So, why not come along to KIM2013 and be part of the *KMRP* tenth anniversary celebrations, too? The KM conference still focusses on model-based analysis and integrating perspectives and we will most definitely be looking forward as well as back.

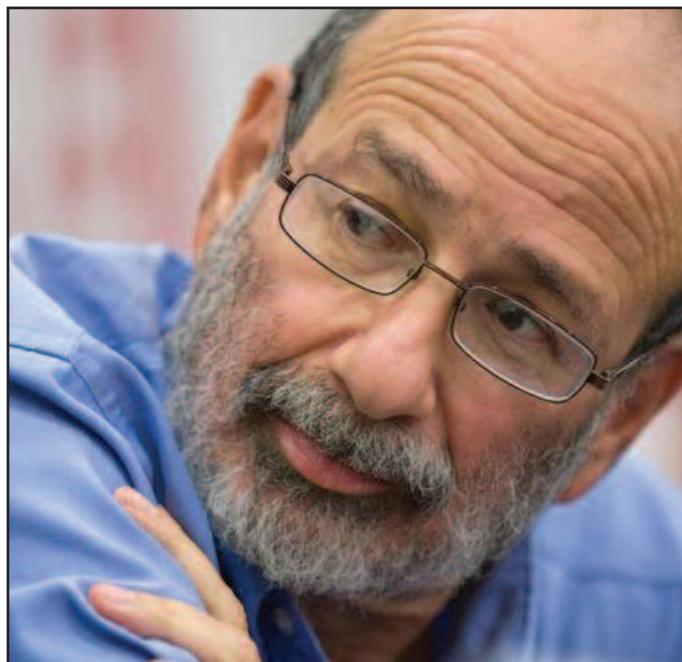
For more information about presenting at and booking for KIM2013 go to <http://www.theorsociety.com/KIM2013>



O.R. ACADEMIC AWARDED NOBEL PRIZE

NIGEL CUMMINGS

The Royal Swedish Academy of Sciences has announced Alvin Roth as a Nobel Laureate in Economics.



Alvin Roth

Roth joined Harvard in 1998 after dropping out of high school in New York (because he felt 'under-stimulated'), studying for his first degree in O.R. at the School of Engineering and Applied Sciences, Columbia University and completing his doctorate at Stanford. He shares his prize with UCLA Economics Professor Lloyd Shapley even though they are separated by a generation and have actually never worked together.

Shapley and the late David Gale devised the Gale-Shapley algorithm in cooperative games theory whilst at Princeton at the same time as Nash (he of 'A Beautiful Mind' fame and 1994 Nobel laureate) was developing his theories in non-cooperative games in the 1950s and 60s.

In the 1980s Roth applied the Gale-Shapley algorithm to existing institutions—including hospitals and universities to help create better matches between new doctors and hospitals. The National Resident Matching Program, which was established in the 1950s, had utilised an algorithm to match newly trained physicians with hospitals, and Roth noticed that the algorithm it used closely resembled the Gale-Shapley algorithm.

Where Shapley (and Gale) were theorists, Roth was the practitioner. Roth's work has largely focused on how individuals, companies, and other institutions select one another in a variety of contexts,

'I've always thought of economics as being not just part of the social sciences, but part of the humanities,'

particularly in markets that do not have prices. He explained that many of life's most significant events can be explained by 'matching markets' from choosing a school, to finding a partner, to starting a career.

Roth noted that this algorithm could become 'unstable' in certain cases. In particular, when trying to match new doctors to hospitals, the algorithm was unable to take into account the fact that doctors with spouses or partners would prefer to work together or, at least, in the same vicinity.

Bringing rigorous game theory approaches to bear on real-world problems, Roth has long been at the forefront of economic design. In particular, Roth has made a number of innovative applications of matching theory. The problems in the real world are that people, especially parents, can get very upset if they do not get what they want [for their children]. This came to a head in New York where parents wanted to get their children into the 'best' schools and were invited to list their top five preferences only to find that these were all filled and that their children had been allocated to their worst nightmare.

Roth, along with then-graduate student Parag Pathak and economist Atila Abdulkadiroglu, redesigned the New York matching system, using a refined version of a 'deferred-acceptance algorithm'. This led to a 90% reduction in the number of students being matched to schools in which they had no interest.

'I've always thought of economics as being not just part of the social sciences, but part of the humanities,' Roth said at a recent press conference held at Stanford following his Nobel award, 'because it gives us a window into people's lives at some of the biggest crossing points. When they get into schools and universities, when they get jobs, when they choose careers, when they get married – these are all matching markets.'



PRACTITIONER – ACADEMIC COLLABORATION - MAXIMIZING RESEARCH IMPACT

JOHN RANYARD

At this year's Conference in Edinburgh (OR54) on the Wednesday afternoon when some of the delegates were out enjoying themselves, a large number of both academics and practitioners stayed behind to debate this important issue.



Apart from the more obvious benefits, there is also the fact that research academics will need to be able to demonstrate to the UK Government funding bodies (i.e. the Research Councils) that their work is, indeed, making an impact. This is the third Practitioner – Academic session I have organised as part of the 'Making An Impact' streams and was, I think, the most successful. I am most appreciative of all who accepted my invitation to take part.

In the Chair was Professor Sally Brailsford and on the panel Professors Stewart Robinson, Loughborough University and Mike Pidd Lancaster University for the Academics and Sean Jones, NATS and Tony O'Connor, GORS for the Practitioners. Each was given a question to answer in around 5 minutes and then the debate was open to the floor.

Stewart quoted a survey of nearly 2,500 simulation papers in academic journals that showed that less than 12% had real world involvement and less than 4% had led to real world benefits (though the figures are higher for simulation journals). However these figures are largely caused by the criteria for publication used by most scientific journals! For every 100 research projects, maybe one will produce something of lasting significance but, alas, there is no way of knowing *a priori* which one and, of course, it may not be as a direct result of the project!

Sean said that he found it best to talk directly to academics because the level of understanding becomes clear very quickly. An example was a new approach to an old problem involving aviation safety –

modelling statistical distributions where all that matters are the outliers. Academic papers can be impenetrable to people outside the chosen field, so there is no value to the reader if he/she can't understand it! Academics must communicate better if they wish to have an influence in the real world and this means talking more and writing less! Both sides need to understand how short term industry challenges (less than one year but ideally less than 6 months) can fit into longer term research. Barriers include the need for industry to make a business case for research, including the likely return on investment; the need to balance pragmatism (and the 80/20 rule) against the need for academic rigour; and intellectual property rights (and company confidentiality) versus open publication.

Mike explained that there are a number of ways in which practitioners can get involved and keep up to date, including joining academic advisory boards, sponsoring research, offering Master's projects and student placements, and secondments but it is important to recognise that timescales and priorities are different. He supported Stewart by stating his view that only around 5% of research came to fruition in the real world. Much existing collaboration involves academics taking on a consulting role i.e. tailoring their research expertise to a specific company context. There are barriers to getting practical work published but some journals are interested e.g. *JORS*, *Interfaces* and *OR Insight*. There is usually a requirement to examine the relevant literature to see what the paper would contribute in a general way (what can others learn?) and/or novelty (what's new in this?). It is also possible to self publish on the internet or use the press, in which case the company's PR people should be asked to help.

Tony said that the key factors included being outcome focussed, timely, and accessible, in order to be impactful. He thought that academics who wish to have an impact on the real world should offer more than a critique – where they criticise a programme or policy they should offer practical alternatives. He agreed with the Government's Chief Scientific Advisor that to be helpful, O.R. needs to engage with the problem, the people and the politics of doability. Academic consultancy is useful but knowledge transfer and expertise building within government is equally important. Shorter articles from academics without the maths would be appreciated!

Academic journals are intended to provide a precise, accurate history of research in the field giving sufficient detail to allow others



to replicate the work done, ideally producing the same results. As such, they are not really intended to be read by non-specialists. It was suggested that *OR Insight* could be revamped and provide a platform to disseminate the results of useful academic research to practitioners. There might also be a case for adding an 'executive summary' aimed at non-specialists. Possible models for a re-focussed *OR Insight* include 'Significance', which is published by the RSS and is more magazine-style, with shorter punchy articles and the INFORMS journal Analytics which is aimed at practitioners.

There are many ways in which academics and practitioners can get together but it has to be recognised that this must provide mutual benefit to both parties. Academics are not free consultants and are not there purely for the benefit of practitioners but are very often more than happy to discuss the problem which frequently is quite sufficient. Finding the right academic to ask can sometimes be difficult but the OR Society website is very often a good place to start. There is also the problem that what might seem trivially obvious to an academic expert may not to a practitioner. Equally, practitioners are likely to have knowledge of the problem which they take for granted but is from obvious to an academic – e.g. EU regulations on pilots' work practices.

Supervisors of both Master and Doctoral students are always looking for suitable practical problems that can be used as bases for

projects. A major problem for practitioners, however, is the timescale. Problems tend not to occur at just the time when a student needs a project and most owners of these problems don't expect to have to wait months or even years for the solution. In many cases, commercial organisations are far from keen to have these projects published, which can pose a problem although there are generally ways around this. Masters projects and placements can however be very cost-effective and can lead to longer term collaboration and sometimes employment for the student – the company gets to know the student over several months at an incredibly cheap rate.

Practitioners can offer test beds for research developments and this may become more important now, given the requirement for impact in forthcoming REF.

From the discussions among those present it is clear that there is much goodwill on both sides. It remains to be seen how this enthusiasm can be harnessed, given the constraints in the real world but it is encouraging that COPIOR and HORF are planning to get together to discuss the issues involved in improving research impact.

<OR>

MWB BUSINESS EXCHANGE LAUNCHES THE UK'S MOST FUTURISTIC MEETING ROOM

The following is based on advertising material sent to the OR Society Office. It is not intended as an endorsement of the product as the author has no personal experience of the system (Ed).

MWB Business Exchange, one of the UK's leading providers of flexible office space and meeting venues, has launched one of the most advanced telepresence systems available to hire in the UK. Situated in MWB's Liverpool Street centre in London, the Immersive Telepresence Meeting Room uses groundbreaking HD technology and offers a better alternative to conference calls and tedious, expensive travel. It comes as a new survey reveals some 63% of human resources (HR) managers in the US said their company often conducts employment interviews via video. This is up from just 14% one year ago.

The new facility will allow important face-to-face meetings and job interviews to take place for less than £200 an hour. The installation is proving extremely popular, with one major City financial institution already block booking the facility for 2 weeks before the service has even launched.

The room is designed using three 60 inch 1080p high definition screens using a Polycom ATX system to create the most immersive meeting experience on the market. Participants sit at a curved table

to ensure the room is functional as a standard boardroom meeting environment that can seat up to fourteen people undisturbed, as well as a six-seat Telepresence system. The arch of the screen was created to match the curve of the table, to provide an aesthetically pleasing design and enable eye-to-eye contact between in room participants and those attending over video link. The three ceiling mounted microphones means that the sound actually appears to come from the person speaking.

Research suggests that over half of all communication is based on what we see and not what we hear. The claim is that the MWB Immersive Telepresence Meeting Room is the next best thing to a face-to-face meeting.

The system, which has been installed by **Saville Audio Visual**, can be used to call video conferencing facilities of any standard.

<OR>



AGENT-BASED MODELLING - THE POWER OF MORE

DAVID BUXTON

On 3/4 December, David Buxton will once again run his highly acclaimed course, Agent-Based Modelling: What, When and Where. Here David explains why there are more reasons than ever to add this powerful modelling technique to your strategic decision-making toolkit.

More complex data

As systems to be analysed become more complex and/or approach design limits, the ability to collect data is also growing and many organisations find themselves in possession of vast amounts of ever more complex information.

More powerful processing

Increases in computational power make it progressively more feasible to model ever finer levels of data to support strategic decision-making. But traditional top-down, aggregate modelling techniques do not fully exploit the more granular nature of the data now available.

More accurate predictions

Agent-Based Modelling captures data at its most granular level. The technique simulates the behaviours of autonomous, self-directed agents, with their own goals and influences, to simulate complex systems. And, particularly when applied in conjunction with traditional modelling techniques, ABMS can predict outcomes more accurately than ever before.

More risk?

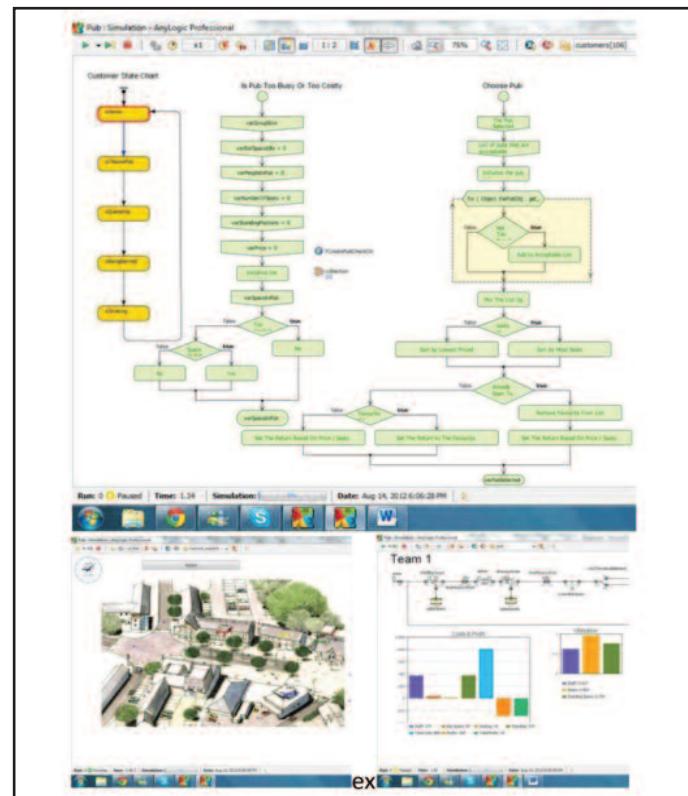
However, alongside this increased ability to collect data and model complex systems, the challenge remains for organisations to identify to which strategic problems ABMS might be most effectively applied. And there are additional corresponding risks associated with the dangers of a poorly designed model or inexpertly interpreted outcomes.

Understand the theory

This practical two-day course not only aims to develop your expertise in Agent-Based Modelling but ensures you gain an understanding of the principles of the three main modelling paradigms (ABMS, Discrete Event Simulation and System Dynamics), and when to apply each.

Apply the technique

With an introduction to the AnyLogic simulation tool, the course introduces design methodology for ABMS and provides plenty of opportunity for hands-on experience in designing, building and implementing agent-based models - and a pub.



Improve your insight

You'll also learn how to interpret outcomes and, perhaps most importantly, how to identify poorly designed models and inputs which have the potential to deliver misleading outcomes and endanger your organisation's decision making.

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David Buxton is the UK's leading practitioner of Agent-Based Modelling and simulation. He applies his expertise in model development through dseConsulting and in his consultancy work with decisionLab.

For more details or to book on the course contact:
jennie.phelps@theorsociety.com



60 YEARS OF O.R. AT BRITISH AIRWAYS

ALISTAIR MOTION

The year 2012 has been notable for a lot of reasons not least because it represents the 60th anniversary of the O.R. group at British Airways (BA).

Despite the trials and tribulations that have confronted the aviation industry in the past 60 years BA has continued to recognise the value of maintaining an internal O.R. group. During its existence the group has made critical contributions to decision making in a wide variety of areas including aircraft acquisition, operational infrastructure, revenue management and more recently alliance and merger strategy. Today the BA O.R. group is still large, with a head count of 51, and provides consultancy right across the business. The group is responsible for enhancing and championing BA's capability in many core O.R. techniques including problem structuring, simulation, forecasting, optimisation and data mining.

Lynne Embleton, Director of Strategy at BA (and formerly of the O.R. group) said 'O.R. has added millions of pounds to BA's bottom line over the years from its optimisation and analytical insight. Many big characters in key roles around the business started their BA career in O.R. Over the 60 years O.R. has proven to be a real asset in the company.'



The 60th anniversary celebrations culminated in a big bash at Drayton Court Hotel, Ealing in November. The event was attended by over 170 BA O.R. members past and present, demonstrating that the camaraderie and family feel still exists even amongst those that have long since left for pastures new. In fact, for some there was literally a family feel to the event as there have been a number of inter-BA O.R. marriages and there was even a father and son in attendance who have both worked in the group (albeit at different times). The organisers of the event would like to thank everyone who attended and made the event such a big success, particularly those that came from far afield. Incredibly there were people who



Heads of O.R. over the ages cutting the cake (left to right - Sean Doyle , Roger Blackburn, Mark Roper, Brian Dolton)

travelled from Australia, China and America to join us in celebrating the landmark.

In response to popular demand, we are intending to arrange another celebration for OR65. If you would like to be able to come along and be part of our longstanding O.R. community, get your job applications ready as recruitment into the group is planned to begin once again shortly! See you there!

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'Financial modelling even predated me'

I don't know whether I should be flattered or insulted, having recently been interviewed on the origins of financial modelling.

Someone obviously thinks I am one of the few people around who might be old enough to remember these origins. Anyway, as I recall, back in the days before personal computers, when a spreadsheet was a piece of paper and not a computer program, and when declining balance depreciation was something that happened to you after a few beers on a Friday night, back indeed in the distant mists of time, financial modelling was something you did with a programming language like Fortran or Cobol. The model was submitted to the mainframe computer; then two days later you would pick up your printouts only to discover that there had been a runtime error, so no results were produced. Even in the unlikely event that there was a pile of reports containing numbers other than zero, it was often the case that the balance sheet didn't balance (some things never change) and you would have to go through another two day cycle to correct the error. Despite these recollections, though, I had to disappoint my interviewer and admit that financial modelling even predated me. Perhaps someone out there knows when it all began.

All this led me to further thoughts about the relationship between O.R. and financial modelling. On the one hand the Society runs training courses on financial modelling, suggesting that it should be part of the toolkit of an O.R. professional. On the other hand there are O.R. practitioners who regard financial modelling as being something quite distinct from O.R., carried out by a completely different brand of modeller. Then again, resorting to my third hand, surely many O.R. solutions have the objective of maximising shareholder value, and how can you demonstrate that without using financial modelling?

Certainly, in my personal case, O.R. and financial modelling have always been closely linked. The O.R. group at Shell where I worked as a freshly hired graduate did just as much financial modelling as optimisation, simulation, statistical analysis, system dynamics or soft O.R. And this included using financial modelling packages as well as programming languages. The applications ranged from investment appraisal to project finance and financial consolidation. As a result many of those who started as O.R. analysts ended up with careers in Finance (poor souls).

Similarly when I moved to professional services in a management science group (fast-forwarding to the age of personal computers and spreadsheets), this team turned out to be the centre of excellence for financial modelling (using Lotus 123) as well as home to the firm's O.R. practitioners. By now there were two separate types of financial modeller – accountants with a knack for IT who had come to their senses and decided they preferred messing about with spreadsheets to auditing, and O.R. folk who had picked up enough accounting and finance to know their debits from their credits. These two types generally coexisted fairly harmoniously and together developed financial modelling methodologies, training materials and approaches to testing and review of models.



In my experience, the most effective financial modelling benefits from an O.R. approach (constructing an appropriate abstraction of the finances of a business in the form of a model, experimenting with that model and then intervening back in the real world on the basis of learning gained from the experimentation). In addition it needs to conform to best practice principles, one example being the separation of input data, logic and output reports, which recalls the structured programming origins of financial modelling. It also, however, requires the auditor's approach to detailed cell-by-cell logic validation, with insufficient review leading to the type of problems we saw recently with the West Coast Mainline franchise debacle. As Ray Panko of the University of Hawaii has famously pointed out, any complex model is likely to contain material errors and so needs to be independently reviewed.

It is likewise the case that effective O.R. studies often need to incorporate financial modelling in order to demonstrate which option delivers the greatest shareholder value. The best pre-tax option is often not the same as the best post tax one. This can be extremely complex and lead to commercially wrong decisions. One example is a North Sea project where different streams of gas flowing through the same pipeline can be taxed at different rates depending on which field they come from, a factor that needs to be taken into account. Also, in many studies there is upfront investment giving rise to future streams of cash flows and only discounted cash flow can adequately handle that trade off.

Another oil industry case study that demonstrates the linkage is the evaluation of Liquefied Natural Gas export schemes. This is also a good illustration of Geoff Royston's theme of O.R. as design. In such projects simulation modelling is typically used to evaluate the volume of gas delivered for different numbers and sizes of ships, different volumes of storage and different port configurations. The costs and delivered volumes of these various options are then fed through a complex financial model under various price scenarios to calculate net present values and internal rates of return, given the added complexity of different ownership structures and tax regimes in each phase of the project (production, liquefaction, transportation and re-gasification). The result is identification of the economically most attractive scheme design.

In conclusion, I don't believe my personal experience is completely out of line with commercial logic. There is a natural alliance between financial modelling and O.R., with the former benefiting from an O.R. approach and O.R. practitioners gaining from having financial modelling techniques in their toolkit. This supports the ongoing need for training of O.R. analysts (including in knowing when to send for an accountant) and greater ties between what have become two communities. Perhaps this is another initiative that could be supported by the OR Society?

<OR>



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HOW O.R. MAKES A DIFFERENCE IN ENERGY MODELLING

NIGEL CUMMINGS

Dr Chris Dent spoke about challenges in energy system modelling: data, optimisation and futurology for the closing plenary at this year's OR54 conference.



Chris Dent AFORS is Lecturer in Energy Systems Modelling in the School of Engineering and Computing Sciences at Durham University. After seven years in Physics research he did an MSc in O.R. at Edinburgh University. He has interests across electrical power systems analysis, including risk and reliability modelling, optimisation, renewables integration, economics and network planning.

Chris illustrated how mathematical modelling can be used as a means of taking systematic decisions across all aspects of planning and operation of energy systems. His presentation took a detailed look at many aspects of energy system modelling: assessment of generating capacity installed; adequacy of power generation; optimisation routines in current energy system management; system scheduling and; operational planning under uncertainty in systems with high capacities of renewable generation.

Electricity generation has a number of features which makes it a particularly interesting topic of study in mathematical modelling. Modellers have to be concerned with the physical laws of electrical

circuits and in particular power flow between two points in a system. Power flow divides up into all possible routes between those two points and is roughly inversely proportional to the electrical impedance of the different routes.

This meant, for example, if Northern France was selling power to Italy, then only about a third of that power would flow directly over the France/Italy border. Half of it would go through Switzerland and about 15% would go through Belgium and the Netherlands. This could lead to the interesting situation where most of the power flowing through the grid of some of the smaller countries within Europe was not actually for that country but simply in transit. Power flows across smaller countries can actually exceed their own demands, so whatever level of granularity you are on, whether it is on a very local level or the continental level you cannot escape those physical laws when modelling systems.

A more dramatic consequence of the physical laws of circuit theory was the possibility of 'wide area blackouts', one of the most famous examples being the 'North East USA blackout' in 2003. This was a cascade event where an overload on one power line forced that line to trip and then the redirection of power along the other available circuits resulted in the overloading other power lines which resulted in further tripping in a 'cascade effect' until 55 million people were without power!

Such events are rare and national power transmission systems are usually run in a 'secure mode' whereby the systems will carry on irrespective of overloads or constraint violations immediately after the first fault, so they usually avoid the cascade effect, but the North East USA blackout occurred because an alarm system had failed and the energy control room did not know it had failed, so the whole system was not actually running in a secure mode at the time the fault occurred.

Electrical power is highly volatile so very difficult to store in large quantities. Although some work has been done on using batteries as storage devices, the only practical large-scale storage technology available at present is to use the power to pump water uphill into reservoirs that can then be used to generate hydro-electric power. The example he gave here concerned the The Dinorwig plant, an 1,800 MW pumped-storage hydroelectric scheme, near Dinorwig, Llanberis in Snowdonia national park in Gwynedd, north Wales.

The original purpose of Dinorwig was to deal with the difficulty that the National Grid would have if the large numbers of planned



nuclear power stations had been built. Such plants were technically and economically inflexible, ideally needing to run at full output all of the time and, so some form of, storage capacity was needed for some of the night-time power when the demand for power dropped off

Today Dinorwig was, he said, not operated as a peaking station to help meet peak loads, but rather as a STOR - Short Term Operating Reserve, or Fast Response plant, acting in response to short term rapid changes in power demand or sudden loss of power stations. Other storage technologies were being developed though, there was for example a great deal of interest in the potential use of large scale battery storage and Durham University had been doing some work on the type of control algorithms that would be needed to run large scale battery storage installations efficiently.

On the subject of electricity as a 'volatile commodity' in terms of financial processes Chris Dent then spoke about the electricity price index in Britain. This was, he said, largely driven by underlying fuel prices so it was not that different from tradable commodity pricing mechanisms. 'What is much more unusual about electricity though is how you get a very sharp, very pronounced diurnal variation in prices.' Overnight the price paid is about 4p per kilowatt hour, but peak pricing on some days can be as high as twenty times the night price, and that was due in part to the lack of ability to store electric power and the fact that suppliers had to pay whatever price the electricity generating plant asked for their services during peak times.

'The most dramatic consequence of this lack of storage and lack of demand site participation in electricity markets is the possibility of absolute price spikes up to whatever price cap is applied in the market... You end up with fixed demand that outstrips the available supply and that can drive up the prices as far as they can possibly go. Electric power is an entirely undifferentiated commodity, in system modelling you define sources of how generation can supply demand and then the physical laws of circuit theory uniquely define how the flows of energy can go along the various lines of the network.'

Chris Dent also spoke about renewable sources of energy, the term 'variable output' was appropriate here he thought, particular in the area of wind and tidal power generation. Such forms of power generation were 'variable throughout the day'. Whilst tide volumes could be calculated seasonally to gain some estimate of the amount of power that could be generated by such means, it was not possible to foresee future demand for the power generated with any clarity.

However even generators that were supplied with conventional fuels to achieve power output had some variability, though the appropriate term for these was probably intermittent output – even assuming such generating facilities had a continuous source of fuel supply, there would be downtime when maintenance had to take place to keep them running efficiently.

He then spoke about generation adequacy assessment and capacity values of systems and the use of simple probabilistic modelling which could provide some indication of when variable power supply systems might need to be augmented by conventional power

'Meteorological data from weather systems showed that wind power resources in Britain were only very rarely capable of supplying enough energy during periods of high demand.'

generation providers to ensure consistent power supply. Wind powered systems for example could at full power provide about 30 gigawatts of power capacity, this was only about half of Great Britain's total peak demand, so conventional power generation systems would always need to be accessed at peak times even if wind generation was operating at full capacity.

Modelling was vital to assess the risks to available supply at any given time. Britain has little in the way of power storage facilities and compared to other countries had less reliance on hydro-electric power generation so knowing when to access mechanical power generation systems which used fuel to create power was very useful information to have.

A scatter block of available wind capacity and demand from winters 2006 to 2011 showed the available wind capacity as a percentage of the peak that could be available. It showed that at any given demand level, 'wind could be doing just about anything, but also there was very little data arising from times of extreme demand'. Meteorological data from weather systems showed that wind power resources in Britain were only very rarely capable of supplying enough energy during periods of high demand.

O.R. has a potential role to play across the whole spectrum from long term planning – what new power generation capacity will be required to replace aging plant or to provide additional capacity through to very short term – which unit should be fired up and when given it takes 24 hours to bring up a coal-fired station and as little as 4 hours for a modern gas-fired one.

Stochastic mixed integer programming is being used to develop models which can be used to decide such matters but there is concern over how realistic these are and whether they are able to take into account all of the factors that are necessary to make such approaches practical. Although there was a lot of data available to drive these models based on what decisions had been made in the past, it was important to take into account what was known to the decision-makers at the time. Forecast accuracy is quite highly correlated with the type of weather system prevailing at the time. 'Though it is a very hard statistical problem to incorporate the special relevance of these forecasts and distributions if you are using them to decide how much operating reserve you need,' Chris concluded.



SUBMIT YOUR YOUNGOR 18 PAPER NOW

MEET STREAM LEADERS: Welcome to YoungOR 18! Next year's conference includes streams ranging from Analytics to Soft Systems. The conference aims to facilitate knowledge sharing between young academics and practitioners with up to ten years' experience in O.R. There will be a number of streams orientated around both applications (e.g. Health) and techniques (e.g. DEA). The streams that are being organised so far are described below but more are being planned.

CALL FOR PAPERS

If you want to give a talk at the conference, please contact the stream leader you think your talk may fit into or visit www.theorsociety.com/yor18 for more information.

Defence:



Alexander Sheen

asheen@mail.dstl.gov.uk

The Defence and Security sector has been at the heart of operational research since the Second World War and today is used to support everything from procurement decisions to in-theatre deployments. Evolutions in threats have driven a greater desire to include O.R. as part of decision making cycles. This presents real - often novel and highly complex - challenges presenting a particular challenge to researchers, especially where traditional techniques may no longer be appropriate. For further details and to register your interest in presenting at the Defence and Security stream please contact asheen@mail.dstl.gov.uk or visit the Young OR18 pages of the OR Society website.

Practical O.R. case studies from those working directly in health policy and health care, highlighting critical success factors, key lessons learnt and challenges faced, are also encouraged.

If you have any questions or are unsure whether your work is appropriate for this stream, please do not hesitate to contact me.

Energy:



John-Patrick Richardson

john-patrick.richardson@nnl.co.uk



Pedro Crespo Del Granado

p.crespodelgranado@lancaster.ac.uk

With a worldwide drive for a low carbon future, both industry and governments in the UK and internationally are looking for ways to improve, become more efficient and increasingly more sustainable. For many this means applying O.R. tools and techniques to support both innovation and continuous improvement, to inform strategy and policy decisions and engage stakeholders, to improve design, to effectively manage operations and to plan and optimise the supporting infrastructure (e.g. transport and logistics).

This stream is interested in understanding how O.R. is being applied in the energy sector, what the key challenges are, how they are being investigated, the processes, tools and techniques that are being applied and the resulting impact. The stream is interested in soliciting papers from academia, the public and private sector and collaborations between these sectors.

Manufacturing:



Fereshteh Mafakheri

F.Mafakheri@greenwich.ac.uk

The manufacturing sector accounts for a considerable share of the global economy. In recent years, however, manufacturing industry is facing many challenges arising from globalisation,

Health:



Praveen Thokala

p.thokala@sheffield.ac.uk

This stream will focus on the development and use of O.R. techniques in health and health care. We welcome case studies or methodological pieces of work which assist healthcare decision-making. Examples may include, but are not limited to:

- Service planning techniques; the use of mathematical models to support resource and capacity planning on a local and national level, e.g. estimating future demand for A&E departments.
- Disease models; the application of O.R. techniques to inform clinical and policy decision-making, e.g. comparing the cost-effectiveness of different screening and chemotherapy options for women with breast cancer.
- Resource allocation models; The application of O.R. techniques to inform resource allocation, e.g. using linear programming techniques for allocating the healthcare budget across different disease areas or geographical locations
- Methodology development; the development of new and innovative O.R. methods to support healthcare decision-making, e.g. the use of metamodels to analyse computationally expensive models.

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financial restrictions, and environmental requirements. In response to these new circumstances, the industry is increasingly looking for innovative approaches towards more sustainable, resource efficient, flexible and change-responsive manufacturing practices. This trend has paved the path for a new generation of O.R. applications in design and management of manufacturing systems.

This track provides an opportunity for researchers and practitioners to present and disseminate recent advances in manufacturing applications of O.R. Areas of particular interest include, but are not limited to, the following:

- Flexible Manufacturing Systems
- Manufacturing Informatics
- Lean and Agile Manufacturing
- Green Manufacturing
- Remanufacturing
- Resource Efficiency in Manufacturing
- Manufacturing Systems Analysis and Policy

Criminal Justice:**Gary Preece**gary.preece@cjs.gsi.gov.uk

The criminal justice stream welcomes papers on the theory and practice of O.R. within all aspects of the criminal justice system. The stream aims to include those from local agencies, e.g. police and probation; central Government departments; and charities/other organisations working in criminal justice.

Papers on the methods and outcomes of academic research, applied case studies and developments in the field are all invited. The stream will enable sharing of ideas and excellent networking opportunities for those working in O.R. across the criminal justice system.

If you have any queries regarding this stream, please do not hesitate to contact me on gary.preece@cjs.gsi.gov.uk.

Consulting:**Faridah Iskandar**faridah.iskandar@capgemini.com

The consultancy stream welcomes both O.R. consultants and O.R. practitioners who have operated in a client-consultant setting. From experience, O.R. consultants are typically brought in to *fix a problem*. As one would expect, in order to solve these problems we often need to apply technical O.R. skills and just as important in our toolkit are consultancy skills.

You may be an *in house* O.R. consultant, or indeed someone employed by a bigger consultancy – we would love to hear about your experience and points of view at YoungOR18.

This stream aims to provide a mixture of case study and point-of-

view presentations from O.R. consultants across all industries and submissions on either of these are very welcome. Below are some ideas on presentation topics.

- How does an O.R. consultant differ from any other kind of consultant?
- The rise of 'Big Data' and the implications for O.R. consultants
- O.R. projects in the public and private sector – what was the problem, what was the solution and how did you implement it
- Are you a customer of O.R. consultants? What was your experience? How did they help?

Service Management**Michael Leyer**m.leyer@fs.de

Services have gained enormous impact on the revenues of companies. Competition is increasing in many markets as customers become more and more demanding. As a result, achieving high productivity with regards to service delivery is a primary success factor for service companies such as travel agents, banks and telecommunication companies.

However, ideas from manufacturing cannot be transferred one-to-one from manufacturing as services are different. Services are dependent on the customer who is integrated while the service is delivered preventing a stock production. Thus, adapted or new methods from O.R. are required to improve service productivity.

This stream provides an opportunity for researchers and practitioners to present and disseminate recent advances in service applications of O.R. Areas of particular interest include, but are not limited to, the followings:

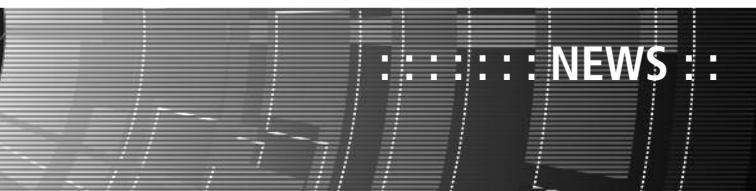
- Methods to improve Service Productivity
- Flexible Service Production Systems
- Lean Service Production
- Scheduling in Service Management
- Resource Efficiency in Services
- Service Systems Analysis and Policy
- Application of Methods in different Service Industries (e.g. Call Centres, Banks, ...)

Soft Methods:**Juan Felipe Henao Piza**jfhenao@icesi.edu.co

Soft methods are currently very popular among O.R./MS practitioners and academics and their benefits to increase our understanding of complex situations have been widely reported in the academic literature.

Nevertheless, several questions still remain unanswered.

In this regard, the soft methods stream welcomes empirical and theoretical contributions that help us to better understand real-



world interventions. Topics of particular interest may include, but are not limited to:

- Multi-methodology: combining soft with hard approaches;
- Assessment or validation of soft approaches;
- Designing innovative applications or new approaches;
- Dissemination of soft approaches outside the UK;
- Development and evaluation of computational tools for applying soft methods;
- Strategies to teaching soft methods;
- So, don't miss this chance and submit your work now!

Analytics:



Sayara Beg

sayara@datanut.co.uk

The term Analytics refers to the identification of trends that can be used to aid decision-making. Its most common application is through deployment of Business Intelligence software over data stored in Data Warehouses and visualised through dashboards and scorecards to forecast or predict business performance, highlighting areas where improvement can be made.

More advanced analytics are now being implemented across all sectors to cover areas such as modelling environmental or human behavioural patterns, social network formations and simulations, improving risk intelligence and enhancing fraud detection and modelling, driving the need for a more broader and deeper dataset for analysis, often referred to as Big Data.

The Analytics stream is looking in two areas. Firstly it is looking for practical case studies of successful deliveries and implementations of Analytics and Advanced Analytics programmes across all sectors, public and private, highlighting critical success factors and key lessons learnt, methodologies used and challenges faced. Secondly it is looking for academic and industrial research in the area of Advanced Analytics, such as key developments in methods of computer science, statistics and mathematics to support and progress the use of Big Data for Advanced Analytics.

Infrastructure:



Fuzhan Nasiri

f.nasiri@ucl.ac.uk

Infrastructures are the key facilities and services that support our society. They include utilities supply and service networks (water, wastewater, gas, electricity, IT & communications, etc.), transportation systems (airports, railroads, roads, bridges, etc.), and public buildings (municipal buildings, hospitals, main sports facilities, etc.), just to name a few.

Reflecting on complexities and multitudes of the challenges facing our infrastructures in the 21st century, infrastructure management has become a top priority in the UK. We are facing a growing stock of aged infrastructure facilities and an increasing demand for

infrastructure services due to a highly urbanized population. Under the current financial and economic conditions, O.R. plays an integral role in supporting an efficient management of our critical infrastructures.

This stream is looking for presentations on current research and practice in the applications of O.R. approaches in infrastructure management including (but not limited to): life cycle cost optimisation, physical asset management, Infrastructure operations management and maintenance, reliability analysis, risk assessment and management, resource planning, infrastructure supply chain and procurement management, financing, Infrastructure and public policy, contract and project management, infrastructure sustainability and resilience, and infrastructure network and interdependency modelling.

DEA:



Bing Xu

b.xu@rgu.ac.uk

The DEA stream invites researchers and practitioners who are interested in the development of DEA methodology and applications of DEA to performance management and measurement in different application contexts.

Submissions on DEA theory and empirical papers from both the academic and practitioner communities are all welcomed. Theoretical themes may include but not be limited to computational aspects, properties of new DEA models and hybrids, and methodological developments. Applications may include but not be limited to Banking, Economics, Education, Environment and Energy, Finance, Marketing, Production and Operations Management.

Disaster Management:



Priyanka Roy

royp1@aston.ac.uk



Oscar Rodriguez-Espindola

rodrigoe@aston.ac.uk

Disasters are a very significant problem worldwide, whether it is in undeveloped countries (e.g. 2007 flood in Mexico, the earthquake in Pakistan on 2005, the earthquake in Chile 2010) or even in developed countries (e.g. Katrina in the U.S. on 2005, flood in London on 2007, the central European floods on 2010). The number and the impact of disasters in the latest years are compelling arguments for the development of suitable solutions to improve disaster management. O.R. is the foundation of several solutions world-wide to aid the decision-making against disaster, and it is our role as researchers to come up with cutting-edge techniques and insightful solutions to improve the operations performed during disasters.

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The purpose of this stream is to gather academics and practitioners alike to share ideas, projects and experiences using O.R. techniques for disaster management. The stream will give a chance for speakers and the audience to get different perspectives, ideas and feedback, and the opportunity for the speakers to disseminate their work and create further connections with people working on the same research area.

If you have any queries regarding the purpose of the stream or the suitability of some paper please do not hesitate to contact us.

MCDA

Brian Reddy
b.reddy@sheffield.ac.uk

MCDA can be defined as the study of methods and procedures by which concerns about multiple conflicting criteria can be formally incorporated into the management planning process. In practice, these problems tend to also involve multiple objectives, multiple stakeholders and an initial lack of clarity about where to begin. As such they tend to be used for complex, even wicked, O.R. problems. Human values and judgements can (and occasionally must be) explicitly integrated into the process, requiring familiarity with soft methods. Other problems are solved using very hard techniques.

As such there is likely to be a wide range of attractions of offer, even within any given paper. The stream, in the open spirit of the approach, will welcome papers across a broad range of areas- academic, practical, mixed and otherwise - and hopes to foster links between these groups as far as possible. I would encourage those unfamiliar with the technique to come along to at least one session to learn more about the techniques and share where they might be appropriate in the future.

Optimization

Pablo González-Brevis
P.Gonzalez-Brevis@sms.ed.ac.uk



Kimon Fountoulakis
K.Fountoulakis@sms.ed.ac.uk

Optimization is a collection of methodologies, techniques and procedures based on mathematics, statistics and computer science, which aims to model real life problems and obtain the best solution among a set of possible solutions.

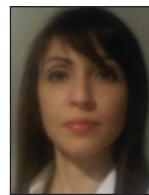
We cordially invite both academics and practitioners to present theirs recent work in the area of Optimization in its broad sense (modelling or algorithms). The scope of this stream is (but not limited to):

- Linear and nonlinear programming

- Integer and combinatorial optimization
- Stochastic programming and robust optimization
- Sparse optimization
- Multi-objective optimization

We would like this stream to provide an opportunity for attendees and presenters to interchange views and experiences about recent theoretical, modelling and computational developments in the area. Also, we are very interested on hearing about recent applications and new algorithms.

If you have any questions or are unsure whether your presentation/topic is appropriate for this stream, please do not hesitate to contact us.

Simulation

Hara Papachristou
HPapachristou@lanner.com

Simulation and managing change
A few of the most commonly asked business questions are how to optimise processes, how to justify investment and how to respond effectively to any required changes. The answer is by using Simulation. When reproducing/modelling the behaviour of a real system, simulation enables the decision maker to identify or predict the source of problems and bring clarity to the reasons for change. This year's Simulation stream aims to reflect the importance of simulation in decision making and implementing change.

The Simulation stream welcomes both academic and industrial practitioners to discuss and share their insights into the role of simulation in exploiting information and predicting the impact of change at both operational and strategic level.

Strategy & Sustainability

Altea Lorenzo Arribas
altealorenzo@gmail.com

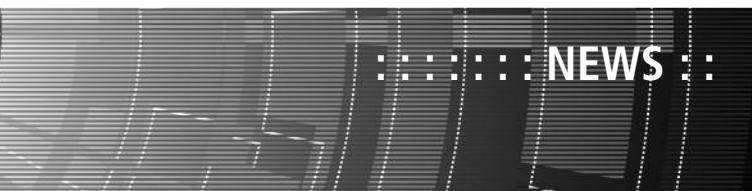


Andrea Bonfiglioli
andrea.bonfiglioli7@studio.unibo.it

This stream welcomes papers on the theory and practice of O.R. within all aspects of *strategic management*. The stream has a particular emphasis on two key themes: (1) the role and importance of good 'governance for sustainability' and (2) 'embedding sustainability into strategy'.

The stream aims to include but is not limited to the following:

- The role O.R. professionals play in supporting strategy development and tackling strategic issues / situations using operational research and other methods



- Opportunity to use O.R. and other methods in supporting the need to:
 - 'Good governance for sustainability' – the influence of good governance on performance and issues in the design of governance arrangements both within the firm and with its stakeholders (i.e. customers, suppliers, investors, community)
 - 'Embed sustainability into strategy' – Design and measuring the impact of organisational and stakeholder decisions on the triple bottom line (economic, environmental and social performance).
- Research and developments in the field may include views from organisational *process* prospective as well as emerging views on the role and importance of managing the *supply* and *demand* chains for sustainability.
- Current and future research issues in strategy development using O.R. research and methods, particularly in the area sustainability and governance.

Papers on the methods and outcomes of academic research, applied case studies and developments in the field are all invited. The stream will enable sharing of ideas and excellent networking opportunities for those working in O.R. across the strategy, particular research focusing on sustainability and governance issues.

Supply Chain



Abhijeet Ghadge

A.S.Ghadge@lboro.ac.uk

Supply Chain Management is gaining increased attention as the businesses are growing faster and wider day by day. It is essential for supply chains to reconfigure themselves by integrating new technologies, strategies and standards to achieve long term sustainability (environmental, social and economic growth). Soft as well as hard O.R. tools have emerged as promising for supply chain and logistics networks issues. We invite contributions from researchers and practitioners from the broad domain of supply chain, operations and logistics management, utilising different O.R. tools to solve their intricate problems.

The objective of this stream to disseminate the knowledge about different O.R. techniques utilised in the current and future supply chain practices. The Supply Chain Management stream welcomes all the papers including but not limited to:

- Purchasing and Strategic Outsourcing
- Collaborative Planning and Forecasting
- Supply chain Risk, Uncertainty and Complexity
- Knowledge Management and ICT in Supply chains
- E-SCM and E-Business
- Design and Modelling of Supply chain networks
- Collaborative and Global manufacturing
- Customer/Supplier Relationship Management
- Supply chain Performance and Assessment
- Transport, Distribution and Logistics Management
- Supply Chain Services and Emerging Markets

System Dynamics



Armin Leopold

armin.leopold@unibw.de

Today's decision-makers are urged more often to assess the impact of their measures and their major intentions on the basis of different aspects. This necessitates using applied scientific models, for example System Dynamics models, as instruments for identifying and evaluating different kinds of impacts of alternative decisions.

One of the main aims for establishing a model is to target operationalisation of the arguments used and thus to achieving inter-subjectivity. For this reason formal logical models are developed that structurally match the verbal argumentation chains. In this sense system dynamic models can be designed and used to support the decision-makers as a comprehensible collaborative decision support system. By designing a System Dynamics model for complex system aspects the structuring of sensitive and complex argumentation chains in a simulation model can be reached in an understandable way.

We invite all research and documented consulting activities in the wide area of System Dynamics. It includes applications of the methodology to solve real world problems, latest technical and SD software developments, and potential productive integration of complementary System Dynamics methodologies in order to generate new solutions.

Revenue Management:

Rupal Rana

R.Rana@lboro.ac.uk

Revenue management refers to O.R. techniques used to maximise expected revenue from selling certain products by controlling prices and/or capacity allocations. These techniques are particularly often used in service industries such as hotels, airlines, car ferries or travel agencies, however, the list of industry adopters is steadily growing.

Forecasting refers to methods that attempt to predict future events such as demand, cancellation rates, no-show probabilities etc. The information provided by the forecast is essential for decision making, and especially the decisions of any RM system depend much on the quality of the forecast.

This stream aims to bring together both academics and practitioners working on revenue management and forecasting problems to discuss current issues and share insights into the latest solution techniques and developments.

STREAM NOT LISTED?

If you would like to discuss any of the above or a topic not listed, please contact our stream organiser(s) above direct or the YoungOR 18 Stream Co-ordinators: Miles Weaver M.Weaver@napier.ac.uk or Vicky Forman vickykforman@gmail.com



THE HUMOR COLUMN

GAVIN BLACKETT, SECRETARY & GENERAL MANAGER

A bit of poetry for this month's column; it's a little racy, so watch out!

The missus bought a paperback
...just the other day,
I had a look inside her bag;
....T'was 'Fifty Shades of Grey'.

Well I just left her to it,
And at ten I went to bed.
An hour later she appeared;
The sight filled me with dread.

In her left hand was a rope;
And in her right a whip!
She threw them down upon the floor,
And then began to strip.

Well fifty years or so ago;
I might have had a peek;
But Mabel hasn't weathered well;
She's eighty four next week!!

Watching Mabel bump and grind;
Could not have been much grimmer.
And things then went from bad to worse,
When she toppled off her Zimmer!

She struggled back upon her feet;
A couple of minutes later;
She put her teeth back in and said
.....I'm gunna dominate ya!!

Now if you knew our Mabel,
You'd know just why I spluttered,
I'd spent two months in traction
For the last complaint I'd uttered.

She stood there bold and naked
Bent forward just a bit
I went to hold her, sensual like
and stood on her left *it!

Mabel screamed, her teeth shot out;
My God what had I done!?
She moaned and groaned and gave a shout:
'Step on the other one'!!

Well my friends, I can't tell more;
About events that day.
Suffice to say my jet black hair,
Turned fifty shades of Grey.....

<OR>

NOTICEBOARD

WHERE ARE THEY NOW?

The following members on the Society's mailing list have recently had their mail returned to the Membership section, presumably because they have changed their address.

Would any member who is currently in touch with them please ask them to email Carol.Smith@theorsociety.com advising us of their current whereabouts so that we can update our database and return to a speedy and efficient service.

Edward J Hagger

London

Shitao Wang

York

David Crawford

London

<OR>



OF OWLS AND MEN: O.R. PRO BONO, 18 MONTHS ON

RUTH KAUFMAN

Are you interested in volunteering your O.R. skills and knowledge to support a charity or other 'third sector' organisation? That was the question put to all OR Society members in an email 18 months ago. So, what has happened since?

The aims of the pilot 'O.R. Pro Bono' initiative are:

- To help charities and other Third sector organisations to do a better job
- To promote O.R. to the third sector
- To give O.R. analysts opportunities to practise in a wider arena, and to improve their skills

by linking analysts wishing to volunteer their time, with organisations that have a relevant need. 'O.R. Pro Bono' sits alongside the Third Sector Special Interest Group, which is for all those interested in O.R. in the third sector, whether through paid employment or consultancy, volunteering, research or just specially interested.

We were delighted to receive over 100 replies to our email, with three-quarters willing to undertake voluntary O.R. work in the near future, and others saying that they would be able to consider this at a later date.

'O.R. Pro Bono' uses the broadest possible definition of O.R.: whatever it takes to help you deal with your organisational problem, as long as it is a non-trivial problem and would not be better served by somebody with a different specific expertise. We will offer our services to any Third sector organisation that can inspire an analyst to want to give their time for free.

We have developed partnerships with two brokerage organisations: Reach Volunteering and the Cranfield Trust and we also get projects directly through personal contacts.

So far, 13 projects involving 17 O.R. analysts are under way or completed. Organisations we have worked with are astonishingly diverse, supporting sexually abused men, storytelling, hospices, community development, and owls (yes, owls, worldwide) amongst others. Their scale ranges from a small local organisation with a single staff member, to the Royal National Lifeboat Institution with 1,600 staff. Most projects so far have supported strategy/business

planning in difficult circumstances, where confident analysts with an 'O.R. mindset' have been able to bring clarity, structure and rigour to organisations feeling overwhelmed by choices, stakeholders and circumstances. Some projects have involved work more traditionally classified as 'O.R.', including system dynamics, discrete event simulation and customer analytics. For more details, see 'O.R. in the third sector: where from , where now, where to?', available on the OR Society document repository <http://www.theorsociety.com/DocumentRepository/Browse.aspx?CatID=2>

And what have our clients thought about this? We have had nothing but positive feedback:

'[The volunteers] used the hard (data crunching) and soft (stakeholder views and use of resources) skills to help us grow and prosper' (Community Network)

'Very empathetic and honest. An objective outsider who could add to my own knowledge and skills in understanding my organisation's needs.' (Kaleidoscope Enterprise)

'We've benefited hugely from your work and support in all areas of the project, and from an organisational perspective you've enabled us to take a highly professional approach to increasing our efficiency.' (Crimestoppers)

Our volunteers have also had positive experiences:

'My volunteering experience helped with my competencies; it helped me plan and deliver strong relationships with stakeholders and has given me additional confidence in my ability to do a lot more.'

'Being a volunteer enabled me to try tools and techniques without feeling too nervous about whether they would work or not. I developed my expertise in soft O.R. techniques.'

Overall, the 'O.R. Pro Bono' pilot has shown that there is a clear need, and value that we can deliver. For the future, the biggest



challenge is to match supply of volunteers with demand for their services - a challenge we are looking forward to tackling!

If you want to know more, come along to the next meeting of the Third Sector Special Interest Group (12 December, 2pm at the RNLI, London Support Team, 124-126 Webber Street, London, SE1 0QL) which will showcase work done by three volunteers for RNLI.

If you can't make the meeting, do have a look on the ORiTS section of the OR Society website:

(<http://www.theorsociety.com/Pages/SpecialInterest/ORThirdSector.aspx>), where you can add your name to the mailing list, and read more about the initiative including 12 case studies and reports of previous Special Interest Group meetings. If you'd like to get involved in O.R. Pro Bono, write to Gavin.Blackett@theorsociety.com to register your interest (subject 'OR in the Third Sector'). We'd love to hear from you, especially if you are already working in the third sector, whether paid or unpaid.

Sample case study:

Improving performance by redesigning shifts

The client:

Crimestoppers: the charity which helps solve crime through members of the public providing information anonymously.

The solution:

- A simulation model of the call centre using PRISM software, used to try out different staffing patterns
- Through data analysis to understand variation in demand
- Recommended staffing levels for different demands



"We've benefited hugely from your work and support in all areas of the project, and from an organisational perspective you've enabled us to take a highly professional approach to increasing the efficiency of our charity" (Performance Manager)

The client's problem:

How to take on new business and improve performance without a big increase in staffing costs

The benefits:

- Better performance without increasing cost, through new shift patterns
- Ability to continue to improve, and to adapt to changing circumstances, into the future

The approach:

The OR Society volunteers specified data requirements and analysed data on demand for Crimestoppers service, both via phone calls and online forms. This summarised overall patterns by time of day, day of week, and time of year. This built a simulation model of the call centre, using PRISM software, based on three separate models for different times of day. This model allowed phone calls to be diverted from one location to other staff at busy times. This validated the model using actual data on arrivals and staffing for a specific week and then used it to explore the impact on KPIs of different proposed staffing patterns. This produced a report, recommending new shift patterns, which improved performance without any increase in staffing costs.

For more information
Email or call

<OR>

Join the largest transformation programme

Reshaping health and social care with Finnamore

Opportunities for *Consultant Analysts – Operational Research*

Leading independent healthcare consultancy, Finnamore Ltd has been helping clients in the health and social sector to improve services for patients across the UK for the last 20 years.

The impact of our work is being seen in positive outcomes for patients, staff and the wider community, creating a legacy for future generations.

Substantial contract wins in the performance transformation areas of our business have created opportunities for suitably qualified candidates to apply to join our team.

All candidates will be expected to:

- Demonstrate a commitment to supporting our teams and clients to create and deliver high quality, sustainable health and social care services whilst realising rapid financial improvement.
- Have strong technical skills in, but not limited to, business modelling, simulation, process re-engineering, output and performance measurement to assist the implementation of operational improvements.

This is an exciting opportunity to influence the direction of Finnamore. Finnamore offers you a professional and supportive team-working ethos. We are totally committed to serving our clients. You will be rewarded for helping us deliver success.

If you are interested please request a candidate pack by emailing kirsty.duck@finnamore.co.uk www.finnamore.co.uk
CVs should be emailed to kirsty.duck@finnamore.co.uk. Closing date for CVs is 11 January 2013.

Shortlisted candidates will be invited to take part in our recruitment process including numerical and verbal reasoning tests leading to a development recruitment centre on Monday 4 February 2013.

Consultant Analysts

You will have gained a good degree in a quantitative subject and working towards completing or have completed a Masters in Operational Research.

You will easily demonstrate your passion for analysing information, applying problem solving techniques and in turn improving business operations.

Whilst improving processes you can also demonstrate your dedication to working as a team to share ideas and facilitate learning. You also enjoy the challenge and variety of project work and working closely with clients and the project team to help reshape health and social care.

You are now seeking a role where you can build upon your experience and develop skills in consulting whilst working on projects and with clients all over the UK which will require a commitment to travel.



THE MEASUREMENT OF PRODUCTIVE EFFICIENCY

a.k.a. DATA ENVELOPE ANALYSIS

MARTIN FIELDHOUSE

The curious tale of how the same subject was developed by two separate research communities.



I would like to pay tribute to Michael Farrell, who in 1957 presented his seminal paper on *The Measurement of Productive Efficiency* at a meeting of the Royal Statistical Society. The discussion that followed, which was published with the paper, was almost as important as the paper itself in guiding future research. Measuring productive efficiency is clearly an important topic. Prior to Farrell's paper, productivity was measured as an average of observations, and little attempt was made to find out how efficient production could be. Farrell suggested that you could take of a set of observations and observe which were the most efficient. Then the other observations were less efficient, and their efficiency could be measured as a simple ratio. His Figure 1, in which he plotted (say) the amount of land and labour used per unit of output by different farms, has a theoretical efficient surface S-S'. If a data point P is inside this surface, its efficiency is the ratio OQ/OP. In Figure 2, he plots actual data points. The most efficient points define a piecewise convex line. Some are less efficient and lie inside this line. Farrell extended these ideas to more than two dimensions of inputs. A member of the audience pointed out that the calculations could be done by the new 'Simplex Method' for LP.

A little later I was introduced to Michael Farrell. I had programmed the EDSAC 2 computer (the first in the country to have a floating point instruction set) to carry out small Simplex LP calculations. I

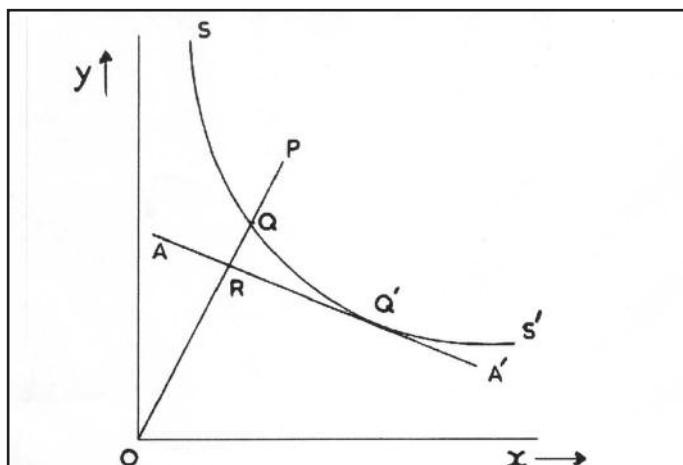


Fig. 1. The definition of Farrell's technical efficiency measures (note that y and x are input coefficients).

was therefore able to apply LP to Farrell's Productive Efficiency ideas. Just 50 years ago, we published a joint paper in 1962 using LP on these calculations. I also explored the properties of the convex region in my PhD thesis submitted in 1961. It is the surface of a convex polytope. The number of efficient facets forming this surface increases combinatorially (exponentially if you prefer) with increasing numbers of input (and output) dimensions. A trickle of papers exploring this new subject followed, mainly written by agricultural economists. The next to use LP was in 1967. Interest in the topic gradually expanded and Farrell's 1957 paper became a 'Classic' after 40 years in 1997 when it had received over 500 'citations' in later papers. At the time that I knew him, Farrell had suffered from polio and used crutches. He died in 1975. His wife is still going strong. She has kindly supplied the photo of Michael.

In 1978, Charnes, Cooper and Rhodes (CCR) published a paper in the new European Journal of Operational Research covering much the same subject, and coining the term 'Data Envelope Analysis' apparently without reference to earlier research. This paper appealed to O.R. and Management Science people and showed how to do the calculations using LP. Citations grew more rapidly and it achieved 'Classic' status after only 20 years in 1998. Most papers cited only Farrell or only the CCR paper as the origin of the subject. Only a few cited both papers. Førsund and Sarafoglou told this story in 2005 and published a graph of the growth of citations.

:: ANALYTICS ::



25

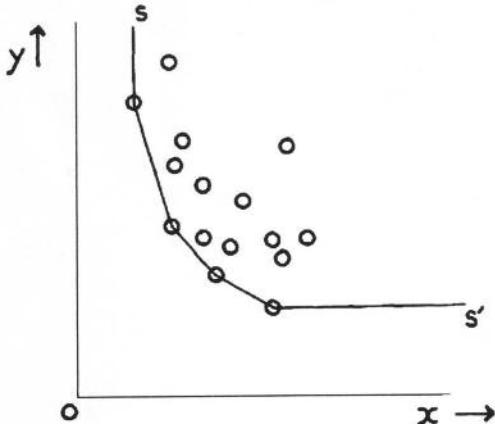


Fig. 2. Estimation of the observed best practice piecewise linear production frontier (unit isoquant SS') (note that y and x are input coefficients).

Actually later investigations showed that Charnes and Cooper had known Farrell well and included his name in the first 60-page draft of their paper, in 1976, but had omitted by the final 15-page version published in 1978. The rate of publication of papers on these two (but the same) subjects doubled in 1996 and has continued at a high rate of well over 100 papers per year since. The LP calculation required is to consider the data points as forming an LP matrix. Each data point (column of the LP) in turn is then also treated as the right hand side. The optimum solution for this right hand side either contains the same column in the basis (100% efficient), or does not (less than 100% efficient.)

I thought my 1962 work and thesis had explored all that was worth exploring about this 'multi-dimensional efficiency indexing technique', but admit that 'Data Envelope Analysis' slips off the tongue more easily. I found large scale linear programming, now usually called mathematical programming, a more interesting and worthwhile subject.

The Post Office used DEA to study the efficiency of sub-post offices. This seemed a good example. There were lots of data points! The technique to improve efficiency was to mini-bus postmasters from inefficient offices to a different area to visit efficient offices. I understand the technique was a success as judged by the style of conversations in the mini-buses on the way back compared with on the way there!

With great confidence this 'new scientific technique' was applied to studying the efficiency of the Police Forces. I think this was less successful, using too many dimensions with too few data points.

A great example of the non-use of DEA was the closing of Coast Guard Centres! In 1999, after a careful O.R. study, the Government announced the closure of three centres. In 2005 a paper was published applying DEA analysis to exactly the same data which came to the conclusion that the Government had closed the wrong three centres!

I think that if several different indices are published about school performance or about hospital performance (say), they could be combined using this technique into a single index, but I have not seen this done.

References:

Farrell M J (1957) *The Measurement of Productive Efficiency*. Journal of the Royal Statistical Society Series A 120 pp253-281 (290)

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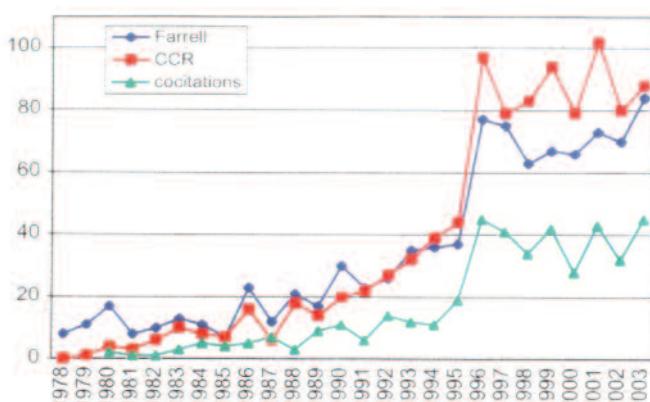


Fig. 3. The development of Farrell and CCR citations and co-citations.



O.R. AND ANALYTICS: AN OPPORTUNITY FOR GROWTH

NIGEL CUMMINGS

John Hopes used his plenary session at OR54 in Edinburgh to describe the analytics landscape, the many and various areas of applications analytics and the reason why analytics is seen as a driver for competitive advantage in business.



John Hopes

The title of his presentation was 'An Opportunity for Growth'; he explained this was a title with several meanings. First of all, it was an opportunity for growth for organisations by deploying analytics in the most effective way, also an opportunity for growth for those who work in analytics and hopefully it would highlight an opportunity for growth for the OR society. He also made it clear that this was a personal interpretation based on his considerable experience as an O.R. consultant.

Analytics has been brought on to the wider agenda. It was by no means new though. In the recent past a book by Professor Tom Davenport, Harvard Business School and Jeanne Harris brought analytics to the attention of CEOs and other senior directors. 'That book I think has been a good thing for all of us who work in the analytical world because it has raised the profile of analytics'.

He thought that Professor Davenport's description of analytics was quite definitive as it concisely summarised the main factors involved. 'Analytics is the extensive use of data, statistical and quantitative analysis, explanatory and predictive models and fact-based management to drive decisions and actions.'

He then spoke about those who do analytics, I.T. professionals certainly do it, but so do O.R. people. I.T. People he said, make extensive use of data to drive decisions and so do O.R. people. Statisticians do statistical analysis, quantitative analysis was common in the world of finance, explanatory and predictive analysis was often undertaken by O.R. professionals, econometricians used analytics to provide facts to support decisions too – 'My point is it's a big community of people, it certainly includes us and what we do and in my view, I would say all of what we do fits in this categorisation'.

The OR Society was aware, following on from some research commissioned from Cap Gemini, that Analytics could be split into two main categories; basic analytics and advanced analytics. Basic analytics is really doing fairly high level analysis of historic data to explain what has happened in some way – all management information pretty much sits in that category. The sorts of tools that are used there are Excel, Access, reporting tools like Business Objects, Cognos and data visualisation tools too.

Advanced analytics is more about supporting strategic and often tactical decisions and particularly looking to the future, so it included predictive analytics where you are trying to forecast what's likely to happen and prescriptive analytics where you are trying to understand what the best course of action might be given uncertainties about the future and what was known about the past.

Such insights provided by analytics technologies could make a real difference and enhance an organisation's performance by increasing its competitive advantage. Analytics could be applied to a whole range of different domains such as sales forecasting, segmentation, supply chain analysis and optimisation.

Gartner identified analytics as one of the top 10 business issues in 2010 and has been cited by many professional bodies as a 'big management issue'. Unlike O.R., it has a very high profile being one of the current 'buzz' words.

The I.T. industry itself was pushing analytics very hard to be the next big thing in I.T. There were all sorts of reasons for that, one of them being if you look back at the history of the I.T. industry we had the ERP systems boom, where just about every business process you could think of was being enabled by I.T. to drive efficiency. This was followed by the Internet boom, which quickly became integrated into the IT world in areas where we could add value. These



generated huge amounts of data and the big question became what do we do with it? But the second thing is that the IT industry recognises addressing the issue presents them with a whole new wave of technology that can be rolled out.

There has been an enormous amount of consolidation in the software world, for example, we see the likes of Oracle, Cognos IBM, SAS and SAP. At the same time if you look at where O.R. qualified people are working these days, particularly in the practical community, they are not working in traditionally O.R. departments. They are more likely to be found in for 'customer insight' or 'credit scoring' or 'business analytics'.

Analytics could also be described by domain, thinking in terms of internal domains for analytics in the finance function it could be simply financial reporting, but it could also be used in activity based costing. More sophisticated finance function and analytics, and there are not many people doing this at present, could be using tools to optimise the business portfolio or using analytics to understand the real value of potential acquisition, not just the more obvious value'.

Analytics had also proved useful in manufacture and quality control, in areas like research and development where modelling is involved for example to optimise the model of clinical trials. Analytics could also be applied to human resources: rostering, scheduling, incentivising .

In terms of external areas, customer facing functions within organisations are using a great deal of analytics – price optimising, customer retention, marketing . On the supply side, supply chain optimisation could benefit considerably from analytics, whether it is distribution optimisation or inventory management. There was also a whole category of analytics that could be applied to the design and function of websites, whether it was facing the customer or facing the supplier.

Many of the traditional sources of competitive advantage no longer exist but even if you had the same strategy as your competitors you could still gain competitive advantage if you executed that strategy more effectively by the application of analytics.

'Distinctive capability' is an area that could prove particularly beneficial to O.R. people. Google was a classic example of a company that had a distinctive capability in deploying analytics in an effective way against its competitors - its Internet search algorithm was made available to everybody free of charge. Marriott Hotels was another good example – their distinctive capability was all tied up in their revenue management utilisation of analytics systems employed to identify the most valuable customers.

A true analytical competitor would have enterprise-wide analytics; it would share data across every level of its organisation to facilitate best possible use of analytics to gain competitive advantage. Such companies would also possess large-scale ambition, they would be spending serious money in order to gain large benefits... There is a correlation between high performing companies and those who are making best use of analytics'.

Tesco were a good example of a company possessing large-scale ambition insomuch as they applied advanced analytics to their customer loyalty schemes and this had proved hugely successful. UPS too had developed a very strong analytics focus on its supply chain and distribution management. It was then sold as a product in its own right to other companies who were willing to buy in to the work they had done in developing analytics tools for the supply chain and distribution market.

'Big Data' is another of those 'buzz' words. The fact that there is so much data being generated is both an opportunity and a challenge for O.R. practitioners - in the digital economy we are just generating so much data!

There are vast amounts of unstructured data and it is doubling in size annually. It was possible to apply analytics to some of this data and gain meaningful insight into the type of people producing it and this in turn would allow companies to target such individuals with marketing opportunities'

Facebook and similar sites are generating data about the users that can and does provide valuable information for companies and organisations capable of exploiting it ranging from increasing sales to tracking terrorist activities.

Financial analytics could help companies to make informed decisions about when and where to make the most appropriate investments.

Advanced analytics can also provided a basis for understanding behavioural responses and dealing with the complexity of balancing the trade-offs against possible risks taken such as pricing, promotions, and markdowns or where and when to open new or close old branches.

"There is so much data being generated is both an opportunity and a challenge '

In terms of what the OR Society could do about analytics, the society has been running with an analytics initiative for 2 years and has commissioned research from Cap Gemini which produced a report and numerous observations and recommendations. This was followed up with a members' survey which tended to indicate that the subject of analytics was an important one and the Society should be doing something. To this end already one-day analytics events had taken place and there were more to follow. It was notable too, that analytics was increasingly being mentioned within *Inside O.R.* There have also been discussions about analytics courses, accreditation, publications and other possible ways of making the OR Society the analytics society of choice.

In summary John believed that analytics was here to stay and that it should be seen as an opportunity for O.R. in general and the OR Society in particular but it would be by no means plain sailing.



SPEED VS RIGOUR – ENHANCING DECISION MAKING IN DEFENCE ACQUISITION

CHRIS JOHNSON AFORS – DEFENCE SCIENCE AND TECHNOLOGY LABORATORY (DSTL)

Comparing Analysis Support for Urgent Operational Requirements to traditional Acquisition Investments - A report from the recent Defence Special Interest Group seminar at which analysis support to Ministry of Defence acquisition projects was discussed.

Thirty people attended and contributed to the seminar which took the form of presentations followed by discussions. Atkins Global hosted the event at their premises near Bristol.

Traditional UK Ministry of Defence (MOD) acquisition and investment can be seen as a long winded process, with examples of investment decisions taking many years. Operational Analysis (OA) may be viewed as contributing to some of these delays, when providing evidence to underpin decision making. In contrast, the procurement of new equipment for deployment into operational theatres, most recently Afghanistan, uses a process called an Urgent Operational Requirement (UOR). An UOR can normally be deployed and operational within 12 months. OA still provides evidence to support UOR decisions, but the generation of this evidence is shifted up a gear. Intuitively, there would appear to be lessons to be learnt for the traditional process; but to what extent has this speed compromised the rigour and certainty of evidence?

This meeting explored these issues by comparing recent MOD procurements using both methods. Three speakers with experience in the subject area provided their views on the differences between traditional and UOR acquisition, and ways in which the processes could be improved.

The first speaker was Tom Baldwin from Dstl's Land Battlespace Systems Department with his talk entitled 'Either UOR or You're Not!' He described the traditional approach of presenting the value for money of options solutions on a Combined Operational Effectiveness and Investment Appraisal (COEIA) plot, illustrating this with investments in the National Imagery Exploitation Centre, and the Defence Electronic Warfare Centre. His UOR example focussed upon the Boomerang system which is now deployed in Afghanistan.

Tom stated that there was potential scope for a 70% evidence solution in support of acquisition decisions. He suggested that there was scope for some analysis to be performed on the cost effectiveness of different levels of evidence to support acquisition decisions.

Gavin Jessup, a Principal Operational Analyst in MOD Head Office spoke next. His presentation focussed on the similarities between the evidence requirements for traditional (core) and UOR procurements. He argued that the process was much the same



Figure 1 - Boomerang Shot Detection System UOR

albeit with some differences in the personnel and organisations involved. He perceived that the difference in difficulty of producing robust evidence resulted from the generality of core acquisition compared to those for UORs where the problem to be solved was well understood, the operating environment clear and the potential solutions likely to be available almost off-the-shelf from a supplier. Furthermore, the assessment of whole life cost for UORs was simpler due to their shorter lifetime. All these factors mean that the UOR analysis problem is more bounded and, therefore simpler and speedier to undertake

The final presenter, Edwin Swidenbank, Chief Engineer at Atkins, chose a different approach to the topic and advocated the adoption of System Engineering methodologies to support the development of appropriate solutions to the traditional acquisition requirements. He contended that by adopting this approach there would be a



Figure 2 - Vallon UOR IED Detector

reduced need for UOR equipments as the development of the requirement space would have been more robust, leading to a flexible solution that would meet future Defence needs.

A discussion session, ably chaired by Stuart Nicholas from Atkins, followed the talks. A number of issues were noted including:

- The difficulty of identifying future operating environments, given that much of the core equipment has lifetimes in excess of 20 years
- The risks associated with a '70% evidence solution'
- How do you know how much evidence is enough, and avoid analysis paralysis?
- Is the UOR process the most efficient and affordable means of meeting operational requirements in the long term?

The discussions continued over tea & biscuits and it was noted that the topic raised many unanswered questions. Dstl intends to further explore these as a result of the seminar.

<OR>

NOTICEBOARD

NEWS OF MEMBERS

The Society welcomes the following new members,
AFZAAL AHMED, London; JOSEPH BARNARD, London; LESLIE HARDY, Hants; PEDRO CORDEIRO DE SOUSA, Portugal; JOHN JARRETT, Hants; FERESHTEH MAFAKHERI, London; IAN SHARP, Cheshire; KATHERINE STOKER, London; KEVIN WILSON, Glasgow; JOE WOOD, London;

and Reinstated members,

MARK BOSTOCK, Nottinghamshire; ASHLEY CARRERAS, Leicestershire; ANTHONY GEAR, Gloucestershire; STEVEN JONES, Solihull; SACHIN KARALE, Ipswich; STEVEN LORRIMER, West Yorkshire; ANDREW TOOKEY, North Yorkshire; KATE WATSON, Kent;

and the following student members,

OLUBUKOLA AGORO, Essex; BANDER ALSAEED, Kent; LISA BULLOCK, Somerset; PAUL EDKINS, Coventry; OLUWATOBI FADOLA, Edinburgh; BRADLEY HARDY, Cardiff; SYED HUSSNAIN, Edinburgh; HARRIET JONES, Cardiff; MATT JONES, Sussex; KERRIE KEENE, Cardiff; STYLIANOS KOTRONIS, Southampton; TIMO KUNZ, Lancs.; HAI Le QUANG, Glasgow; AHMAD MUKLASON, Nottinghamshire;

GEORGE MUREVESI, Paisley; PANAGIOTIS NTONTOS, Kent; ALIREZA PAKGOHAR, Devon; ANTONIOS PETSAS, Birmingham; OSCAR RODRIGUES-ESPINDOLA, Birmingham; ELEANOR SAVAGE, Somerset; PRIYANTA ROY, Birmingham; LINN SOMA, Glasgow; ALEKSEY TKACHUK, Glasgow; MAUNZIO TOMASELLA, Edinburgh;

Total Membership

2342

NEW ACCREDITEES

The Society is pleased to announce that the Accreditation Panel has admitted the following members to the categories shown. These members are now entitled to use post-nominal letters as indicated: -

Admit to the category of Associate (CandORS)

Afzaal AHMED

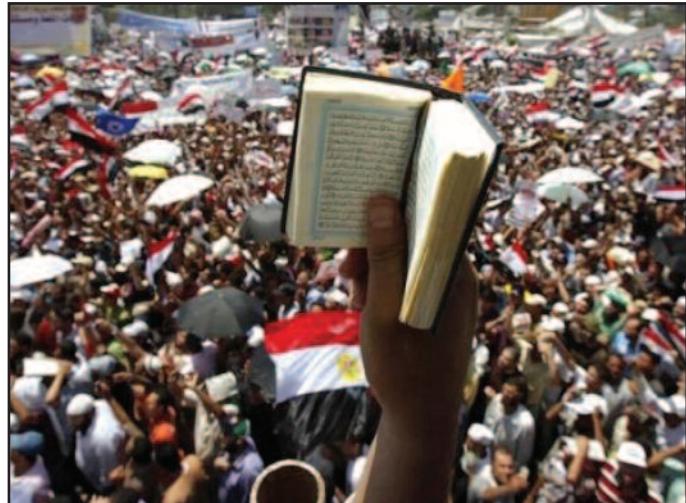
<OR>



IS PREDICTING THE FUTURE FANTASY OR GOOD MATHEMATICS?

NIGEL CUMMINGS

The Arab Spring, a term given to the Arab Revolution, was a revolutionary wave of demonstrations and protests which occurred in the Arab world from 18 December 2010. But was it predictable?



To date, rulers have been forced from power in Tunisia, Egypt, Libya, and Yemen; and probably very soon in Syria. Additionally civil uprisings have erupted in Bahrain and major protests have broken out in Algeria, Iraq, Jordan, Kuwait, Morocco, and Sudan. Yet for some reason intelligence officials using the latest predictive analytics applications, failed to predict any of these uprisings. All this has occurred despite the fact that billions of pieces of disparate electronic information have been analysed in order to identify hot spots before they explode.

The intelligence community has always been in the business of forecasting the future. The question now though, is whether tapping into publicly available data such as twitter, news feeds, social networks and blogs can help them do that faster and more precisely. Surely the information dredged from such sources could have been used to identify potential hotspots developing in the Arab world?

Perhaps the problem with predicting such events has been in the type and quality of analytics used to analyse the data. Now in what seems to be echoes of the popular science fiction film, 'Minority Report' a Swedish-American start-up company called Recorded Future has developed algorithms that sift through huge volumes of information to find relationships between people and organisations. Then the sifted and sorted data is processed by 'visualisation software' to generate giant searchable timelines of possible future events.

Co-founder of Recorded Future, Christopher Ahlberg, a former member of the Swedish Special Forces, says. 'What we're trying to do here is figure out a cool way that we can use to observe the world. We're trying to find new ways of generating data that tell us what's going on in the world ... what did happen, what will happen. We're not going to get 100% in terms of outcome, but we can pull things together in a way that no one else can. So, what we are trying to do is figure out how we can take large portions of the web and extract what we call signals of activity that relate to people and places and associate them with events and time. Time is often a forgotten dimension in analysis, and we think it is key.'

Recorded Future's goal is to provide analytical tools which give users the ability to see events or relationships in sequence and make it easier to find patterns and relationships that traditional 'Big Data' programs might miss. Hedge funds already use Recorded Future to invest, and the intelligence community could use it to help predict world events.

Ahlberg says there are hints about the future everywhere. Governments release economic projections; newspapers report on upcoming events; and information derived from Twitter can provide a good idea of what people are talking about. In Egypt last year, organisers used Twitter and social media to rally protestors. If intelligence analysts had had a systematic way to track those posts, it might have helped them forecast what was to come.

There have already been efforts to try to tap into what is bubbling under the surface by tracking things like Google searches, and Researchers at West Point's Combatting Terrorism Centre and Princeton University tracked Google searches in Egypt starting in January 2011 and found, for example, that there were more searches about events in Tunisia and its protests than for Egyptian pop stars. Recorded Future builds on that kind of public intelligence.

Utilising such data and adding the element of time could be the key to gaining useful predictions from such data. Ahlberg also says that. 'An event we'd track might be people traveling from A to B ... people talking to each other ... a government guy making a statement, a country doing a military manoeuvre. We capture those activities ... they can be small scale or large scale - and then time is associated with that. What we're doing is organising the data in a way so you can ask the right questions of it.'



In January 2010, Recorded Future predicted from a number of blog posts that Yemen was headed for disaster. It predicted that a combination of floods, famine and Islamic terrorists were conspiring to wreak havoc. The company used Twitter feeds, blogs, U.N. food

program data and news sources to come up with their forecast. According to Ahlberg, accuracy of that particular time line was not 100% though as, 'Yemen took five months longer than we predicted, but if you go back and look at our earliest blog posts, it's all there. That said, we didn't predict the Arab Spring.'

After the attack on the U.S. consulate in Libya, Recorded Future made a prediction that the attack would eventually be traced to al-Qaida's arm in Yemen, known as al-Qaida in the Arabian Peninsula. That is the same al-Qaida group that was behind the Christmas Day attack on a U.S. airliner in 2009. Recorded Future came to that conclusion because its algorithm linked a militant group in Libya, Ansar al-Sharia, with an al-Qaida group in Yemen with the same name. The people who use Recorded Future, Ahlberg says, are experts, so they should pick this up.

Of course, now that people have been made aware of this type of analysis, they may use it to their advantage by generating large amounts of false information to mislead the analysts as to when and where the next terrorist activity will take place in much the same way as Operation Bodyguard in WWII.

<OR>

YOUR 2013 TRAINING GUIDE

With this issue of Inside O.R.

Your 2013 Training Guide detailing 27 OR Society approved training courses.

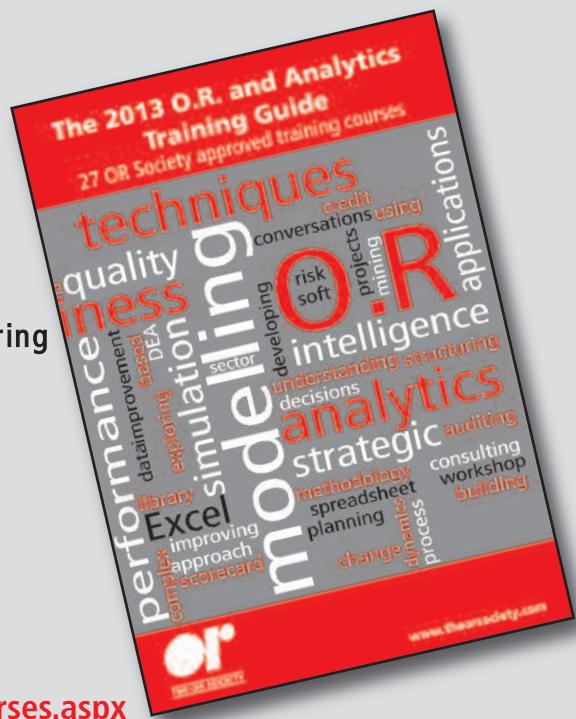
The OR Society is committed to supporting you and ensuring that you have the tools you need to develop your career in line with changing industry needs.

You can also go online at

<http://www.theorsociety.com/Pages/Training/TrainingCourses.aspx>

to download your Training Guide or if you'd like more hard copies contact Jennie Phelps on

+44(0)121 234 7818 or by email at jennie.phelps@theorsociety.com



www.safety.gov

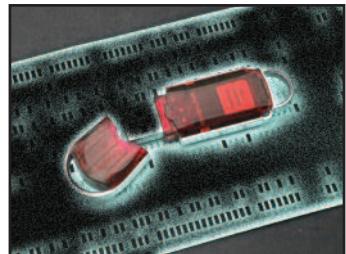
<OR>



YOU'RE SO 'DATA SCIENTIST' AND YOU DON'T EVEN KNOW IT!

NIGEL CUMMINGS

Thanks to Sue Merchant, (Blue Link Consulting), for bringing this material to my attention.



Increasing numbers of us are signing up to LinkedIn the world's largest professional network with over 175 million members and growing rapidly. LinkedIn connects us to trusted contacts and helps in the exchange of knowledge, ideas, and opportunities amongst a broad network of professionals. In June 2006 when LinkedIn was in its infancy though, it fell to Jonathan Goldman, PhD in physics from Stanford, as if he were arriving for work in a business that was still in its start-up phase.

At that time LinkedIn had fewer than 8 million accounts, but it was clear there was some growth in the signing up of new members as existing members were inviting their friends and colleagues to join. Unfortunately site users were not seeking out connections amongst existing LinkedIn members; they were merely assisting in the creation of new members.

A LinkedIn manager at that time, summed up what was missing from the site's operation, 'It was like arriving at a conference reception and realising you don't know anyone. So you just stand in the corner sipping your drink -and you probably leave early'. That statement probably equates well to those who join social networking sites such as LinkedIn, Facebook, or Workday because of an invite, but fail to stay connected because they fail to see the point of belonging to such networks.

Goldman decided to look into the phenomena that were increasing membership but not usage because he was intrigued by the linking he could see taking place and by the richness of the user profiles. From his observations it became clear to him that allowing existing

members to carry on in this way was a recipe for messy data and in the long term, for unwieldy analysis. So he began exploring LinkedIn people's connections and started to see some possibilities where order could prevail.

He began forming theories, and found patterns that allowed him to predict whose networks a given profile would land in - he could imagine that new features capitalising on the heuristics he was developing might provide value to users. Unfortunately, at that time, LinkedIn's engineering team were more concerned with scaling up the site, than exploring Goldman's ideas. Some of the team wondered why users would ever need LinkedIn to figure out their networks for them. The site, after all, had an address book importer that could pull in all a member's connections.

Fortunately LinkedIn's co-founder Reid Hoffman had faith in the power of analytics and because of his earlier experiences with analytics whilst working at PayPal, he decided to give Goldman a high degree of autonomy which would allow him to circumvent the companies' traditional product release cycle and allow him to publish small modules in the form of ads on the site's most popular pages.

One of Goldman's early modules looked at what would happen if users were presented with names of people they hadn't yet connected with but seemed likely to know - people who had shared their tenures at schools and workplaces for example. The module he selected to test his theories displayed the three best new matches for each user based on the background entered in his or her LinkedIn profile. Within a short time of implementing his module – the click-through rate on each module became the highest ever seen for LinkedIn.

Goldman continued to refine how the suggestions in his modules were generated, incorporating networking ideas such as 'triangle closing'. The idea there, that should you know two members for example, there would be a good chance that those two members would know each other too.

This idea was so good that LinkedIn made it a standard feature before long, and 'People You May Know' ads achieved a click-through rate 30% higher than the rate obtained by other prompts to visit more pages on the site. This in turn generated millions of new page views and caused LinkedIn to enlarge its growth curve upward – the start-up had it seemed, come of age!



Jonathan Goldman is an example of a new type of data professional; he is a 'data scientist', a high-ranking professional with the experience and curiosity to make discoveries in the world of big data. The term data scientist by the way is a relatively new it was coined sometime during 2008 by D.J. Patil, and Jeff Hammerbacher, then the respective leads of data and analytics efforts at LinkedIn and Facebook.

Without knowing it though, thousands of us are working as 'data scientists' at both start-ups and well-established companies. Our sudden 'importance' to the business scene reflects the fact that companies are having to come to terms with increasingly large amounts and varieties of information – better known perhaps as Big Data!

Much of the current enthusiasm for big data focuses on technologies that make taming it possible, including Hadoop (the most widely used framework for distributed file system processing) and related open-source tools, cloud computing, and data visualisation. Not only but also, here is the good news there is a shortage of data scientists in many business sectors and O.R.

professionals are natural born data scientists, we've been doing it for years!

Companies are increasingly looking to recruit data scientists. If capitalising on big data depends on hiring scarce data scientists, then the challenge for managers is to learn how to identify that talent, attract it to their enterprise, and make it productive. The need for growing numbers of such scientists could be good news for O.R. recruitment in 2013. We are natural born problem solvers with natural born data processing skills – what a potent combination?

Interestingly, there are no university programs offering degrees in data science yet unless of course you consider some of the components and modules that O.R. students encounter in their university studies. There is also little consensus on where the role of data scientists fit into organisations yet, and how data scientists can add value. These could be golden times for O.R. professionals to augment their experience portfolios and prove to the outside world, the increasing value of analytics and associated O.R. skills.

<OR>

Have you joined the OR Society's LinkedIn group?

Go to www.LinkedIn.com and search for The OR Society.

FACULTY POSITION IN OPERATIONS RESEARCH SCHOOL OF MATHEMATICAL AND PHYSICAL SCIENCES UNIVERSITY OF NEWCASTLE



The School of Mathematical and Physical Sciences at the University of Newcastle, Australia, invites applications for a tenure-track faculty position commencing in 2013. We seek candidates with a strong methodological foundation in Operations Research, e.g. integer programming, stochastic programming, and nonlinear programming, as well as a demonstrated interest in applications, e.g. transportation and logistics, energy and the environment, and healthcare. Applicants should also have a strong commitment to teaching, to mentoring graduate students, and to developing and maintaining an active program of sponsored research. Applicants must hold a Ph.D., or expect to complete their degree by Fall 2013, in Operations Research, Industrial Engineering, Mathematics, Computer Science, or a closely related discipline.

The successful applicant will be part of a vigorous Operations Research group that conducts methodological as well as applied research and that has many national and international collaborations.

Newcastle is located less than 100 miles north of Sydney on Australia's beautiful east coast.

Additional information about the school can be found at www.newcastle.edu.au.

Applications are accepted online at www.newcastle.edu.au/job-vacancies, Reference ID #2044.

Applicants should submit a cover letter, a curriculum vitae, a statement of research interests, a statement of teaching interests, and three references.

For more information contact Professor Martin Savelsbergh at martin.savelsbergh@newcastle.edu.au.



JOURNALS & SPECIAL ISSUE CALL FOR PAPERS

SPECIAL ISSUE

The Internet-of-Things: Shaping the new Internet Space CONCURRENCY AND COMPUTATION: PRACTICE AND EXPERIENCE (CCPE)

Further information:

<http://eu.wiley.com/WileyCDA/WileyTitle/productCd-CPE.html>

Abstract: The new version of the Internet Protocol - IPv6 - has astronomically increased the IP address space from around 4.3 billion IPv4 addresses to roughly 340 trillion trillion trillion new IPv6 identifiers. This humongous pool of addresses ensure the continued expansion of the Internet for many decades to come and it realises the vision of everyday objects that are uniquely identifiable and are connected to the Internet – this is commonly known as the 'Internet-of-Things' (IoT).

IoT extends the human-centric view of the Internet market space wherein it was thought that the 'world of humans represented a market space that would reach saturation sometime soon' (Internet Society, 2012); IoT broadens the device-centric view that predominantly considered computing and electronic devices (e.g., PCs, mobile phones, home electronics, smart cars) as the defining elements of the Internet space.

IMPORTANT DATES

Paper submission deadline: 15 January 2013

Authors will receive initial decision and reviewer comments: 15 April 2013

Final papers due date: 15 June 2013

Final decisions: 15 July 2013

Accepted papers are expected to appear online for early view within 4 months of final decision.

CALL FOR ENTRIES

2013 Franz Edelman Award

Further information: www.informs.org/Recognize-Excellence/Franz-Edelman-Award/Application-Process

Abstract: The purpose of the Edelman competition is to bring forward, recognize, and reward outstanding examples of operations research, management science, and advanced analytics in practice. The prize is awarded for implemented work, not for a submitted paper or for the presentation describing the work. The client organization that uses the winning work receives a prize citation and is inducted into the Edelman Academy. The authors of the winning work receive a cash award and are designated as Edelman Laureates. All finalists receive the opportunity to publish their papers in INFORMS' prestigious journal, *Interfaces*.

IMPORTANT DATES

Summary of Achievement submission due date: 17 October 2012

Finalist announcement: 17 December 2012

Full paper submission: 15 February 2013

Finalist presentation rehearsal: INFORMS Conference on Business Analytics & O.R., San Antonio, TX: 7 April 2013

Presentations and award: INFORMS Conference on Business Analytics & O.R., San Antonio, TX: 8 April 2013

First prize author keynote address: 2013 INFORMS Annual Meeting: 3-9 October 2013

SPECIAL ISSUE

Knowledge Management Research & Practice (KMRP)

Sustainable Quality: Knowledge and Information Management

Further information:

www.theorsociety.com/Pages/Conferences/KIM2013/KIM2013.aspx

Abstract: This Special Issue, in conjunction with KIM2013 (the OR Society's inaugural Knowledge and Information Management conference) is dedicated to the theme of Sustainable Quality. This wide-ranging topic is relevant to organisations and individuals working in any sector of the economy. Knowledge Management has become a key process in understanding organisations and their use of resources and, ultimately, quality is a major differentiating factor when considering goods and services. Sustaining quality requires taking a strategic view that may present short to medium term challenges and knowledge management should be able to help address such challenges. For large organisations, knowledge management may be seen as an intra-organisation activity, but sustaining quality for small to medium enterprises may require inter-organisational cooperation. Papers that relate to the theme and to knowledge and information management will be welcome. Areas of particular interest include (but are not restricted to) the management, practical application, limitations, implications, lessons learned and challenges related to KM and sustainable quality in the areas of services, education, health and manufacturing.

IMPORTANT DATES (in conjunction with key dates for KIM2013)

KIM2013 conference paper titles and abstracts submitted: 7 December 2012

Full conference papers submitted: 11 January 2013

Notification of outcomes of reviews of conference papers: 1 March 2013

Final manuscripts submitted (for conference): 10 April 2013

Conference: 4-5 June 2013

Final manuscripts submitted for KMRP: 1 July 2013

Electronic publication expected in KMRP: 1 September 2013

NOTICEBOARD



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CALL FOR PAPERS

SIMULATION MODELLING PRACTICE AND THEORY SPECIAL ISSUE ON 'Energy efficiency in Grids and Clouds'

Further information: <http://ees.elsevier.com/simpat>.

Abstract: Computational and data grids and clouds are large scale distributed systems used for serving very large and complex applications. Grids and Clouds performance became more important due to the tremendous increase of users and applications. However, the usage of energy has become a major concern for grid and cloud computing since the price of electricity has increased dramatically.

IMPORTANT DATES

Manuscript submission deadline: November 30 2012

Manuscript reviews to authors: February 28 2013

Manuscript revision due: May 30 2013

Final notification of acceptance: July 31 2013

Final manuscript submission deadline: August 31 2013

Expected publication of the special issue: December 2013

CALL FOR PAPERS

EURO JOURNAL ON DECISION PROCESSES

Special Issue on Problem Structuring Research and Practice

Further information at: <https://www.editorialmanager.com/ejdp/>

Abstract: Problem structuring has long been acknowledged as a core modeling activity in the practice of operational research. What is modeled and how influences the way the problem is understood, therefore guiding the actions of individual, groups and organizations. Although there is a significant literature on problem structuring support, much more work is needed in this growing area of operational research and management science. This Special Issue will present important advances on problem structuring research and practice at individual, group and organizational levels.

IMPORTANT DATES

Deadline for the submission of extended abstracts: November 15 2012

Deadline for the submission of full papers: March 15 2013

Final decision notification: April 30 2014

Publication of the Special Issue: 2nd quarter of 2014

CALL FOR PAPERS

CCPE Special Issue on 'The Internet-of-Things: Shaping the new Internet Space'

Further information at:

<http://www.cc-pe.net/journalinfo/issues/2013.html#IOT2013>

Abstract: The new version of the Internet Protocol - IPv6 - has astronomically increased the IP address space from around 4.3 billion IPv4 addresses to roughly 340 trillion trillion trillion new IPv6 identifiers. This humongous pool of addresses ensure the continued expansion of the Internet for many decades to come and it realises the vision of everyday objects that are uniquely identifiable and are connected to the Internet – this is commonly known as the 'Internet-of-Things' (IoT).

IMPORTANT DATES

Paper submission deadline: January 15 2013.

The authors will receive initial decision and reviewer comments: April 15 2013.

Final papers: June 15 2013.

Final decisions: July 15 2013.

Accepted papers are expected to appear online for early view within 4 months of final decision.

<OR>

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Contact Carol Smith

carol.smith@theorsociety.com

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log on and click 'My Contact Details'



OBITUARY CHRISTINE FAULKNER

NIGEL CUMMINGS

Christine Faulkner was very much a fixture of the Operational Research Society editorial team when I first began contributing to the O.R. Newsletter back in the 1990s. The news that she has passed away just 9 years after retiring from her post and aged only 69 has left us all tinged with sadness.



Christine, in addition to being for many years the principal editorial coordinator of the Journal of Operation Research (JORS), was a seasoned traveller, author and raconteur. She had a keen interest in foreign affairs, in particular those of North Africa. Her jaunts to Egypt, in the Luxor region are legendary, as was her fascination with ancient Egyptian history, modern day Egypt and other cultural groups around the world. Her depth and knowledge of Egyptian antiquities alone would have been more than sufficient to author several books on the subject.

While Christine never got around to authoring books on her North African passions, she was always ready to regale us in the office with tales of her visits to many and varied foreign locations supported by her albums of meticulously labelled photographs (Christine was a prolific photographer) to show us and illustrate the depth and breadth of her travels.

Christine also had another passion. In between her extensive travels, her many and varied duties at the O.R. Society and her role as a mother to Jason and Marina, she somehow managed to fit in time to research the material for her book about hops and hop picking. In the history of her family, the yearly jaunt to the hop fields during the hop picking season (of August and September) was dear to her heart, so much so in fact, that she felt a need to document this period in history and open a window to a forgotten age. Although it would be regarded as child-labour today, it was the only chance many of the children from the East End of London ever got to breathe fresh air and see the open country.

From the late 1980's until 1992 Christine painstakingly gathered information and illustrations pertinent to Britain's almost forgotten hop picking industry. This collection of material she published in a highly engaging and informative book in December 1992. **Hops and Hop Pickers** a paperback by Christine Faulkner is still available from Amazon and Google books. It is a large format book comprised of 76 pages and replete with many photographs, anecdotes and information about the history of hop picking and those who were involved in the industry.

(Hops and Hop Pickers by Christine Faulkner, Faulkner Publications (Dec 1992) ISBN-10: 095205700X, ISBN-13: 978-0952057000)

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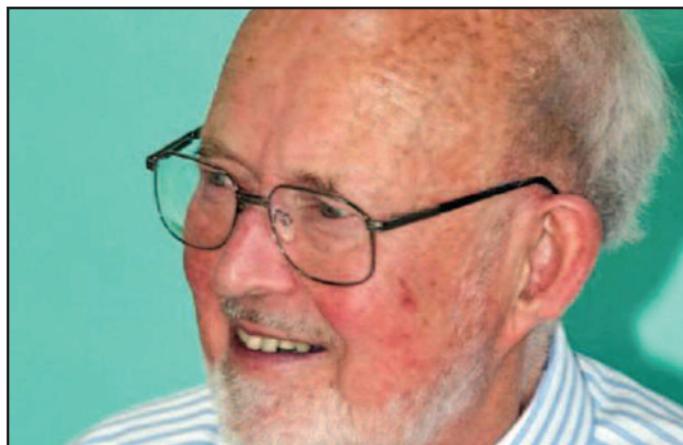
'Her depth and knowledge of Egyptian antiquities alone would have been more than sufficient to author several books on the subject.'



OBITUARY PROFESSOR JOHN BATHER

NIGEL CUMMINGS

Professor John Bather, statistician who developed mathematical tools to optimise the running of complex organisations died on 7 September.



With regret we announce the passing of John Bather, noted statistician specialist in O.R. and decision theory. John's prime area of research interest was in the field of dynamic programming and sequential analysis. He collaborated with colleagues in North America and Europe, being awarded the Bolzano Medal in 1988 to mark his joint work with Czech scientists. He worked at the University of Sussex from 1967 to 2003.

He guided 11 research students to their doctorates, and published more than 50 papers that ranged over different aspects of statistics. His writing was characterised by its rigour and completeness: he preferred to work ideas fully through, rather than publish a succession of shorter papers.

Perhaps his most notable publication was 'Decision Theory: An Introduction to Dynamic Programming and Sequential Decisions'. This book was first published in 2000 by John Wiley and Sons. ISBN: 0-471-97648-2. It is notable for its content insomuch as it deals exhaustively with mathematical induction and its use in solving optimisation problems. Its foreword ably summarises the breadth of his research work. 'The concept of a system as an entity in its own right has emerged with increasing force in the past few decades in, for example, the area of electrical and control engineering, economics, ecology, urban structures, automation theory, operational research and industry. The more definite concept of a large scale system is implicit in these applications, but is particularly evident in such fields as the study of neural networks.'

His book details deterministic models, directed networks, shortest paths, critical path analysis, scheduling and convexity. It also illustrates stochastic dynamic programming, optimal stopping problems, Markov decision processes, the minimisation of expected costs, policy improvements and problems with unknown statistical parameters. His fluent literary style will ensure the work lives on

beyond him. It continues to be popular with students of optimisation and decision theory, and those with an avid interest in the subject.

Towards the end of his career, John Bather worked jointly with Sussex engineer Professor Derek Atherton on problems of data fusion and recursive estimation that arose in the control of aircraft. He was promoted to Professor at Sussex in 1969, chaired Mathematics from 1974 to 1977, and sat on most major committees of the University.

Under a national scheme in the 1970s to boost the general pool of UK statistics talent, he introduced a cosmologist, John McNamara, to the modern ideas of decision theory, and he was delighted to attend the graduation ceremony in July 2012 when Sussex awarded Professor McNamara an honorary Doctor of Science degree.

John Bather died on Friday 7 September at the age of 76, having suffered from multiple myeloma just seven days after his wife, June, had died unexpectedly. John and June married while John was a research student, and celebrated their golden wedding earlier this year. June worked for many years in the Health Centre on the Sussex campus, and was a stalwart of the University's Women's Group.

A joint service was held for them both at Worthing Crematorium on 21 September 2012 at 2.20pm. More information on the service, tributes paid and means to donate charitable funds in memory of John and June, can be located at: www.Juneandjohnbather.com

<OR>

'He collaborated with colleagues in North America and Europe, being awarded the Bolzano Medal in 1988 to mark his joint work with Czech scientists. He worked at the University of Sussex from 1967 to 2003.'

December 2012

MESM'2012 The 13th Annual International Middle Eastern Simulation and Modelling Conference
10-12 December 2012, Muscat – Oman <http://www.eurosis.org>

GAMEON-ARABIA'2012 The 3rd annual Pan-Arabic Simulation and AI in Computer Games Conference
10-12 December 2012, Muscat, Oman www.eurosis.org

IEEE 2012 International Conference on Industrial Engineering and Engineering Management
10-13 December 2012 Hong Kong www.IEEM.org

January – March 2013

ORO2013 Second international conference on Operations Research and Optimization
19-22 January 2013, Tehran, Iran. <http://math.ipm.ac.ir/conferences/2013/ORO2013/>

ASTEC'2013 4th Annual Asian Simulation Technology Conference 2013
7-9 March 2013, Shanghai, China P.R. www.eurosis.org

GAMEON-ASIA'2013 5th annual Asian GAME-ON Conference
7-9 March 2013, Shanghai, China www.eurosis.org

EMO 2013 - the 7th International Conference on Evolutionary Multi-Criterion Optimization
19-22 March, 2013, Sheffield, UK, www.shef.ac.uk/emo2013

IMCIC2013 - 4th International Multi-Conference on Complexity, Informatics and Cybernetics
19-22 March 2013 Orlando, Florida, USA <http://www.2013iiisconferences.org/imcic>,

7TH IMA Quantitative Modelling in the management of health and Social Care Conference
25-27 March 2013, London, UK <http://www.ima.org.uk/conferences/health2013.cfm>

April – June 2013

EVO2013, 16th European Conference EuroGP, EvoCOP, EvoBIO, EvoMUSART and EvoApplications
3-5 April 2013, Vienna, Austria www.evostar.org

YOR18, Young OR18 Bi-annual Conference for O.R careers of less than 10 years
9-11 April 2013, University of Exeter, UK <http://www.theorsociety.com/Pages/Conferences/YOR18/YOR18.aspx>

FUBUTEC'2013 9th Annual Future Business Technology Conference 2013
15– 17 April 2013, Lincoln, , UK <http://www.eurosis.org/cms/?q=node/2281>

ICMSAO'13 5th International Conference on Modeling, Simulation and Applied Optimization
28-30 April 2013, Hammamet, Tunisia www.icmsao.org

ISORAP 2013 International Symposium on Operational Research and its Applications
8-10 May 2013, Marrakech, Morocco <http://isorap.uiz.ac.ma/>

ISCRAM2013: The 10th International Conference on Information Systems for Crisis Response and Management
12-15 May 2013, Baden-Baden, Germany <http://iscram2013.org>

IIE 62nd Annual Conference & Expo
18-22 May 2013 San Juan, Puerto Rico <http://www.iienet2.org/annual2/>

ISC'2013 11th Annual Industrial Simulation Conference 2013
22-24 May 2013, Ghent, Belgium <http://www.eurosis.org/cms/?q=taxonomy/term/334>

CIAC 2013 8th International Conference on Algorithms and Complexity
22-24 May 2013 Barcelona, Spain <http://albcom.lsi.upc.edu/ciac2013>

KIM2013 Knowledge and Information Management conference
4-5 June 2013 Meriden, UK www.theorsociety.com//KIM2013/aspx

MathSport 2013 – The 4th International Conference on Mathematics and Sport
5-7 June 2013 Leuven, Belgium <http://www.mathsportinternational.com>

:: EVENTS WORLDWIDE ::

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ICAPS'13 The 23rd International Conference on Automated Planning and Scheduling
 10-14 June 2013 Rome, Italy <http://icaps-conference.org>

MCDM2013 22nd International Conference on Multiple Criteria Decision Making
 17-21 June 2013 Málaga, Spain <http://www.mcdm2013.decytec.ccee.uma.es/index.php>

MIM 2013 IFAC Conference on Manufacturing Modelling, Management and Control
 19-21 June 2013 Saint Petersburg, Russia <http://www.mim2013.org/>

July – September 2013

Euro XXVI and INFORMS Joint Conference
 1-4 July 2013 Rome, Italy <http://euro2013.org/>

IMSIO 5 2013 The 5th European Conference on intelligent Management Systems in Operations
 3–4 July 2013, University of Salford, UK email s.vadera@salford.ac.uk

MISTA 2013 Special Track on EDUCATIONAL TIMETABLING
 27-30 August 2013, Gent, Belgium <http://www.schedulingconference.org/>

OR55 Operational Research Annual Conference
 3-5 September 2012 Exeter, UK <http://www.theorsociety.com/pages/conferences/conferences.aspx>

International Conference on Operations Research
 3-6 September 2013, Rotterdam, The Netherlands, www.or2013.org

CONFERENCE NEWS

EVENT:	Blackett Lecture	DATE:	29 November 2012	VENUE:	The Royal Society, London
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EVENT:	YoungOR18 Conference	DATE:	9 – 11 April 2013	VENUE:	University of Exeter
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EVENT:	KIM2013 Conference	DATE:	4 – 5 June 2013	VENUE:	Forest of Arden Hotel, nr Coventry
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EVENT:	IMS105 2013	DATE:	3 - 4 July 2013	VENUE:	University of Salford
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EVENT:	OR55 Annual Conference	DATE:	3 – 5 September 2013	VENUE:	University of Exeter
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REGIONAL SOCIETIES

EAST MIDLANDS (EMORG)

CONTACT: Chris Smith

TEL: 01530 416426

EMAIL: chrissmith677@gmail.com

EMORG - Sports Analytics

Date/Time: Tuesday 12th March 2013 at 6pm

Venue: Room BE1.42, Business School, Loughborough University

Speakers: Andy Shelton, Head of Sports Science at Leicester Tigers

Abstract: 'There is tremendous value to be gained by retaining experienced players within the squad and we are confident that, by adopting predictive analytics, our team will be able to leverage data about the physical condition of players for the first time and considerably enhance our performance.'

LONDON & SOUTH EAST (LASE OR S)

Programme 2012

Location (unless otherwise specified): *In the upstairs bar of Ye Olde Watling, on the Corner of Bow Lane and Watling Street nearest stations are Mansion House (Bow Lane exit) and Bank (exit 8) for tube, or Cannon Street and City Thameslink for rail. The event is open to all and with a free buffet of sandwiches available afterwards.*

FOR FURTHER DETAILS CONTACT:

Sandra Weddell

TEL: 020 7918 4591,

EMAIL: Sandra.Weddell@tube.tfl.gov.uk

or Martin Caunt

TEL: 020 7215 3317,

EMAIL: Martin.Caunt@dti.gsi.gov.uk

LASEORS - Christmas Quiz

Date/Time: Wednesday, 05 December 2012 at 18.30

Venue: Upstairs bar of Ye Olde Watling, on the Corner of Bow Lane and Watling Street

LASEORS popular annual quiz night is back please sign up early, for this year's festive event. All profits from the event will go to charity. Teams should comprise 3 - 6 people. As last year's winners will be able to tell you there will be lots of exciting prizes etc.

There is limited space, so entries will be accepted until capacity is reached. The entry fee is £40 per team this will include a buffet. Please send cheques payable to LASEORS, the team name, a contact phone number, and a contact name along with the expected number in your team, before 30th November to ensure a place.

If you do not have a team please get in touch as we will be endeavouring to make up a team for those whose friends and colleagues are busy with the party season.

Location: In the upstairs bar of Ye Olde Watling, on the Corner of Bow Lane and Watling Street nearest stations are Mansion House (Bow Lane exit) and Bank (exit 8) for tube, or Cannon Street and City Thameslink for rail. The event is open to all and with a free buffet of sandwiches available afterwards.

LASEORS - Forecasting demand for London 2012 and what really happened

Date/Time: Tuesday, 15 January 2013 – Start 18.00

Venue: In the upstairs bar of Ye Olde Watling, on the Corner of Bow Lane and Watling Street nearest stations are Mansion House (Bow Lane exit) and Bank (exit 8) for tube, or Cannon Street and City Thameslink for rail.

Speaker: Neil Bichard of Transport Modelling, London Underground

Abstract: A presentation on the demand forecasts developed for the London 2012 Olympics and Paralympics. This process covered the London Underground, London Overground and Dockland Light Railway networks, bringing together multiple data sources to represent the overall transport system. With the Games now over, the presentation will also focus on the rare opportunity to use actual data to review the accuracy of a complex forecasting process, and thus highlight lessons to be learned.

The event is open to all and with a free buffet of sandwiches available afterwards.

For further details contact:

Sandra Weddell Tel: 020 7918 4591,

Email: Sandra.Weddell@tube.tfl.gov.uk

or Martin Caunt Email: martin.caunt@dh.gsi.gov.uk

MIDLAND (MORS)

CONTACT: Jen East (Secretary)

EMAIL: MidlandsORSociety@live.co.uk

NORTH WEST (NWORG)

CONTACT: Nathan Proudlove

EMAIL: nathan.proudlove@mbs.ac.uk

NOTICEBOARD



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SCOTLAND (ORGS)

CONTACT: Kerem Akartunali (Chair)

EMAIL: Kerem.Akartunali@Strath.ac.uk

CONTACT: Roberto Rossi (Secretary)

EMAIL: roberto.rossi@ed.ac.uk

SOUTHERN OR GROUP (SORG)

CONTACT: Patrick Beullens

TEL: 023 9284 6357

EMAIL: p.beullens@soton.ac.uk

SOUTH WALES (SWORDS)

CONTACT: Dr Jonathan Thompson.

TEL: 029 2087 5524 Fax: 029 2087 4199

EMAIL: ThompsonJMI@cardiff.ac.uk

SWORDS - O.R. in sport: some examples

Date/Time: Tuesday, 26 February 2013 at 17.45

Venue: TBC

Speaker: Phil Scarf

This talk considers how modelling can be used to shed light on a variety of sporting problems. We look at:

1. How the timing of a declaration in the third innings in test match cricket can be 'optimized'.
2. Route choice in mountain running events and an empirical basis for Naismith's rule.
3. Rating football players based upon actions that contribute to the final result of the game.
4. How we might rank players in test cricket putting batting and bowling contributions on the same scale.
5. Optimum strategy in match sprint track cycling.
6. Tournament design.

Not necessarily in this order and with more or less detail depending on how it goes...

Phil Scarf is a professor at the University of Salford. His research interests are in Replacement Modelling, Reliability and Maintenance Modelling, and O.R. and Statistics in Sport. He is currently co-editor of the IMA Journal of Management Mathematics which recently published a special issue on O.R. in Sport under his editorship. He has competed in a variety of sports: rugby, cricket, rowing, orienteering, cycling. His current hobby is expedition racing.

Dates for your Diary

Wednesday 12th December 5.30pm, Cardiff University – Professor Jeff Griffiths. The Heathrow Queuing Problem

Wednesday 20th February 3.30pm – Trip to the Royal Mint

Tuesday 26th February 5.30pm Cardiff University – Professor Phil Scarf, O.R. in Sport: Some Examples

Tuesday 5th March 5.30pm Cardiff University – Steve Black and Jon Cook (PA Consulting). Applications of O.R. within health and the pharmaceutical sector.

WESTERN (WORDS)

CONTACT: Dr Jo Smedley

TEL: 01633 432573

EMAIL: jo.smedley@newport.ac.uk

The WORDS/IMA - Is 42 the real answer?

Date/Time: Wednesday January 23rd 2013

Venue: University of the West of England (Frenchay Campus), Bristol.

Speakers: Dr John Crocker

Abstract: Simulation, whether Monte Carlo (MCS), discrete-event (DES) or agent-based (ABS), can be a very powerful and often useful tool but it is not reality. This is especially true when used in conjunction with optimization methods. We shall look at some of the ways the results of a simulation model can lull you into a false sense of security, so to speak.

YORKSHIRE & HUMBERSIDE (YHORG)

CONTACT: Stuart Johns.

TEL: (0114) 225 3136

EMAIL: s.l.johns@shu.ac.uk



SPECIAL INTEREST GROUPS

COMMUNITY OR NETWORK

CONTACT: Leroy White

EMAIL: leroy.white@bristol.ac.uk

TEL: 0117 954 5683

COMPLEX SYSTEMS DISCUSSION GROUP

CONTACT: Kevin Gilligan

TEL: 0208 977 8553

EMAIL: GilliganMauve@geo2.Poptel.org.uk

Group meetings to be held at 12 Noon

Last Friday of the month

The Adelaide, Park Road, Teddington

Talk Title : Presumption of Complexity

CRIMINAL JUSTICE

CONTACT: Ian Newsome

TEL. DDI: 01924 292244 **Extension:** 22244

EMAIL: ian.newsome@westyorkshire.pnn.police.uk

CJSIG NEXT MEETING:

Date/Time: Monday 26th November 2012, 2.00pm-4.30pm

Venue: MoJ in central London

Speakers will include:

- Munira Dossaji and Chola Mukanga, MoJ, on the international benchmarking of justice indicators;
- Jane Parkin, independent consultant, on her simulation work for Crimestoppers;
- Rebecca Endean, MoJ, on existing and new applications of O.R. in MoJ;
- Chris M Smith, Warwick University, on his work for Warwicks Police

Please notify Sue Merchant as soon as possible if you would like to attend as space is likely to be limited.
suemerchant@hotmail.com

Dates for your Diary:

Criminal Justice Special Interest Group Meeting

Date/Time: Monday, 04 March 2013

Venue: W. Yorks Police, Wakefield

Speaker: TBC

Details to be notified at the end of 2012.

DECISION ANALYSIS

CONTACT: Nadia Papamichail

TEL: 0161 275 6539

EMAIL: nadia.papamichail@mbs.ac.uk

Decision Analysis SIG NEXT MEETING:

Date/Time: Thursday 06 December 2012 Start 10am Finish 5pm

Venue: Magnox Limited

Speaker: Various - see below

Abstract: The DASIG workshops bring together academics with consultancy and industry/public sector practitioners and are generally lively and informal affairs. All the presentations will all be accessible to us ordinary mortals and applicable on practical projects. We get a good range of interesting people attending and detailed discussion of real life applications is normal, so please do come along if you have an interest in the application of BAT, MCDA, and other structured decision methodologies.

Here is the programme:

10.00 – 10.45	Registration
10.45 – 11.00	Nadia Papamichail (Manchester Business School) Introduction and welcome
11.00 – 11.30	Simon Turner (Magnox) 'Decision Analysis in Nuclear Decommissioning: Developments in Techniques and Stakeholder Engagement Processes'
11.30 – 12.00	David Bangert (Polaris Consulting) 'Option Assessment in Submarine Decommissioning'
12.00 – 13.00	Lunch
13.00 – 13.30	Dr Gilberto Montibeller (London School of Economics) 'Recent Advances in 'Best Available Technology' Assessments'
13.30 – 14.00	tbc
14.00 – 14.30	Coffee break
14.30 – 15.30	Plenary session 'Decision Analysis in the nuclear industry - What's next?'
16.00 – 17.00	(Optional) outdoor tour

Please send your email/postal address to Simon Turner (simon.d.turner@magnoxsites.com) to book a place. It is necessary to fill out security paperwork for this event.

There is no charge but you MUST register in advance, by Monday 19th November at the latest. We strongly encourage you to register asap though if you are interested, because places are limited.

NOTICEBOARD



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DEFENCE

CONTACT: Noel Corrigan
EMAIL: noel.corrigan@corda.co.uk

ACTING CHAIR:

Alan Robinson
 Chief Scientist
 PCS Dept,
 Defence Science and Technology Laboratory (Dstl)
 Portsdown West, Portsdown Hill Road,
 Hampshire, PO17 6AD
TEL: 02392 53 2839
EMAIL: arobinson@dstl.gov.uk

FINANCIAL SERVICES

CONTACT: Peter Cohen.
TEL 0207 512 7074.
EMAIL: pcohen@ecgd.gsi.gov.uk

FORECASTING

CONTACT: James Taylor
TEL: 01865 288678
EMAIL: james.taylor@sbs.ox.ac.uk

HEALTH & SOCIAL SERVICES

CONTACT: Thierry J. Chaussalet
TEL: 020 7911 5000 ext 4310
FAX: 020 8911 5187
EMAIL: chausst@wmin.ac.uk

Quantitative Modelling in the Management of Health and Social Care Conference

Date/Time: Monday 25 March 2013

Speakers: See below

Venue: Woburn House Conference Centre, London

Abstract: Health and Social Care systems are facing major challenges worldwide, due in part to changes in demography and advances in technology and in part to changes in the structure and organisation of the system whether they are hospitals, general practitioners or long-term care settings. Yet running health and social care systems efficiently and effectively is crucial to improving or even maintaining our quality of life. Over the years, extensive research has been conducted to find immediate and long-term solutions to issues that are routinely faced by health and social care professionals, such as waiting lists and bed capacity, hospital redesign, workforce planning and scheduling, patient flow, performance management, disease monitoring, and health care technology assessment. Mathematical modelling and computer simulation techniques (statistical analysis, stochastic processes, queuing theory, mathematical programming, heuristics, discrete event simulation, system dynamics, etc) have shown to be increasingly valuable in providing useful information to aid

planning and management. The aim of the conference is to bring together health care managers, clinicians, management consultants, and mathematicians, operational researchers, statisticians, health economists, computer scientists etc from across the world with a view to bridging the gap between the respective communities and to exploring recent developments and identifying fruitful avenues for further research.

Confirmed Invited Speakers

Professor Stephen E. Chick, Professor of Technology and Operations Management, Novartis Chair of Healthcare Management, INSEAD, France; Professor Malcolm Grant, CBE, UCL Provost and President and Chair of the NHS Commissioning Board; Dr David Paynton, FRCGP, DMS, MBE, Practicing GP, Clinical lead for Out of Hospital care at Southampton City Clinical Commissioning Group and National Clinical Lead for the Royal College of General Practitioner's Centre for Commissioning; Dr Geoffrey Royston, President of the Operational Research Society and former Head of Strategic Analysis and Operational Research in the Department of Health for England, and Professor Peter Smith, Professor of Policy and co-Director of Centre for Health Policy, Imperial College London.

We invite researchers in all relevant problem domains and methodologies to submit abstracts of 300 words by Friday 14th December 2012 by e-mail to conferences@ima.org.uk.

For more information visit

www.healthcareanalytics.co.uk/conferences/imahealth2013/

INDEPENDENT CONSULTANTS NETWORK

CONTACT: Hadley Hunter, Chair
TEL 020 8202 9279
EMAIL: hadley@hadleyhunter.co.uk
SUPPORTED BY: Colin Elwood
TEL 01372 450022
EMAIL: crelwood@dweomer.co.uk

INFORMATION SYSTEMS

CONTACT:
TEL
EMAIL: email@theorsociety.com

LOCAL SEARCH

CONTACT: Said Salhi (chair)
TEL: 01227 824672
EMAIL: s.salhi@kent.ac.uk
CONTACT: Rong Qu (secretary)
TEL: 0115 846 6503
EMAIL: rxq@cs.nott.ac.uk



MATHEMATICAL PROGRAMMING

CONTACT: Katarina Papadaki, London School of Economics
EMAIL: k.p.papadaki@lse.ac.uk or
CONTACT: Giacomo Zambelli
EMAIL: g.zambelli@lse.ac.uk
TEL: 0207 955 7693

O.R. AND STRATEGY

CONTACT: Frances O'Brien
TEL: 02476 522095
EMAIL: Frances.O'Brien@wbs.ac.uk

O.R. FOR DEVELOPING COUNTRIES

CONTACT: Eric Soubeiga
TEL: 020 8659 3265
EMAIL: eric.soubeiga@hotmail.co.uk or
eric.soubeiga@orpagroup.net

O.R. IN THE THIRD SECTOR

CONTACT: Katherine Byrne
EMAIL: katherine.byrne@voa.gsi.gov.uk

OR in the 3rd Sector: Improving RNLI Response

Date/Time: Wednesday, 12 December 2012 – 14.00

Speaker: Andy Verity-Harrison (FICO), Stuart Nicholas (Atkins), Kevin Sheehy (Lanner), Cath Reynolds (RNLI)

Venue: RNLI, London Support Team, 124-126 Webber Street, London, SE1 0QL

Abstract: The OR in the Third Sector (ORiTS) special interest group aims to help O.R. analysts working or planning to work in third sector organisations (charities, social enterprises, voluntary and not for profit groups and non-government organisations). In this talk, we will present a case study of an ORiTS project with the Royal National Lifeboat Institution (RNLI, <http://rnli.org>): how an project starts, how it progresses and what is involved. The RNLI is an independent charity, wholly funded by voluntary donations, which provides, on call, a 24-hour lifeboat search and rescue service crewed by volunteers, a seasonal lifeguard service and safety advice. The aim of the RNLI is to save lives at sea.

The ethos of the RNLI is one of volunteering – over 95% of its staff are volunteers and each volunteer is valued not only for the time they give, but for the diversity and skills they can bring to the organisation. It was therefore natural for the RNLI to get involved with ORiTS, which encouraged O.R. volunteers to engage with third sector organisations. One of the first projects that presented itself was to better understand the impact on cover when a lifeboat goes off service, and therefore what metrics might be used to maintain cover whilst reducing relief fleet and maintenance costs wherever possible.

One of the first projects the ORiTS volunteers have been asked to investigate is the application of condition based maintenance to the lifeboat fleet. Specifically the impact on risk calculator metrics of classifying station assets according to the amount of time they can spend off-service.

This sort of problem lends itself to a simulation, but before we could start we had to get a better understanding of RNLI operations.

We used a systems dynamics model to represent the flows of resources (lifeboat assets) and the flow of incidents (rescues) over time. This gave us some useful insights into the way the RNLI worked and some initial results showing us how robust the overall system was to changes in incident types and rates as well as changes in the way the lifeboat fleet was being managed.

Simulation was also used, to investigate the dynamic between the availability of lifeboats, the utilisation of lifeboats and the response times to incidents when modelling the deployment of life boats to incidents around the coast of Wales, England and Ireland.

Please email katherine.byrne@voa.gsi.gov.uk if you would like to attend.

PROBLEM STRUCTURING METHODS

CONTACT: Giles Hindle (Chair)
TEL: 01482 463457
EMAIL: giles.hindle@hull.ac.uk
or **CONTACT:** Dr. L Alberto Franco, University of Warwick
TEL: 024 7652 4391
EMAIL: alberto.franco@wbs.ac.uk

PRODUCTIVITY MEASUREMENT

CONTACT: Ozren Despic
EMAIL: o.despic@aston.ac.uk

SD+ (SYSTEM DYNAMICS)

CONTACT: David Lane (Chair)
TEL: 0207 955 7336
EMAIL: d.c.lane@lse.ac.uk
or **CONTACT:** Sally Brailsford (Secretary)
TEL: 023 8059 3567
EMAIL: s.c.brailsford@soton.ac.uk

SIMULATION

CONTACT: Christine Currie
TEL: 0238 059 3647
FAX: 0238 059 5147
EMAIL: christine.currie@soton.ac.uk
or **CONTACT:** Katy Hoad
EMAIL: Kathryn.hoad@wbs.ac.uk



Announcement and Call for Papers

THE FIFTH EUROPEAN CONFERENCE ON INTELLIGENT MANAGEMENT SYSTEMS IN OPERATIONS

**3-4 JULY 2013, UNIVERSITY OF SALFORD, U.K.
ORGANISED BY THE OR SOCIETY**



Call for Papers

Operations management poses a number of problems of significant complexity the solutions of which would lead to more effective operations and bring significant economic benefits. Their solutions, however, require novel approaches that are based on techniques and principles from both Operational Research and Artificial Intelligence.

As business and industry become more global, diverse and market driven, the drive for more effective solutions for problems in operations management increases. Using traditional O.R. techniques alone has long been recognised as being too restricted for many applications, leading to research on the use of a combination of AI and O.R. techniques for problems in operations management.

This will be the fifth in a series of conferences that aims to bring together researchers developing and applying techniques from AI and O.R. to problems in operations management. Previous conferences held in 1997, 2001, 2005 and 2009 proved to be very successful and led to a total of six special issues of the Journal of the Operational Research Society and the International journal of Manufacturing Technology Management.

This conference, which we hope to hold in Media City, Salford University, aims to bring together researchers and practitioners working on the challenging problems in operations management that are at the O.R.-AI interface.

Researchers and practitioners from industry and academia are invited to submit papers in all areas related to aspects of design,

development, testing and implementation of intelligent management systems in manufacturing and service operations covering but not restricted to:

- Media Operations
- HealthCare
- Knowledge Management in Operations
- E-Business and E-Manufacturing
- Finance and Credit Scoring
- Logistics
- Maintenance and Fault Diagnosis
- Scheduling and Capacity Planning
- Supply Chains and Inventory Management
- Process Design, Quality Management & Control
- Operations and Control of Intelligent Buildings

Papers describing case studies utilising or evaluating AI techniques such as Neural Networks, Data Mining, Knowledge Discovery, Semantic Ontologies, Knowledge Based Systems, Case Based Reasoning, Fuzzy Logic, Bayesian Networks, Agent Technology as well as Hybrid Intelligent techniques are particularly encouraged.

Key Dates & Deadlines

- * Indication of intention to present a paper A.S.A.P.
- * Extended abstract of around 500 words to be submitted by 21 December 2012.
- * Accepted papers to be notified by 19 Jan 2013.
- * Full papers to be submitted by 29 March 2013.

Organising committee

Khairy A. H. Kobbacy, University of Salford (Chair)
Sunil Vadera, University of Salford (Co-Chair)
Hilary Wilkes, Conference Organiser, The OR Society

Submission Procedure

Send intent to attend/submit a paper or abstract to:

Khairy Kobbacy or Sunil Vadera,
The University of Salford,
Salford, M5 4WT UK.

Email: k.a.h.kobbacy@salford.ac.uk; s.vadera@salford.ac.uk



OR-30

December 1982 (John Crocker)

This month, given it is coming up to the festive season and the time for such things, I have decided to reproduce a paper written by Howard Malin from December 1982 in its entirety – enjoy!

Forecasting – A Cautionary Tale

Howard Malin

This one-act play consists of a short dialogue between a Professor of Forecasting and a student who has grave doubts about the philosophical status of the Professor's subject. The student, nicknamed 'Worried' by his university colleagues, is much troubled over the fact that in the Forecasting course he has been attending there has been an absence of any serious discussion, not only about the contrast between predictions concerning natural phenomena and predictions concerning social phenomena, but also the associated problem of assessing the degree of success or failure in predictions of the latter kind. Not content with this state of affairs, worried seeks out the Professor. He finds him in the local pub close by the Department of Forecasting. And Worried opens the conversation in a somewhat sarcastic and abrasive tone.

WORRIED: Hello Professor, and how will you be tomorrow?

PROFESSOR: I will be fine, Worried.

The Professor, realising the student is not very adept at his subject, continues the conversation thus:

PROFESSOR: And how are you?

WORRIED: Worried!

PROFESSOR: Why?

WORRIED: Well, I am not at all sure about the epistemological and methodological status of this subject called 'Forecasting'. What bold and interesting successful predictions can you make about the future behaviour of our society of groups of people or individuals, for that matter, that I can't?

PROFESSOR: I can give you a very interesting prediction – I predict that there will be a spontaneous gathering of many of the undergraduates, postgraduates and staff of the Department of Forecasting in this pub at 12:30pm on [14th December 2012].

WORRIED: That is interesting! But how can you be so certain that this prediction will come to pass? Surely when dealing with human beings and all the creative and transcendent qualities that they possess, all sorts of factors are introduced which effectively reduce the success of any such predictions to probability zero.

PROFESSOR: I take your point but think it irrelevant. Organizational systems, and people involved with them, operate in highly constrained ways, and by modelling these constraints and by making some very natural additional assumptions, we may obtain predictive success. In the case of my prediction made a few moments ago, one has only to note firstly, that the 14th is a Friday, secondly, that it is for all intents and purposes the last day of the Christmas term and, lastly, that people who have just completed an exhausting period of teaching, learning and research like to celebrate.

WORRIED: I get your drift, but I am not convinced that you have made an interesting prediction. I believe that if your prediction is successful, then it will be because it was self-fulfilling. [[Original] AUTHOR'S NOTE: As any self-respecting philosopher will tell you, self-fulfilling predictions are not very interesting predictions.] Having stated your prediction publicly, members of the Department of Forecasting will come to this pub on the 14th just to see if the prediction is correct and will in the process make it come true. Can you please give me an example of a successful, interesting prediction that is not self-fulfilling?

PROFESSOR: Yes?

(Pause)

WORRIED: Well?

PROFESSOR: Here is an interesting, non-self-fulfilling prediction:- in the next ten minutes you, Worried, will take at least one breath.

Ten minutes later Worried is dead Worried – not having taken one breath during this interval of time.

PROFESSOR : I must confess that Worried, for all his faults, certainly took indeterminism, testing and refutations seriously – pace Popper – (to the audience) which is more than I can say about Professors of Forecasting!

Curtain falls.

Malin, Howard, (1982) Forecasting – A Cautionary Tale, *JORS* 33.12, Pp 1173-1174, (jors1982243a.pdf)



OR-20 Extracted from OR Newsletter December 1992

The Oracle

Evelyn Waugh is alive and well

I was talking to my old friend Max Giddens last week and the conversation drifted around to the subject of the ways in which life can so frequently imitate fiction. As regular readers of this spasmodic column will recall, Max holds occasional visiting appointments at different universities and is currently Visiting Professor of Eclectic Management at a university which had best remain nameless. Somehow or other he'd found himself as a representative of this institute's Business School on various committees. He thinks this must have happened when he was asleep at a meeting. Like most older folks he sometimes nods off to sleep when the going gets heavy and he assumes that, in his case, he was asleep when committee representation was discussed and that, for him at least, a sleeping nod was as good as a wink.

When I met Max he greeted me with the words 'Evelyn Waugh is alive and well'. Now it was about 10.00am when last we met and so I assumed that Max must be stone cold sober and I wondered what he was on about. It transpired that the University of Rutland, for it was this institution at which he was currently a visiting professor, has appointed him to membership of the university-armed forces liaison committee. On second thoughts, that should be the University-Armed Forces Liaison Committee. Max's only qualification for this onerous task is that he, unlike the university's full-time staff, is old enough to remember the second world war.

Max may be old but he is not senile and so I wondered what the reference to Evelyn Waugh's continued existence might mean, but Max was giving little away, other than insisting that we must meet that evening. So, some ten hours later we were almost through our first bottle of 1964 Gevrey Chambertain Combottes when his tongue started to work loose. Apparently he had, that very morning, received the agenda for the meeting of the UNIVERSITY ARMED FORCES LIAISON COMMITTEE (Looks much better all in uppercase, so much more important). Agendum seven was what had set his mind spinning back to thoughts of Evelyn Waugh: There, in black and white, after matters arising and other trivia, was the big item for the meeting. 'Relations between the Officer Training Corps and the Student Gay, Lesbian and Bisexual Societies'.

Despite being a specialist in eclectic studies, Max was lost for words on this one. What could lie beneath this innocent sounding agendum? Were relations too friendly, and thus a threat to national security, or too beastly, and thus a threat to national security? Max only knew that Evelyn Waugh could have written a novel around the idea. So, if you read of a newly discovered unpublished work by a member of the Waugh family and its theme is relations between the officer training corps and the student gay, lesbian and bisexual societies, remember that you read it here first.

By the way, this is entirely true. And Max and I wish everyone a very happy and peaceful Christmas.

<OR>

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MODELLING & SIMULATION
£30,000 - £50,000 + Bonus

Our client provides simulation-enabled business transformation solutions for an established, worldwide client base. Their current need for an energetic, motivated graduate, with experience of/an aptitude for dynamic simulation, advanced spreadsheet modelling, database systems and optimisation, ideally including Witness or Simul8. In return, our client offers a great team environment, where individual achievement is rewarded and full commitment given to training and development.

West Midlands

CONTRACT MODELLER/ECONOMIST
Excellent Fee Rate

Major retail financial services group requires an accomplished professional, with sound economics knowledge, for a key initiative concerning retail deposits market forecasting. You will need exceptional data analysis & modelling capabilities to derive trend forecasts based on the impact of prevailing macro/micro economic indicators and correlations, with the objective of providing meaningful decision support indicators for senior management within an exacting time frame.

Central London

MARKETING INSIGHT CONSULTANCY
£30,000 - £80,000 Neg DoE

One of the world's leading research and insight consultancies, renown for measuring the effectiveness of marketing related activities, are extending their client offerings and capabilities beyond their econometric roots and are seeking high calibre candidates from Analyst through to Associate Partner level. Applicants will need to offer a balance of sound technical and analytical tools and techniques, demonstrable problems solving skills, a genuine understanding of commercial imperatives – all underpinned by impressive academic credentials.

SE London

SENIOR STATISTICS CONSULTANT
To £40,000 + Bonus + Benefits

Excellent opportunity to work on a wide variety of projects and consultancy across the retail, leisure, property and public sectors. Project work includes building tools, providing recommendations and consultancy to enable clients to enhance and develop their spatial and customer strategies. The successful applicant will be proficient in a range of statistical and location planning approaches, have good problem solving skills, the ability to be pragmatic and apply their knowledge to ensure recommendations are in-line with client objectives.

W London

DECISION SCIENCES ANALYST
To £35,000 + Benefits

Exciting opportunity to join a new, highly visible Decision Sciences Team to shape and deliver information and intelligence, you will produce and communicate a wide range of analytical models and solutions to support commercial decision making. Of graduate calibre, you will ideally have 1-2 years commercial experience demonstrating an understanding of statistics principles and the desire to learn advanced modelling techniques. You will be confident with SQL, big datasets and Excel modelling.

Hampshire M3/J4

GRADUATE CORPORATE ANALYSTS
To c£26,000 + Benefits

High calibre 'Graduate Analysts' required to join a leading online Insurance Company's Corporate Analysis team. You will be a recent graduate with a strong performance in a degree with substantial mathematical/statistical content (2.1 minimum, BSc and MSc level applications welcomed). You will have a logical approach to problem solving, with attention to detail and good communication skills. Experience of statistical packages (i.e. SPSS, SAS) and/or analytical placement advantageous but not essential.

Surrey

SUPPLY CHAIN GRADUATE
£24,000 - £30,000

The fast-growing European division of his leading US supply chain consultancy now seeks to augment their Solutions team with recently graduated talent. Those appointed will be using sophisticated modelling tools/techniques to contribute to client-led solutions. Candidates will need excellent BSc, MSc or PhD academic credentials representing one or more of the following: supply chain modeling; discrete event simulation; linear programming and/or network optimisation.

London/Bedford

**With over 30 years
of specialist market
knowledge, Prospect
is uniquely positioned
at the forefront of
Operational Research
and related areas.**

- Forecasting & Optimisation
- Business Modelling
- Process Re-engineering
- Financial Modelling
- Credit & Risk Management
- Change Management
- Simulation
- Customer Relationship Management
- Revenue/Yield Management
- Marketing Analysis

CREDIT MODELLING ANALYST
£35,000 - £55,000 DoE

This established consultancy provides risk modelling solutions to the UK credit, collections and fraud industry. With staff based either at home or on client site, strong interpersonal and client management skills are a pre-requisite. Successful candidates will need to offer at least two years' analytical delivery and project leading experience, a solid understanding of consumer credit and risk, coupled with proven technical SAS modelling skills.

Home Base/UK Wide Client Sites.

MANAGEMENT CONSULTANT
£40,000 - £60,000

As a consequence of continued business success, this expanding consultancy is seeking a Senior Consultant to join their dynamic Management Consultancy team. With a minimum of 4 years experience from within a professional services environment, the successful applicant will have broad sector experience to include retail and/or financial services and the ability to lead, manage, and deliver profitable project engagements. Knowledge of analytical tools and processes and Data/CRM Consultancy experience is also essential.

London

DATA SPECIALIST
To c£27,000

Having successfully pioneered and launched a revolutionary approach in its field, our client has an additional requirement calling for a highly data literate, analytical professional. Initially focussing on data format, quality and transformation, the role will quickly mature to one requiring the application of analytical expertise. Candidates will be considered from graduate entrant level and, in addition to good Excel skills, will need strong client focus ability.

London

HEAD OF YIELD DEVELOPMENT
&Competitive + Benefits

Enviable opportunity for an accomplished OR professional to expand the current analytics, modelling and optimisation capability of this leading travel group. Responsible for the definition and delivery of their Yield Blueprint – defining the science, algorithms, methods and approaches to ensure they maintain a state-of-the-art/competitive yield management capability, you will be min MSc qualified with 3+ years experience of working within an analytical and modelling environment, have expertise in forecasting and/or optimisation, and in either MATLAB or C++.

Peterborough

RISK MODELLING CONSULTANTS
£30,000 - £70,000

As the world's leader in catastrophe risk modelling, our client continues to grow and diversify. Current recruitment needs are for a high calibre consultant or senior consultant, with proven catastrophe modelling experience, either gained in a consulting or insurance environment. A good science/numerate degree, sound technical skills and well developed consulting and stakeholder influencing capabilities are essential.

London

For an informal discussion in total confidence on any of these positions or the market in general, please contact: Mark Chapman, Teresa Cheeseman, Kate Fuller or Sarah Sambrook. Alternatively visit our website to view our current vacancies.

Telephone: 01892 510892**Email: or@prospect-rec.co.uk****Web: www.prospect-rec.co.uk**