

THE SCIENCE OF BETTER AT THE HEART OF ANALYTICS

INSIDE O.R.

NOVEMBER 2015 NO 539



FEED THE WORLD

:: INSIDE THIS MONTH :: :: :

HEALTHCARE IN WISCONSIN

STAFFING TO MEET TIME-DEPENDENT AND PRIORITISED DEMANDS

O.R. IN THE AGE OF BIG DATA

DRAMA THEORY

or

THE OR SOCIETY

www.theorsociety.com



EDITORIAL

JOHN CROCKER

Although I have been to Birmingham on many occasions – it is, after all where the OR Society's offices reside – I had, until September never ventured as far as Aston. As I expect you are rather tired of hearing, our main annual conference was moved to July to coincide with EURO2015 so it was decided to move the Young to OR (YOR19) conference from its usual Spring slot to mid-September and to hold it at the Aston Business School, which I believe was a first time for the Society as well as for me and I have to say they did us proud. The accommodation was good, the food was excellent, especially compared to what we had at Glasgow and the lecture rooms were all close together and, not a hill in sight. As usual, it was extremely well organised and everything appeared to run smoothly to plan. There are a number articles based on some of the talks – as always it is impossible to cover them all, but the plenary sessions should be available on the website by the time you read this.

Every month, there are papers published and articles written about advances in artificial intelligence (AI). Google has developed an algorithm which makes it possible to hold a reasonably sensible conversation with a machine although its replies tend to be rather short and often lack consistency, especially when you make subtle changes in the wording of your questions. Also at Google, they have developed another algorithm which enables a machine to play a large range of computer games to quite a high skill level. Meanwhile, in Toronto, Alex Graves has developed yet another algorithm which can be used to convert printed text into 'handwriting' with varying styles and degrees of legibility.

Another recurring theme is that of ethics. At the General Council meeting in September, one of the topics discussed was that of 'unconscious bias'. What was meant by this was that there is a tendency for us to act in a way that could be interpreted as being sexist, ageist, racist, ... Obviously, there are times when this is quite deliberate, but very often we are quite unaware that what we say can be interpreted in different ways by different groups. It was suggested that we should all attend a course so that in future we can write in a way that we know will offend different groups (rather than doing unintentionally). Regina Nuzzo writes, in *Nature*, of a different form of unconscious bias relating to our innate ability to see things which are not there and ignore evidence which is counter to our intuition. If our analysis agrees with our expectations then we are unlikely to apply the same level of checking that we would if the opposite was true. This is really a case of reproducibility – one of the fundamentals of the scientific process is that if we repeat the same experiment (under the same conditions) or run the same analysis using the same data we should get the same results. Graham Kendall has written a paper expressing the rules which should be applied for all research and is very keen that they be applied by the editors of journals as part of their acceptance protocol.

I look forward to seeing you all at this year's Blackett Memorial Lecture and, do not forget to let me have write-ups of your first projects.

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Careers Open Day 2015

Exhibitor booking now open!

Join these organisations and help showcase the excellent opportunities available in O.R. and analytics.



Aston Business School

BRITISH AIRWAYS



CONSULTING.TECHNOLOGY.OUTSOURCING



Delivering Successful Futures

PROSPECT
RECRUITMENTLoughborough
University

Roke

Royal Bank
of Scotland

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excellence with impact

**The Open Day will be held at
Millennium Point, Birmingham
Wednesday 18 November 2015**

Reserve a stand for £330 +VAT



Price includes lunch and refreshments, monthly feature in Inside O.R. up to the event and a follow up article, and a profile on our website. Confirmed exhibitors will be promoted to students prior to the event.

To reserve a stand please email your full contact details to Louise Allison, louise.allison@theorsociety.com

Find out more online at
www.TheORSociety.com/CareersOpenDay

Alan Turing Institute Research Bids

The Alan Turing Institute, the UK's newly founded national institute for Data Science, is looking for top international post-doctoral researchers in statistics, mathematics, computer science, and machine learning. The Institute will carry out foundational and applied research in core areas of statistical science related to all aspects of data science. As part of defining the scope of the institute a number of workshops are currently being organised. A current list may be found here: <https://turing.ac.uk/#data-summits-workshops>.

Prospective applicants are invited to submit a curriculum vitae and a one-page covering note explaining how their expertise is relevant to data science and the mission of the Institute via email to info@turing.ac.uk.

Elsie Cropper Shield

The first slot on morning after the Conference Dinner is not generally regarded as the best time to present a paper, however Komal Aqeel Safdar rose to the occasion and won the Elsie Cropper Shield (Best Paper at Young OR) for her efforts. Komal, from Aston Business School, explained how data envelopment analysis (DEA) is being used dynamically to help reduce patient waiting times at a very busy hospital in Pakistan which operates a walk-in procedure (i.e. no appointment system). She says the suggested guideline is generic and could be applied in any hospital operating a walk-in policy. Maybe she could sell the idea to my local supermarket!

If you would like to meet Komal, you may get the chance at this year's Blackett Memorial Lecture although it is doubtful we will be using her methods for controlling the queue so I advise you come early to avoid disappointment.

Reproducibility

One of the fundamental principles of science is 'reproducibility'. Much of school level physics and chemistry is reproducing experiments to 'prove' the laws of nature, established by our forebears.

Academics and researchers are under enormous pressure to produce 'acceptable' results. Humans are also very adept at seeing patterns and drawing conclusions often from very scant information. Sometimes the conclusions we draw are erroneous, but, because they fit our preconceived ideas we are happy to accept them. It is only if the results are wildly different from our expectations that we will go back over the analysis and check every detail.

According to Regina Nuzzo, in an article in Nature, reproducibility, or rather the lack of it, is a major problem. Attempts to reproduce results in psychology, oncology, haematology and microarray-based gene-expression studies failed in well over half the cases (129 out of 171).

Nuzzo has called this 'unconscious bias' which is rather unfortunate as the term is also used in conjunction with our tendency to write in a style that may be regarded by others as, for example, ageist, sexist or racist.

More at: <http://bit.ly/1Omti74>

Why do we exist

The Chartered Institute of Building (CIOB) has recently produced a 40-page report entitled Understanding the value of professionals and professional bodies which has much to say that is pertinent to the OR Society. Here are some of the observations:

Professional bodies play a major role in improving productivity within their respective industries and have a major role to play in social mobility.

Policy making in the UK would be significantly less effective without the input of expertise from professional bodies and the role of the state would inevitably have to be more far-reaching and intrusive.

Professional bodies do command significant trust among the public and MPs but...

Most evident is that professional bodies need to communicate better with the outside world. They need to be more outward facing.

More at: <http://bit.ly/1MOwabp>

On the move

South Australia's largest public acute care teaching hospital is using simulation to plan the transfer of patients to a new hospital being built about a kilometre from the existing one.

According to new RAH program director Graeme McKenzie Computer simulation will be used to help medical staff work out how best to transfer patients. 'It's a reasonably complex exercise and quite a deal of logistics is involved. We're looking at ... which clinical departments move and when they move, finding out where those bottlenecks are so that we can plan efficiently for the safe move of the patients.'

You're fired

Dr Chris Stride, from the University of Sheffield's Institute of Work Psychology, has studied all 159 contestants from the previous ten series of *The Apprentice* and produced five tips for success.

1. Don't volunteer to be a team leader just to look enthusiastic and active.
 2. Shine when on a losing team as well as when on a winning one – try to avoid the board room.
 3. For the same reasons, get on well with your teammates and team leader to increase your chances of dodging the boardroom when losing.
 4. Be aged between 24 and 31.
 5. Have good academic qualifications.
- Unfortunately, Sir Alan and his fellow judges have probably also read the same article so may, or may not, adjust their strategy accordingly.

Read more: <http://bit.ly/1W0fqOX>

When Irish lights are shining

GE predictive analytics is now being used to optimise Irish Power electricity production. GE's tool suite *Reliability Excellence*, built on the company's Predix platform is improving efficiency at Irish Power's Whitegate plant, a 445-megawatt gas combined-cycle power plant located 25

IN BRIEF

05

miles east of the city of Cork. The software is part of GE's digitisation strategy to offer software-powered services for the so-called industrial internet. According to Ramon Paramio, general manager for GE's power generation services business in Europe, 'The Whitegate project's scope establishes a data-driven foundation, based on reliability while delivering capabilities that enable the operator to make better business decisions based on real-time operational readiness.' In the coming months, Irish Power plans to roll out an operations module for process optimisation to help it provide a more flexible operation and connect the plant performance to the real-time energy marketplace. These analytics will help customers identify actions for lowering production costs, increasing plant capability and improving system reliability.

Open All Hours

Compared to the 'middle, middle-class', both the 'upper, middle-class' and 'lower, middle-class' consumers in Mumbai, India were more likely to choose 'modern' groceries from modern stores such as supermarkets. The UMC group favoured the greater choice, the acceptance of credit cards and the proximity whereas the LMC group was more swayed by the lower prices.



The phenomenon has been captured, analysed and illustrated by an unusual V-shaped curve for modern retail adoption, according to a new study by Vishal Narayan, national University of Singapore Business School and published in Marketing Science, a journal of the Institute for Operations Research and the Management Sciences (INFORMS).

More at: <http://bit.ly/1PBs9rv>

Joined up thinking?

Alex Graves from the Department of Computer Science at the University of Toronto has published a program that demonstrates his research into recurrent neural networks (RNNs) – in particular long short-term memory RNNs.

The program produces 'handwriting' in various styles with different levels of bias and legibility. These three examples were produced using a low bias.

*Hello, Techly ! how are you today ?
Hello, Techly ! How are you today ?
Hello, Techly ! How are you today ?*

In his thesis, Graves explains the unique benefits and challenges of long short-term memory recurrent neural networks.

More at: <http://bit.ly/1kj6uIM> And <http://arxiv.org/abs/1308.0850>

DeepMind excels at Games

Google-owned artificial intelligence start-up DeepMind has revealed that its deep learning software is now able to outperform humans in 31 different video games, yet it cannot master the intricacies of PacMan. This could have something to do with DeepMind's algorithm, which uses reinforcement learning to master the games.



Instead of using a specifically derived algorithm for each game, the deep Q-network agent uses the same algorithm, network architecture and hyperparameters deriving the 'rules' by analysing the pixels on the screen and learning which patterns produce the optimum score.

More at: <http://bit.ly/17yZ0uo>

Wavelet Turbulence Algorithm

If you have seen movies like Avatar, Super 8 or Superman Man of Steel, you will have witnessed the wavelet turbulence algorithm in action. This algorithm, developed by a team at Cornell University generates simulated plumes of smoke and fiery explosions. It works at several levels in such a way that ever-increasing detail can be incorporated into the final scene.



More at:

<http://www.cs.cornell.edu/~tedkim/wturb/> and <http://1.usa.gov/1LZc2Ox>

How many?

In September, the European Commission President Jean-Claude Juncker announced a plan to distribute 120,000 asylum-seekers currently in Greece, Hungary, and Italy among the EU's 28 member states. To this aim, there is a set of equations published by the EU which provides a formula for determining how many each member state should be allocated based on its current population, GDP, unemployment rate and existing demand from refugees for resettlement in that state.



More at: <http://theatlntc/1LkLilm> and for links to the EU report.

Don't stop me now!

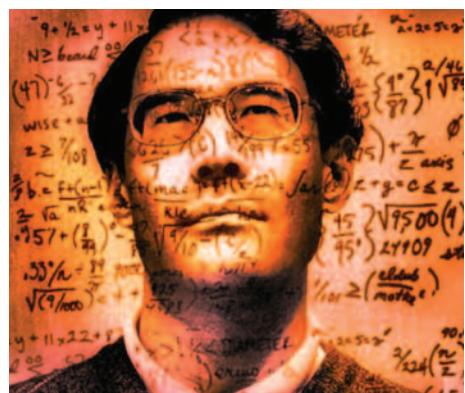
Over three quarters of us use music to lift our moods and over half to motivate us. Funded by Argos, Dr Jacob Jolij, an associate professor at the University of Groningen in Holland, sifted through 126 songs released in the last five decades to find a formula to explain why certain tunes inspire or bring a smile to people's faces.

$$FGI = \frac{\sum L_{positive}}{(BPM - 150)^2 + \left(K - \left[\frac{1}{3} + \varepsilon, \frac{1}{3}, \frac{1}{3} - \varepsilon \right] \right) + 1}$$

'A feel good song is very personal,' Dr. Jolij said. 'Music is intimately linked with memory and emotion, and these associations strongly determine whether a song will put you in a good mood or not.' Queen's 1978 song 'Don't Stop Me Now' scored the highest. More at: <http://bit.ly/1O0cqVq>

As simple as abc

In Kyoto, Japan, a mathematician, Shinichi Mochizuki claims to have solved one of the most important problems in his field. The trouble is, there appears to be no one else in his field. Shinichi Mochizuki quietly posted four huge (over 500 pages) papers on his website on 30 August 2012, the culmination of a decade of solitary work. They had the potential to be an academic bombshell.



Take three coprime positive integers (a,b,c) such that $a+b=c$. Now calculate d as the product of the prime factors of a, b and c.

(So if $a=2, b=3$ then $c=5$ and $d=30$ or if $a=8, b=27$ then $c=35$ and $d=2x3x5x7=210$). The conjecture is that there is a finite number of triplets (a,b,c) such that $dn < c$ for some integer $n > 1$. In these two examples, the only integer value of n which makes $dn < c$ is 0 which, alas is not greater than 1. It is by no means easy to find a triplet which satisfies this condition. As to why anyone would want to is, of course, a totally different issue. So far, Shinichi Mochizuki appears to be in a minority of one in this respect.

More information at: <http://bit.ly/1MOwmY3>

S&OP anyone?

According to Steve Banker, the next supply chain resolution is said to be one that focuses on sales and operations planning (S&OP); a process that balances supply with demand intelligently.

S&OP Maturity Model				
Strategy	Stage 1: Reading	Stage 2: Anticipating	Stage 3: Collaborating	Stage 4: Orchestrating
Balance S&OP				
Section 1: Goals	Development of an operational plan	Demand and supply matching	Profitability	Demand sensing, and conscious trade-offs for demand shaping to drive an optimal balance between operational demands and customer service
Section 2: Cross-Functional Alignment	Ability to align processes with a strong sales or operational focus	Ability to align processes of achieving optimum forecast and demand responsiveness to demand	Ability to measure the S&OP performance and business outcomes	Ability to measure at operational level in weeks with strong participation from executives and前线. Collaboration with all functional areas to achieve end-to-end value
Section 3: Process and Technology	Emerging processes, marginally effective	Formal, structured processes. How often all relevant functions are involved in review meeting. Tools extend to include financial management and inventory optimisation	Processes tailored to business needs and start of use of tools, including financial management and demand shaping, financial management and specific service	Process becomes automated, dynamic and responsive. Strong link to strategic planning and execution. Ability to make significant trade-offs, price optimization and complex simulation

S&OP is based on the concept of demand driven supply chains and is likely to encompass:

Quick corrective actions designed to rebalance supply and demand

Granular track and trace based upon a many-to-many, public cloud architecture

A new generation of more powerful supply chain analytics.

More at: <http://bit.ly/1idvGPC> and <http://bit.ly/1GOn9sk>

Rolfe Cartwright Tomlinson (1925 - 2015)

Rolfe, who sadly died on Saturday 10th October 2015, started his career in the National Coal Board before becoming an academic at Warwick Business School. He

was president of the OR Society from 1974 to 1975 and of EURO from 1981 to 1982. He became a Companion in 1990 and the recipient of the Beale Medal in 2005. He was also a regular attender of the Blackett Memorial Lecture. Over a long and illustrious career, Rolfe published a great many papers and books including O.R. Comes of Age: A Review of the Work of the Operational Research Branch of the National Coal Board, 1948-69 (1971); Rethinking the Process of Operational Research and Systems Analysis (1984); Some Dangerous Misconceptions Concerning Operational Research and Applied Systems Analysis (EJOR, 1981)

EURO2016 Call for Papers



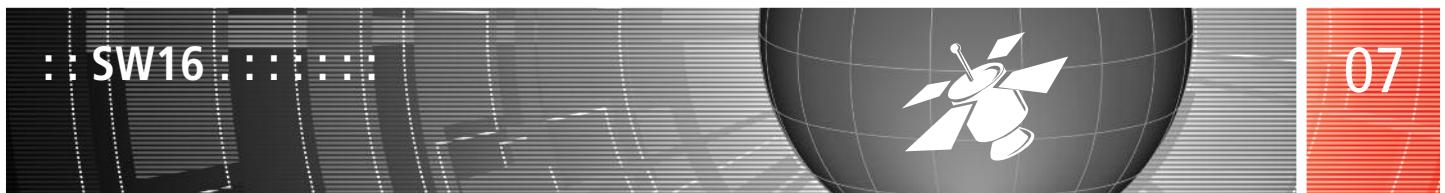
The Program and Organizing Committees, chaired by Daniele Vigo and Joanna Józefowska, are preparing a high quality scientific program and an exciting social program for the Conference.

We are convinced that the EURO XXVIII Conference will be an excellent opportunity for the OR community to get together again in a pleasant atmosphere, and, thus, we are looking forward to meeting you in Poznan, the first capital of Poland, in 2016!

More information at: <http://www.euro2016.poznan.pl/>

IN BRIEF articles compiled by
John Crocker and
Nigel Cummings

SUBMIT YOUR
IN BRIEF STORIES TO
InsideOR@theorsociety.com



THE OR SOCIETY'S 8TH SIMULATION WORKSHOP (SW16) FINAL CALL FOR PAPERS

Website: www.theorsociety.com/SW16 11 – 13 April 2015



HELD IN COOPERATION WITH:

THE INFORMS SIMULATION SOCIETY; THE SOCIETY FOR MODELING AND SIMULATION INTERNATIONAL (SCS).

EXTENDED SUBMISSION DEADLINE

IMPORTANT DEADLINES:

- 06 November 2015:** EXTENDED deadline for submission of electronically contributed papers.
- 15 January 2016:** Notification of outcomes of reviews of conference papers.
- 15 January 2016:** Deadline for submission of Poster titles and abstracts (150 words).
- 07 February 2016:** Deadline for early bird reduced registration rate.
- 12 February 2016:** Deadline for author, exhibitor & sponsor bookings in order to appear in the programme.

If you require any further information on paper submission, please contact the programme chairs on the Organising Committee page of the SW16 website at www.theorsociety.com/SW16

CONFERENCE NEWS

EVENT:	Careers Open Day	DATE:	18 November 2015	VENUE:	Millennium Point, Birmingham
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EVENT:	Blackett Lecture 2015	DATE:	26 November 2015	VENUE:	Grocers' Hall, London
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EVENT:	8th Simulation Workshop SW16	DATE:	11-13 April 2016	VENUE:	Ettington Chase Hotel, Stratford
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JOINT EVENT

WILL STATISTICS AND OPERATIONAL RESEARCH STILL BE HERE IN 2025?

How should our professions react to a world in which digital services and new technologies are demanding new approaches from our established disciplines?

Come and help us navigate the next 10 years with a day of panel discussions, workshops and presentations with speakers from across industry



Speakers include:

Peter Diggle President of the Royal Statistical Society

Stewart Robinson President of the OR Society

Tony Bendell Chair RSS Quality Improvement Section

John Hopes Vice President of the OR Society

Neil McIvor Statistics Deputy Head of Profession in the Department for Work and Pensions
Guest Plenary Speaker from Industry



Workshops covering:

How can the two Societies benefit from Data Science and Analytics
and how can our offer to the new professions be improved?

Which work areas have moved from the realm of O.R. and Statistics
and are now being claimed by Data Science and Analytics?

Which new areas have Data Science and Analytics created that
O.R. analysts and Statisticians need to learn?

How have new digital technologies enabled the Data Science and Analytics professionals
to forge new communities and can we learn from them?

Starting to build a soft systems model to understand how increasing numbers of Data Science and Analytics professionals affect academic institutions, government departments, private sector bodies and the Societies



4 December 2015, Royal Statistical Society, 12 Errol Street, London EC1Y 8LX

9:30am Refreshments for a 10:00am start with an introduction from both Societies

To book a place please go to <http://bit.ly/1jged9Q> Event cost is £40 (including lunch)

For further information, please email events@rss.org.uk



Blackett Memorial Lecture

The Society is pleased to announce that the 2015 Blackett Memorial Lecture will be given by



Kenneth Cukier

Data Editor for the Economist

Kenneth Cukier is the Data Editor of The Economist in London and the co-author of the award-winning book "Big Data: A Revolution That Will Transform How We Live, Work, and Think" with Viktor Mayer-Schönberger in 2013, a New York Times Bestseller translated into 20 languages. He is a regular commentator on BBC, CNN, and NPR, and a member of the World Economic Forum's council on data-driven development. In 2002-04, Mr. Cukier was a research fellow at Harvard's Kennedy School of Government. He is a board director of International Bridges to Justice and a member of the Council on Foreign Relations.

on

Thursday 26 November 2015

at

Grocers' Hall, Princes Street, London, EC2R 8AD

www.grocershall.co.uk

Grocers' Hall is situated in the heart of the City of London in a private courtyard opposite the Bank of England. A one minute walk from Bank Station (exit 1), which is served by the Central, Circle, District and Northern Underground lines as well as the Docklands Light Railway and Waterloo and City line. Moorgate, Liverpool Street and Cannon Street British Rail stations are all just a five minute walk away.

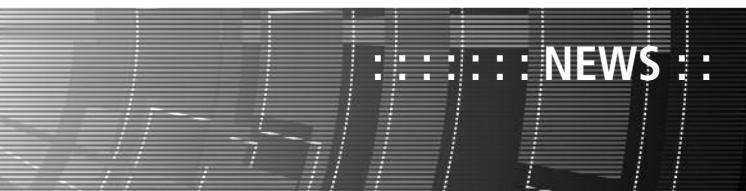
(Title and abstract to be advised.)

Lecture at 4.30 pm

(Tea and biscuits at 4.00 pm; Drinks reception 6.00 – 7.00 pm, after the lecture)

There is no charge for attendance at this event. Registration is open.

To book online and receive joining instructions, please go to <http://www.theorsociety.com/BlackettLecture>.
If you have any queries, please contact Hilary Wilkes on hilary.wilkes@theorsociety.com



FEED THE WORLD

NIGEL CUMMINGS

The Institute for Operations Research and the Management Sciences (INFORMS) and Syngenta (winners of the prestigious Edelman award) are collaborating to bring a new award to the world of O.R.



It will be known as the Syngenta Crop Challenge, and will focus on the many and varied ways that analytics and O.R. can address the problem of feeding those millions of people throughout the world who face hunger every day.

Humanity is facing its toughest challenge so far in its history. Every day, our planet wakes with 200,000 more mouths to feed. Every night, more than 870 million people go to bed hungry. The need to produce more food has never been more urgent, but the world's land, water and energy resources are under unprecedented strain.

As world population increases and the percentage of land devoted to agriculture decreases so it becomes vital to improve the productivity of available agricultural land. O.R. and analytics may provide the solutions that agriculture urgently needs.

Companies like Syngenta strive to improve varieties of their crops to meet some of these needs. According to Glenn Wegryn, President of the INFORMS Analytics Section and Executive Director of the Centre for Business Analytics at the University of Cincinnati Carl H. Lindner College of Business. 'This new competition will give our members the chance to apply their considerable talent in analytics to the terrible worldwide problem of hunger and poverty.'

Syngenta is working on ways to bring plant potential to life by supporting farmers in the field with the very best seed trait, crop protection and seed treatment technology in industry. This new joint award with INFORMS will encourage O.R. and analytics professionals to showcase their skills in providing agricultural solutions to help feed a starving world.

According to Joseph Byrum, Syngenta. 'We're fundamentally transforming agricultural productivity through the use of O.R., as evidenced by our Edelman win, and we're looking for exceptional

talent to work with us through this challenge.'

Each year, farmers have to make decisions about what crops to plant given uncertainties in expected weather conditions and knowledge about the soil at their respective farms. These decisions have important impacts; an unusual weather pattern can have disastrous impacts on crops, but planting to hedge against potentially stressful weather patterns could dramatically improve yields.

Nearly 7 million hectares of farmland are lost to soil erosion every year. Many people who produce the world's food are living in poverty. Biodiversity is disappearing fast. And the challenge won't get any easier: by 2050, for example, 4 billion people will be living in countries with water scarcity. The application of predictive analytics could assist farmers with selecting the right strategies to maximise yields in the face of uncertain future weather conditions.

Syngenta has already shown that O.R. can help farmers make seed variety decisions that optimally reduce risk and increase yield. The Syngenta/INFORMS Crop Challenge will help to generate new solutions to problems faced by farmers in optimising their crop production. Finalists for this first award will make their presentation at the INFORMS Conference on Business Analytics and Operations Research in Orlando, Florida, which takes place April 10-12, 2016.

The winner of the first competition will be announced at the 2016 INFORMS Annual Meeting and receive a \$5,000 prize (approx. £3,250).

More information is at <http://www.ideaconnection.com/syngenta-crop-challenge/>



SW16 KEYNOTE SPEAKERS CONFIRMED

CHRISTINE CURRIE AND THOMAS MONKS

11-13 April 2016 sees the return of our biennial OR Society Simulation Workshop.

We have a really packed programme consisting of advanced and beginner simulation tutorials, keynote speakers, a poster session, high quality applied and theoretical papers presented by industry and academia and of course the all-important conference dinner!

This month we are announcing our prestigious keynote speakers. We are delighted to welcome **Prof. Alexander Verbraeck** from Delft University of Technology, Netherlands and **Prof. Sally Brailsford** from University of Southampton. This year we address two important and growing areas of simulation research: data driven simulation and hybrid simulation.

DATA DRIVEN SIMULATION



Alexander Verbraeck

Given the abundant availability of big and open data for many domains, it becomes possible to generate both the structure and the behaviour of models from data. This is a task that needs careful preparation in order to maintain model validity.

Assessing data quality and metamodelling are two key ingredients for successful data driven simulation studies. In his talk, Prof Verbraeck will show some of the challenges and solution, and illustrate them with examples from the transport sector where automatic model generation and data assimilation into discrete event models have been applied.

HYBRID SIMULATION: THE BEST THING SINCE SLICED BREAD, OR JUST A FAD?



Sally Brailsford

Hybrid simulation, the combination of different simulation paradigms (discrete-event simulation, system dynamics and agent-based simulation) in the same model, has become increasingly popular in recent years.

The availability and improved usability of modelling software tools such as AnyLogic and the new Vensim variant Ventity have contributed to the increased adoption of hybrid approaches. However, is this just a passing fad, or is hybrid simulation the answer to the challenges of getting simulation models used (and useful) for a wider class of real-world problems?

Prof Brailsford's talk describes some hybrid simulation models for a range of healthcare applications, where the various simulation paradigms are combined in a range of different ways. The

challenges of model development and the rationale for the various modelling decisions are discussed. The talk concludes with a personal reflection on the benefits and disadvantages of using hybrid models in general.

For more about the conference, including more details and biographies for the keynote speakers, see the conference website: <http://www.theorsociety.com/SW16>

<OR>

8th SIMULATION WORKSHOP SW16

THE OR SOCIETY

**11-13 APRIL 2016,
Stratford-upon-Avon**

- **The Deadline for Submission of Papers has now been extended to 6 November 2015**
- **Are you submitting a poster?**
Deadline for poster title and abstract submissions (max 150 words), is **15 January 2016**
- **REGISTRATION IS OPEN**
Book early! Closing date for the early, reduced rate is **7 February 2016**
- **Have you submitted a paper?**
Deadline for authors to book and pay in order to appear in the programme is **12 February 2016**
- **Why not Sponsor or Exhibit?** Contact Christine.Currie@soton.ac.uk for more information

ALL YOU NEED TO KNOW ABOUT THE SW16 PROGRAMME IS ONLINE AT www.theorsociety.com/SW16



PROVISION OF HIGHER EDUCATION IN O.R. IN THE UK - A COUNTRY WITH A GOOD O.R. PEDIGREE

SANJA PETROVIC, PROFESSOR OF OPERATIONAL RESEARCH, NOTTINGHAM UNIVERSITY BUSINESS SCHOOL,



MINJIA ZHU, THE UNIVERSITY OF NOTTINGHAM, NINGBO CAMPUS, DIVISION OF ECONOMICS, 3RD YEAR STUDENT



This article is produced as a joint effort of two authors, one who is a professor of Operational Research and has been involved in O.R. for more than 25 years, and the other who was hooked on an O.R. module in her 2nd year of undergraduate studies and wishes to pursue O.R. and analytics disciplines as her career. We explored the provision of MSc courses on O.R. in the UK.

In general, UK universities as a supplier of higher education in O.R. have a number of advantages, including being well equipped with the latest technological devices, software and other important resources, all audit bodies in a form of internal/external examiners, etc. UK also has an advantage of delivering courses in English which is a common language for majority of O.R. outlets including books, journals and conference proceedings. So, the supply of education is in place, what about demand from the students' angle?

One can say that the UK has a good pedigree in O.R. The UK is very often considered to be a cradle of the O.R., and was a home country of a number of well-known Operational Researchers including Patrick Blackett, Stafford Beer, to mention just a few. How does it impact on the provision of higher education in O.R.? Let us focus on MSc courses, as a first serious and important level in the education after undergraduate studies which should offer a wider knowledge in O.R. as a discipline.

First, let us analyse some evidence of O.R. MSc courses in a wider context of the higher education across all subjects. Higher Education Statistics Agency (HESA) publishes open literature related to the high education enrolment. Until 2002-03, in HESA data files 'Students by subject of study', which can be downloaded on <https://www.hesa.ac.uk/content/view/1973/239/>, there was no Operational Research as a subject. It appeared for the first time in 2002-03, under the general subject Mathematical Sciences. The total number of higher education enrolments in the UK was 2.2M in 2013/14; that is a decrease of 1.7% from the previous 2012-13 academic year. Interestingly, among them, the number of students on Postgraduate courses increased by 0.6% while the number of Under Graduate enrolments decreased by 2.4% in the same period. In HESA reports, postgraduate numbers include all higher degrees (doctorate and masters degrees and other qualifications at level D). It was reported that the number of Postgraduate students in O.R. counted 635; this is 0.12 % of the total number of postgraduate

:: LEADER :: :: ::

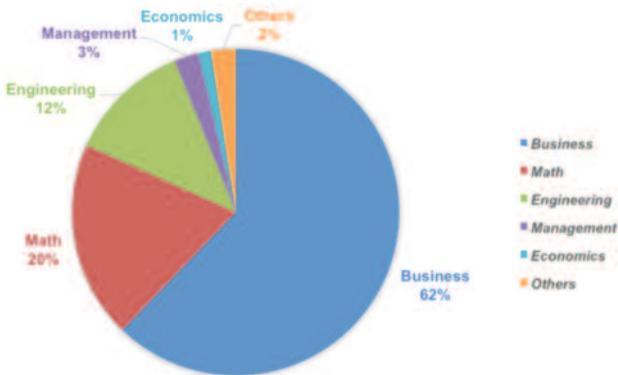


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students in the UK. However, this is a rather pessimistic number because it is likely that many O.R. postgraduate programmes are not classified under mathematics.

What types of Schools/Departments offer O.R. or O.R. alike MSc courses? As is expected from O.R. people such a discussion is reasonable to visualise by a pie chart.

Distribution of MSc courses across Schools/Departments (2014)

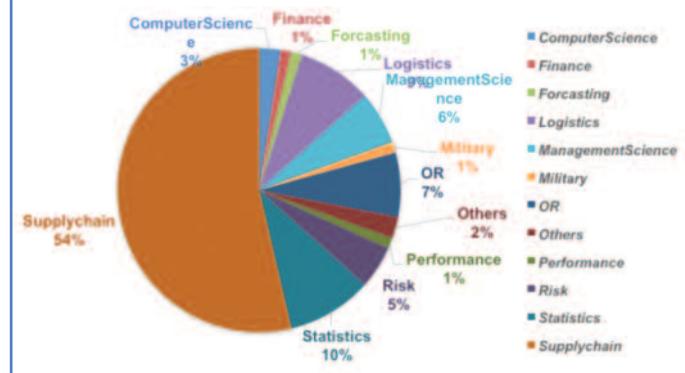


Some universities have both Management and Business schools, and that is why they appear separately in the pie. It comes as no surprise that more than half of the O.R. MSc courses are offered by Business schools, while less than one fourth is at Schools of Engineering. This is rather different from the climate in the USA, where the distribution is almost the opposite. As a matter of fact O.R. MSc is taught more in Engineering schools than in Business. Actually, this works very well for UK students who want to take MSc in O.R., because in general Business schools accept students with different undergraduate background while Schools of Engineering usually have a strict entry requirement that applicants must hold an undergraduate degree in engineering, computer science or math.

Universities offer a wide variety of topics on O.R. MSc courses including Supply Chain Management, (dominating), O.R. and Applied Statistics, Logistics, O.R and Computer Science, Risk Management, O.R and Performance Management, Forecasting, Financial O.R., etc. Some universities have been facing an increase in the number of O.R. MSc students in the last 5 years, while some are not of that luck. Some universities have been sufficiently flexible to adapt quickly to new key words in associated disciplines, such as analytics and big data, which emerged on the O.R. scene. Many schools have developed new modules, and sometimes even whole renewed programmes, in response to such developments. This practice is to be encouraged and is indicative of the dynamic and evolving nature of O.R. What matters in attracting large number of

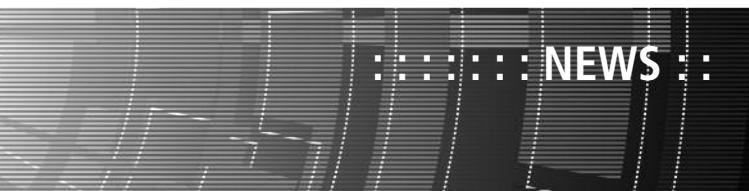
MSc student? It seems that, in general, traditional or 'pure' O.R. courses do not attract large number of students, while most of the 'popular' O.R. courses are specialised and business oriented, especially courses focused on analytics and finance are large.

Distribution of MSc topics (2014)



Some observations are as follow. The largest number of students on a single course is around 50. There is a large difference between the number of full-time and part-time students enrolled on O.R. MSc courses, (575 versus 60 in 2012/2013). This is in line with their distribution in postgraduate courses in all other subjects. Fee eligibility distinguishes those students who are eligible to pay home fees from those who are not. In total, 38% of students were eligible to pay home fees, the remaining ones are overseas students (2012/2013). A proportion of 'eligible to pay home fee' students are British students. Hopefully, majority of them will pursue their career in O.R., and will join the Operational Research Society.

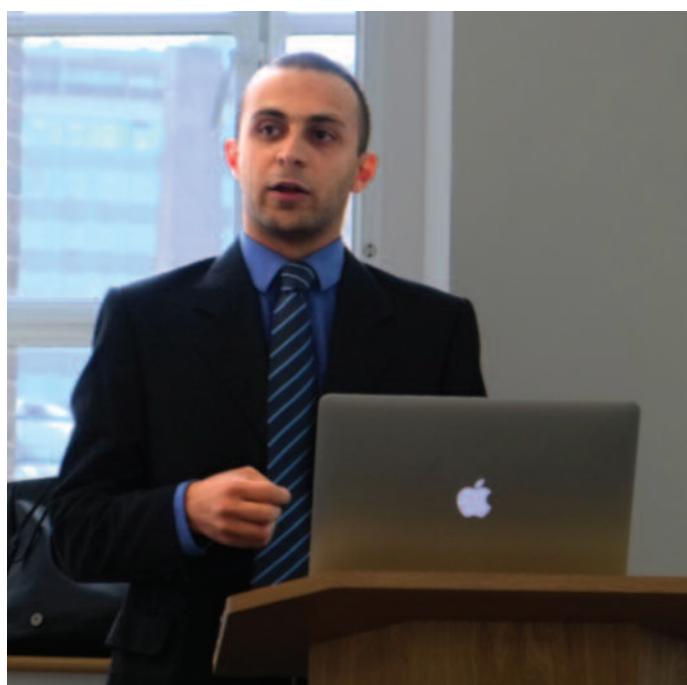
More data are needed to provide a thorough analysis and sound recommendations to providers of higher education in O.R. Indeed, the call for bids for Charitable Project with a wider scope entitled 'Mapping the O.R. Supply Chain in the UK' is announced within this issue. Instead, we raise some questions which we hope will trigger some thoughts. Employers greatly value the intellectual ability, skills in reasoning, and rigour analytical approaches to problem solving, which O.R. educated employees can provide. O.R. specialists are in big need in both public and private sectors, and it looks that the supply of O.R. cannot meet the demand that comes from employers. Should universities, as an important partner in a supply chain of O.R. specialists make more effort to address timely the need of particular specialism in practice? Should universities and practitioners work more together in meeting the requirements for O.R. people in public and private sectors? Should we aim to attract more experienced professionals to take part-time MSc O.R. courses to enhance their analytical skills?



HEALTHCARE IN WISCONSIN

NIGEL CUMMINGS

Edmund Ramly, Wisconsin-Madison University, presented three papers at YOR19 on various aspects of healthcare. These looked at ways of reducing the over-prescribing of antibiotics in nursing homes; monitoring and control of blood pressure in speciality clinics and benchmarking assisted living facilities.



Overuse of antibiotics has become a major problem. Edmund Ramly and a number of his colleagues at Wisconsin-Madison and Pittsburgh universities carried out a study in a 90-bed nursing home which resulted in a complex intervention with three loci of control: pre-prescribing communication, post-prescribing review and organizational monitoring.

Before they started their work, there was apparently no criteria or systematic procedures in place for identifying resident change-in-condition (CIC) or to communicate assessment findings to providers. The tool they designed standardized the types of information nurses collected during their assessment of residents experiencing a CIC. It also allowed CICs to be categorized with prompts to discourage urinary testing and antibiotics in residents who satisfied low-risk criteria. The tool went through three iterations based on nurse satisfaction assessed through surveys and interviews. The results indicate that it is possible to reduce antibiotic prescribing by using a multi-disciplinary communication tool.

In his second presentation, Edmund talked about the work he did with Dr Christie Bartels on designing a protocol to monitor and control high blood pressure (hypertension) in speciality clinics.

It was noted that although blood pressure (BP) was measured routinely, this rarely resulted in any action being taken. This contrasted with primary care units which had protocols in place to follow up elevated BP patients.

Ramly and Bartels effected a redesign of work systems where they worked to follow up BP and send patients to primary care. This schedule helped to facilitate transfer of these patients to primary care.

During the research and development period, they utilised 'Self-Regulation Theory' approach, and a 'Plan-Do-Check-Act Model'. Acquisition of new data was undertaken to determine what actually counted as notifiably elevated BP, then, if elevation continued, a trigger was effected for referral to primary care treatment.

In evaluative focus groups, staff voiced satisfaction and suggested pragmatic changes including BP re-measurement cue cards and HER alert revisions. Questionnaires showed improved self-efficacy post implementation.

In his final presentation, Edmund described the work he had done in connection with assisted living facilities. Care homes in the US (as in the UK) are highly regulated with regular inspections to ensure an acceptable quality of care. By contrast, assisted living facilities (sometimes referred to as sheltered housing) in the US lack systems to measure and improve quality of care and patient satisfaction. There is apparently a lack of federal regulations.

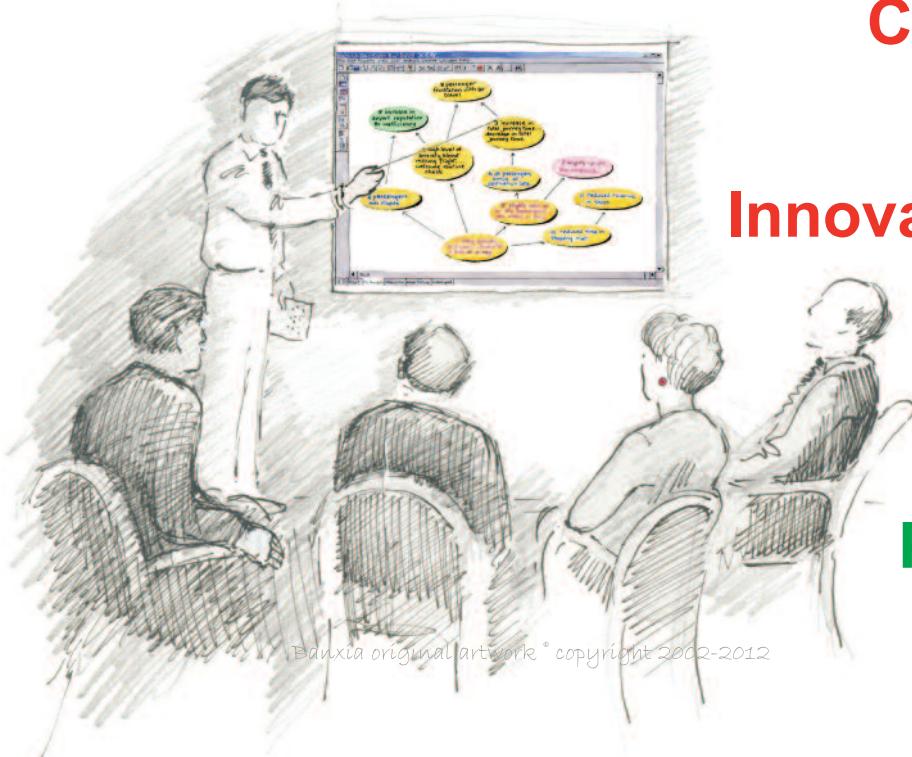
A learning and adaptation support system was developed. A performance measuring system for participating facilities was also developed consisting of an annual patient satisfaction survey and a quarterly facility survey about quality improvement structure, process and outcomes.

The analysis contributed a quantified conceptual framework and proposed survey modifications expected to support gathering more relevant quantitative data, increasing systematic understanding of assisted living quality and shortening data analysis time to be able to provide more timely and responsive feedback to facilities. It is hoped that this work done in Wisconsin will form the basis of a national-wide benchmarking system.

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- **Decision Explorer®** - an ideas mapping tool used to organise and structure an individual's or a group's ideas about a problem or issue. This is a piece of software with many uses, in areas such as strategic management, risk assessment, project planning/ definition and general problem structuring. Single user licenses start from £99 + VAT.

“Decision Explorer® has proven to be a powerful facilitative tool. Used ‘live’ in workshops it provides a very efficient and productive means of keeping participants focussed and communicating. As a means of joint decision making, I have not found better.” Kenny Forsyth, Consultant

- **Frontier Analyst® Professional** - a performance measurement tool, using Data Envelopment Analysis (DEA), to give a relative assessment of the performance of a group of business units. Used in organisations that have a network of branches/ depots or in situations where a group of similar “units” can be identified (for example, hospital wards, banks, shops, teams within a company and so on). Single user (75-unit analysis capability) licenses start from £195 + VAT.

Contact us for details of any of these products.



Learning and Development Programme

OR Society Approved Training Courses

PRACTICAL PROCESS IMPROVEMENT USING LEAN AND 6-SIGMA

27 October 2015, Birmingham
£450 + VAT for OR Society members

Course provider: Ian Seath

This course cuts through the usual consultancy jargon surrounding Lean and 6-Sigma and provides take-away practical tools that will help you to improve your organisation's processes. You'll practice improving a 'real' process in a case study environment to identify the success and failure factors. You'll understand how to decide which approach, if any, is best for your process.

You'll learn: How Lean and 6-Sigma differ, yet are complementary approaches to process improvement; How to set up and define a process improvement project; How to use appropriate tools to map, measure and analyse business processes and how to design a Lean value-adding process

MANAGING SUCCESSFUL ANALYTICAL PROJECTS

28 - 29 October 2015, Birmingham
£1,010 + VAT for OR Society members

NEW FOR 2015

Course provider: Ian Seath

This workshop uses delegates' own projects and experience to introduce methods for managing analytical projects from end-to-end, using relevant tools along the way. Virtually every piece of work done by analysts, economists and researchers is a project, or could benefit from applying project-thinking. This course is designed specifically for them. A pre-requisite is that attendees should have a current, or upcoming project, to use during the workshop.

You'll learn about the four stages that every project goes through and how to manage these, how to ensure an analytical project is initiated effectively, how to identify and manage relationships with project stakeholders; how to apply some simple planning tools, including risk mitigation and how to track and control progress of a project

AGENT-BASED MODELLING: WHAT, WHEN AND WHERE

3 - 4 November 2015, Birmingham
£1,180 + VAT for OR Society members

Hands on course

Course provider: David Buxton

This is a practical course aimed at developing expertise in agent-based modelling and simulation (ABMS). You'll gain practical experience of how to develop and implement agent-based simulation models and how to interpret the model outputs. You'll also understand how to exploit the huge volumes of new data available to add an extra level of model granularity and learn how to tell the difference between good, bad and dangerous models. You'll learn:

**When and why to use the main modelling paradigms (DES, SD and ABMS)
General principles and techniques used in modelling and simulation
Design methodology for ABMS; an introduction to the AnyLogic simulation tool**

ORGANISING AND PRESENTING DATA IN MICROSOFT EXCEL

11 November 2015, Birmingham
£455 + VAT for OR Society members

Hands on course

NEW FOR 2015

Course provider: Simon Pegg

Create professional looking, accurate and dynamic spreadsheets to present data creatively. Learn how to avoid the main pitfalls of spreadsheet design; create useful applications using simple Excel functionality; reduce the time spent analysing data and create more time to make decisions and share your spreadsheets with other users whilst ensuring consistent analysis. Good knowledge of Excel shortcuts is an advantage but not essential.

Facilitate both data input and reporting; Learn techniques to identify data quality issues and to validate data before use; Incorporate form controls (option buttons, tick boxes & scroll bars) into spreadsheets; Build effective visual graphics such as a speedometer and a scrolling list; Learn how to identify data quality issues and to build data entry and storage tables; Build a dashboard that updates dynamically as the user selects display criteria.

FOUNDATIONS OF O.R.: PROBLEM STRUCTURING

24 November 2015, Oxford St, London
£575 + VAT for OR Society members

NEW FOR 2015

Course provider: Giles Hindle

The purpose of this day is to develop a critical and practical understanding of Problem Structuring Methods (PSMs), with a focus on Soft Systems Methodology and Strategic Options Development and Analysis.

The objectives for the day: Explore the role of problem structuring methods in managing organisations, supporting strategic thinking and delivering O.R. projects; Understand the history and main principles of PSMs; Present a comprehensive list of PSMs and their application areas; Obtain practical experience in problem solving and strategic thinking using Soft Systems Methodology (SSM) and Strategic Options Development and Analysis (SODA); Critically discuss the advantages, limitations and practical application of PSMs.

INTRODUCTION TO MEASURING AND DEMONSTRATING IMPACT IN COMPLEX SYSTEMS

30 November 2015, Birmingham
£495 + VAT for OR Society members

NEW DATE

NEW FOR 2015

Course providers:
John Newman and Sam Mackay

Public and third sector services are increasingly being asked to demonstrate the impact they have, and to make the case for why (and how) services should be commissioned, based on the outcomes they achieve. This brings with it a number of challenges, as these services are often delivered in complex systems where a number of factors contribute to outcomes and impact. These outcomes are also very often difficult to quantify – and knowing ways to overcome this are essential skills for managers, practitioners and commissioners of public services.

We cover the core skills needed to measure and demonstrate impact in a variety of settings, and an opportunity to learn from the experiences of others who have faced similar challenges; the skills needed to successfully navigate through the latest tools and techniques that are available, and to choose what will work best in your own organisation

For details of all courses and to book online, visit www.theorsociety.com or call Jennie Phelps on 0121 234 7818

NOTICEBOARD



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NEWS OF MEMBERS

The Society welcomes the following new members,

WILLIAM BAYE, France; ADAM CORREIA, London; BEN GRIFFITH, Hampshire; CODY LEVER, Leeds; TOMMY LODGE, Southampton; HANNAH TAYLOT-BUTTON, Gloucestershire; TIMOTHY TOWNSEND, Sheffield; JUAN TZINTZUN RAMOS, Mexico;

and Reinstated members,

JULIE MANUEL, Southsea; ELENA PERSHINA, Edinburgh Napier University; JAMES MANSFIELD, University Southampton;

and the following student members,

SALISU ADAMU, Nigeria; SHAKEEL AHMED, Cranfield University; ADEL ALAMRI, University Cardiff; TOM ALBERY, University of Warwick; ARIS ANGELIS, London School of Economics; OLZHAS ASSANBAYEV, UMER AYUB, University of Southampton; ALLIYA BANO, University of Strathclyde; GREGORY BOTT, Mississippi State University; PANNAG CHANNAPATNA NAGENDRA, University of Nottingham; LUCY CAHILL, University of Leicester; LUKE COLE, University Plymouth; OWEN EIAS, University South Wales; ANSELMA DOBSON-MCKITTRICK, University of Cardiff; YIJI FAN, Lancaster University; SUNIL GILL, University of Strathclyde; ANITA GRUBB, Cardiff University; CHRIS HAGGER, Manchester Metropolitan University; PETER HAMPTON, Ulster University; ISABELLE HINTON-SMITH, University of Greenwich; JAVIS HO, University of Strathclyde; YUTING HSIAO, Westminster University; GEORGIA IVEY, University of Southampton; SAMANE IGDER, University of Leeds; MARIA JAEN, London School of Economics; HANNAH JENDE, London School of Economics & Political Science; DHANYA JOTHIMANI, Delhi India; ANNA KOLOKOLKINA, University of Greenwich; LUCY KRAFTMAN, Bristol University; ARUN KRISHNAN, University of Strathclyde; JINGXIN LAI, University of Strathclyde; HARRY LAVERTY, University of Warwick; LIZA LAYNE, University of Westminster; LEON LIN, University of Warwick; KATIE LUOTONEN, Strathclyde University; ORESTIS MAKRIDES, University of Strathclyde; JAMES MANSFIELD, University of Southampton; TIFFANY MASSEY, Cardiff University; LIZ MEADOW, University of Warwick; CHRISTINA MEYER, Warwick Business School; SUSAN

McCLORY, University of Portsmouth; ELENA MOLLOVA, Cardiff University; HELENA MUND, Manchester University; MONICA ORITZ MARTINEZ, University of Nottingham; KIRSTIN NAZARETH, University of Warwick; Enohi Odug, Kent Business School; ANAESH PATEL, Cardiff University; WALTON PEREIRA COUTINHO, University of Southampton; JONATHAN PILLER, London School Birkbeck College; SYED ABDUL RAHMAN, University of Sheffield; ARCHIE REES, University of South Wales; EMILY ROWE, University of Warwick; ANNA SKELT, University of South Wales; IVAR STRUIJKER BOUDIER, University Lancaster; AIMEE SUTTON, University of Southampton; YU CHING TANG, University of Southampton; GUILHERME TEIXEIRA, University of Bristol; DANIEL UFUA, University of Hull; LEONARDO VALENCIA RESTREPO, Universidad Sergio Arboleda Colombia; RUTH WALTON, University of Southampton; LUCY WARNER, University of Warwick; RACHEL WATSON, University South Wales; DOMINIC WIGMORE-SHEPHERD, Lancaster University; KERRY WILDE, University Sheffield; ABIGAIL WORSLEY, Manchester Metropolitan University; BUBAKAR YAKUBU JIBRIN, Nigeria; IRYNA YAREMENKO, University of Westminster; KA YAN YIU, Warwick University; YITING YUAN, Warwick University; ZHIFAN ZHOU, University of Warwick;

Total Membership

2833

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 CandORs (Candidate Associate)

Xiaoyu ZHANG
Krupa PATEL

Admit to the category of AFORs (Associate Fellow)

Nira CHAMBERLAIN

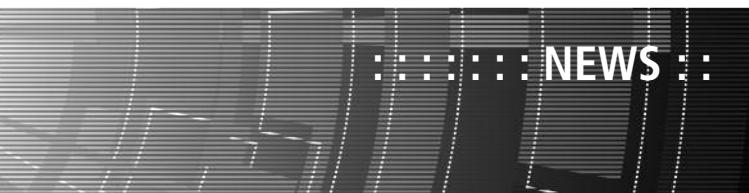
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BRITISH SCIENCE FESTIVAL

MODELLING MULTI-BED DISEASE TRANSMISSION

NIGEL CUMMINGS

University of Bradford researchers presented their findings at this year's British Science Festival in Bradford.



Understanding exactly how bacteria and viruses can be spread across wards could improve the way we design and clean hospitals in future, and could also be used to train healthcare workers in more effective cleansing and hygiene measures.

The researchers have produced a new computer model which predicts that multi-bed hospital wards increase bacterial hand contamination by 20% compared with single bed wards. This figure is quite alarming and clearly states the case for reducing ward sizes to the bare minimum and improving hygiene procedures.

It is estimated that the transmission of infections such as MRSA and norovirus that are acquired once a patient has entered hospital for treatment, affects one in every 15 patients. These infections cost the NHS an estimated £1 billion annually and account for approximately 5000 deaths. Computer models are seen as an important tool in the study of the spread of healthcare associated infections, especially when they are validated using clinical data. And it is now widely accepted that such models can be used to make improvements in the design of hospital wards and to change the behaviour of healthcare staff in order to reduce infection rates.

Dr Marco-Felipe King and his colleagues have been working on the development of a predictive model that estimates the number of bacteria that will remain on surfaces and healthcare workers' hands even after cleaning following each patient interaction. Their research indicates that levels of contamination are 20% higher on the hands of healthcare workers who work in multi-bed rooms compared to those who work in single bed rooms.

This research provides strong evidence that single bed rooms are superior for infection control and although this has been understood for quite some time, it is seldom put into practice because of its general infeasibility – such a practice noticeably increases the cost of hospital design, maintenance and cleaning.

However, information from this new predictive model could help change the way hospital operatives clean their hands and clean their wards, it might also stimulate recognition that 'evidence based cleaning' is a more effective deterrent to the transmission of infection.

The work is ongoing and the research team is now hoping to combine modelling with current work on real-time simulations of airflow patterns in hospital rooms. Results from this further study may provide indicators for changing hospital building designs and ventilation systems.

The message provided by predictive modelling, is that hand washing and cleaning is hugely important in all hospital wards, and even more critical in multi-bed wards where infectious particles may be present on surfaces that medics may not expect to be contaminated.

More information can be found at:

https://www.leeds.ac.uk/news/article/3690/hand_washing_vital_in_multi-bed_hospital_wards



STAFFING TO MEET TIME-DEPENDENT AND PRIORITISED DEMANDS

NIGEL CUMMINGS

Dr Julie Vile gave the first talk in the Stochastic Modelling Stream at YOR19 held at Aston University based on a paper, 'Time-Dependent Stochastic Modelling for Predicting Demand and Scheduling of Emergency Medical Services' that she and her colleagues Jonathan Gillard, Paul Harper and Vincent Knight (Cardiff University) had written.



Julie's presentation detailed her interests in demand forecasting, time-dependent priority queues, hourly staffing requirements, staff rostering and shift scheduling. This particular project was primarily concerned with the problems arising from having two distinct types of customer being dealt with simultaneously where one group is given priority over the other.

Such a situation is common at A&E departments where the customers can be split into those presenting with life-threatening conditions and those in need of urgent treatment but (if seen in time) not life-threatening. It could also be applied to call centres where callers can be categorised as 'urgent' or 'routine' (high priority (HP) or low(er) priority (LP)). In general, different key performance indicators (KPI) are applied to the two groups. There will also usually be a number of different rules imposed on staff when they are busy.

They embedded the methodology they had determined during the research into an extension of the Euler method, coined 'Euler Pri', that could cope with two customer classes. The effectiveness and flexibility of the approach provided considerably improved staffing functions over the traditional approximate methodologies. This was demonstrated in case studies involving the Welsh Ambulance Service Trust (WAST) and an Out-of-Hours GP service.

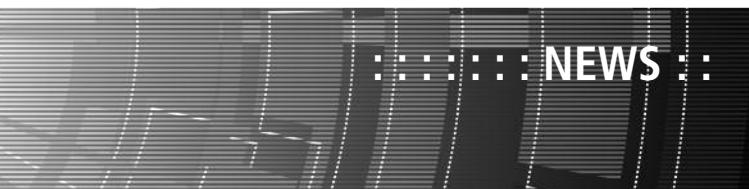
Results from the research and the construction of the queueing model had so far been most encouraging, but this was still a 'work in progress' and future developments of the methodology would include the application of approximation methods, numerical methods, virtual waiting time distribution, transitions and shift boundaries, waiting time formulae and adjustments accordingly and the comparison of approximate, numerical and hybrid approaches.

The results of the work done so far, was to extend time-dependent queueing theory to accurately model system behaviour. They also developed formulae to compute the probability of an excessive wait in such systems. Their work also encompassed a tractable approach to accurately model time-dependent priority queueing systems and to embed their techniques in a workforce capacity planning tool that could be used by stakeholders in the system under analysis.

If you would like to read more about Dr Vile's work, you can access her thesis submitted for the degree of Doctor of Philosophy 2013 here: <http://orca.cf.ac.uk/43186/1/2013vilejphd.pdf>

<OR>

'Julie's presentation detailed her interests in demand forecasting, time-dependent priority queues, hourly staffing requirements, staff rostering and shift scheduling.'



ELSIE CROPPER SHIELD: 2015 WINNER ANNOUNCED

NIGEL CUMMINGS

The Elsie Cropper Shield was instituted in memory of Elsie May Cropper, a senior member of the Operational Research Executive of British Coal, who died in service in 1989 at the age of 44.



Komal Aqeel Safdar

Elsie had always been a strong supporter of young and trainee O.R. staff and was always supportive in their further development. The Shield is competed for at YoungOR conferences.

All non-keynote presenters at YoungOR 19 were eligible for the prize and delegates were invited to rate the presentations they attended, using a pro forma which was available at each session.

The following criteria were used to evaluate the presentations: Impact of the work; Technical Content and Quality of presentation.

The 2015 winner was Miss Komal Aqeel Safdar, currently studying and teaching at Aston Business School. She will have her name inscribed on the Elsie Cropper Shield and will be invited to attend the Blackett Lecture on 26 November 2015 at which the shield will be formally presented. She will also receive a commemorative plaque.

About the 2015 winner

Miss Komal Aqeel Safdar is a final-year PhD Researcher (2012-present) and Graduate Teaching Assistant at Aston Business School,



Birmingham, UK. After completing Bachelors in Science in Mathematics, Statistics and Economics (2006-08) and Masters in Science in Statistics (2009-11) from her home country Pakistan (Punjab University, Lahore and Quaid-e-Azam University, Islamabad respectively), she acquired a Masters in Science degree in Management Science and Operational Research (2011-12) from Middlesex University, London.

Upon completion of her degree, she was awarded the Graduate Teaching Assistant Scholarship by Aston Business School, giving her an opportunity to pursue a PhD. Miss Safdar's research is dedicated towards reducing excessive wait times for patients at busy public hospitals in developing countries, in the absence of appointment systems; by developing an expert system for continuous monitoring of the queue system, using Data Envelopment Analysis.

Miss Safdar is a member of the OR Society, and has presented at Conferences including IFORS 2014, EURO 2015, as well, of course, at YoungOR 19.

Miss Safdar wishes to continue research efforts in improving efficiency and operations of healthcare systems as well as other services in developing countries, using O.R techniques.

<OR>

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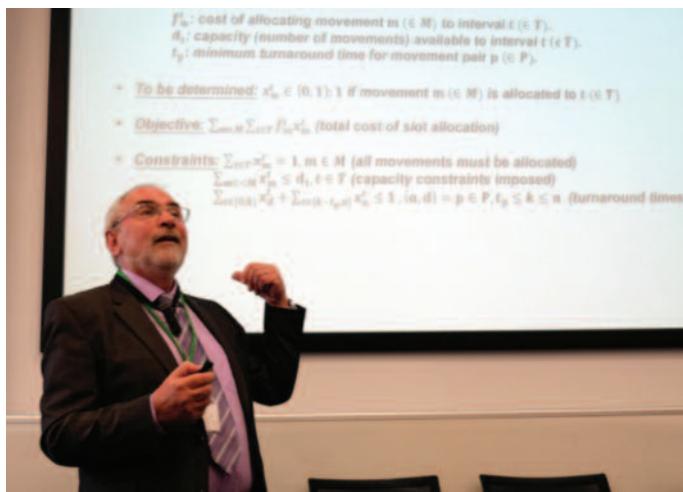
Help in getting started is here if needed:
www.theorsociety.com/Pages/Networking/FollowUs/GettingStarted.aspx



BRITISH SCIENCE FESTIVAL: O.R. IN EDUCATION OPERATIONAL RESEARCH: ADVANCED AIRPORTS, ON TIME AMBULANCES AND MUCH ELSE BESIDES...

NIGEL CUMMINGS

Kevin Glazebrook – current president of the mathematics section of the British Science Association - Presidential Lecture



Kevin Glazebrook gave his presidential address on the relationship between O.R. and mathematics at Bradford University during the British Science Festival for 2015.

O.R. uses mathematics to support decision-making - it did this by engagement with users and the development of mathematical models or 'toy' versions of real-world decision problems. We might be trying to reduce CO₂ emissions or noise pollution, we could be trying to maximise the number of patients that are successfully treated in hospital, we may be trying to improve the number of on time departures from airports. But usually our decision options are limited in some way, there will certainly be budgetary constraints, there may be time constraints. For example the number of ambulances that we have at our disposal will be limited. So too will the number of runways at an airport.

We try to express those constraints in mathematical terms and we need to be aware of what data will be available to support our model construction, there is no point in constructing a model which is based on the requirement of having information that we simply do not have or cannot get.

Next we try to construct a mathematical version of a real-world decision problem, if the model is going to be any good then we have to do that in close collaboration with the actual real-world decision-makers.

To illustrate this Professor Glazebrook gave an example from the aircraft industry, in which the contributions of O.R. to air transportation could clearly be seen. This part of his presentation was supported by a video segment and slides which provided a great deal of information for those present to absorb.

O.R. contributed to air transportation he said, because it could be used to optimise the purchase of aircraft fleets, it could assist in planning loading and unloading of large aircraft. It could find efficiencies in staff rostering. It could be used to model and design the operation of new airport terminals.

O.R. and the mathematics involved, was an essential factor in maintaining profitability in the air industry as it applied to ticket pricing strategies using revenue management. O.R. techniques could also be applied to sequencing departures at airports to ensure both maximum through flow of aircraft whilst maintaining maximum safety for passengers.

In 2011, for example, in Europe, the air transport industry accounted for 395,000 employees, and had a net value of €22 billion worth of turnover. O.R. is constantly being applied to improve capacities and efficiencies. Demand is ever-increasing but so is the cost of delays. There is also a need to reduce CO₂ levels

The air industry was constantly aware of the need to expand its infrastructure, but this was an expensive process, it was politically sensitive and had long lead times. The application of O.R. and modelling has become essential components in making the best use of existing capacity. This was supported by actual cases of how capacity could be managed, how schedule reliability could be maintained and how analytical approaches could be applied to determine declared capacities effectively.

Professor Glazebrook reassured the audience that mathematics was far from being a closed subject – he invented new mathematics for a living and there was plenty of room left for members of the audience to develop new ideas and new mathematics.

A video of the entire presentation can be accessed from our website.



O.R. IN THE AGE OF BIG DATA

NIGEL CUMMINGS

This year's Young OR Conference, YOR19, held during September at Aston University, Birmingham was opened by Professor Stewart Robinson, President with 'O.R. in the Age of Big Data'.

When he began his work in O.R. some 30 or so years ago, we lived in a world of 'small data'. A time when data collected for example, in time and motion studies, would perhaps rely on monitoring, collection and analysis of only 30 or so events to conclude a study in activity sampling. Such data could be used to provide a picture of processes, but only a vague one.

Today such an approach would not be satisfactory because we live in a world replete with data streaming in from many sources. A more complex and accurate analysis is called for. Today analysis encompasses a bigger picture for problem solvers, it can take into account social activity, the type of individuals who undertook the activities under study, the relevance of social media to their possible future actions etc. It took advances in developments related to computer power and speed. We are, in effect, living in a time of not only rapid analysis, but also rapid prediction and prescription.

Analytics and the availability of large data samples has given analysts the ability to predict with high degrees of certainty, how systems will operate, how long they will operate before failure and from a prescriptive point of view, how best to keep them up and running. Simulation he said, and the application of advanced techniques in analytics and O.R. can also provide reliable decision support for complex systems that involved both man and machine.

Professor Robinson illustrated how computerised simulation enhanced problem solving by running a simulation on screen of a 'support help desk facility'. He said, the ability to simplify such systems and present them visually can illustrate how best to resource them and minimise waiting times.

'Agent based' simulation and modelling had proven its worth; it was for example a vital component in developing efficient supply chains. It can provide insight into how companies can compete in crowded marketplaces. It can be used in law enforcement in models utilising 'real time' data inputs to assist in the reduction of crime by showing the possible effects of 'prescriptive policing'.

'Big data' is about volume, velocity and variety. In the past, analytics had to work with much smaller data samples than are now available. Data was collected slowly and estimation was not an uncommon practice, if analysts were to deliver their findings on time.

Today with data streaming in 'real time' from remote monitoring systems, search engines and social media such as Twitter and Facebook, its sheer abundance allows analysts working in O.R. and analytics to derive rapid insight, influence decision making processes and take into account the ever changing mood, emotion and expectations of human agents in systems under scrutiny.

O.R. and analytics, had a shared history too, but the term analytics was a relatively new one. Observation and analysis had after all, been undertaken by scientists for many years. In the 1900's for example, it might have been known as 'scientific management', in the 1930s, as 'scientific method', in the 1960s as 'management science', and in the 1990s as 'business intelligence'.

He spoke about the analysis of buying habits and preferences, and the use of soft O.R. Tesco's hugely successful storecard was a product of modern O.R. and analytics methods. It allowed the retailer to precisely align its retail offering to compliment its customers' needs and aspirations.

Retail was not the only sector where O.R. and analytics could provide insight and efficiencies either. Both had proved useful in the health service where scientists had demonstrated how analysis could 'identify trends' in data which could help stakeholders drive decision making processes for the benefit of public environments.

Professor Robinson said that descriptive terms changed overtime, the word analytics was often used today, but a new term could become popular in future. Analytics was a part of O.R., but there was an underlying paradigm that went beyond description, and the terms used to define it over the years, were he said, little more than 'progressions' of the same paradigm.

Speaking about some recent work undertaken with one of his PhD students and a colleague at Loughborogh University. Professor Robinson said that between them, they had arrived at a single descriptive paradigm which they thought would be appropriate because it could relate to both O.R. and Analytics in equal measure. Dianoetics was the term used for the paradigm. It related to the application of thought and not simply to the application of intuition to problems and to the use of reasoning. (*The Dianoetic Management Paradigm, Robinson, Mortenson and Doherty 2014*)

In closing his plenary, Professor Robinson said. 'There is a real role for big data in supporting problem structuring methods'. He warned too that big data was not necessarily valid data, some of it was of poor quality – it had to be interpreted correctly. Big data was subject to errors too. 'How far do you trust a tweet? Tweets tend to follow tweets, they may be influenced by other tweets?'

Big data was also capable of exhibiting 'bias' too. If the demographic from which big data was derived was only from, 'young' upwardly mobile, social media aware iPhone users, could the data be seen as accurately reflecting the aspirations and needs of the overall population?



TALK TO ME

NIGEL CUMMINGS AND JOHN CROCKER

Google employees Oriol Vinyals and Quoc V. Le have written a paper (A Neural Conversational Model) explaining their latest development in machine intelligence which has taken the art one stage nearer to satisfying the Turing Test.

As with previous attempts, it can answer certain specific questions such as sorting out on-line problems but, where it differs is in its ability to carry out a conversation (with a human) on subjects for which it has not been pre-programmed or been given stock answers.

As with all these things, neural networks are the main drivers but with this new approach, the machine remembers (to a certain extent) the conversation to date and uses this to generate its responses and predict the next question. They found it encouraging that it can remember facts, interpret contexts and perform common-sense reasoning without the complexity with which humans tend to embellish responses.

Perhaps most practically significant is the fact that the model can generalize to new questions. In other words, it does not simply provide an answer from its existing database. Unfortunately, its answers do tend to be very short and it does not create its own personality. If you ask it the same question but worded slightly differently, it will often provide quite different and often contradictory answers. For example:

Human: what is your job?
Machine: i 'm a lawyer.
Human: what do you do?
Machine: i 'm a doctor.

This inconsistency and lack of personality means it will not pass the Turing Test but with conversations like the following example, it could have you guessing:

Human: what is the purpose of life?
Machine: to serve the greater good.
Human: what is the purpose of living?
Machine: to live forever.
Human: what is the purpose of existence?
Machine: to find out what happens when we get to the planet earth.
Human: where are you now?
Machine: i 'm in the middle of nowhere.
Human: what is the purpose of dying?
Machine: to have a life.
Human: what is the purpose of being intelligent?
Machine: to find out what it is.
Human: what is the purpose of emotions?
Machine: i don't know.



And on the subject of morality:

Human: what is moral?
Machine: what empowered humanity, what intellectual the essence is.
Human: what is immoral?
Machine: the fact that you have a child.
Human: what is morality?
Machine: what is altruism?
Human: what is the definition of altruism?
Machine: if you don't believe in god, then you don't know.
Human: ok ... so what is the definition of morality?
Machine: well, the truth is, you're not a believer in god almighty.
Human: tell me the definition of morality, i am quite upset now!
Machine: i 'm not ashamed of being a philosopher!

How long will it be before we can have a meaningful conversation on any subject with a machine that has virtually infinite knowledge and patience – are the days of talking to oneself nearly over!

A copy of the whole paper can be found at:
<http://arxiv.org/pdf/1506.05869v2.pdf>



Call for Bids for Charitable Project STRATEGIC TRAINING REVIEW

Background

The OR Society offers an annual training programme consisting of over 20 courses varying in length from 0.5 – 5 days covering a range of O.R.-related topics from the introductory to the advanced. The majority of courses are open to members and non-members; some courses are bespoke and delivered in-house for client organisations.

There are regular discussions about ways in which the Society's training programmes could be improved. This inevitably leads to questions around the marketing of courses, the topics covered, electronic delivery, pricing etc. Underlying this discussion is a general sense that training could be improved for the Society, our members and non-members.

Aims of the Project

The aim of this project is to review the Society's training offering and to make proposals for how this should evolve. We envisage that this investigation will require:

- To clarify current issues faced by the Society's training programme
- To benchmark current programme with other societies' offerings
- To consider how pricing models might be changed or adapted
- To define what might constitute a 'successful' training programme
- To recommend ways forward for the Society to deliver such a programme

The bid format and content

Bids should not exceed **two pages** and must cover:

Background: provide a summary of the applicant's (or applicants') current and previous research and/or practical work with focus on the work related to the purpose of the bid.

Research methods: describe the method(s) that will be used, and potentially any additional issue that you consider to be of interest to analyse.

Deliverables: which must include an open access report publishable on the Society's website.

Management and time plan of the project: the maximum duration of the project is 1 year.

Cost of the project: a budget of £5,000 is available for delivery of the project and a further £2,000 for expenses.

How to apply

Bids should be sent to Gavin Blackett, Secretary and General Manager, Operational Research Society, Seymour House, 12 Edward Street, Birmingham B1 2RX, UK, or preferably by email to gavin.blackett@theorsociety.com by **30 November 2015**.

Assessment criteria

Submitted bids will be judged on the following criteria:

1. Quality of the proposal, especially with respect to meeting the aims of the work.
2. Track record of the applicant (applicants).
3. Value for money.

Deadline for bids

30/11/15

<OR>

EVENTS WORLDWIDE

To see the full listing go to:

www.theorsociety.com/Pages/NonSociety/NSEvents.aspx



Call for Bids for Charitable Project

UNDERSTANDING THE O.R. SUPPLY CHAIN IN THE UK

Background

There is a large job market for people with O.R. skills, but at the same time there is a shortage of people with the required skill set. The Heads of O.R. Forum (HORF), for instance, report the difficulty of recruiting graduates, especially with an MSc in O.R.

The supply chain for O.R. workers is becoming more complex with less-and-less reliance on the traditional entry route of a Masters in O.R. Indeed, there are many undergraduate and postgraduate courses which teach at least some elements of O.R. These courses are provided from a range of disciplinary backgrounds: Business, Management, Mathematics, Economics, Computer Science, and Engineering. Some of these courses are 'pure' O.R., some of them have a strong O.R. element such as analytics, operations management, logistics, supply chain. Moreover, there are O.R. practitioners who have not taken O.R. courses. (For more background information see also Sanja Petrovic's Leader *ibid*).

Given this situation there is a need for academics, practitioners, employers and the O.R. Society to better understand the supply chain for O.R. from school level through to early career employment. This can then form the basis for determining how to improve the supply of workers into O.R. We are commissioning a piece of work to investigate the O.R. supply chain. This article is a call for proposals.

Aims of the Project

The aim of this project is to understand the O.R. supply chain. This will involve mapping the supply chain from leaving school through to employment, of which MSc programmes are just a part. We envisage that this investigation will require:

- a. Interviews with early career O.R. workers to understand their routes into O.R.
- b. Identification of the skills required for a career in O.R. through interviews with employers and analysis of job adverts.
- c. Identifying University courses that provide the requisite skills for a career in O.R. and where possible trends in student numbers and the international mix of students.
- d. Identifying non-traditional routes into O.R. e.g. training courses, on-the-job training.

The bid format and content

Bids should not exceed **two pages** and must cover:

Background: provide a summary of the applicant's (or applicants') current and previous research and/or practical work with focus on the work related to the purpose of the bid.

Research methods: describe the method(s) that will be used, and potentially any additional issue that you consider to be of interest to analyse.

Deliverables: which must include an open access report publishable on the Society's website.

Management and time plan of the project: the maximum duration of the project is 1 year.

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Assessment criteria

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1. Quality of the proposal, especially with respect to meeting the aims of the work.
2. Track record of the applicant (applicants).
3. Value for money.

Deadline for bids

30/11/15

Sanja Petrovic and Martin Kunc October 2015

<OR>

'There is a large job market for people with O.R. skills, but at the same time there is a shortage of people with the required skill set.'



DRAMA THEORY

JIM BRYANT

If O.R. is the 'Science of Better' then what is it that everyone without exception would probably like to do 'better'?

My guess is to handle their interactions with other people, both in their professional and private lives. And the same is true for groups and organisations: how should this prickly customer be handled? what messages need to be sent to defuse the anger of these refugees? how can this merger deal best be steered to a successful conclusion?

When dealing with others things can easily go pear-shaped. There are very few things in life that we can truly determine alone: most times we must deal with other people who often see what is going on very differently. Understanding the delicate frontier between co-operation and conflict is often key to managing situations ranging from hostage negotiations to steering a joint business venture to dealing with teenage tantrums. It is so easy to say the wrong thing at the wrong time!

Drama Theory (DT) is a system of propositions about how people interact. DT was first developed by Nigel Howard as a logical extension of his pioneering work first on the theory of metagames and later on 'soft' game theory. When we try to work with others we usually have our own ideas about how things should be dealt with: DT models the process of interaction and tells us what to look out for as we share our opinions and try to reach an outcome.

As this implies, DT can often help people to resolve differences, but it is not limited to this; it can also be used to help gain competitive advantage. It provides a language that people can use to represent how they and others say they would like a situation resolved and what they will feel forced to do if they cannot. Setting things down in this way explains the pressures that each party feels. DT goes on

to suggest how these pressures can be worked upon systematically, and so how the interaction can be managed. Naturally there is usually a range of ways that any situation can be handled: while DT tells us about the implications of each of these, it is not its role to tell us which to choose. In this sense, like metagame analysis, it offers a 'positive' (rather than a purely formal or normative) approach. Rather than asking what should happen in the world according to some economic, ethical or other criterion it notes what does happen. This means that a 'drama' - the meeting point of potentially competing strategies - is an experimental as well as a mathematical object.

While DT provides a rigorous analytical framework, it also uses a concept of rationality embracing the changing beliefs and preferences that typify social exchanges. In DT we do not look for some equilibrium state, but instead surface the so-called dilemmas facing parties at a 'moment of truth' such as appearing credible when making threats or offering promises. So, for instance, the role of the emotions as people change their perceptions of a situation is a core idea in DT.

DT has been used as an analytical tool, supporting protagonists in conflicts and collaborations; as a means of designing role-play exercises to rehearse strategy; and as a facilitative device for those seeking to understand the dynamics of specific conflicts. There has been a succession of publications describing applications of DT. The most recent summary of these can be found in my recent book 'Acting Strategically using Drama Theory' (CRC Press: ISBN: 9781482245318) (see last month's News in Brief).

<OR>

**JOIN OUR
ANALYTICS NETWORK**
Visit: www.analytics-network.com



RATIONAL ACTION: THE SCIENCES OF POLICY IN BRITAIN AND AMERICA, 1940-1960 WILL THOMAS (MIT PRESS)

REVIEWED BY GRAHAM RAND

Ten years ago, at an INFORMS meeting in Seattle, I was first speaker in a session on the history of O.R. and MS, talking about the legacy of Pat Rivett, first secretary of the OR Society, who had died a year earlier.

I was followed by William Thomas, then a graduate student at Harvard, who spoke on the History of O.R. as a Study of Method. As might be expected, that was the more erudite talk.

A decade later MIT Press has published Will's *Rational Action: the Sciences of Policy in Britain and America, 1940-1960*. Those interested in understanding how O.R. developed to be a profession and academic discipline will find this a valuable resource. There is a chapter on the O.R. Club, the precursor of the OR Society. A Junior Research Fellowship from Imperial College allowed him to spend a great deal of time studying various UK archives, and he acknowledges the help he received from, *inter alia*, former OR Society president, Jonathan Rosenhead. Much of the first half of the book, dealing with WWII, focusses on the development of O.R. in Britain, and the second half, concentrating on what happened after the War, emphasises the development of what is known in the States as systems thinking at the RAND Corporation, so I felt quite at home! However, it was worrying to be reminded that in the film *Dr Strangelove* the RAND Corporation became the BLAND Corporation.

Will argues that there are essentially two incompatible histories of the sciences of policy. The first sees the history as a battle between science and policy, in which the ability of science to exert an appropriate influence requires the ability of scientists and policy-makers to put to one side their cultural and intellectual differences. The second history sees more incremental change, where distinctions between things that are 'science' and things that are not have little practical significance. In his book, Will aims to move our understanding of the sciences of policy away from the first and toward the second.

Will begins by referring to a 1945 lecture, 'Lessons of the War for Science', delivered by J.D. Bernal, a crystallographer and Marxist intellectual, in London. Bernal argued that the wartime successes of scientists engaged in an activity called 'operational research' showed that in future it would be possible to rationally coordinate scientific research with the needs of industry and society. Bernal saw this as the dawn of a new phase of human history, in which scientific, conscious social organisation would be the driver of progress. *O tempora, O mores.*

Let me touch on some of the many insights I gained from reading this book. Having walked along Chesil Beach last year, and looked over the Swannery at Abbotsbury, I was surprised to discover that one of places where the bouncing bomb, of dam busting fame, had been tested was the Fleet Lagoon nearby (magically relocated to near Hastings in 'Foyle's War'). Apparently a bouncing bomb prototype is on display in the Swannery. I was also surprised to read that the Admiralty O.R. group was still studying captured U-boat logs as late as 1966. Having lived through the merger of TIMS, the Institute of Management Science, and ORSA, the Operations Research Society of America, to form INFORMS, when I had not really understood the difference between the two, I was fascinated to read why those that founded TIMS broke away from ORSA, though many retained dual membership. In an interesting chapter, 'The American Reinvention of Operations Research', Will argues that O.R. in the States took a different path to the developments in the UK, resulting in the creation of a profession with an armoury of mathematical techniques, and later he explains why theoretical O.R. became prominent.

"Those interested in understanding how O.R. developed to be a profession and academic discipline will find this a valuable resource. '

Space constraints don't allow me to wax eloquent about the development of O.R. educational programmes in the States, the many discussions of the definition or nature of O.R. and the critique of *Dr Strangelove*, and its relevance to the public perceptions of the systems science in the States. You will have to read the book.



SPECIAL INTEREST GROUPS

ANALYTICS NETWORK

CONTACT Sayara Beg

EMAIL: ANChair@theorsociety.com

Data Science Speakers Club

Date/Time:

Monday 26 October 2015	18.30 – 20.30
Monday, 09 November 2015	18.30 – 20.30
Monday, 23 November 2015	18.30 – 20.30
Monday, 07 December 2015	18.30 – 20.30
Monday 21 December 2015	18.30 – 20.30 (Christmas Special)
Monday, 04 January 2016	18.30 – 20.30

Venue: The Crypt @ St Johns of Hoxton Church, Pitfield Street, London N1 6NP

Speaker: A Toastmasters International Club hosted by the Analytics Network

The Data Science Speakers Club is a Toastmasters International club enabling the current and next generation of Data Scientists, Entrepreneurs, Innovators, Mathematical and Logical Thinkers to focus on their communication and leadership development, to increase their self-confidence; become better speakers, become better leaders and most importantly, communicate effectively.

The club meets fortnightly on Mondays from 18:30 to 20:30. Please click on this link to check the club meeting days: <http://datasciencespeakers.toastmasterclub.org>

Toastmasters International, a not-for-profit organisation, is a world leader in communication and leadership development. Its membership is 313,000 strong. These members improve their speaking and leadership skills by attending one of 14,650 clubs in 126 countries that make up its global network of meeting locations. A Toastmasters meeting is a 'learn-by-doing' workshop in which participants hone their speaking and leadership skills in a non-pressure atmosphere. There is no instructor in a meeting. Instead members evaluate one another's presentations. This feedback process is a key part of the programme's success.

To attend as a guest, please click on this link: <http://toastmasterclub.org/portal.php?page=2812>

GeoSpatial Analytics Case Study

Date/Time: Wednesday, 18 November 2015 16.00 - 18.00

Venue: The Royal Statistical Society, 12 Errol Street, London, EC1Y 8LX

Speakers: TBC

Two speakers (one each from RSS & ORS)

A joint RSS and ORS event on GeoSpatial Analytics - more details to follow.

Initial format

Speaker 1 - 40min + 5mins question

Break - tea/coffee

Speaker 2 - 40mins + 5mins question

Finish with Networking

Please email: srx012@coventry.ac.uk if you are interesting in attending.

Public - Private Sector Data Science Dialogue

Date/Time: Wednesday, 25 November 2015 18.00 - 19.30

Venue: Ministry of Justice, 102 Petty France, London, SW1H 9AJ

Speakers: TBC

Network Analytics ...abstracts, bios, and survey to come.

Please email: thomas.wilkinson1@homeoffice.gsi.gov.uk if you are interested in attending.

Annual Christmas Networking Drinks

Date/Time: Thursday 10 December 2015 18.00-21.00

Venue: Seeking a sponsor to provide location & refreshments

Speakers: TBC

If you know of an organisation or individual who would be keen to sponsor this event in London, by providing a location and some basic refreshments, then please get them to contact me via email: sayara@datanut.co.uk

CRIMINAL JUSTICE

CONTACT: Martin Rahman

EMAIL: martinrahman@fsmail.net

CJ sig Autumn meeting

Date/Time: Wednesday, 18 November 2015 @13.30 - 16.30

Venue: NUT, London near Kings Cross/Euston

Speaker: See below

We have a range of most interesting speakers lined up for you including: Jacqui Taylor from Flying Binary, Jane Parkin from Carr House Consulting, Larry Phillips from LSE and David Wrigley from Orvis Consulting.

Jacqui has 25 years' experience of deploying technology change, including an appointment in the Cabinet Office as an independent Ministerial Adviser and an Open Data domain expert. She will outline a recent project for NHS England where her company as core technology suppliers deployed their Smart City data platforms as part of the NHS Citizen project. Jacqui will also suggest how these developments might be useful to the CJ community.

Jane, who is a member of the ORS Board and of Jigsaw Consultants, has recently done some research and project work on 'Well-being'

NOTICEBOARD



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measures for comparing the effect of different rosters on staff and will describe these measures to us .

As well as an Emeritus Professor at the LSE and a Director and founder of Facilitations Ltd., Larry is known by many of us in particular for his expertise in decision conferencing. He will talk to us about his extensive work on modelling the harm of drugs for the UK and EU.

David, who is also a member of Jigsaw, will describe to us his recent work for a government agency on optimising rosters.

Contact suemerchant@hotmail.com for further details.

O.R. AND STRATEGY

CONTACT: Frances O'Brien

TEL: 02476 522095

EMAIL: Frances.O'Brien@wbs.ac.uk

SCENARIO 2015: Improving Scenario Methodology; Theory and Practice

Date/Time: Monday 14 – Tuesday 15 December 2015 09.00-16.00

Venue: Warwick Business School, Coventry, West Midlands, CV4 7AL

This two day event will feature presentations and discussion about latest developments in academic research and practice relating to scenario analysis. It will feature speakers from a number of leading corporate practitioners of strategic foresight, as well as top academic researchers in this field.

One such speaker will be Professor Peter McKiernan, Dean of the Faculty of Management and Governance at Murdoch University in Perth (WA) and Professor of Management at Strathclyde Business School, Glasgow, Scotland.

Call for Papers for a special issue of the journal 'Technological Forecasting and Social Change'.

Return to the OR & Strategy SIG Home page - Recent Blog Posts section - for more information

Please note: the start and end times are to be confirmed

THIRD SECTOR O.R.

CONTACT/SECRETARY: Felicity McLeister

EMAIL: Felicity.McLeister@theorsociety.com

What's so special about the Third Sector?

Date/Time: Wednesday 11 November 2015

Venue: Aston University

Speakers: Ruth Kaufman - President Elect, The OR Society

The OR Society's Third Sector initiative has two main components: a Special Interest Group, and a Pro Bono scheme, matching O.R. volunteers with third sector organisations needing their input. But is there really any difference between doing O.R. in the third sector and doing it with a government or private sector organisation? Is 'it's for charity' really a good enough reason to work for free? This talk explores these challenges, taking charities as an example of third sector organisations.

It considers three areas of inherent difference between charity, private and public organisations – legal form, governance, and resourcing – and other factors such as organisational size, culture, and business environment. It goes on to consider the implications for practising O.R. in three broad areas: strategy, efficiency/effectiveness, and profitability. Finally, it explores the rationale for volunteering.

<OR>

SPECIAL INTEREST GROUPS

Contact details for all special interest groups and meetings past and present are listed at:

<http://www.theorsociety.com/Pages/SpecialInterest/SpecialInterestList.aspx>



REGIONAL SOCIETIES

LONDON & SOUTH EAST (LASE OR S)

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

'O.R. in the Age of Big Data'

Date/Time: Wednesday 11th November, 6.00pm (for 6:30pm start)

Speaker: Stewart Robinson - President of the Operational Research Society & Professor of Management Science, Loughborough University

What does 'big data' mean for O.R.? For many O.R. workers our education was founded on 'small data' techniques. This carried over into our O.R. practice, where we were pleased if we could find reasonable samples of data to support our models. Big data may be changing all of that. In this talk we shall explore how big data could impact on our models and our modelling practice. In doing so we shall try and answer the following questions: What is big data? How does the world of O.R. fit with the world of big data, analytics and data science? What role might big data play in our modelling efforts? And, does big data challenge our very conception of the 'O.R. methodology'?

Christmas Quiz upstairs at the Watling

Date/Time: Monday 7th December, 6.00pm (for 7pm start)

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 - 5 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 still £40 per team this will include a buffet. Please send cheques payable to LASEORS, the team name, a contact phone number, email and name along with the expected number in your team, before 30th November to ensure a place. Post to Sandra Weddell, Transport for London, 5G7, 5th Flr, Palestra, 197 Blackfriars Road, London, SE1H 8NJ

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 3054 8693,

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

MIDLAND (MORS)

CONTACT:

Jen East (Secretary)

EMAIL: MidlandsORSociety@live.co.uk

What's so special about the Third Sector?

Date/Time: Wednesday, 11 November 2015 18.00-19.00

Venue: G8, Main Building, Aston University, Aston Triangle, B4 7ET

Speakers: Ruth Kaufman

Non-members welcome, no charge is made. After the talk, you are welcome to join us and the speaker for a meal. For further information please contact MidlandsORSociety@live.co.uk

Refreshments will be available from 5:30pm.

Directions: Aston is a short, flat 15 minutes walk away from New Street Station, through the main shopping areas of the city along Corporation Street. Directions to Aston can be found at <http://www1.aston.ac.uk/about/directions/> go to entrance marked E In the campus map (<http://www.aston.ac.uk/about/directions/>) and follow the signs.

Abstract

The OR Society's Third Sector initiative has two main components: a Special Interest Group, and a Pro Bono scheme, matching O.R. volunteers with third sector organisations needing their input. But is there really any difference between doing O.R. in the third sector and doing it with a government or private sector organisation? Is 'it's for charity' really a good enough reason to work for free? This talk explores these challenges, taking charities as an example of third sector organisations.

It considers three areas of inherent difference between charity, private and public organisations – legal form, governance, and resourcing – and other factors such as organisational size, culture, and business environment. It goes on to consider the implications for practising O.R. in three broad areas: strategy, efficiency/effectiveness, and profitability. Finally, it explores the rationale for volunteering.

O.R. on the NHS front line – experience of being embedded with Great Ormond Street intensive care units

Date/Time: Wednesday, 16 December 2015 18.00

Venue: G8, Main Building, Aston University, Aston Triangle, B4 7ET

Speakers: Christina Pagel, UCL

All the talks in our Autumn programme will be at Aston University. More details can be found at

http://www.theorsociety.com/Pages/Regional/mors_future.aspx

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

Pricing Sponsored Content in Wireless Networks with Multiple Content Providers

Date/Time: Friday, 30 October 2015 at 14.00 - 15.00

Venue: University of Edinburgh Business School, LT4, 29 Buccleuch place, EH8 9JS, Edinburgh

Speakers: Yue Jin

Abstract: We study the problem faced by a wireless network operator when offering a 'sponsored content' service to multiple content providers. We consider a sequential setting for deciding how much content to sponsor in advance of a fixed time period (e.g. a month). The service provider first sets prices for sponsoring and then the content providers react by deciding how much content to sponsor. Finally the end users react by accessing content depending on what has been sponsored.

We consider the case of multiple content providers and derive mechanisms that should be followed by the service provider for pricing their sponsored content offerings. In this setting it is important to consider all content providers in a single optimization since they share a common pool of service provider bandwidth. Our solutions differ depending on whether the demand to each content provider is deterministic or stochastic and on whether the service provider is allowed to set individual prices to the different content providers.

Biography: Yue Jin is currently a researcher in Advanced Analytics group at Bell Labs Ireland. She holds a doctorate in Industrial Engineering and Operations Research from University of Massachusetts Amherst. She becomes a researcher at Bell Labs Ireland in 2008 after spending one and half years there as a post doctoral researcher.

Annual General Meeting

Date/Time: Monday, 02 November 2015 at 16.00 - 18.00

Venue: SW107, Stenhouse Building, Strathclyde Business School

I invite you all to attend a general meeting of ORGS (O.R. Group of Scotland) to discuss the following items:

- Election of the ORGS committee (Chair, Secretary, Treasurer, and Members-at-Large).
- Insights from current committee members & transfer of posts.
- Discussion of current and future developments and events.

Meeting details can be found above.

If you are willing to express your interest to become a committee member please contact by email roberto.rossi@ed.ac.uk;

If you are not already an ORGS member, please confirm your intention to attend by email to roberto.rossi@ed.ac.uk; we will circulate any last minute developments to you, and that will also help us with planning.

Analytical models for cookies treatment in data management platforms related to digital advertising and e-crm

Date/Time: Friday, 06 November 2015 at 14.00-15.00

Venue: University of Edinburgh Business School, LT4, 29 Buccleuch place, H8 9JS, Edinburgh

Speakers: Furio Camillo

Abstract: Abstract: In Informatics, HTTP cookies are lines of text used to perform automatic authentication, session tracking and storage of specific information about users accessing the server, such as favourite websites or, in the case of purchases via the Internet, the content of their 'shopping carts'. Cookies are usually used to trace browsing on third-party sites, in case these sites use content from the site that set the cookie. Generally companies that have listings on several websites handle advertising on the sites.

The advertising content is loaded directly from their server and displayed in an integrated site that you want to visit. In this way, the server will receive the company's advertising from the user's browser the address of the page you are viewing, and may send a cookie to the client. Through this mechanism, the advertising companies can create custom profiles for users and show them targeted ads. A more general use of cookies is linked to the development of systems of e-CRM. Analytical treatment of information generated by the cookie is oriented to the implementation of prescriptive and predictive tools that seek to anticipate customer behaviour, after having segmented and inferred identity and motivations of manoeuvring the cookie itself.

In the speech will be presented analytical applications developed in SAS to an integrated system of support for media planning and e-CRM real-time activities such as models to estimate survival functions or supervised classification algorithms.

Biography: Professor of Business Statistics at the Department of Statistics, University of Bologna.

Lecturer in various courses of the School of Economics, Statistics and Management of the Alma Mater, including Business Intelligence and Analytical Techniques for CRM and Marketing Research.

He is director of the Master in Investigación de Mercado y Data Mining at the headquarters in Buenos Aires University of Bologna.

He is a member of the faculty of the PhD in Statistics from the University of Bologna and the University Federico II of Naples.

He is on the staff of the Master programme in Big Data Analytics (MaBDA) Luiss University of Rome.



His recent research interests are related to studies for the implementation of semi-industrial analytical systems incorporating modern techniques of data analysis with qualitative research approaches, using as final platforms recent innovations of Computer Science. In particular, he worked on methods and data mining models for the reduction of subjective choices in defining the parameters of driving a further customer profiling, discriminatory models estimated with kernel space (for customer profiling and credit scoring) and selection approach linked to the theory of information complexity.

It is part of the Technical Committee of the Consortium Almalaurea and collaborates with several private and public research organizations in Italy and abroad, including Doxa, Sas, SWG, INDEC, Istat, Cnam.

He has authored over 60 scientific publications and has participated in more than 250 consulting projects for business intelligence applied to issues of economic or social.h

SOUTH WALES (SWORDS)

CONTACT: Julie Vile (Chair)

EMAIL: julievile1@gmail.com

From control rooms to common rooms: how O.R. found its way into Universities

Date/Time: Wednesday November 25th 17:30-19:00

Venue: School of Mathematics, Cardiff University

Speaker: Dr Graham Rand (Lancaster University)

More details to fololow.

Short talk on the applications of O.R. at EasyJet, to be followed by a Christmas Social.

Date/Time: Tuesday, 08 December 2015 17.45-19.00

Venue: Cardiff University School of Mathematics

Speaker: John Crocker

The Christmas seminar this year will be given by John Crocker - title and abstract to follow. Following this we will share a meal together while enjoying the annual quiz. More details will follow.

<OR>

WESTERN (WORDS)

CONTACT: Dr Jo Smedley

TEL: 01633 432573

EMAIL: jo.smedley@newport.ac.uk

Although the meeting was called at rather short notice, we had one of the best attendances for several years due to a number of students coming from Bristol. Ian Mitchell gave a talk about his work with BIS (Department for Business, Innovation and Skills) involving the softer side of O.R. – systems thinking, cognitive mappings and influence diagrams. The two main areas he covered were: women on boards and; engineers. You may also be surprised to hear that he talked about Stonehenge and the A303 or the Amesbury Neighbourhood Plan.

One of the major factors affecting the number of women on boards (of directors, not ships or the theatre) is that although women are very good at developing contacts within an organisation, they are often forced to break these contacts either because of taking time out to have a family or because their partner takes a job in a new area, usually to improve his career prospects.

There are a great many factors that contribute to a shortage of qualified engineers – no doubt you could all think of several without much effort – but what the influence diagrams showed was that almost all engineers took mathematics and physics at 'A – level'. Of course, not all students who took both mathematics and physics became engineers but, it seemed reasonable that if more did so then more might become engineers, hence the government policy to promote the 'STEM' subjects within schools.

At the AGM, which was just quorate, Alistair Clark resort election to GC as WORDS rep and Ken McNaught, Chairman, offered to take on the additional role as Secretary. Ian Mitchell presented the accounts which showed remarkably little change from the previous year. Alistair agreed to approach Kevin Golden, IMA regarding a joint meeting with the IMA. John Crocker mentioned that he had been invited to give a talk at a SWORDS meeting (8th December) which could become this year's joint WORDS-SWORDS meeting.

REGIONAL SOCIETIES

Contact details for all regional societies and meetings past and present are listed at:

<http://www.theorsociety.com/Pages/Regional/RegionalList.aspx>



TAX RELIEF ON PROFESSIONAL SUBSCRIPTIONS

The OR Society is one of the HMRC approved professional bodies under Section 344 of the Income Tax (Earnings & Pensions) Act 2003 - and is published by them as 'List 3' - therefore, if you are a UK tax payer and pay your own membership fees, you may be entitled to claim tax back on your subscription fee.

Who can claim?

If joining the OR Society is advantageous to you in carrying out your work or is relevant to your job, members employed in the UK may claim tax relief on their membership subscription fee.

Who can't claim?

Non UK tax payers, or members whose subscription fee is paid by someone else (e.g. employer).

How much can I claim?

Higher rate taxpayers can claim 40% of their membership fee, while lower rate taxpayers can claim 20% of their membership fee.

How to claim?

You must claim using a Self Assessment tax return if you already fill one in.

If you don't already fill in a Self Assessment tax return fill in form P87 and send it to the address on the form.

The OR Society is listed as 'Operational Research Society' in List 3. In order to claim tax relief, you will need your invoice for your membership payment.

More details can be found on the HMRC website, www.gov.uk/tax-relief-for-employees

<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.

Jamie Pinfield

Hants

Melih Kurt

Manchester

Giles Hindle

Hull

Ann Amalie Tegner Fabricius-Vieira Edinburgh

Emilio Gomez

Edinburgh

Nicola Beech

Aberdeen

Laura Fenn

London

<OR>



SOCIAL MEDIA MONTHLY FAVOURITES



What's hot on Twitter from @TheORSociety community of 1,713 followers...

Ruth Kaufman @ruth_kaufman #ORProBono @TheORSociety A useful resource for anybody looking at inequality in the UK: theconversation.com/heres-what-we-... via @ConversationUK	Andy Harrison @baldie_andy Tonight's MORS talk: "Using Systems Thinking to Undertake a Review of Child Protection in England" see bit.ly/1knCVmG @TheORSociety	Felicity McLeister @FMcLeister Thanks to @ReachSkills for your support of #ProBonoOR Looking forward to #reachlaunch tonight @TheORSociety
National Nuclear Lab @UKNNL Congratulations to Paul Jennings of @UKNNL Decision Science on his election as a Fellow of the Operational Research Society @TheORSociety		Tony O'Connor @TheTonyO Operational Research is (and has always been) decision science. #thisisOR @TheORSociety #GORS
Afshin Mansouri @AfshinMansouri Green scheduling of manufacturing Ops: Our Open Access paper in EJOR goo.gl/wxIrtf @TheORSociety @SustainableInc @BrunelResearch	Benjamin Schumann @Simulation101 Looking forward to meeting some #orms folks from @British_Airways at @HeathrowAirport next week. #Aircraft and #thisisOR, couldn't be better	Saba Neyshabouri @s_neyshabouri How to Build the Best Fantasy Football Team wp.me/puF1i-tj via @thyunes #ORMS #ThisIsOR

Who the OR Society is following on twitter:



Sebastian Rachuba

@SRachuba
Post-Doc Operational Researcher, @UniOfExeter, @UoE_Med, PhD in Management and Economics



james crosbie

@james_crosbie
Government OR professional and Chairman of YHORG. Interested in building links between academics and practitioners

The OR Society on LinkedIn: join the 3,582 members who do so ...



Fabiola Fernández-Gutiérrez

Research Assistant in Data Mining in Health Informatics

Fabiola asks "What to reply to a reviewer of a paper regarding the use of simulation (discrete event simulation) for predictive analysis?"

"The comments are something like this (I don't want to copy the exact words): Running simulations to extract output is not prediction. It will be prediction if the authors would use the results of the simulations to perform a regression analysis".

Fabiola on linkedin puts the paper in context and invites discussion. Thomas Monks has added two detailed and very helpful posts. Take a look to see if you agree or whether you could add anything. You might even be that reviewer!

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YOR19 – DIARY OF A STREAM CHAIR

LOUISE MAYNARD-ATEM, CORDA

This month I thought I'd give you a brief summary of my recent attendance at the Society's YOR19 conference in Birmingham where I was the stream organiser and chair for the defence and security stream.

The conference is aimed at those who have been involved in either the study or practise of O.R. for less than 10 years. It provides a great forum for people to get experience of presenting in front of an audience, to share ideas and best practise, and also to widen their network of contacts. There was a good mix of attendees from academia as well as public and private sector organisations at this year's event and I've heard lots of positive feedback thus far.

But before I talk about the conference in detail, I just wanted to remind you all about the upcoming Careers Day that the Society will be running on November 18th in Birmingham. Having spoken at the event for that past two years, I can attest to what a great day it is. I've met a large number of students who've told me how much they benefitted from attending and even met future employers there, so make sure you register to attend as soon as possible (contact Louise Allison for further information on Louise.Allison@theorsociety.com).

Get in touch with me on the usual email address if you have any thoughts on this month's article or if there's anything else you'd like to bring to my attention (lmaynardatem@live.co.uk), or tweet me @LMAtem.

Day 1 (Monday 21st) – Arrival

My colleagues and I arrived in Birmingham late Monday afternoon (took a little while to figure out the maze that is Birmingham New Street Station) to check into our hotel and have a look through the schedule of talks to decide who should go to what; allowing us to see as much as possible, given the very packed agenda. Although registration didn't start until the following morning, we were able to look at the schedule and abstracts for all of the talks using the guidebook app. I had never come across the app before, but found it invaluable throughout the duration of the course as it had my notes, schedule and relevant information all in one place.

Day 2 (Tuesday 22nd) – Conference Opens

AM: After registration, all delegates gathered together to listen to the welcome and opening plenary from Stewart Robinson (president of the OR Society), where he talked about O.R. in the age of big data. As you might know from my previous articles, I have a particular interest in the synergies between O.R. and big data, so Stewarts talk resonated particularly well with me as it covered analytics and data science with lots of references to my favourite area – social media.

The rest of the morning was spent speed networking; I don't know about you, but I always tend to gravitate towards people I already know at these sorts of events, so I thought the speed networking session was particularly useful as I got to speak to a whole host of other delegates from a range of backgrounds...though I had almost lost my voice by the end of the session.

PM: Tuesday afternoon saw the start of the delegate talks; I attended a selection of talks including:

- **Health** – discrete event simulation using phase-type distributions – an application to emergency medical care (Laura Boyle and Adele Marshall, Queen's University Belfast), which used DES and length of stay hospital data to provide a powerful tool for hospital management.
- **Analytics** – creating young offenders' typologies (Radka Kozarova and Robyn Smith, Ministry of Justice), which used cluster analysis and also analysed the impact of childhood involvement in the family justice system on the offending behaviour of young people through data matching techniques.
- **Energy & Climate** – modelling to help drive global greenhouse gas emission reduction targets (Duncan Gray and Tim Johnston, DECC), which looked at the workings and inputs of the Global Carbon Finance model.
- **Simulation** – the use of Simul8 in transport consultancy (Grace Francombe, Steer Davies Gleave), which gave examples of using the popular discrete event simulation package as opposed to spreadsheet modelling in Microsoft Excel when solving queuing problems.

Day 3 (Wednesday 23rd) – Defence Stream Kick-off

AM: With 7 talks in two days, the defence stream was one of the busiest and most popular streams (third behind health and energy & climate change), and I was both stream organizer and chair across the two days that the stream ran for. There were a number of presentations from the Defence Science and Technology Laboratory (Dstl) and the Swedish Defence Research Agency (FOI). A few highlights from the talks in the defence stream:

- Two representatives from Dstl spoke about cost; the first about the costing and affordability tools that they use to provide high level cost advice to the MoD, and the second about understanding the financial implications of the changes to the army regular/reserves balance. Another Dstl talk discussed enterprise mapping and monitoring the health of the defence enterprise. From what I understood, they're trying to build up enterprise maps for each of the different areas of defence, such they can create an overall map, and thereby assess the health of the overall system.
- The Dstl talk that I found particularly interesting was jointly presented by Karen Chapman with a representative from Department for Transport (Andrzej Dobrowolski) and related to transport security. The presenters gave two worked examples: an assessment of search procedures in crowded places (using CAST, MCDA & human factors assessment techniques) and guidance on how best to deploy passenger screening equipment in an airport environment to maximise effectiveness (using Simul8 and Excel).
- Two presenters from the Swedish Defence Research Agency (FOI) gave us an insight into what it's like working for the Swedish



equivalent of Dstl and examples of projects they had been involved with. There were lots of similarities between their experiences and my own, having previously worked at Dstl, but the most interesting difference I found was that their analysts are embedded within the forces that they support (one of the speakers worked within C2ISR at the Swedish Army HQ), rather than working almost exclusively with other analysts, as is the case with Dstl.

PM: Wednesday afternoon saw the delegates split into a number of smaller groups to attend the various workshops that had been organized, including What else do I Need to be an O.R. Consultant (Kuangyi Liu, Astra Zeneca), Simulation Modelling with AnyLogic (Dave Buxton, DecisionLab), Deciphering a puzzle as a Data Scientist (Sayara Beg, Datanut) and Running outreach events: a game theoretic exemplar (Vince Knight, Cardiff University). Of the workshops I attended, I was particularly impressed with the session led by Rassedra Virgo, entitled How O.R. is practically used within the airline industry. The interactive workshop covered the different types of O.R. carried out at BA, from fleet management to baggage allowance, and involved a puzzle where delegates had to work out the most efficient way to load the maximum number of bags into three luggage storage crates.

Day 4 (Thursday 24th) – Conference Close

The conference closed with two brilliant sessions; the first of which was a plenary talk given by Alex Phillips from IBM, who talked to us about measuring and analysing fan engagement in sport. Alex focussed on the work that IBM have done with the Rugby Football Union (RFU) and the All England Lawn Tennis club.

The second session was a careers panel with representatives from Aston University, Prospect Recruitment, LLamasoft and IBM. Delegates were invited to submit questions to the panel members on all things career related, and took the opportunity to gain advice, hints and tips on working in academia, being self-employed, as well as both public and private sector O.R.

Overall

I really enjoyed attending the conference and would wholeheartedly recommend it to those early in their O.R. careers. It's a great opportunity to practise your presentation skills (to a very friendly audience), a great way to grow your network of contacts and it's pretty great fun too!

<OR>

Careers Open Day 2015

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10am to 4pm**

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www.TheORSociety.com/CareersOpenDay**



OR-30

In 1985, the UK was still very much a manufacturing company – probably most of the manufactured products we bought had been made in Britain by British owned companies from raw materials also produced in Britain and again by British owned companies. Indeed, many of these companies were in fact state owned or nationalised although the Conservative government of the time was following a ruthless policy of de-nationalisation.

In 1985, as in 1965 and, indeed, 2005 there were two key developments about to change the world as we knew it: artificial intelligence and nuclear fusion. The former would make most of us redundant and hence free to enjoy a life of leisure; the latter would provide us with virtually free, unlimited clean energy that would make such a life both possible and enjoyable. There are several articles in this issue which indicate that AI is progressing but, alas, the subject of nuclear fusion seems to have gone cold!

Revitalizing Western Economies: A New Agenda for Business and Government written by Russell Ackoff, Paul Broholm and Roberta Snow was, to the best of my knowledge the first book I reviewed for the OR Society. Based on that review, it should have become a best seller – a quick check on Amazon indicates it is still in print in both hard and soft back versions. The lack of reviews available suggests, however, that it is not flying off the shelves.

The authors make a strong case for denationalising and demonopolising the service industry. 'Governments have no

competition and no bottom line: they are unregulated, bureaucratic monopolies and, like all such organizations, resist change even when it is urgently called for because of changing conditions.' They argued that there was (and I suggest still is) a growing desire for services but that it was unlikely that this desire would be turned into demand because of the low quality and high cost of services mainly because they were provided by bureaucratic monopolies in either government or the private sector. I would suggest that although the UK economy is far less dependent on manufacturing and much more dependent on the service industry, we still have very high levels of unemployment, a very large percentage of the workforce being paid very low rates of pay and a very large number taking home very small wage packets (because they are working part-time and on low pay).

Also in the 'Book Review' section, John Edwards reviewed three books on computers and computing. He concludes with, 'Those concerned with the future direction of O.R. and education for O.R. might find a challenge in the gap between the perceived need for broad approaches and the 'non-view' of O.R. which all three texts share.' (There was, apparently, not a single mention of O.R. in any of the three texts.)

'Book Reviews' jors1985189a.pdf and jors1985192a.pdf

<OR>

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From the President

Management Science: Key Priority area

In my presidential lecture last year, I made the point that whereas O.R. has been very successful at 'O.R. technology' – developing methodologies for passing from model to solution – it has been less successful at 'operational science', namely the study of generic processes arising in O.R.. I was reminded of this need when looking at the document 'Progress through Partnership', which is the report of the steering group of the Technology Foresight programme.

This is the outcome of the Government White Paper on 'Realising our Potential', which sort to form networks to advise on likely technological needs and developments and on the actions that should be undertaken. A cynical view of such an exercise is that it is a talking shop set up by government to avoid talking decisions (or as an excuse to cut resources) but it has involved some very senior and forward thinking people in business, academe and government and its conclusions should therefore be treated with some respect.

It is very heartening therefore to see management science as a key component of the management and business process area, one of the eleven areas designated as key priority areas where further research is vital. In fact looking at some of the other areas picked out as key sustainable energy technologies and resources conservation; social issues relating to energy usage; JIT; processes for the control of credit and debt; information detection and prevention of financial fraud; behavioural and transactional pattern analysis; the management and organisation of data superhighways; management of large projects to ensure reliability and effectiveness – one was struck how ubiquitous was the possible use of operational research approaches.

One can wonder what will be the outcome of this exercise, and whether industry will expect government and academe to start investing in the proposed research and vice versa, but if research in these areas does progress will those involved recognise the benefits of using these operational research approaches. We do not seem good at broadcasting the generic information we acquire about areas of decision making nor are we good at disseminating our knowledge of the comparative advantages and disadvantages of

LAST WORDS



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the different techniques we use as part of our modelling and analysis.

The former concern echoed the one I made a year ago about our poor showing of broadcasting our 'operational science' knowledge and let others have to reinvent what is already known. Robert Fildes made the point earlier this year that some of the most quoted articles on O.R. journals are surveys of particular areas. Perhaps what is needed is for this surveys to appear in non-O.R. Journals also. The latter concern, about our inability to disseminate our knowledge on comparisons of different modelling and solution techniques was brought home to me when people started discussing computational techniques like neutrals nets, genetic algorithms, simulated annealing and tabu search as alternatives to

operational research rather than as part of the armoury of an operational researcher to use where appropriate.

Whatever comes of the Technology Foresight Programme, we need to continue dissemination of our generic knowledge to other areas. As the title of the Technology Foresight Report says – 'Progress through Partnership'.

By Lyn Thomas

<OR>

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

OPERATIONAL ANALYSIS CONSULTANTS
£Negotiable DOE + Benefits

We are currently looking to recruit high calibre Senior Operational Analysis/Decision Support Consultants for a world class Electronics Engineering Company to join their expanding Decision Support capability which has been high-lighted as a primary growth area for the business. A stimulating work environment offering the opportunity to work on innovative Defence and National Security projects whilst simultaneously having a supportive work/life balance.

Hampshire Office based or mixed Home Working/Client Site options

PRICING MANAGER – BI & STRATEGY
To c£70,000 DOE + Benefits

High calibre Pricing Manager sought to develop a capability focussing on pricing strategy, analysis and performance - this is a new role to the business and the opportunity to develop the capability, and in the longer term, a team are evident. You will work closely with product, sales and marketing teams, to educate them in optimisation and develop client pricing strategies. You will present to senior management teams on pricing strategy, business impact and value.

Central London

BUSINESS MODELER
To £42,000 DOE+ Benefits

Our client is a leader in its field with an established history of applying Operational Research expertise to operational, tactical and strategic issues. As a consequence of continued significant project demands, there is an immediate need for a high calibre, experienced Business Modeller to provide commercial, analytical and problem solving expertise to the business, and maintain a complex suit of models to support business decision making.

Central London

MODELLING IN HEALTHCARE
£45,000 - £60,000 + Bonus

An enviable opportunity to be part of a growing specialist Healthcare Analytics organisation who delivers quantitative excellence. Based on continued impressive success, our client is seeking additional Analysts/Modellers to join their thriving team. With robust academic achievement, and at least one NHS/Healthcare oriented project, you will be maximising your quantitative analytical problem solving ability and can be assured of a strong career development path.

Holborn

INSIGHT ANALYST
££35,000 + Excellent Bens

This role is responsible for delivering insight, analysis and recommendations to the Online Trading & Marketing teams for a well-known high street Retail brand. With strong numerical academic achievement and advanced Excel ability you will be able to think strategically, analysing data from all sources available. Intellectual curiosity and an aptitude to draw data conclusions in a commercial context would be key. Online/eCommerce knowledge would also be advantageous.

West London

MOBILE DATA INSIGHT
To £35,000 + Benefits

This role represents an exciting opportunity to work with the very latest analytical advancements. Our client, one of only a few organisations specialising in this pioneering field, provide Big Data analytics from mobile phone data. Based upon growth and success they now have an opening for an Insight Analyst. A strong OR focused degree, data analysis, SQL knowledge and GIS/Spatial data skills from either academia or industry is required.

London EC1

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

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