

# INSIDE O.R.

MARCH 2015 NO 531



## YOU ARE WHAT YOU BUY

:: INSIDE THIS MONTH :: :: :: ::

ON YOUR BIKE

CHURCHILL'S SCIENTISTS

E-INFRASTRUCTURE AND OPERATIONAL RESEARCH

GETTING OVER THE FINAL HURDLE



THE OR SOCIETY

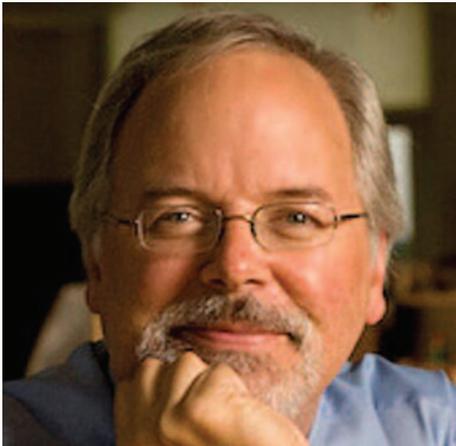
[www.theorsociety.com](http://www.theorsociety.com)





## New President for IFORS

Professor Michael Trick has been elected the next president of the International Federation of Operational Research Societies (IFORS). Michael is senior associate dean for faculty and research at the Tepper School of Business at Carnegie Mellon.



Michael is a researcher and educator in O.R., with a specialisation in computational methods in integer programming. From 1998-2005, he was President of the Carnegie Bosch Institute for Applied Studies in International Management.

Michael was responsible for creating 'Michael Trick's Operations Research Page' on the Internet which provided a hugely informative and inspirational O.R. resource. Michael also maintains a highly entertaining and informative blog about O.R. which can be accessed at: <http://bit.ly/1AAdvF5>

He can be tweeted via @miketrick

## Doctor Analytics

Analytics can now change medicine from retrospective practice to predictive practice thanks to a new predictive health tool developed and launched by 4D Healthcare by former IBM U.S. executive, Star Cunningham.



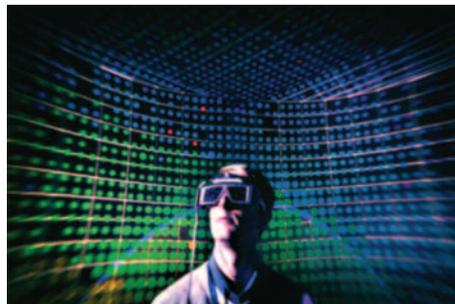
IN BRIEF

The aim of 4D Healthcare is to connect to patients at an individual level and provide customised, personalised and actionable health information. Its software acts as a 'clearinghouse' running across platforms and aggregating immense amounts of patient data. It then uses algorithms to prioritise specific health metrics.

As a long time Crohn's Disease patient, Cunningham understands the frustration of having to navigate medical systems that are sharply divided into silos of information. 4D she believes can break down such barriers and guide patients toward actionable health information. More information can be seen and heard at: <http://bit.ly/17gG57p>

## Simulation may alter our brains

According to neurologist Olaf Blanke of the École polytechnique fédérale de Lausanne in Switzerland, 'Two minutes of simulation can override an entire lifelong experience when it comes to what your body is and where it is.'



Apparently, when we are immersed in virtual reality, new research indicates that we experience behavioural changes that may last for hours, days or even months to come. Researchers like Blanke have started to pull back the curtain on how the brain responds to simulated realities, and they are finding that taking off the headset, or flicking off a screen, does not end the effects of the technology.

More information at: <http://bit.ly/1z4U5c5>

## R.U. Data

At a seminar hosted by the Guardian and sponsored by Accenture, a debate was held to discuss the impact big data is having on the sport of rugby union. The panel

consisted of 'senior figures from the worlds of rugby and business' and the debate took place before an audience of 'some 50 data and digital executives'.

The general conclusion seems to be that [big] data provides an invaluable supporting role but it would be dangerous to rely too heavily on it.

More including a video of highlights of the debate can be found at: <http://bit.ly/1zf5nhn>

## Out of the blue

JJ Food Service has around 60,000 customers and receives some 5,000 orders daily from its catalogue list of more than 4,500 products. Its customers include cafes, restaurants, schools, and office canteens. JJ Food Service is one of the largest independent food delivery companies in the U.K.

Although ecommerce reduced costs and increased efficiency, it reduced interaction resulting in a loss of cross-sell and up-sell opportunities. However, Microsoft's Azure machine learning product has come to the rescue. This does two things: it pre-fills the customer's basket with the items it has anticipated will be required and; it identifies a number of other products that are likely to be of interest to this customer.

'The wow factor is huge', according to Mushtaque Ahmed, COO of JJ Food Service, 'Customers are amazed that we can predict so accurately what they need'.

The next stage is to move to price and warehouse stock optimization.

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

## Plug in and go

Sales of electronic vehicles are increasing worldwide but rather slowly. Research by Michael K. Lim of the University of Illinois at Urbana-Champaign, Ho-Yin Mak of Hong Kong University of Science and Technology,



and Ying Rong of Shanghai Jiao Tong University has been published in INFORMS.

There appears to be two significant factors: vehicle range and resale value. The main problem is not so much the capacity of the battery but the ability to recharge it away from home. One option is to offer exchange batteries via a battery leasing system. The second option is to provide a much better public charging infrastructure such as providing recharging facilities at car parks via special bays for electric vehicles

A number of interesting conclusions arose from the study, and more information can be found at: <http://bit.ly/1v4kXMI>

## Anyone for poker!

It may not win every hand it is dealt, but Cepheus plays a near-perfect game of poker (albeit not the sort most commonly played).



To learn the game, Cepheus spent two months playing the equivalent of more than a billion billion hands of 'heads-up limit hold 'em'. Training Cepheus required the number-crunching power of four thousand computer processors, each handling six billion hands every second.

Cepheus learns from an algorithm that essentially minimises its regrets: the program reviews every decision made and then learns which moves paid off and which cost it the hand. 'For every single possible situation you could get into, it has a description for how you should play,' said Neil Burch, a computer scientist who helped develop Cepheus at the University of Alberta Computer Poker Research Group.

More detailed information can be found at: <http://bit.ly/1Ilg0u8>

## O.R. to the rescue



Alongside the Cabinet Office's Autumn Statement, a report has been published called 'A forward look at Efficiency & Reform for government', in which it suggested that a modern Internet-based approach could more than halve the cost of providing technology-based services. An example given is paying one's car tax when insuring one's car.

The government claims it has already made major savings and this is just continuing the good work – nibbling away at the inefficiencies.

More details on the report in PDF format can be located at: <http://bit.ly/1Eg9AS2> (Older readers are advised that too much salt may be harmful.)

## The outlook for 2015 is cloudy

According to Christopher Iervolino, Research Director at Gartner Inc, corporations have only scratched the surface of what predictive analytics and big data can do for financial planning and forecasting.



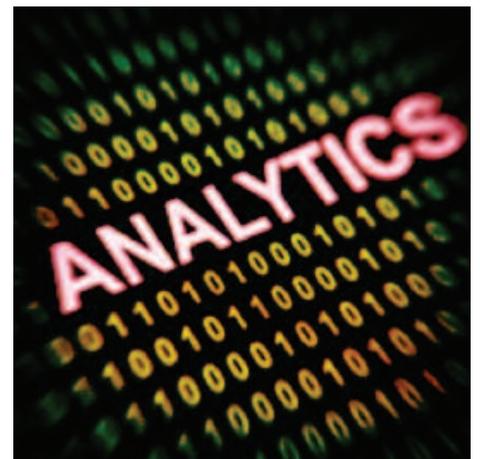
'In 2015, we are going to start to see big data find its way into finance, powering more diagnostic, predictive and prescriptive

planning and forecasting. It is only used by a small minority of organizations right now, less than 10%, but will become used more widely.' He also thinks the use of cloud computing and storage will continue to grow.

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

## Easy Analytics

Lavastorm has launched a new analytics engine that enables business analysts with limited knowledge of data science to deliver predictive insights. The company's 'analytics for the masses' approach has been designed for SME's to enable them to look at the 'big picture', diagnose situations and deploy analytical processes.



Lavastorm claim their new engine provides 'ordinary' users, 'with the knowledge necessary to assess the situation', and equip them with streamlined tools that require minimal configuration to deploy analytics.

More information at: <http://bit.ly/1L479G0>

## It's no joke

The comedian and science enthusiast Dara O'Briain took time out in February to visit an exhibition at University College Cork (UCC) to celebrate the bicentenary of





# EURO2015

Glasgow, 12-15 July



**Have you submitted your title and abstract?**

*Deadline for Abstract Submissions: 16 March 2015*

**Have you registered?**

*Early Bird Reduced Rate Registration Deadline: Monday 20 April 2015*

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**For more information on all aspects of this amazing conference,  
to submit and register, go to [www.euro2015.org](http://www.euro2015.org)**

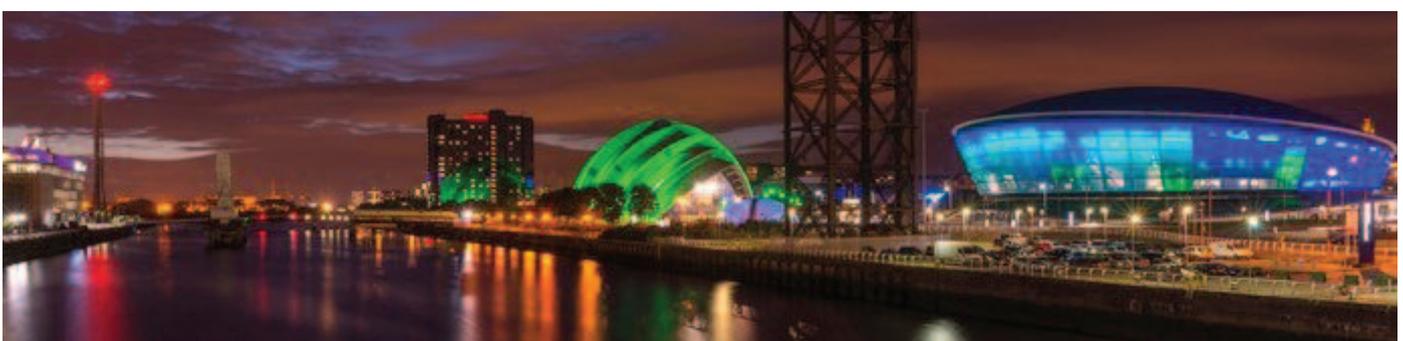


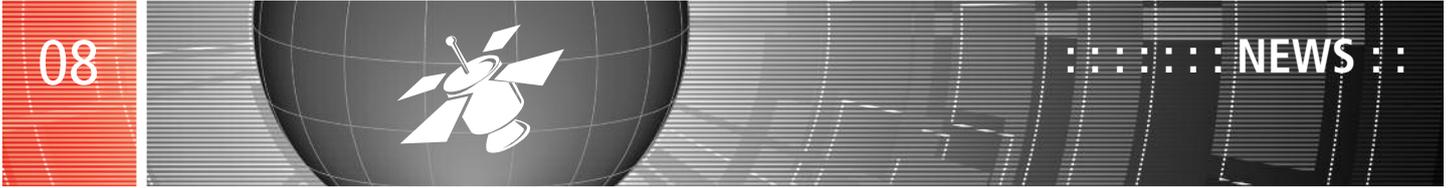
27<sup>th</sup> European Conference on  
Operational Research

12-15 July 2015

University of Strathclyde

**EURO**  
The Association of European  
Operational Research Societies





# DON'T FORGET IFORS

SUE MERCHANT

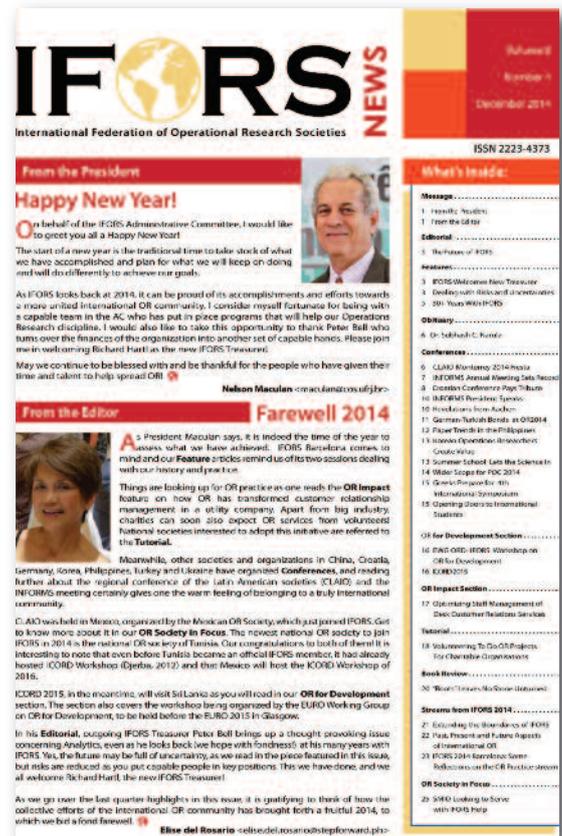
The latest edition of IFORS News is packed with interesting articles for academics and practitioners alike. A few are mentioned below.

Prof Peter Bell (the retiring Treasurer of IFORS) discusses (as have many societies!) whether IFORS should incorporate Analytics in its objects, and there is a pen picture of the new treasurer, Prof Richard Hartl from Vienna.

The UK gets quite a few mentions, including Prof Lyn Thomas who gave a much appreciated IFORS Distinguished lecture at the INFORMS conference; Graham Rand's talk at the IFORS conference on our pro bono scheme is described as is the scheme itself (thanks to Felicity and others) and this incorporates an interesting section on the pro bono work that Sophie Carr did for Ian Seath on incidences of epilepsy in dachshunds; John Ranyard describes the stream on O.R. practice he ran at the IFORS conference with Sue Merchant; and Patrick Blackett's work is mentioned in the context of international O.R.

Finally there is an interesting article on Optimising Staff Management of Desk Customer Relations by Daniele Vigo from Italy in the O.R. Impact column, a book review (on the Roots of Logistics), lots of reports of international conferences which illustrate how vibrant O.R. is worldwide, and an article on the handling of risks and uncertainties in project work by Germany's Dr. Ulrike Reisach who concludes that 'researchers in companies, universities and think tanks have to be in constant dialogue about future challenges and integrate all societal groups'.

See <http://ifors.org/web/december-2014-newsletter/>



# CONFERENCE NEWS

<b>EVENT:</b>	Beale Lecture 2015	<b>DATE:</b>	26 February 2015	<b>VENUE:</b>	Midland Hotel, Manchester
<b>EVENT:</b>	Annual Analytics Summit 2015	<b>DATE:</b>	29 April 2015	<b>VENUE:</b>	BMA House, London
<b>EVENT:</b>	EURO2015	<b>DATE:</b>	12 (welcome), 13 – 15 July 2015	<b>VENUE:</b>	University of Strathclyde, Glasgow
<b>EVENT:</b>	YoungOR 19	<b>DATE:</b>	22 – 24 September 2015	<b>VENUE:</b>	Conference Aston Marketing Suites, (CAMS), at Aston University

# ORGANISING AND PRESENTING DATA IN EXCEL

## 11 MARCH 2015, BIRMINGHAM

**SIMON PEGG, HOLLETH LIMITED**

### General Information

On this course you will learn how to create Excel reports and dashboards that look and feel like bespoke applications, without the need to learn a programming language.



### Benefits

If you use Excel regularly then this course will enable you to create flexible and professional reports with the following benefits:

1. Improved reporting accuracy.
2. Reduced data input errors.
3. Reduced time spent creating reports.
4. Sharing spreadsheets will be easier.
5. Report presentation will be improved.
6. You will have more time to make decisions.
7. No special Excel skills are required to administer the spreadsheets.

### Approach

The course starts by teaching the basic spreadsheet design principles that are so often overlooked.

Using a pre-prepared data set the delegates work step by step along with the tutor to build their own dashboard.

The final spreadsheet can be taken back to the workplace and used as a template for a wide variety of bespoke applications.

### What does the course involve?

This course will teach delegates to:

1. Understand the basic rules of model building.
2. Validate and clean data before use.
3. Structure data to simplify query building.
4. Use form controls to create user interfaces.
5. Select data for reporting purposes.
6. Build effective dashboards.

### Who is the course for?

Candidates should be familiar with Excel and be using it to produce reports.

As a guide, participants should already be able to use a range of formulas and functions.

### When will the course take place?

The course will run at the Society's offices in Birmingham on Wednesday 11 March. It can also be delivered 'in-house' at your premises by arrangement.

<OR>

**TO BOOK ON THIS COURSE PLEASE CONTACT JENNIE AT  
JENNIE.PHELPS@THEORSOCIETY.COM OR 0121 234 7818**

## 2014 OR SOCIETY DOCTORAL AWARD: CELEBRATING EXCELLENCE IN PHD RESEARCH

**GAVIN BLACKETT, SECRETARY & GENERAL MANAGER**

Nominations for the 'Most Distinguished Body of Research leading to the Award of a Doctorate in the field of O.R.' is now open with the annual award being made at the OR Society's Blackett lecture in November 2015.

The thesis being submitted for consideration must have been examined at a UK University in 2014. The qualifying period is the calendar year in which the PhD or DPhil is defended or approved. Further details are available on the OR Society webpages at <http://www.theorsociety.com/Pages/Awards/PHD.aspx>.

With a prize fund of up to £2500 plus conference places available for the winner and runners-up, this represents an exciting new development for PhD students. Initial nominations are normally from the external examiner who has identified the body of research as of exceptional quality.

The winner of the award wins a cash prize of £1500. Up to two runners-up each receive £500. The winner has their name engraved on the George Paterson shield as a permanent record of their achievement. The successful candidates are expected to present their work at the annual conference of the OR Society. A significant contribution towards to cost of the conference is available to all prize winners.

The deadline for receipt of submissions is **30 April 2015**. All submissions should be sent to Gavin Blackett, OR Society Secretary & General Manager ([gavin.blackett@theorsociety.com](mailto:gavin.blackett@theorsociety.com)).

The winner and runners-up for this award will be announced during October.

**Make that submission now!!**

Previous Winners:

- **2013 Winner:** T Lidbetter, London School of Economics. *Runners-up:* C Pickardt, University of Warwick; J Vile, Cardiff University
- **2012 Winner:** K Rustogi, University of Greenwich. *Runner-up:* C Paterson, Lancaster University
- **2011 Winner:** R Wood, University of Cardiff. *Runners-up:* S Allen, University of Nottingham; Dong Li, Lancaster University
- **2010 Winner:** F Liberatore, University of Kent. *Runners-up:* Md Asaduzzaman, University of Westminster; G De Maere, University of Nottingham
- **2009 Winner:** A Strauss, Lancaster University. *Runners-up:* S Adeyemi, University of Westminster; A Tako, University of Warwick
- **2008 Winner:** K Kaparis, Lancaster University. *Runner-up:* D Arthur, University of Surrey

<OR>

**MAKE SURE YOUR CONTACT DETAILS  
ARE UP-TO-DATE**

Contact Carol Smith

[carol.smith@theorsociety.com](mailto:carol.smith@theorsociety.com)

or go online to [www.theorsociety.com](http://www.theorsociety.com)

log on and click 'My Contact Details'



Building a better  
working world

**It's applying  
diverse techniques.  
It's a variety  
of assignments.  
It's working across  
industry sectors.  
It's where you'll thrive.**

**Operational Research roles – all levels  
London**

Our OR team has grown fast, and we have ambitious plans to grow even further. As a part of our Valuation & Business Modelling business, we develop vital insights from the development and application of OR models using the full range of OR and analytics techniques. Working alongside multiple senior stakeholders, we help organisations make the best possible strategic, tactical and operational decisions across their business.

We have opportunities to join at all levels. Applications are particularly welcome at the more senior levels from those with experience of business development within professional services. Your assignments will involve working with senior stakeholders both within UK and internationally in environments as varied as airport operations, global drinks manufacturers, government departments and even internationally renowned museums – no two projects are the same.

You'll bring experience of applying OR to practical problems, along with commercial awareness, business acumen, and a high degree of personal drive and motivation to succeed. In return, you'll enjoy greater diversity, and the chance to grow personally and professionally – with the support of an ambitious global organisation behind you. How far you go is up to you.

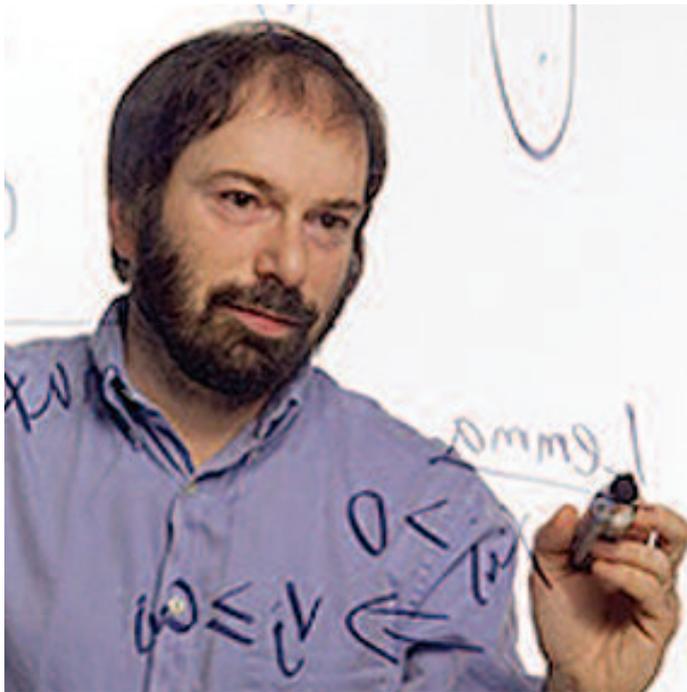
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## ON YOUR BIKE

**NIGEL CUMMINGS**

Many cities operate a cycle hire scheme – bicycles are made available at key locations throughout the city for commuters, shoppers, tourists and the like for hire.



*David Shmoys*

In some cases these will be returned to the point of hire after they have been used but, in most cases they are used to go from A to B. The problem is that whilst A may be a very popular place, typically a station or car park, B is likely to be very much less popular (e.g. a place of work). The result is that large numbers of bikes will be unavailable during the day.

A typical journey will be a commuter coming into town by train, picking up a bike at the station, cycling to work where the bike stays until said commuter cycles back to the station in the evening. The bicycle is actually in use for perhaps no more than 20 min in a day. The commuter would not hire the bicycle if she had to pay for a whole day's hire and why should she because technically it is available for others to use during the day. The solution is 'rebalancing'.

David Shmoys, professor and director of the School of O.R. and Information Engineering at Cornell University, and graduate student Eoin O'Mahony have developed algorithms and data analysis tools to help rebalance as efficiently as possible. They also assisted in the development of a 'smartphone bike hire app'.

Professor Shmoys said. 'Deciding how many bikes to take from one station to another, and how to get them there, is a hard problem to solve, certainly by hand, but even by computer.'

The 'rebalance system' he helped develop makes use of integer programming. It starts by representing each possible route as a separate point in a high-dimension space, then repeatedly recalculating to eliminate a large fraction of those points in each step.

Although trucks could be used to move some 20 bikes at a time, they would often get caught up in traffic and, of course, add to the congestion and pollution that the bikes were supposed to eliminate. The answer was to use pedal-powered trailers that carry just four bikes. Eoin O'Mahony said, 'We found that trailers can move more bikes per hour than trucks.'

Additionally, the researchers developed additional algorithms to pair nearby locations that are often out of balance, for example pairing one at New York's 44th Street and Fifth Avenue with one at Grand Central Station, sending trailers back and forth between them. O'Mahony added that. 'Although it is nearly impossible to keep the entire system balanced, this ensures people are not too far from an empty dock or a bike, and the Citi Bike smartphone app shows them where these are.'

Shmoys and O'Mahony are now developing a system to choose the best locations for new bike-sharing sites, based on data from taxi usage and neighbourhood boundaries. 'The problem intrigues computer scientists', Shmoys says, 'and many are working on rebalancing bike-sharing systems in major cities around the world'.

O'Mahony described the system at the 2014 INFORMS Annual Meeting, 'Bridging Data and Decisions,' in November 2014 in San Francisco. He earned first place and a \$1,000 cash prize in the 'Doing Good with Good O.R.' student competition with his paper, 'Smarter Tools for (Citi) Bike Sharing.'

More information at:

<http://www.news.cornell.edu/stories/2015/01/cornell-research-steers-nyc-bikes-needy-stations>

<OR>





## YOU ARE WHAT YOU BUY

**NIGEL CUMMINGS**

Metadata can be used for identification purposes by the simple application of analytical rules.



Scientists have revealed it is now possible to determine the identity of shoppers using credit card purchase and location metadata. The mechanisms used in such research can be applied to data from other sources too; it is not merely a measure of shopper viability, but it can also be a measure of whereabouts or intent, depending upon which behavioural metadata dataset it is applied to.

Smartphones, browsers, credit cards and cars generate information about, who we call, what we 'search' for, how much we spend and where we are. Whilst this data has many good uses, it could also have more sinister applications.

Openness is a requirement and the sharing of metadata has been encouraged by the scientific community - the transformational potential of metadata data sets is, after all conditional on their wide availability. In science, it is essential for the data to be available and shareable, but sharing data could be problematical, even though it allows scientists to build on previous work, replicate results, and propose alternative hypotheses and models.

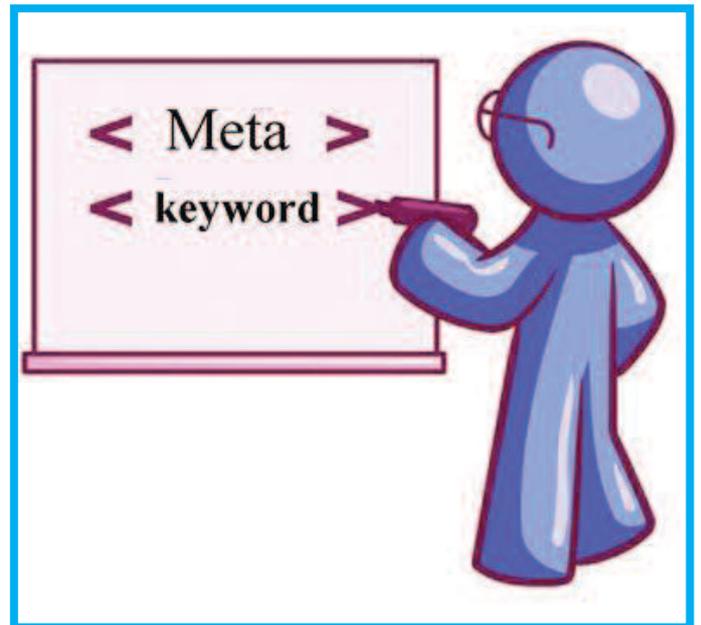
A data set's lack of names, home addresses, phone numbers, or other obvious identifiers does not make it anonymous or safe to release to the public and to third parties. A study was conducted using three months of credit card records from 1.1 million people who made purchases in 10,000 shops.

The research published in the journal 'Science' found shopping receipts could be matched with four spatiotemporal points (sources) of external location data acquired from repositories like social media to determine identities with 90 percent accuracy.

Knowing factors such as the price or timing of a purchase further increased the likelihood of a shopper being identified. The research

showed that each string of purchases made was highly unique making identification possible with additional external metadata. Armed with a receipt for purchase, a photo such as a 'selfie', a tweet perhaps, and a status update derived from social media sources, any competent analyst could accurately identify the buyer.

The research indicated that knowing the price of a transaction increases the risk of reidentification by 22 percent on average. Even data sets that provide coarse information at any or all of the dimensions noted here, provide little anonymity – the research also indicates that women are more reidentifiable than men in credit card metadata.



The researchers, Yves-Alexandre de Montjoye; Laura Radaelli; Vivek Kumar Singh, and Alex Pentland from the Massachusetts Institute of Technology say that. From a policy perspective, their findings highlighted a need to reform data protection mechanisms beyond 'Personally Identifiable Information' and anonymity and toward a more quantitative assessment of the likelihood of re-identification. Finding the right balance between privacy and utility is absolutely crucial to realising the great potential of metadata.

Detailed information on this study can be located at: <http://www.sciencemag.org/content/347/6221/536.full>



## MAKING AN IMPACT – EURO2015 FOR PRACTITIONERS

**RUTH KAUFMAN**

Strathclyde in 2015 will see one of the biggest gatherings ever of O.R. people in the UK, from every part of the European O.R. community, and we're aiming to capitalise on this to make sure there is plenty of value for practitioners. And there is still time – just – for you to put your name forward to contribute.



Of course, there is no need to actually contribute to get value out of the conference; but for many people, half the fun – and benefit – of a conference is getting actively involved in the programme. So: how can you get involved with EURO2015?

**Case studies** – 20 minute presentations of actual applications – will be welcomed. In particular, the stream 'Case studies in O.R./analytics' will bring together case studies that have provided valuable outcomes and/or insights for the client organisation, with reflections on technical process, content and lessons. It's a fantastic opportunity to present and share experience; and for those in the audience, to be informed, stimulated and inspired. The deadline for case study abstract submission is **15 March**.

We will be taking advantage of the presence of many academics to encourage fruitful interactions. One case-study session will focus on 'lessons from industrial collaboration'. There will also be a round table discussion involving academics and practitioners, to look at both opportunities and barriers to closer collaboration. And this theme will also be addressed at the **academic-practitioner bazaar**, a lively session to promote the exchange of information between both sides of the profession, using the format tried and tested at previous UK conferences. Academics and practitioners display posters describing current challenges or projects that would benefit from closer academic-practitioner collaboration, or

past/current projects illustrating successful collaboration. The session starts with a high-energy 60-second presentation from each presenter, to whet the appetite and set the conversations going. If you think you might have a topic you would like to present, please contact us at [MAI\\_EURO@theorsociety.com](mailto:MAI_EURO@theorsociety.com)

An innovation for 2015 is one-to-one **mentoring** sessions from experienced practitioners, to help others overcome barriers and make more of an impact in their own jobs and careers. Mentees will be able to browse a list of possible mentors, choose one with the background or expertise they are looking for, and book a 15-20 minute slot. If you like helping your O.R. colleagues, sharing your experiences and offering advice, do get in touch at [MAI\\_EURO@theorsociety.com](mailto:MAI_EURO@theorsociety.com)

And as ever we are planning a full programme of 90-minute **workshops** on practical and technical issues aimed at helping practitioners improve their effectiveness. If you would like to lead a workshop – or suggest a topic for others to lead – contact us at [MAI\\_EURO@theorsociety.com](mailto:MAI_EURO@theorsociety.com)

More information about 'Making an Impact' planned activities is on the website: [www.euro2015.org/MAI](http://www.euro2015.org/MAI)

We'd love to hear from you if you want to contribute. And even if not, if your day-job is using O.R., analytics, or anything similar to help organisations become more effective, we'd love you to come and participate, and to bring your colleagues. Pass on the message, and put the dates – 12-15 July 2015 – in your diary now.

<OR>

'There will also be a round table discussion involving academics and practitioners, to look at both opportunities and barriers to closer collaboration.'



# NOMINATIONS FOR BEALE MEDAL AND COMPANIONSHIP OF O.R.

**GAVIN BLACKETT, SECRETARY & GENERAL MANAGER**

The President Elect's committee under the stewardship of Ruth Kaufman is responsible for stimulating and reviewing nominations for these two prestigious awards. This is your opportunity for an input into the process.

## BEALE MEDAL

This award is named in memory of E M L Beale. It is designed to give formal recognition to a sustained contribution by one person to Operational Research in the United Kingdom.

### Eligibility

All persons other than members of the Awards Panel who, at the time of application, have at least ten years' working experience, based in the United Kingdom, of Operational Research in industry, commerce, government, or in a University teaching or research post, are eligible for consideration. Existing holders of the Beale Medal may be considered, provided that the contribution forming the subject of the entry is in a different area or is substantially differentiated from the basis of the previous award in some other manner.

### Entry

Candidates may nominate themselves, be nominated by a member of the Operational Research Society, or be nominated by the President Elect's / Past President's Committee. In respect of each nominee the required submission is a statement describing the sustained contribution made by the candidate to Operational Research, which must have extended over a period of at least five years. The contribution may be to the philosophy, theory or practice of Operational Research, or to some combination of those areas. The contribution must be such as to have advanced significantly the knowledge, understanding or practice of the subject. The statement must be endorsed by at least six independent sponsors, who shall be members of the Operational Research Society and shall have appended their names and signatures to it.

'In any year, the award will be made to the individual who, in the opinion of the Awards Panel, has made the most outstanding sustained contribution to Operational Research.'

## Selection

In any year, the award will be made to the individual who, in the opinion of the Awards Panel, has made the most outstanding sustained contribution to Operational Research. The Awards Panel may, if necessary, take advice from outside specialists in the field, who are independent of the candidate. The decision remains the responsibility of the committee alone. The Committee may decline to make an award if it considers that none of the entries is of sufficient merit.

## COMPANIONSHIP OF O.R.

The Companionship of Operational Research should be awarded for sustained support and encouragement for the development of operational research or for those in influential positions who are in broad sympathy with the subject area. Such contributions might be through public or private activities.

### Eligibility

Companions are normally expected to fall within one of six categories covering practitioners, senior non-O.R. academics, eminent persons in related disciplines, noted public figures, those who have given outstanding or otherwise inadequately recognised service to the OR Society or leaders of operational research societies in foreign countries.

### Entry

Candidates may be nominated by a member of the Operational Research Society, or be nominated by the President Elect's / Past President's Committee. Each nomination should be supported by a statement outlining the case.

Further details can be found at <http://www.theorsociety.com/Pages/Awards/Awards.aspx>

Nominations for both awards should be sent in strictest confidence to , Secretary & General Manager [gavin.blackett@theorsociety.com](mailto:gavin.blackett@theorsociety.com).

The deadline for nominations is 31 May 2015.



# Learning and Development Programme

## Approved courses in O.R. and Analytics

### ORGANISING AND PRESENTING DATA IN MICROSOFT EXCEL

**11 March, Birmingham**  
**£455 + VAT** for OR Society members  
**Hands on course**

**NEW FOR 2015**

**Course Provider**  
Simon Pegg, Holleth Limited

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.

Organise data to 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.

### IMPROVING QUALITY & PERFORMANCE WITH THE PUBLIC SECTOR SCORECARD

**12 March, Birmingham**  
**£500 + VAT** for OR Society members  
**Hands on course**

**Course Provider** Max Moullin

Gain a greater understanding of the topics of quality, excellence and performance measurement and an appreciation of the need for performance measurement to be based on stakeholder needs, the organisation's strategy and process; appreciate the debate on targets in the public sector and the eight essentials of measurement.

Find out about the latest developments in performance measurement; Ensure that performance measures are aligned with service user and stakeholder needs, with the organisation's strategy, and the processes used to achieve it; Keep up-to-date with developments in quality management and be able to advise on developing quality user-focussed public services; • Learn how to use the balanced scorecard and strategy mapping

### USING SOFT SYSTEMS METHODOLOGY

**25 March, Birmingham**  
**£550 + VAT** for OR Society members

**Course Provider** Mark Westcombe

This is a practical course aimed at developing expertise in applying Soft Systems Methodology (SSM). We look at the application of SSM for problem structuring within complex projects, and how to use the approach for planning the project process.

The practical skills of applying SSM; Using SSM for thinking about and planning projects; The importance of process and process facilitation; Using SSM models to improve dialogue and decision making; Direct application of SSM in the delegate's workplace

### PRACTICING SOFT SYSTEMS METHODOLOGY

**26 March, Birmingham**  
**£550 + VAT** for OR Society members

**Course Provider** Mark Westcombe

This is a practical course aimed at furthering expertise and confidence in the use of Soft Systems Methodology (SSM). The course develops the skills learnt in the 'Using Soft Systems Methodology' course (above) and it may be combined to form a two-day programme. Alternatively, it can be used as a stand-alone day to refresh skills or to gain feedback on using SSM.

Further practice in the application of SSM techniques; Enhanced understanding of the use of SSM in practical situations; Guidance on using SSM techniques with delegates' own work based problems; Discuss application of SSM in the workplace; Gain expert feedback on your use of SSM

### SIMULATION: A PRACTICAL GUIDE TO DEVELOPING AND USING MODELS

**25-27 March, Birmingham**  
**£1,680 + VAT** for OR Society members  
**Hands on course**

**Course Provider** Stewart Robinson

If you develop and use discrete-event simulation models in your work, this course will enable you to top up on the skills required for successful simulation modelling and analysis. You'll learn how to build valid and credible simulation models and perform experiments with models to compare the results of different scenarios appropriately and efficiently.

Learn how to determine what to model and what not to model; Find out how to collect and analyse the data needed for a model; Gain an understanding of the approaches for verifying and validating a model; Learn how to carry out experiments to obtain accurate estimates of performance; Understand the methods of running and comparing multiple scenarios

**For details of all courses and to book online,  
visit [www.theorsociety.com](http://www.theorsociety.com)  
or call Jennie Phelps on 0121 234 7818**

# YoungOR19

22-24 September 2015



## Come and raise your profile with our 'young to O.R.' professionals!

- A biennial conference for practitioners and academics with up to ten years of experience in O.R.
- Learn about how O.R. techniques have been used in a wide range of applications.
- A great opportunity to meet fellow O.R. practitioners, share best practice and learn about new areas where O.R. can make an impact.

**Sponsor and/or Exhibit at YoungOR19** and your logo and details appear on our YoungOR19 website, in the conference handbook, in *Inside O.R.* our monthly magazine and on any suitable sponsored item!

## Calling for papers

**Abstract Submissions are open!** Presentations welcome from practitioners and academics alike on a wide range of O.R. topics and areas of application including, but not limited to, the new and emerging area of analytics, more conventional hard O.R. and soft O.R. methods. Application-oriented presentations and case studies in areas such as health and defence are also welcome.

Simply submit a title and abstract via [www.theorsociety.com.YOR19](http://www.theorsociety.com.YOR19) !

**Deadline for submissions 12 June 2015.**

**For more information on all aspects of this superb conference, go to [www.theorsociety.com/YOR19](http://www.theorsociety.com/YOR19)**







**ENTRIES REQUIRED  
BY 28 FEBRUARY!**

## EURO2015 - EURO Excellence in Practice Award

*Sponsored by IBM Research - Zurich*

# INVITATION TO SUBMIT AN ENTRY

The EURO2015 conference in Glasgow, 12 to 15 July, will replace some aspects of the OR Society conference including the fact that there will be **no President's Medal competition**. Instead UK practitioners are invited to enter the 2015 EURO Excellence in Practice Award which has similar objectives and criteria.

### PURPOSES

The purposes of the competition are to:

- recognise outstanding accomplishments in the practice of O.R.; attract more application-oriented papers to EURO-k Conferences; promote the practice of O.R. in general.

### GUIDELINES

All interested authors are invited to submit a detailed description of an application of O.R. which has original features, whether in methodology, application or implementation. This may be in the form of a paper written for publication (although not necessarily published at the time of submission), a client report, or other appropriate documentation. The documentation must describe the work in a way which illustrates how it meets the criteria outlined below. The age limit for published papers is four years. The work must not have been submitted concurrently to another competition. The application is open to O.R. specialists from any part of the world.

### EVALUATION CRITERIA

The criteria for the evaluation of the papers are:

- scientific quality; relevance to O.R.; originality in methodology, implementations and/or field of application; a real impact on practice; appreciation by the organisation involved with the application. Letters of appreciation are important.

### THE PROCESS

The jury selects a short-list of finalists who will present their work in a special session of the EURO2015 Conference. There is no registration fee for one author of each of the finalist presentations. The winner will be determined by the jury at the end of the special session and will be announced by the chair of the jury during the closing session of the EURO2015 Conference.

### THE PRIZE

The prize for the winners is a distinct honour, and in material terms consists of:

- a certificate of excellence in O.R. practice for each author of the paper; an amount of 3,000€ shared between the authors.

### THE JURY

- Luca Gambardella (Switzerland) – chair; Ton G. de Kok (The Netherlands); Ulrich Dorndorf (Germany); Marco Laumanns (Switzerland); Sue Merchant (UK)

### SUBMISSION

Please submit the material online on <http://www.euro-online.org/awards/eepa2015/registration.php> before **28 February, 2015**.

**Wednesday, 29 April 2015. 9:00am to 5:00pm**

**BMA House, Tavistock Square, London WC1H 9JP**

The Annual Analytics Summit, in association with the Royal Statistical Society, brings together speakers and exhibitors from the very cutting edge of decision analytics to deliver a one-day event that is a one-stop shop for learning about how big data & analytics are shaping the future of organisational decision making.

The array of excellent speakers from high profile organisations will be discussing topics ranging from strategies for embedding analytics to using social media to find out what people really think about your brand.

### **This year's speakers are:**



**Clive Humby**  
*Chief Data Scientist,  
Starcourt*



**Sanjeevan Bala**  
*Head of Data Planning &  
Analytics, Channel 4*



**Peter Williams**  
*Head of Enterprise  
Analytics, Marks &  
Spencer*



**Andy Harrison**  
*Director, Analytic  
Consulting, FICO*



**Phil Hall**  
*Managing Director,  
Elzware Ltd*



**Carl Miller**  
*Research Director of the Centre  
for the Analysis of Social Media,  
Demos*



**Tom Jackson**  
*Director of the Centre for  
Information Management,  
Loughborough University*

**Book your ticket now at [www.analytics-events.co.uk](http://www.analytics-events.co.uk)**

Early bird rate - £95 + VAT until 31 March 2015

Confirmed exhibitors include:



**GOVERNMENT OPERATIONAL RESEARCH SERVICE**

# SPECIAL INTEREST GROUPS

## ANALYTICS NETWORK

**CONTACT** Sayara Beg

**EMAIL:** ANChair@theorsociety.com

### Annual Analytics Summit 2015

**Date/Time:** Wednesday, 29 April 2015 09.00 – 17.30

**Venue:** BMA House, London

The OR Society is pleased to be organising the 4th analytics one day event, in association with the Royal Statistical Society, that showcases how advanced analytics can be the key to better decision making in virtually any area of business.

Over the last 75 years, Operational Research (O.R.) professionals have developed mature methodologies to analyse and use data that can add significant value in big data analytics.

The aim of this event is to demonstrate, by way of case examples, how developments in analytics are leading to increased competitive advantage.

Speakers will represent a broad spectrum of sectors that can benefit from advanced analytics. Talks will be of general interest, and are intended to raise awareness of applications and techniques, that will inspire delegates to think about decision making in their organisation.

**Chairs:** **Stewart Robinson** President, the OR Society and **John Hopes** Vice President, the OR Society and Chair of its Analytics Development Group

### Confirmed speakers:

**Clive Humby** – Chief Data Scientist, Starcount

**Sanjeevan Bala** – Head of Data Planning & Analytics, Channel 4

**Peter Williams** – Head of Enterprise Analytics, Marks & Spencer

**Tom Jackson** – Director of the Centre for Information Management, Loughborough University

**Andy Harrison** – Director, Analytic Consulting, FICO

**Carl Miller** – Research Director of the Centre for the Analysis of Social Media, Demos

**Phil Hall** – Managing Director, Elzware Ltd

Further details at

<http://www.theorsociety.com/Pages/Conferences/Analytics2015/Analytics2015.aspx>

## CRIMINAL JUSTICE

**CONTACT:** Ian Newsome

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

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

### CJ SIG Spring Meeting 2015

**Date/Time:** Friday 13 March 2015 @11.00

**Venue:** West Yorkshire Police HQ, Laburnum Road, Wakefield, West Yorkshire, WF1 3QS

**Speaker:** Various as below

Booking through: martin.rahman@westyorkshire.pnn.police.uk

Event Speakers:

**Muz Janoowalla, Accenture Analytics:** 'How Accenture and the Metropolitan Police Service used predictive analytics to identify those gang members at highest risk of committing a violent crime in the next 4 weeks'

**Jo Leigh, Loughborough University:** 'Predictive Positioning Modelling of Police Officers'

**Gail Mawdsley, West Yorkshire Police:** 'Building an understanding of the future operational characteristics of the National Police Air Service using simulation modelling'

**Matt Grainger, West Yorkshire Police:** 'Using Design Thinking to Understand the Mental Health challenge (in WYP)'

## THIRD SECTOR O.R.

**CONTACT:** John Holt

**EMAIL:** jholt@danielholt1992.com

### Spring Meeting 2015

**Date/Time:** Thursday 23 April 2015, 14.00

**Venue:** Central London, precise venue to be decided

**Speakers:** TBA

### O.R in support of services to young people

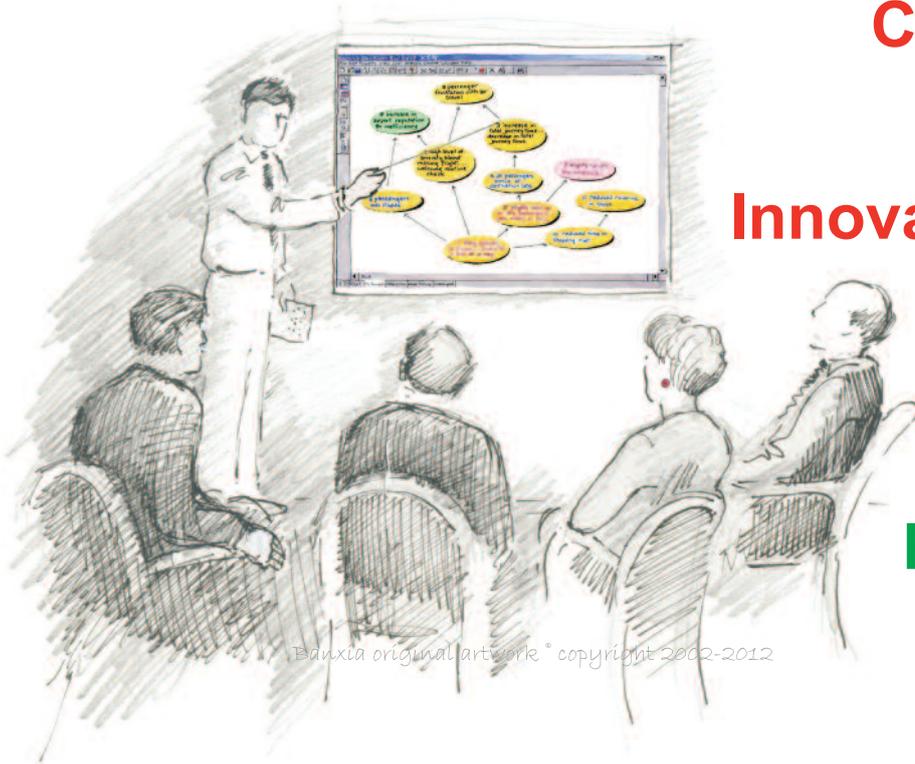
A range of speakers, providing O.R. support to the Joseph Rowntree Foundation, Elfrida Rathbone, The Childhood Trust, and others.

*More details to come.*

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- **Connect™** - allows a group of people in the same location to collaborate in the entry of ideas around a topic, and then to organise them by preferencing, rating or otherwise evaluating them. Designed to support Visual Strategy Making alongside our Decision Explorer software, it is free to try it out, and supports up to 32 participants using tablets or laptops with any modern browser. Decision Explorer Connect starts at £99 + VAT for 8 participants.
- **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*

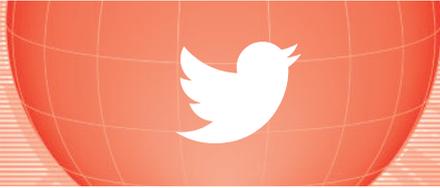
- **Frontier Analyst® Professional** - a performance measurement tool, using Data Envelopment Analysis (DEA), to give a relative assessment of the performance of a group of business units. Used in organisations that have a network of branches/ depots or in situations where a group of similar “units” 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.

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# SOCIAL MEDIA MONTHLY FAVOURITES



## What's hot on Twitter from @TheORSociety community ...

<p><b>The OR Society @TheORSociety</b> Congrats @miketrick &amp; Luciana Buriol! MT @IFORS_News: Upcoming IFORS President and Vice President (2016 – 2018) <a href="http://t.co/6ZUn8cy9W8">t.co/6ZUn8cy9W8</a></p>	<p><b>Catherine Hobbs @systemslocalgov</b> Newly-formed Public Policy Design Special Interest Group by the Operational Research Society @TheORSociety more info <a href="http://bit.ly/1v4Prch">bit.ly/1v4Prch</a></p>	<p><b>Andy Harrison @baldie_andy</b> Do you use data, analysis, modelling, science, common sense? Then Make an Impact <a href="http://euro2015.org">euro2015.org</a></p>
<p><b>tom monks @tommonks1</b> The location for @TheORSociety simulation workshop 2016 has been chosen. Very excited. Announcements coming soon. #orms #thisisOR</p>		<p><b>james crosbie @james_crosbie @GoodPracticeNW</b> Yes, the Yorkshire &amp; Humber event of @TheORSociety is open to all. Just send me an email so I can sort out pass</p>
<p><b>Felicity McLeister @FMcLeister</b> Great to see extra benefits coming from #ProBonoOR One volunteer joined the board of an org he volunteered with @CareerVolnteer @TheORSociety</p>	<p><b>PenCHORD @PenCLAHRCOR</b> We're recruiting! We're recruiting a Research &amp; Operations Manager post, more details here : <a href="http://t.co/WANiYG7aQn">http://t.co/WANiYG7aQn</a> #thisIsOR #penclahrcOR</p>	<p><b>The OR Society @TheORSociety</b> Guardian mentions O.R. in context of Science Museum exhibition <a href="http://t.co/jlrpLErq">http://t.co/jlrpLErq</a> Worth a visit?</p>

## The OR Society on LinkedIn: join the 3,174 members who do so ...

### More evidence that Data Scientist (aka O.R. Analyst) is the job to have



Post started by Gillian Groom (Technical Specialist at Minitab Ltd)

Gillian posts an article <http://mashable.com/2014/12/25/data-scientist/> and highlights that a Data Scientist is the career to have or to start working towards. The article suggests three key things you need: 1. Be good at Maths; 2. Aptitude to develop computing skills to manipulate data, they mention Python but there are other tools that will be equally good; 3. Have knowledge of a specific industry.

This has received 3 likes and a comment. Gillian asks: *What do you think? Do we fit this profile? Is the marketplace for our skills as buoyant as this article indicates?* If you have any ideas or you think this is good news, like Gillian does, then why not add your contribution on the LinkedIn group page.

### Great event at Loughborough looking at Soft OR and MCDA



Post started by Giles Hindle (Researcher, Consultant and Educator)

Giles posts about a great event that took place at Loughborough University before Christmas. The discussion was looking at the relationship between Problem Structuring Methods and Decision Analysis (in particular MCDA). A client from a Government Department presented a problem and then both a Soft OR and a DA practitioner worked on the problem. Giles noted that it was clear that there is considerable overlap in how we go about working with a client and that the tools do focus analysis in certain ways. He suggests that some of the participants are going to write a short report which shows how the logic differs.

There are currently 7 likes and two comments. *Why not post your own comment?* Giles is particularly interested to know *if any quants modellers use any formal methods to structure problems, so we can map all the different logical pathways.*

**Why not join us on Twitter, LinkedIn or Facebook**  
[www.theorsociety.com/FollowUs](http://www.theorsociety.com/FollowUs)  
**Get tweeting and posting: Your contribution might be featured next?**



THE OR SOCIETY

## Operational Research and Design – Developing the Dialogue



**Tuesday 10<sup>th</sup> March 2015 10.30am – 4.00pm**  
**RIBA, 66 Portland Place, London.**

Any O.R. professional knows that clients often want support not only on *decision analysis* but also with the *design* of systems or processes. Do we know enough about the tools and skills of design?

Last year, to explore connections and synergies between the worlds of design and of operational research and to consider how these links might be usefully developed, the OR Society and the Design Society held a successful joint workshop (a report of which can be found in the April 2014 issue of “Inside O.R.”).

**The two societies have now arranged a further joint one-day event, featuring a range of presentations from both communities on topics of mutual interest, including some practical case studies. Confirmed speakers are:**

**Robert O’Keefe**, Vice Principal and Dean of Management, Royal Holloway University of London

**“From Analysis to Design: Why So Difficult?”**

**Chris McManon**, former President, the Design Society

**“Design Research: Three Illustrations”**

**Giles Hindle**, Senior Lecturer, Centre for Systems Studies, University of Hull

**“Using Soft Systems Methodology to Support the Design and Innovation of Business Models and Service Systems”**

**Camilla Buchanan**, Policy Advisor Insight, Design Council and **Rob Solly**, Senior Principal Analyst, DSTL

**“Applying Design Principles and Problem Structuring Methods to the Design of Public Policy”**

**Claudia Eckert**, Professor of Design, Open University

**“From Observation to Method: the Example of Engineering Change Prediction”**

**Martin Kunc**, Associate Professor of Management Science, Warwick Business School

**“Systems Thinking for Design”**

**Alexander Komashie**, Research Associate, Engineering Design Centre, University of Cambridge

**“Applying a Design Process to a Neuropsychological Rehabilitation Unit: The Role of Systems Modelling and Simulation”**

**Ian Newsome**, Head of Organisational Development, and **Matthew Grainger**, Principal Business Change Officer, West Yorkshire Police

**“Employing Design Principles and Analysis to Challenge the Policing Response to People in Mental Health Crisis”**

**Refreshments and a buffet lunch will be provided.**

**The event is free and open to all on a registration basis. Early registration is advised, as numbers will be limited.**

**To reserve your place go to [www.theorsociety.com/oranddesignbooking](http://www.theorsociety.com/oranddesignbooking)**



## E-INFRASTRUCTURE AND OPERATIONAL RESEARCH

**SANJA PETROVIC**  
NOTTINGHAM UNIVERSITY  
BUSINESS SCHOOL



‘E-infrastructure enables access to huge databases which provide input to many real-world O.R. problems.’

The last years have seen an intensive acceleration of interest in the development and use of e-infrastructure.

What is meant by e-infrastructure? E-infrastructure refers to ‘a combination and networking of digitally based technologies (hardware and software), resources (data, services and digital libraries), communications (protocols, access rights and networks), people and organizational structures needed to support modern internationally leading collaborative research be it in the arts and humanities or the science’ (see *e-infrastructure – Research Councils UK, Report of the e-Infrastructure Advisory Group, 2011*). For scientists in all domains E-infrastructure is the term for the technology and organisation environments that support research in mathematics and physical sciences, social sciences, medical and life sciences.

As such, e-infrastructure received the highest priority in the research and development programs in the highly developed world. The main activities of e-infrastructure take place in the UK, EU and USA. For example, in the UK, Department for Business, Innovation & Skills (BIS) published in 2012 a ten year strategy for developing and managing the e-infrastructure in the UK to support research and development in both industry and fundamental science (see ‘*Strategic vision for UK e-infrastructure: a road map for the development and use of advanced computing, data and networks*’ published by BIS). Another good example is EU, where over the last few years a number of e-infrastructure programs under the term *EINFRA* have been launched. The topic of the first one entitled *EINFRA-1* included the managing, processing and computing with big research data, while the last one, *EINFRA-9*, introduced the concept of VRE – Virtual Research Environment, dedicated to provide a unique platform fully customised to the needs and goals of research groups comprising staff, students and third parties including civil societies or international partners. More details about the future programs within EU are given in *E-infrastructure in Horizon 2020 – vision, approach, policy background, challenges, 2012*. The focus will be on social challenges including health, clean energy, and transport. Drivers for change are computational capabilities and big data. Interestingly, a leading role in developing and promoting e-infrastructure in USA is given to universities. Technology developers and e-infrastructure entered the era of cloud and grid computing. See for example ‘*U.S. infrastructure – APAN, 2014*’.

Will the development of e-infrastructure shape the future advancement of operational research? We strongly believe that a fast and intensive development and use of e-infrastructure will have a vigorously effective impact on the operational research in all its parts: in education and teaching, in research area, and particularly in O.R. in practice. We all witness a strong convergence of operational research and computer science in the last decades or so. However, the rapid growth of e-infrastructure characterised by high computational capabilities, the ability of collecting and handling big

data (a very popular term whose precise meaning has not reached a consensus), and especially the need for global communications, bring absolutely a new dimension in O.R. as a discipline. In our opinion e-infrastructure can considerably influence the syllabus of teaching O.R. courses, and equally the future of O.R. research projects. For example, a provocative question arises whether more or less standard introductory lectures on linear programming, which present in detail analytical and graphical methods on small size examples with two-ish variables and a few constraints, need to undergo changes? Or, shall we in our introductory lectures present shortest path problems or Hamiltonian problems on small baby graphs with 10ish vertices and 10ish arcs? It is likely that these introductory lectures will need to discuss consequences caused by the problems of large size and the role of e-infrastructure in the collection and preparation of data for such real-world O.R. problems.

E-infrastructure enables access to huge databases which provide input to many real-world O.R. problems. This may open new avenues also to O.R. in practice. E-infrastructure should provide operational researchers with the tools and services they need to do research and apply O.R. methodologies as efficiently and effectively as possible. It is to be expected that some specific branches of O.R. will get much higher priorities than they have today. For example, a higher priority could be given to algorithms for solving large scale real world linear programming problems with millions variables and constraints; complex nonlinear optimisation problems; large scale

travelling salesman and vehicle routing problems with thousands of nodes and links in graphs; large scale resource allocation problems stated as combinatorial optimisation tasks; dynamic programming optimisation problems with a large number of decision variables; large scale simulation where large refers here to a simulation which may require multiple computers to be run on which are organised in a network that supports effective communication between computers, etc. It is to be seen if e-infrastructure will generate new branches in O.R. to fully exploit all advantages that it offers.

Will the development of e-infra structure change the character of scientific papers in O.R. journals and create new expectations for publishing? It is likely that a smaller number of papers will have a section 'illustrative example' where authors usually demonstrate the functioning of an introduced algorithm on some illustrative problems of very small size. Instead of that, it will be possible to present O.R. results on real-world problems by using shared distributed electronic resources, grid computing, storage of large data sets, and networking, which e-infrastructure supports.

To summarise, this article does not aim to offer a comprehensive overview of the effects that e-infrastructure may have on the further development of O.R. However, we hope it will trigger some thoughts about not so distant future.

&lt;OR&gt;

## WANT TO ATTEND YOUNGOR19 FOR FREE?

**GAVIN BLACKETT, SECRETARY & GENERAL MANAGER**

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

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

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

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

supply the names and contact details of two independent referees, one a member of the Operational Research Society, the other a client unless inappropriate, who are in a position to testify as to the accuracy of the submission and the fact that the work described was done by the candidate(s). A detailed curriculum vitae is required for each candidate, and in the case of multiple authorship of a submitted paper, the submission must also include a statement detailing the contribution that each author has made to the work described. Submissions should be sent by email to Gavin Blackett, Secretary & General Manager of the Society, email [gavin.blackett@theorsociety.com](mailto:gavin.blackett@theorsociety.com). The closing date is 31 May 2015.

&lt;OR&gt;

## GETTING OVER THE FINAL HURDLE

LOUISE MAYNARD-ATEM

This month sees the final part of my *Getting Hired* series in conjunction with Mark Chapman from Prospect Recruitment where he'll be giving advice on how best to handle the Assessment Centre stage of the recruitment process (which is often the area that people find the most daunting).

Before that, I'd like to say a huge thanks to Mark for all of his contributions over the past three issues, I've found them to be an invaluable insight and don't doubt this information will be very useful to me in future. If you have any recruitment related questions, queries or more general comments on this series, or indeed ideas on what you'd like to see in subsequent articles, don't hesitate to get in touch on the usual address (lmaynardatem@live.co.uk).

### Assessment Centre Advice: Nailing the AC

**Preparation** – *what are the best ways to prepare for AC's and approximately how much time should you spend?*

A good starting point for planning your preparation, is to have as much information beforehand on what the AC is likely to involve and what you might expect the agenda to comprise. Usually, the confirmation of your attendance will include at least a brief summary of the agenda. If you've been introduced to the role via an intermediary such as a recruitment agency/consultancy, they should have a thorough knowledge of the agenda as well as what assessment criteria are key and should brief you accordingly – but if they don't, make sure you ask for details. If they can't supply these, they're probably not very good, so pick **Prospect** next time! Other external channels could be the internet with its plethora of information, or your own network – picking the brains of friends/colleagues who have had previous experience of AC's themselves.

The sections following below are those that typically comprise an AC but, inevitably, different organisations will have different specific agendas – so be ready to apply flexibility. And this is probably the bottom line. Your job as an O.R. professional is invariably a project based role which, by definition and whether you are part of an in-house or external facing consulting team, will be one where variety and the unexpected are frequent hallmarks. The AC is fundamentally a vehicle for simulating key aspects of the role for which you've applied and assessing the commensurate qualities, capabilities and knowledge you're able to bring to that role. So a good starting point is to think through the things you already do in your current job, and then consider those additional aspects that may be involved, of which you perhaps have not had much experience to date. If you're a graduate entrant, reflect on your relevant experience, capabilities, strengths, gaps and weaknesses in a similar vein. You're then into prioritising where you need most preparation.

But don't spend too long trying to prepare for every eventuality. At the end of the day, an AC is all about the assessors seeing the *real*

*you* – which is not about contrivance, it's about ensuring that you're able to put *you* across. And as with the 'product analogy' in my previous piece on interviews, if you've given your best true reflection of yourself but the buyer decides you're not the product they want, there's nothing wrong with that and it's better to find out now!

**Numeracy, Logic, Verbal, & Written Tests** – *what format does this part of the AC usually take? How do candidates go about getting practise for these?*

Numeracy, logical and verbal reasoning tests are, in my view, less about fundamental mathematical, reasoning and verbal ability, and much more about mental dexterity. They are usually part of an AC, are invariably timed and the timing is usually deliberately tight and challenging. However - is it not most unlikely that you will have succeeded as you have, in a role for which mathematical, reasoning and verbal communication capabilities are fundamental, without these skills? Probably - but, can you think fast on your feet? Are you adept at handling the pressure of a situation where you have to rapidly assimilate new information, plan and then execute your response – all with absolute accuracy in a matter of a few minutes? That's invariably the focus of the tests, so ensure you are mentally revved up to sufficient speed. Also, bear in mind that time spent familiarising yourself with how the test works is usually wasting valuable answering time, so do your research on the various testing companies frequently used, most of which have practice sites you can access, so that you can hit the ground running when the test starts.

The objective of written tests is clearly to judge your command of the written word but, again, they are invariably timed and designed to assess your ability to assimilate, plan and structure under pressure. If your previous experience has frequently involved written pieces, then ensuring you can produce these under tight time constraints is probably your main focus. If you rarely produce pieces in the written word, it is probably well worth taking a few examples of projects you are currently undertaking, imagining that you need to produce a succinct summary for your Director or Senior Manager in, say, 45 minutes and practicing accordingly. If you are a graduate starter, use a project you've done as part of your course or work experience. Then use friends or colleagues as sounding boards for constructive criticism. Another compelling practical reason for practicing is that most written tests require production in long hand – and how often do we write as opposed to type these days! So practice to avoid hand cramp!

**Group Exercise** – *what types of behaviour are usually tested? How should candidates behave in such situations? How can they best interact with other participants?*

Group exercises are invariably designed to: assess your ability, in a team context, to handle an information assimilation, analysis, solution design and subsequent presentation challenge; judge your capabilities as a team player; identify your characteristics, strengths and weaknesses; assess your capabilities in terms of level of seniority and commensurate responsibilities. Again, they are effectively a simulation of a real work situation, so the important starting point is to ensure that you display the real you.

That said, you need to step up to the proverbial plate. The Group exercise is your principal opportunity to demonstrate your proactivity capabilities and your influencing and communication skills. In all probability, your team members will be fellow AC candidates, whom you will doubtless already have met at Reception, during breaks etc. Take full advantage of any opportunity to introduce yourself and become acquainted. View them as prospective colleagues rather than competitors, as they should certainly be the former when it comes to the Group Exercise. If you have already built up some rapport with them, this will show in the exercise – and your ‘team working’ skills will be duly noted by the assessors. Also, ensure that you do demonstrate to the assessors what you’re seeking to get across to them. Remember the analogy with the driving test. It’s not just important to check the mirror before executing a manoeuvre – it’s important to have *been seen* by the invigilator to have checked the mirror!

Conduct yourself and forge your brief within the team in accordance with your experience level and capabilities. Be confident in your own views, be prepared to challenge on the strength of well reasoned logic and ensure you tread the delicate line between being either too over-bearing, or too subdued.

**Presentation** – *there is invariably a presentation aspect, how should candidates prepare themselves for this part of the AC?*

In some AC’s, the presentation element will solely be part of the Group Exercise. In others, there will be the additional need to prepare and give an individual presentation – sometimes with advance notification, other times on the day. This piece is not about Presentation Skills, but a few observations nonetheless.

If the presentation is one you are required to present in advance, be pleased! It is the one aspect of the AC over which you have total control. So ensure you give it due preparation time, care and attention and also make sure you deliver what is asked – both in terms of content and timing. And the only way to fully judge that, is to practice with a friendly (but critical!) audience.

When the presentation preparation is required on the day, whilst content and delivery are obviously key, the absolute starting point is to apply the skills emphasised earlier – the ability to think clearly, accurately and quickly. Start from a holistic perspective, get the structure right, and then add the detail. Ensure any slides or written material are as ‘pretty’ as time allows, but be pragmatic and prepared to compromise in relation to the time available. Above all, remember that it is essentially a simulation of your real job. You’ve probably delivered under this sort of pressure several, if not many

times before – so remember how you’ve successfully done so in the past and garner confidence you can do so now. For graduate entrants – again, you’ve probably done this before at University, during work experience or at previous interviews, so the same applies.

**Interviews** – *how many and what types of interview might the candidate expect in a typical AC? What’s the best way of preparing for these?*

Some AC’s don’t include any interviews, others feature one or more than one - and the interviews themselves may be one-to-one or one-to-several. A few points from earlier advice on interview preparation bear repeating. If you haven’t been advised in advance who the AC assessors might be, you’ll probably have met them or been introduced to them as a group earlier in the AC. Use any free moments to check them out on social media, or network and glean any other information before you meet them. Try to get a clear steer on the interview objectives beforehand. Is this a technical interview, or one focusing more on softer skills and general career objectives, motivation and the like? What is being sought from me? What are the aspects I need to highlight? What are the behavioural characteristics I’d do well to emphasise? And finally, what are the questions I will want to ask. The AC is likely to be subsequent to an initial interview, so you will be expected to have progressed your thoughts and views on the company, department and role, in relation to your career plans and objectives.

**Technical Assessment** – *what are employers expecting to see in terms of technical knowledge? How is this tested and how can candidates perform to the best of their abilities in this area?*

Technical assessment may take place as part of the AC interview(s), be deliberately incorporated into the presentation and/or Group Exercise, be the subject of specific tests, or not be covered at all, with the interview(s) preceding selection for AC participation being deemed to have covered this. It is fair to suggest that, concerning technical knowledge and capability, you either have it or you don’t. You can probably gain some insight to the technical demands of the role from the Job Description and you may well have reasonable insight from the preceding interview(s) so, if you are rusty on a key technical aspect, it is probably worth revising this. Beyond that though, your knowledge/experience either equips you to deliver or it doesn’t. So the key start point, as with most of the above, is to keep the mental speed optimal, remain calm and deliver as best you can.

*Finally, to paraphrase the closing general comments from my previous piece on Interview Preparation* – remember that an AC is generally about human interaction and is simulating the sort of activities in which you will frequently engage as part of the job. So plan and approach it as you would in other situations: consider your audience (the assessors) and your fellow AC attendees, conduct yourself according to your reading of them, and be **you**, demonstrating who you naturally are. As I have emphasised before, if the ‘match’ is right, it’ll work – if it’s not, it probably won’t. Which, again, is of course the fundamental object of the exercise.

## REGIONAL SOCIETIES

### EAST MIDLANDS (EMORG)

**CONTACT:** Chris Smith

**TEL:** 01530 416426

**EMAIL:** chrissmith677@gmail.com

**EMORG - Transport Analytics: Using Big Data to Improve Efficiencies in Logistics**

**Date/Time:** Wednesday, 25 February 2015 at 18.00 – 19.30

**Venue:** Room BE0.41, Richard Morris Building, Loughborough Uni

**Speaker:** Matt Hague, Microlease

Microlise is one of the world's leading telematics solutions providers, with customers in over 130 countries. @Microlisemonitor some of the worlds largest distribution fleets as well as providing white label solutions into OEMs including MAN, DAF and JCB, as well as Tata Motors in India.

In the UK, Microlise track the usage, location, fuel economy and health of over 60,000 HGVs, with Microlise systems processing 4.5 billion miles of driving data per annum. Whilst customers use this data within their operations to more efficiently manage their fleets, Microlise recognises there is a huge potential in leveraging the aggregated and anonymised big data to provide our customers and other third-party organisations with value-added information.

Matt Hague's brief presentation will provide an overview of how Microlise is starting to use big data to allow customers to benchmark their operations to make their drivers and managers lives easier and better manage risk

Matt Hague graduated from university in Manchester in 1994. Hopes of joining the RAF were not realised on medical grounds so Matt undertook postgraduate studies and spent a short time in academia, before joining Microlise as a teaching company associate. Matt has worked for Microlise ever since and was responsible for Microlise's move into telematics and transport management systems nearly 15 years ago. A director of the company for approaching a decade, Matt is now responsible for product strategy, consultancy and marketing.

Matt is married with two sons and lives in Ampthill where, when he's not ferrying his boys to various sporting events, attempts to play the occasional game of rugby.

This is a joint event with the OR Society, Analytics Network and is open to both members and non-members. For more information please contact Michael Mortenson (M.J.Mortenson@lboro.ac.uk). Telephone: +44 (0) 1664 503712 Mobile: +44 (0) 780 506 3647 E-mail: Chris.Teale@gfk.com

### MIDLAND (MORS)

**CONTACT:** Jen East (Secretary)

**EMAIL:** MidlandsORSociety@live.co.uk

**OR's solution of problems in rain-interrupted one-day cricket matches; the story of the Duckworth/Lewis method**

**Date/Time:** Wednesday, 04 March 2015 at 18:00 - 19:00

**Venue:** MB206, Main Building, Aston University, Aston Triangle, B4 7ET

**Speakers:** Dr Tony Lewis MBE, Duckworth-Lewis Consultants

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

A buffet 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

Invented in the 1970s one-day cricket has become very popular, especially amongst spectators wanting to see a result at the end of the day's play, and has appealed to a wider audience of supporters. Because of cricket's unique playing structure, however, any shortening of the match due to rain, or any other cause, affects the two teams differently.

Tony Lewis's talk will illustrate the problems that result from reductions through real case studies and will show how early attempts to handle the issues, although simple to apply, were largely inadequate producing many grossly unfair situations.

The talk will explain how, in collaboration with Dr Frank Duckworth, the pair used O.R. modelling principles to develop the method that now bears their name and which solves the problems of those earlier unfair scenarios. Some background in persuading cricket's authorities to adopt the method and subsequent reactions of players and the media from the method's early implementation will be summarised.

Although the method has now been in use for nearly 20 years the need to monitor and update the modelling will be explained along with anecdotes of further more recent perceived controversies.

**Parking details:** Visitors may use the pay-and-display car park in Car Park 12 (Number 27 In the campus map) from 16:30 to 24:00. The barriers will lift automatically as you come in through Colleshill Street. Alternatively, there are public pay and display car parks at Millennium Point and Love Lane. The Millennium Point/Think Tank Museum Multi Storey car park is approximately five minutes' walk from the Aston University Main Building, and marked on our campus map. This car park is across the road (Jennens' Road) from Aston University. Access to this pay car park is via Jennens' Road (City Bound), B4 7AP. Further details can be found at: <http://www.aston.ac.uk/about/directions/visitorparking/> See [http://www.theorsociety.com/Pages/Regional/mors\\_future.aspx](http://www.theorsociety.com/Pages/Regional/mors_future.aspx)



## OR-30

After last month's Blakett Lecture, March has been a bit of an anticlimax. Two papers, one by R.J Martin and P.F Taylor from the British Gas Corporation and the other from John Wilson when he was at Loughborough looked to be the most hopeful.

The BGC paper related to work carried out two years earlier but, nonetheless, it still provides something of an interesting insight on what life was like for practitioners in this period. This paper looks at 'computing equipment selection for O.R. By 1983, microcomputers (desk-tops or simply PCs) were starting to become available but they were rather limited. In those days we were still talking in terms of kilobytes of memory and a screen which could, at best, display 24 rows of 80 characters invariably as green on black.

The specification of requirements, determined following a questionnaire sent to the twelve regional O.R. groups, concluded: 1 VDU per 2.5 staff operating at a minimum of 2400 baud;; 1 possibly low speed print per group; access to a fast printer; 1 teletype per group for occasional access to an external bureau. Regarding software, FORTRAN, BASIC, FCS and full-screen editing were regarded as essential (FCS was a financial modelling language). Under the highly desirable category were APL, simulation languages, statistical and forecasting packages, graphical packages and relational database systems. Critical path analysis and word processing were [only] 'desirable'.

TABLE 1. Results of cost study (units: £p.a.)

Cost category	Option 1 (Mainframe)	Option 2 (8-bit micro + mainframe)	Option 3 (16/32-bit micro + mainframe)	Option 4 (Mini)
Hardware	17,000	14,000	15,000	15,000
Software	8000	8000	3000	6500
Support	3500	3500	3500	3500
Total	28,500	25,500	21,500	25,000
(10 O.R. staff)				
Total	43,000	39,000	34,000	33,000
(20 O.R. staff)				
Remote users	30,000	9000	20,000	30,000

The results indicated that for an O.R. group of up to 16 staff, mainframe plus 16-bit micros was the best option but for larger groups it was slightly better to go for a minicomputer (mainly because the specialist software was cheaper than for a mainframe).

John Wilson's paper was far more academic. It looked at three classification models in O.R. In the 60s and 70s, Ackoff and Sasieni had recognized 'that in solving a problem, what is required is an examination of the structure and content of the problem. In Rivett's book (*Model Building for Decision Analysis* (1980)), he gives three approaches: *AR* which classifies in terms of form and content (e.g. queueing, inventory and allocation); *AS* which classifies according to the difficulty of formulating ranging from 'problems in which the logical structure is simple and transparent enough to be solved by inspection and discussion' through to 'problems where sufficient data are not available and experimentation is precluded' and his own *R* problems with or without feedback. There are seven categories under *AR*, five under *AR* and just two under *R*. (*AR* – Ackoff and Rivett (1963); *AS* – Ackoff and Sasieni (1967) and *R* – Rivett (1980)).

Wilson gives a discussion of each recognizing that the *AR* categorisation needed to be updated regularly as new techniques became available. Out of 44 cases investigated, 32 could be categorised using *AR*, 41 using *AS* and the same 41 using *R*. By extending the list of techniques, all the 41 cases could be included. It was suggested that the three that could not were not truly O.R. (whatever that means).

Martin, R.J and P.F Taylor (1985), Micro, Mini or Mainframe – What's Right for You?, *JORS* 36.3, Pp 217-224 (jors198539a.pdf)

Wilson, J.M. (1985) Classification of Models in operational Research, *JORS* 36.3, Pp 253-256 (jors198544a.pdf)

<OR>

## OR-20

### From the President Elect

#### The ethics of O.R. Practice

I am writing this leader in the early days of 1995. Much of the media focus in the past few weeks has been the analysis and summary of the past year. This is quite usual at the turn of the year, but what has been new this time is the attention to evidence to allegations of sleaze and corruption in high places. There seems to be a fresh recognition of the need for morality to govern our behaviour.

Now morality and ethics are very difficult subjects, and analysis on

such a level can very quickly sink into a morass of contradictions and inconsistencies. These things are bound up in context of the culture norms and beliefs which prevail in our society. Whatever their background, however I believe most people will have some ethical framework in place which usually governs their behaviour and basically enables them to distinguish right from wrong.

I guess most of us in operational research will have acquired an education based very much on the scientific method – based very much on 'facts', and logical reasoning leading from observation and experimentation to conclusions. We often make a virtue of the 'objectivity' of operational research – we study problems or situations and we draw our conclusions (upon which

recommendations are based), without partiality, on the facts as we see them.

At least that is the theory. I have touched on this in an earlier leader about how irrational decision-making can be in practice. I do not intend to go over the same ground, but the issue that comes to my mind - as it does from time to time - is the ethics of the process of practicing operational research.

Amongst others, consider the question of how far one stands up for objective reporting or to what extent objectivity is subordinated to commercial or political expediency. To illustrate what I am writing about, try the following questions.

1. Your client has asked you to build a simulation model of his factory because he would like to install new plant and needs to justify it to his bosses. He also needs an answer next week. You can carry out only a limited number of simulation rounds in the time scale and point out to him the need for a properly designed experiment, and the dangers of insufficient analysis and premature conclusion. He prevails upon you to build a 'prototype'. You do one run, and the results support his case. He loses interest in further experimental work there and then. Do you
  - a) Produce a report that supports his case and shrug your shoulders in the interest of keeping happy a client who may be useful in the future; or
  - b) Carry on to complete the desirable experimental programme at your own expense and produce a comprehensive report, full of disclaimers and caveats concerning decisions based upon inaccurate assumptions or insufficient analysis; or
  - c) Write to the Managing Director about the quality of his management?
2. Your client has asked you to build a decision-making tool to aid her department in a regular allocation decision. You develop a linear programming-based model and install it on a PC in her department. It has lots of user friendly facilities to enable it to be used regularly without the need for your further help. You discover later that the model is being over-constrained with 'political' constraints, so that it produces solutions that fit well

with your client's desires. The model is being used as scientific window dressing. Do you-

- a) Let her get on with it because she has just commissioned another piece of work from you; or
  - b) Go and educate her about the real value of linear programming how it provides opportunities for finding solutions which are more financially advantageous to the company; how it ....; or
  - c) Write a case study for OR Insight, warts and all?
3. You are asked by your senior management client (to whom your own O.R. Department also reports) to do some financial modelling to help with an investment decision. He provides data and assumptions. You know that the critical threshold payback period in the company is currently 3 years. You do the analysis and payback comes out at 3.4 years. The client then reallocates some of the variable costs to fixed and takes a more optimistic view with the sales forecasts, and asks you to do the analysis again. Payback comes out at 2.9 years. The client happily builds the second set of figures into his case. Do you -
    - a) Remain his obedient servant; or
    - b) Give him a lecture about risk analysis and ask him why he bothered asking for your help; or
    - c) Write an article for a national newspaper about decision-making in the company?

Now for the traditional comment on your scores. If you got three a)s you have been probably been in practice for a long time! If you got three c)s you probably didn't stay in practice for very long! If you got a mixture, you are probably like most of us! The ethical issues I leave you to muse on.

Ian Disley

<OR>

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**IMPORTANT:** Contributors please note. All contributions must be in four parts as follows (1) headline (approx 6 words); (2) mini-abstract (max 25 words); (3) main body of contribution (max 500 words); (4) keywords. At the editor's discretion, contributions exceeding 500 words will be shortened, serialised or published with the warning Long article. X words. Whenever possible contributions should be submitted electronically as Word files and emailed to [insideor@theorsociety.com](mailto:insideor@theorsociety.com). Illustrations should be attached as JPG, GIF, TIF or files of other common formats. Contributions submitted in hard copy must be posted to The OR Society at the address above, or sent to the Society's fax number, and be clearly marked Inside O.R. All contributions must bear the author's name and address (not necessarily for publication). All contributions accepted by the editor will be published in the print version subject to availability of space. The editor's decision on all contributions is final and no correspondence will be entered into.



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Our client, a specialist Simulation company providing plant, assembly and facility expertise to an array of operations, is fortunately experiencing a growing workload. Accordingly, they have created a rare opening for an OR professional. Successful applicants will be able to demonstrate 2-3 years' work experience encompassing discrete event simulation, ideally within manufacturing/logistics, underpinned by strong academic achievement within the numerical field.  
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**£Attractive**

Based on a number of forthcoming client initiatives, we are currently seeking a number of Masters and/or PhD level candidates. With or without commercial application, your experience to date will be within the OR arena and will have a strong focus on either Simulation (Discrete Event Simulation in particular) or Modelling. Individuals with well-developed communication, interaction and presentation ability will be given priority.  
**North, Home Counties, London.**

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.