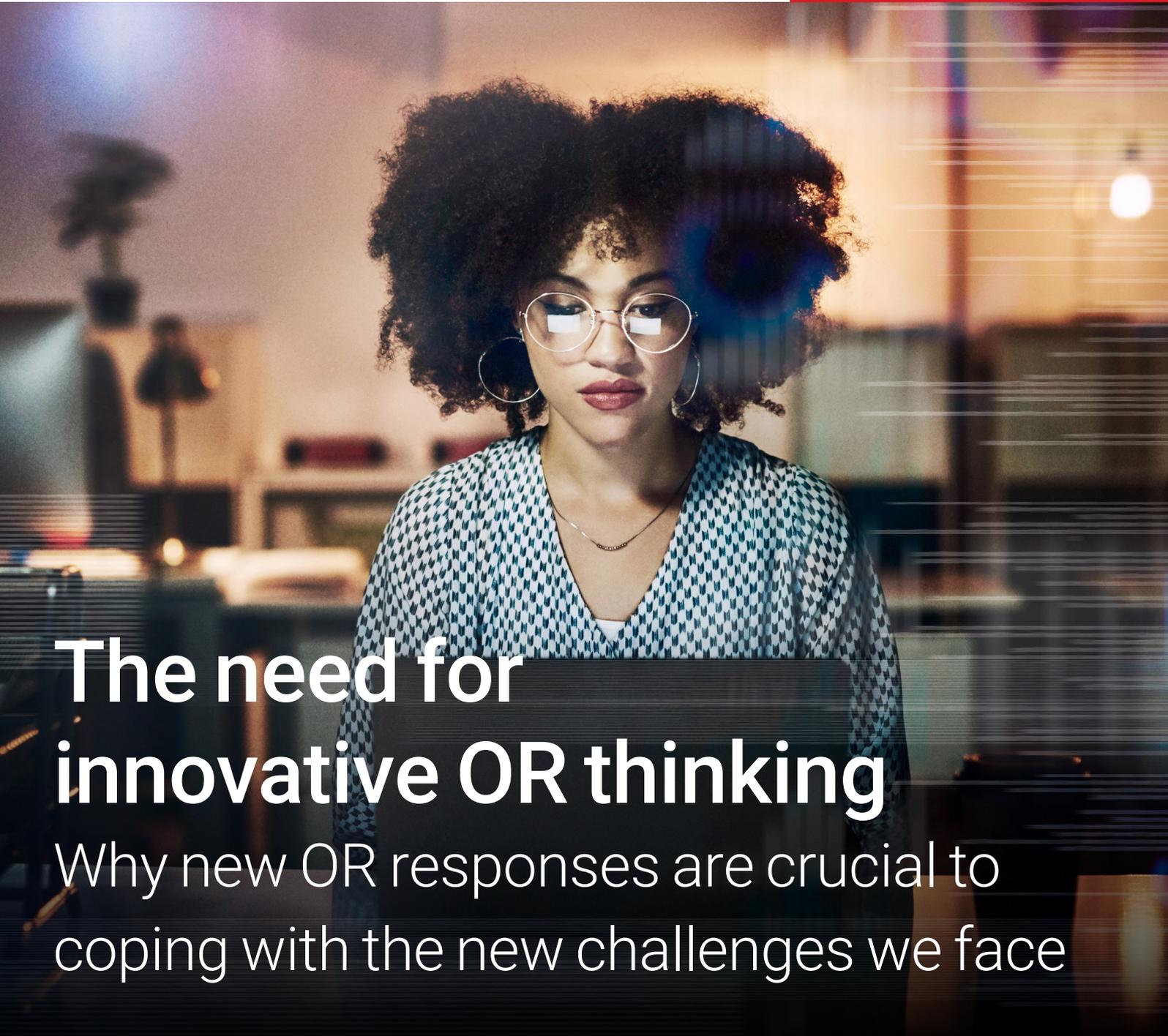


INSIDE

THE SCIENCE OF BETTER AT THE HEART OF ANALYTICS



The need for innovative OR thinking

Why new OR responses are crucial to coping with the new challenges we face

inside:

Reimagining education

Introducing new ways of learning about systems in schools

Making an impact

Creating a better future at our annual conference

Build better

Analysing The British Science Association report

DIARY DATES 2021

EVENT	DATE	VENUE
Problem Structuring Methods Webinar	1 September	Online event
Women in OR & Analytics Network OR63 Event	13 September	Online event
OR ECR Network OR63 Event	13 September	Online event
OR63 Annual Conference	14-16 September	Online event
Careers Open Day	17 November	Online event
Blackett Lecture	November	Online event
Validate AI	2-3 December	Online event
Beale Lecture	February 2022	TBC
New to OR	March 2022	TBC

The OR Society is following advice from the government, Public Health England and the World Health Organisation about COVID-19. Face to face events and training courses have been replaced by online alternatives for the foreseeable future. Rescheduled dates for ORS events are detailed above, please check our website for the latest details or contact us at event.enquiry@theorsociety.com for specific enquiries.

Submitting Articles for Inside OR

Guidelines and format:

- 1) MS Word document of 500 words.
- 2) Articles may be edited for space, grammar and accuracy.
- 3) Inside OR adheres to the University of Oxford Style Guide.
- 4) Deadline for submissions for the September edition is 1 August.
- 5) Deadline for submissions for the October edition is 1 September.

Contributions should be submitted as an MS Word document to insideor@theorsociety.com and will be edited at the discretion of the editor. Please submit print-quality, high-resolution photos or graphics attached as one of these file formats: JPEG, TIFF, PSD, EPS or AI with the articles. Print-quality resolution requires a minimum graphic size of 640 x 480px or scans made at 300dpi. Do not submit copyrighted photos, graphics or content unless you are the copyright holder or have written permission for reproduction from the copyright holder, which should be part of your submission. Photos and graphics copied from websites are almost always not suitable for printing and are usually copyrighted by someone. The editor's decision on all contributions is final and no correspondence will be entered into.

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Editor: John Crocker

Journalist: Nigel Cummings

Content Manager: Rachael Howes-Tonks

Creative Designer: Elli Michael

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Editorial

AUGUST 2021

JOHN CROCKER, FORS



May I start by thanking all of you who have submitted your answers to the Inside OR survey. I had hoped to convey the results but feel it would be prudent to wait. The preliminary results suggest that I can in future refer to “readers” of the magazine (if not the editorial) in the plural. Sadly, only around 13% of the early birds were “students” or “early career”. It is really these groups that we most want to hear from. You are the future, and we want to know how we can help you get the most

from OR and The OR Society, so if you haven't already completed the survey, please spare a few minutes to do so now before it closes on 10 August [1].

Talking of education, Kerry Turner has written a most enlightening article on how teaching needs to change to meet future demands. As I understand it, this has already started to happen in the US and has been endorsed by INFORMS [2].

There are also indications that some of the changes that have been introduced in the way we work due to the COVID-19 pandemic will become “normal” practice. In particular, it would appear that many organisations have recognised that employees can, in fact, be more productive when allowed to work from home for at least part of the week. There are, however, a number of downsides to this practice, many of which have been discussed at recent WORAN meetings, which you can read about within or watch online via our website.

I cannot remember where, but recently I read that despite all of the advances that have been made in the AI field (many of which we have reported in these pages), AI has no perception of the laws of physics. As a result, it is unable to anticipate what will happen next. So, for example, if it is shown a film of someone throwing a ball in the air, it is at a loss as to what will happen to that ball in the next frame, even when it “knows” it is a ball. Clearly, AI still has a long way to go before it is ruling the planet.

Talking of the planet, this year's ‘Making an Impact’ theme is very much centred around climate change and the future of life, as we know it, on the planet. There is still time to get involved and, of course, register for this year's OR63. As with last year, it will again be all online, but that means you can drop in and out at any time and “attend” those sessions and activities which most appeal without the hassle of travelling.

Returning to the survey, one person would like to see more competitions. I love solving puzzles, and I guess that is one reason for taking up a career in OR, but, alas, I lack the imagination necessary for creating these puzzles. If you would like to send in any puzzles (that have not appeared elsewhere), please do so, and we will publish the best ones.

Enjoy your summer safely. 

[1] bit.ly/3cFRZN2

[2] bit.ly/InformsEdu

Contents



Leader

The need for innovative OR thinking 8

News and Features

News in brief 4-6

Food For Thought 10

Matchett wins Waterman Award 11

Finding the right tools for simulation modelling 12

My EPSRC Peer Review College Experience 14

See the Systems 19

Latest research & publication news 23

The future of work, work relationships and HR 25

Serendipity and roads less travelled 27

Bill Donaldson Obituary 28

OR Society Business

Making an Impact 15

ECR and WORAN at OR63 17

OR63 Grand Challenge 18

Careers Open Day 21

Training courses 22

Special Interest Group events 24

OR Minus 20 29

OR Minus 30 30

Making an IMPACT at OR63 31

Webinar Wednesday 32



New centre to advance AI and quantum computing

UKRI, STFC and IBM have launched the Hartree National Centre for Digital Innovation (HNCDI) in Liverpool, which will bring together world-leading expertise with innovative AI and quantum computing technology.

Professor Mark Thomson, STFC, said, "The HNCDI programme will foster discovery and provide a stimulus for industry innovation in the UK".

It aims to employ 60 scientists, plus further interns and students to gain hands-on experience. [or](#)

More at: bit.ly/advanceai

Google system used to plan unit

Google Brain's reinforcement-learning system claims it can do microprocessor and floor-planning designs faster and better than humans.

An explanatory paper, "A graph placement methodology for fast chip design", by Azalia Mirhoseini, Anna Goldie, et al., was recently published in Nature. It describes a deep reinforcement learning system that can create floor plans in under six hours versus the several months it would normally take.

Google has used it to produce a floor plan of their next-generation tensor processing unit. [or](#)

More at: bit.ly/Chipfloorplan



Pest control simulation

Researchers at North Carolina State University have developed a simulation model to predict when and where pests and diseases will attack crops or forests.

The model combines information on climate conditions, records of where cases have been recorded, the reproductive rate of the pathogen or pest and how it moves in the environment. It is constantly updated and improved as natural resource managers add data they gather from the field.

A report was published in the journal Frontiers in Ecology and the Environment at bit.ly/Pestcontrol2 or view a more comprehensive report at bit.ly/Pestcontrol3S [or](#)

New Domo Everywhere

A new version of Domo Everywhere enables its users to build, market and share advanced analytics applications, including machine learning models and other assets built using augmented intelligence.

Additionally, Domo users can now take advantage of the platform's ability to output low and no code customisations that can be distributed to customers to visualise and understand the insights provided by processing data on Domo platforms. [or](#)

More at: bit.ly/Domostreamline





Google reads between the lines

Google's machine learning systems now allow Google Analytics to model conversions in Google Ads based on past insights and broader response info to provide, essentially, an estimate of audience responses when actual response data is not present.

Google says that if the data in a 'User Acquisition' report is incomplete, its new modelling process will fill the gaps to help provide more perspective on the number of new users advertising campaigns have acquired. 

More at: bit.ly/GoogleMLads

Application of Grover's Algorithm

Four Stanford University researchers have applied Grover's algorithm to number partitioning – an NP-complete problem.

Research proves that the Grover's algorithm can provide a quantum speedup across a known phase transition in the computational complexity of partition problems. Grover's Algorithm makes it possible to obtain a 'quadratic speedup' compared to equivalent classical algorithms. 

More at: bit.ly/3GroverAlgorithm



Time to improve your golf

The datafication of golf has seen slow and steady growth over the past few years. Analytics are now routinely used to gain insights into players' performance, their swing techniques and consistency of performance.

Scot Scope, founded in 2013 by Heriot-Watt University graduate, David Hunter, is rapidly proving itself the technology to wear in the GPS watch world of golfers.

The inventor of this device says that his device was developed to "engineer the game of golf, and it worked out really well." 

More at: bit.ly/golfddata2



Don't talk to me about life

Recently Google CEO Sundar Pichai introduced LaMDA, AI "designed to have a conversation on any topic." At Google's annual developers' conference, he demonstrated what it is like to converse with a paper aeroplane and the celestial body Pluto.

For each query, LaMDA responded with three or four sentences meant to resemble a natural conversation between two people. Over time LaMDA could be incorporated into Google products including Assistant, Workspace, and most crucially, search. It is likely to make information and computing radically more accessible and easier to use. 

More at: bit.ly/PlutoAI



Penn State team wins Simio prize

The bi-annual Simio Student Simulation Competition is for teams of students taking courses in simulation modelling and scheduling. This year 339 teams consisting of 1,343 students took part.

The problem was based on Demand Driven Materials Requirement Planning (DDMRP). The aim was to optimise labour utilisation and minimise the chances of missing customer delivery goals.

The winning group was the Nittany Lion Group, consisting of two graduate students, Justin Rist and Robert Newton, supervised by Professor Jon Song from Penn State University. 

Could your students bring the 2023 prize to the UK? More at: www.simio.com

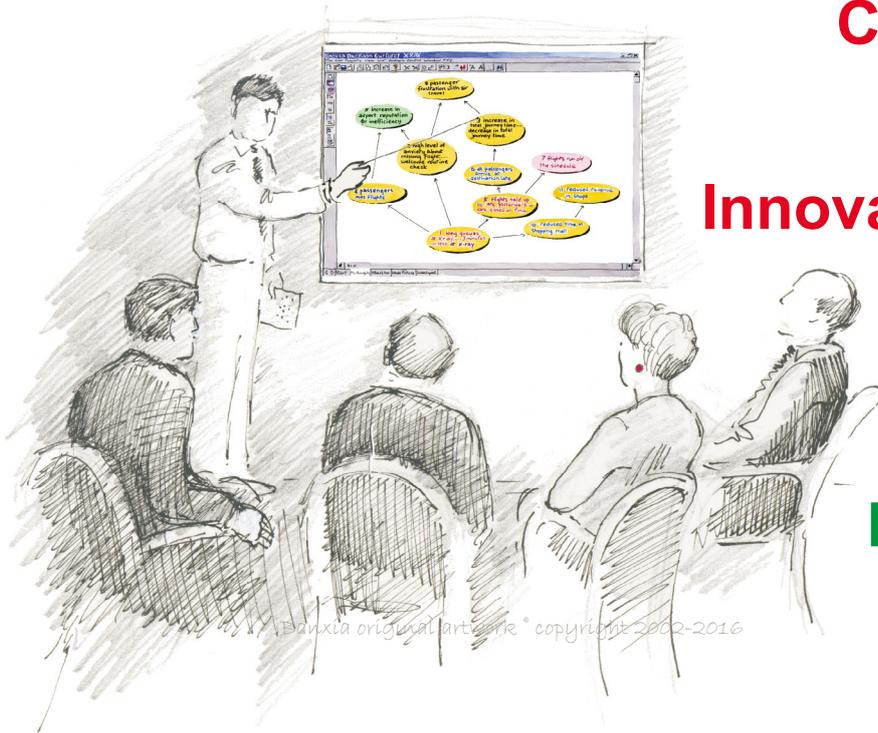
Does studying maths improve brain development?

Researchers at the University of Oxford have found that in a rather small sample of students, those who stopped maths after their GCSEs had less gamma-aminobutyric acid than counterparts who pursued maths post-16. This chemical is critical for brain and cognitive development.

Researchers were able to spot those who did or did not study maths post-16 based on concentrations of the brain chemical in each student. Perhaps, those with lower levels of this chemical were less inclined to study mathematics. 

More at: bit.ly/braindev1





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*"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***

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The need for innovative OR thinking

KEVIN GLAZEBROOK, CHAIR, RESEARCH COMMITTEE



Since its inception, the research committee has sought to strengthen the Society's links with EPSRC and other major funders of OR research. This works to our mutual benefit.

The need for innovative OR thinking is unrelenting. New practical challenges, whether the design of an effective response to a pandemic or the achievement of net-zero carbon emissions, call for new OR responses. In the meantime, advances in computer technology continually expand the scope of what can be achieved, reshaping the nature of the task facing the developers of OR solutions.

Five years ago, the Society instituted a research committee to strengthen its support for OR research and its engagement. In particular, the committee seeks:

- to ensure that the Society is fully informed about the research landscape, using this knowledge to respond to issues, threats and opportunities;
- to ensure that the Society's voice is heard in relevant national bodies and consultations, with respect to OR research and its impact;
- to enable the OR research community to access funding and to achieve impact, and to enable the OR practice community to benefit from research and academic expertise;
- to ensure that the Society makes research-related information accessible via the website or other routes.

One key step toward enabling us to meet these aims has been the development of substantial research-related content on the Society's website. If you have not already checked this out, please do so at bit.ly/Researchweb

There you will find a great deal of information on how to seek funding for OR research and where the key current opportunities are. If you are an OR researcher, please add your profile to the researcher database featured on these pages. The online form to complete is short and straightforward. This will be of particular benefit to those seeking to grow their own research networks or connect with others in the development of collaborative projects.

One of the other things you will find on the website is an invitation to apply for membership of the Peer Review College of EPSRC (The Engineering and Physical Sciences Research Council). EPSRC is a major funder of OR research in the UK. Its current portfolio of funded OR grants has a total value of around



£40M. As recently as 2016, EPSRC recognised Operational Research as a research area, cutting across a wide range of their funded programmes, including mathematics, computer science and engineering.

Since its inception, the research committee has sought to strengthen the Society's links with EPSRC and other major funders of OR research. This works to our mutual benefit. They can seek our input on the design of new funding streams (a new fellowship scheme, for example) while we gain a greater understanding of the research landscape, which we can then pass on to the benefit of the Society's members. In the course of our discussions with EPSRC, it emerged that they needed access to more members of their Peer Review College who could assess new grant applications in OR. Hence the invitation on the website to apply for membership of the college.

If you are interested in this opportunity, please go to bit.ly/EP SRCweb where you will find full details, including short case studies featuring Kerem Akartunali (Strathclyde), Kathy Kotiadis (Kent) and Alain Zemkoho (Southampton) who share why they decided to join the college and the benefits it has brought to them.

In brief, other highlights of the Committee's recent work have included:

- encouraging the development of a network of early-career researchers (ECRs) in OR. This was formed following a successful ECR workshop at Lancaster immediately

preceding the national conference OR60. The network is for ECRs and is run by them. It now has ninety members and holds ECR focussed events around four times a year. Membership is via a LinkedIn group, and you can join via bit.ly/LinkedInECR

- discussion of the challenges posed in the Blackett Lecture delivered by Chris Skidmore MP last November, including establishing a national research institute in OR
- ensuring strong OR input into the New Mathematics Initiative, which grew out of the Bond Review into knowledge exchange in the mathematical sciences. These are important developments, and members of the research committee have played key roles
- exploring how greater equality, diversity, and inclusion can be encouraged within the OR research community.

These are exciting times for OR, in general, and OR research, in particular. Watch this space for further developments. If you have any thoughts regarding issues or concerns to which the research committee should be giving attention, please do share them by contacting Carol McLaughlin at carol.maclaughlin@theorsociety.com 

Food For Thought

Build better

NIGEL CUMMINGS



The British Science Association (BSA) has published a report aimed at leaders in business, science, policy, and civil society. Part of their *For Thought* series, the report aims to address key scientific and social challenges facing the world in the 21st century.

The report is based on conversations, evidence and ideas discussed at a series of *For Thought* events held during February and March 2021. These discussions took the COVID-19 pandemic as a starting point to explore how science, research, innovation and technology could be used to deliver a more equitable, sustainable and prosperous future for people and the planet.

For Thought: Build better sets out a plan for meeting the BSA's biggest challenges – pandemics, climate change, cybersecurity, the future of cities and food security. The

purpose of the report is to increase public awareness of our co-dependency and the world's inequalities – as well as the demonstrable power of science to improve all of our lives.

The challenge for leaders in business, science and policy is how they can create long-term value when politicians are elected for five-year terms, most research grants run for three to five years, and the average tenure for a Chief Executive at the top 2,500 global companies is five years.

According to the report, evidence has emerged which indicates that young people, those aged 12-24 years, are among the worst-affected groups in terms of the economic and social impact of the pandemic, particularly in terms of the labour market and mental health outcomes.

Young people from the poorest households or ethnic minorities are twice as likely to have lost their jobs. It urges its readers to consider ways of addressing intergenerational inequality in order to build trust in future decision-making.

The worlds of business, policy and science have the power to bring about change, but leaders must view the large societal shifts needed from a whole systems perspective. There is a need for greater collaboration between public and private sectors and across borders and industries. This will require data sharing and trusted evidence and insight to formulate an action plan. A global crisis requires a global approach and as such, how we harness technology and data sharing is of the essence.

This new report is both timely and important inasmuch as it shifts and focusses our attention on ideas, experiences and learnings that place future generations at the heart of our institutional and systems decision-making, shares the benefits of research and innovation across different communities and creates a long-term leadership coalition to deliver the UK's Net Zero ambition. 

You can access *For Thought: Build better* here: bit.ly/thought-pdf

Waterman Awards for 2021

NIGEL CUMMINGS

The Alan T. Waterman awards are made annually by America's National Science Foundation (NSF) to nationals under the age of 40. It is worth \$1 million for research on their chosen field, spread over five years. This year, there were two winners: Melanie Matchett Wood, Professor of Mathematics at Harvard and Nicholas Carnes, a Associate Professor of Public Policy and Political Science at Duke University.

Melanie Matchett Wood's award spotlights and recognises her outstanding early career in mathematics, specialising in number theory incorporating arithmetic and algebraic geometry, topology, probability and random groups. Dr. Wood is the first woman to receive this award in mathematics since its inception in 1975. She is also the seventh Harvard scientist recipient (following Emily Balskus, a Harvard chemist who won the award last year).

Dr. Wood says she was "gobsmacked" when she heard the news from NSF Director Sethuraman Panchanathan. Wood says, "my work has shown that by combining perspectives from probability, geometry and topology, we can understand things about how factorisation works across different number systems and how number systems can be enlarged by adding in new numbers."

Her research into foundational questions in mathematics is important because it tells us about our world and about new technologies it may lead to in the future. The award given to Wood recognises her fundamental contributions in number theory, algebraic geometry, topology, and probability.

Her co-winner, Dr. Nicholas Carnes, a social scientist, is the Creed C. Black Associate Professor of Public Policy and Political Science in the Sanford School of



Public Policy. He is recognised by the award for his research on the social determinants affecting public or community service. Carnes has played a key role in moving the field to take economic inequality seriously as a factor in representative democracy. Carnes is also co-founder of the Research Triangle Chapter of the Scholars Strategy Network (SSN), a fast-growing national association of engaged scholars.

Dr. Carnes said, "This award is the greatest honour of my career. The Waterman Award will allow me to carry out research that has never been feasible before. My most significant contribution has been helping to revive research on the obstacles that prevent lower-income and working-class Americans from serving their communities as political leaders."

NSF Director Sethuraman Panchanathan said of the awards, that it was a "delight" to recognise the outstanding talent embodied by Dr. Carnes and Dr. Wood as this year's recipients of the Alan T. Waterman Award, the highest honour given to early-career scientists and engineers.

"Wood is tackling the mysteries and most complex problems in mathematics by looking into the connection of number theory and random matrices. Carnes is looking into how a person's social background may influence their decision to pursue public service and what factors would increase their opportunities to serve."

The Waterman Award was presented to the winners at the National Science Board (NSB) meeting on 18-19 May.

More at bit.ly/watermanwinner 





Finding the right tools for simulation modelling

NIGEL CUMMINGS

Simulation modelling, the process of creating and analysing digital prototypes of existing and proposed systems to predict their performance in the real world, has become one of operational research's most important fields. The tools that simulation modelling provides both in engineering and business disciplines can reap abundant benefits for any organisation that utilises them.

Some of these benefits include:

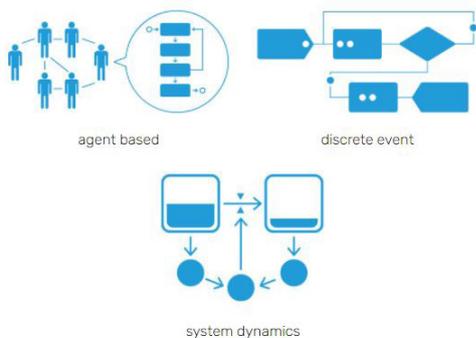
- Shorter design and development cycles, with the ability to modify and re-test a model without the need to spend time and money building and testing multiple prototype iterations.
- A virtual platform for creating realistic test scenarios. Other types of prototypes are not always practical for testing all possible operating conditions. However, there are no 'physical limits' to the operational scenarios that can be modelled and tested with simulation.

Simulation modelling has advantages over more traditional approaches, such as mathematical forecasting and optimisation. These approaches are more 'theoretical' and are often based on mathematical assumptions and constants about how an object and/or process will behave. With simulation, you do not need to make as many assumptions - with an accurate model design and the right simulation software. You can try different scenarios and know exactly what the behaviours of objects and processes might be.

Simulation modelling software is available in many forms. Some utilise spreadsheet scripts linked with relational databases and automation, which are regarded as the simplest and most universally used general-purpose simulators. Others provide more explicit discrete event simulation, with process-centric elements that model the transactions and flows within systems. Additionally, some offer agent-based simulation or systems dynamics approaches. Only one, as far as we are aware, provides its users with a 'hybrid' multimethod approach for creating realistic and insightful scenarios. Multimethod modelling environments which 'package' discrete event, agent-based, and system dynamics approaches can be used to simulate systems of greater complexity and at different granularities, more simply.

AnyLogic, a simulation package serviced by DSE Consulting, is regarded as being the first tool to introduce multimethod simulation modelling. No doubt its competitors will follow similar approaches, but AnyLogic retains the pole position in its field for now.

AnyLogic provides its users with various visual modelling compatibilities that are embodied in process flowcharts, state charts, action charts, and stock & flow diagrams. It also provides animation and visualisation facilities too. Such capabilities are augmented by drawing from extensive sets of 2D and 3D graphical objects to visualise vehicles, staff, equipment, buildings, and other items and processes related to business.



Moreover, it can convert a model's logic and metrics into interactive dashboards, capturing your key performance indicators in an and integral way with CAD layouts and GIS maps within its outputs. These graphical features have been found to be particularly useful for engaging and informing stakeholders by adding a positive 'feel' to the simulations, which inspire confidence in the end results.

Additionally, AnyLogic uses an extensible Java IDE that allows users to import custom 3D models, icons, drawings, and other geometric and operational data files into its modelling environment. There is also an existing set of industry-specific libraries, which act as verticals for a range of business processes and workflows to make modelling extremely rapid.

Software today would not be attractive unless it has a cloud component. AnyLogic has a range of cloud capabilities from

subscriptions to local server-based, which position it for use on a range of platforms from the desktop to fully portables phones and tablets. In addition, its private cloud infrastructure can be integrated into company workflows so that the models it outputs can be deployed virtually, anywhere.

DSE Consulting experience healthy sales of its multimethod simulation package and have caught the industry's eye for innovation. As a result, it was recognised by the Midland Enterprise Board in 2020 as the 'Best International Software Reselling Business in the UK' in its field. The award was given to help organisations management teams and business leaders solve the latest data analytics problems.

In 2021 the company became a headline sponsor for The OR Society's Simulation Workshop, an event that celebrated the latest simulation and modelling breakthroughs internationally, across industry and academia. 

You can find out more about AnyLogic here: www.anylogic.com
And more about DSE here: www.dseconsulting.co.uk



My EPSRC Peer Review College Experience



We spoke to Dr Kathy Kotiadis, University of Kent, to find out about her experience of being a full member of the EPSRC Peer Review College. Kathy is a Reader in Management Science/Operational Research at Kent Business School and has been peer-reviewing for almost five years.

Can you tell us a bit about your experience of being at the EPSRC Peer Review College?

I have been part of the EPSRC Peer Review College for almost five years and it has been a rewarding experience. I became a member a couple of years after returning from a career break. When I put in my application I was not expecting to be selected as I had not even got a permanent academic appointment at that time! It really is true that the college look for a variety of people. It was very useful in reconnecting with the EPSRC grant writing process from the reviewers' point of view.

What are the benefits of taking part in the peer-review process?

One of the key benefits is the training that is provided initially which really helps to prepare you for the role. Being part of the peer-review process helps you to have a greater understanding

of the process of writing a grant, in the same way that reviewing journal papers helps you to become a better author of journal articles.

What insights have you gained?

I have gained confidence in the value of my expertise through the process of reviewing applications. It's a good experience to know that my expertise is needed! The EPSRC college needs a variety of expertise and experiences and it's important that a variety of people join the college.

Why is it important that OR is well-represented at EPSRC?

It is very important that OR is represented at the EPSRC so that experts in that subject area can review applications from that field. But, more importantly, it is important that both hard and soft OR are represented. EPSRC also needs those that have theoretical and practical/applied experience.

What networking benefits are there?

I have not had the chance to explore these yet, but I will certainly look out for them more in the future.

Do you feel being part of the College has a reputational benefit?

I have not actually mentioned my membership to the college to many people so I have not, but I will be moving forward. I only recently discovered that I was in the minority of OR people in business schools who are members.

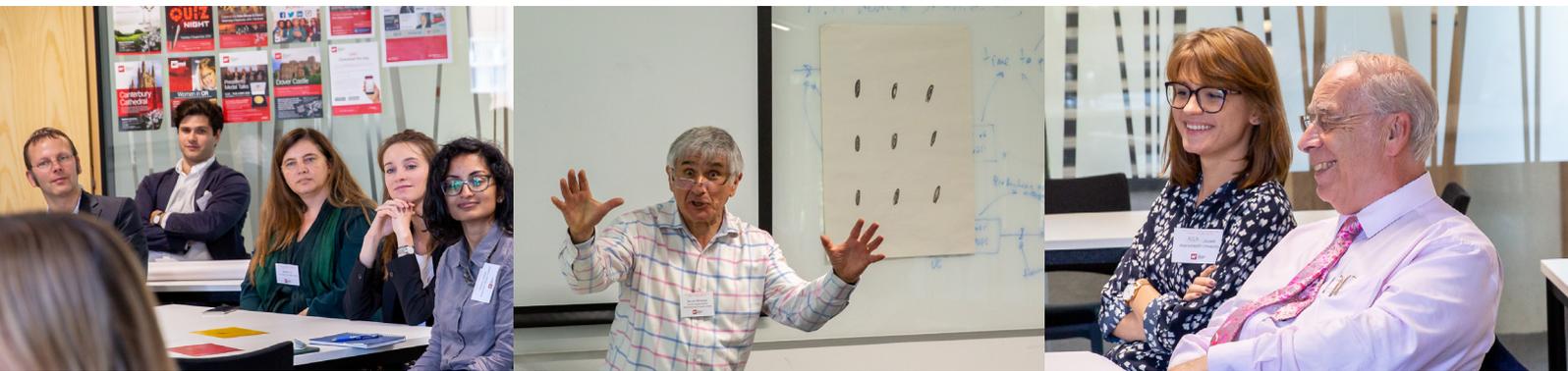
How has being part of EPSRC helped you to understand research strategy better?

It certainly has. It was covered in the training provided and being part of the process has continued to strengthen my understanding.

If you are interested in finding out more about EPSRC Peer Review College, visit our webpage here bit.ly/EPSRCpeerReview 

Making an Impact at OR63 Online

MARTIN KUNC, UNIVERSITY OF SOUTHAMPTON, OR63 CONFERENCE CO-CHAIR



This year's Making an Impact at OR63 Online is designed to support everyone – analytics professionals, academics, and practitioners – in Making an Impact. Whether it's by learning about new tools and techniques, participating in system workshops, getting a better understanding of what can be done with new technology or finding new opportunities for collaboration, OR63's Making an Impact is your key to being more effective and successful in OR.

Our theme this year is **"creating a better future"**. We will be exploring how OR can help build a better future after the pandemic, and how the future will change how we as OR professionals work.

This year's Grand Challenge links to the UN Climate Change Conference in Glasgow and will draw on the skills and experience of the OR community to help drive the world towards net zero. We also have workshops exploring all the different ways that people can work more effectively together, emphasising how to collaborate more efficiently

online and a ground-breaking poster session that showcases those at the start of their OR journey.

Grand Challenge

This year, Miles Weaver's Grand Challenge will be focused on the need to move the world to net-zero and how OR can help in this objective. The Grand Challenge will link to the UN Climate Conference in Glasgow and include a contribution from a UN representative, with follow up through OR Society Pro Bono projects and a Grand Challenge-based OR Society webinar.

Workshops

We are also planning a full programme of workshops to help you Make an Impact using new tools and techniques or exploring aspects of OR practice. These will include guidance on running an online workshop, using Simul8's new online tools, and using IBM's Watson to structure your optimisation

Come and see how others are making an impact

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problem. There is also a set of workshops in partnership with the Systems Thinking stream that will help you understand complex systems and the 'See the System' competition, plus workshops on ORS initiatives. These will include volunteering, diversity and inclusion, the professionalisation of Data Science and a session on how to maximise your chance of obtaining EPSRC funding.

Posters

We are giving a special invitation to MSc/PhD students to present posters on their research and practical projects. We are offering student members a reduced rate - which extends to attendance of the whole conference. (Student members can join the OR Society for free!) These posters will be combined with a special session of Quickfire Poster Presentations to give each of the presenters a 3-minute window to highlight what makes their work special. This will be followed by the opportunity to talk to the poster presenters in their own online space before and after the President's Medal presentations.

We will also be welcoming other posters, which can be from any OR area, so long as they show how they have used OR to Make an Impact. For those interested, submissions can be made on the OR63 website using the Making an Impact Posters stream or directly to Stefano Coniglio at S.Coniglio@soton.ac.uk. We can even cope with poster submissions after the official closing date for abstracts. Presenting a poster at OR63 will enable you to

start conversations and build networks for future collaborations. Posters will be on display through the conference app as well as on the Making an Impact day.

Book your place

As you can see we have a packed programme for you. The only way to explore these exciting opportunities to Make an Impact is to register to attend OR63 online. In addition, if you are contemplating presenting a poster, then there is still the option to submit a poster for inclusion in the special poster session, including the option of free attendance on the day for poster presenters who are still students on MSc and PhD courses, or reduced attendance for the whole conference. 

Come and see how others are making an impact

Register today:

www.theorsociety.com/OR63

Join our pre-annual conference sessions!

On the eve of our annual conference, OR63, there are two sessions for you to join for free to engage and learn with the operational research community. Find out more about our sessions on 13 September below.

Early Career Researchers Workshop

Making impact with your research: What to know before starting an impact case study

Date: 13 September

Time: 2.00 - 4.00 pm



The next Early Career Researchers (ECR) Network event will focus on how those who are early in their academic career can make substantive impact with their research. The format of the event will include an introduction, panel session, and speed networking session.

The panel will discuss 'Creating and measuring impact in research.' It will be hosted by a panel of experienced operational research academics including Robert Fildes (Lancaster University), Julian Hall (University of Edinburgh), Sally Brailsford (University of Southampton) and Daniel Gartner (Cardiff University). They will be on hand to answer any questions attendees may have about this important topic.

The event will also provide an exciting opportunity for ECRs to network with peers and make connections within the network. These connections can help to provide support and to share ideas and comparative experiences of working within the field of operational research.

This Early Career Researchers event will be taking place at 2 - 4pm on 13 September. 

Find out more and sign up to attend here:
www.theorsociety.com/ECR63

The Women in OR and Analytics Network event

Date: 13 September

Time: 4.30 pm



The Women in OR and Analytics Network (WORAN) invites all members of the OR/analytics community, and especially conference participants, to join them at an informal and informative get-together on the eve of the conference.

Following a brief introduction to WORAN, Cynthia Barnhart, Chancellor of the Massachusetts Institute of Technology, and former president of INFORMS, will give a presentation. She will be speaking from a female perspective before a lively Q&A session and networking session in small groups in breakout rooms. This will give all attendees a chance to meet old friends and new, talk about the issues raised, and maybe arrange a time for a further catch-up during or outside the conference.

WORAN meetings aim to make women visible as role models and contributors to OR, to explore issues affecting women, to help build and consolidate professional interaction and networking, to make sure that women's voices are heard, and to be an enjoyable opportunity to 'get out and about'. These goals are relevant to the whole community, not just to women, so the meetings are open to everybody. 

Find out more and sign up to attend here:
www.theorsociety.com/WORANOR63



Why you should take part in the Grand Challenge

DR MILES WEAVER, EDINBURGH UNIVERSITY

As we know, operational research traces its origins back to the Second World War. Its creation paved the way for complex problem solving, new ways of thinking and methods that have transformed the world around us. However, some of the most challenging problems that OR has been faced with still loom ahead. I am, of course, talking about the issue of sustainable development goals.

What is the Grand Challenge?

The Grand Challenge takes place every year at our annual conference. In the past, we've looked to help a local council with truck congestion in Kent and to solve logistical challenges faced by the Navy.

For the challenge, all of the different methodologies and experiences of OR are united to help achieve a common goal. It's why we are so passionate about this event; it brings the OR community together to find practical solutions to solve a real world problem.

How does the challenge work?

- To begin with, attendees will hear from two guest speakers who will pose their challenge.
- Small breakout groups will then seek to draw a 'rich picture' of solutions to the problems raised.
- Following this, together, we will feed the proposed solutions back to our guests.
- Each idea will be considered as a potential student or Pro Bono project, a research funding or independent consultancy bids.

Why we need you

Whether you are early in your career, an experienced practitioner or even a student, there is a place for you at our Grand Challenge. All methods of operational research are welcome, systems thinking, behavioural OR, public policy, problem structuring methods to name a few. The challenges require everyone working together combining skills and experience to offer solutions that can be turned into actionable projects.

Taking part not only gives you a chance to share your expertise but will offer the experience of working to help solve a client's problem, the chance to engage and network with others in the community and ultimately, to help make our world a better place. 

We hope to see you there.



UN CLIMATE
CHANGE
CONFERENCE
UK 2021
IN PARTNERSHIP WITH ITALY



To learn how you can contribute to this year's challenges and register to take part, visit:
www.theorsociety.com/GrandChallenge

See the Systems

KERRY TURNER, PHD RESEARCHER, UNIVERSITY OF HULL

“Tell me and I forget, teach me and I may remember, involve me and I learn” (Benjamin Franklin). Unfortunately, despite Franklin’s advice, the “Read, Remember and Recite” model of learning permeates our schools in the way that “Command and Control” permeates our organisations.

Recite means that things stay the same. At a point in our evolution when we most need creativity, we still teach compliance, and this leads to people unable to think and decide for themselves. Instead, they simply follow orders, leading to disasters like Grenfell Tower and looming disasters like climate change.

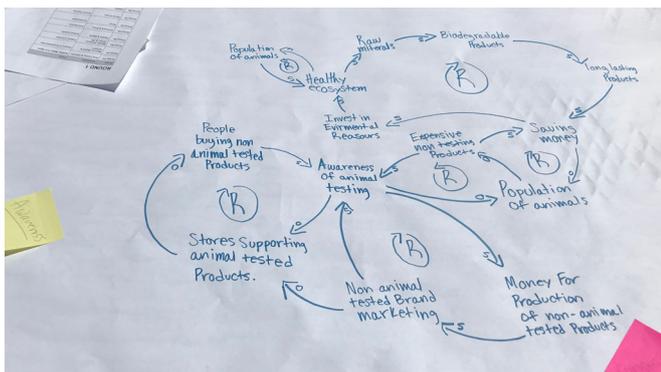
The recitation model is based on telling (often with explanations or proofs). It is reinforced with rewards for compliance and punishments for non-compliance. The rewards are qualifications and the promise of a “good career.” The punishments are being bottom of the class or the threat of the dole queue. Children’s environments are micro-managed by we adults to avoid failure. Yet failure can be a source of huge learning, and dealing with failure teaches us creativity and resilience.

Systems thinkers (myself included!) have attempted to introduce new ways of learning about systems in schools. But, generally, the focus has remained on learning in the safety of a classroom. Imagine what could happen if we gave children the agency and freedom to intervene in real systems and create real change, outside the classrooms, in their own communities!

The Four I’s:

1. Identifying Issues (IMPACT);
2. Mapping the system (INTERACTIONS);
3. Identifying leverage points & their consequences (INSIGHT); and
4. Making it happen (INTERVENTION).

These are the four I’s of systemic learning by doing.



Since 2018, I have been pursuing a vision to bring systems thinking to children. I launched my project at OR60 and reported on progress at OR61. Recently I had a revelation: What if we created a new educational system rewarding the four I’s in practice?

What is the initiative?

See the Systems brings systems action to local communities around the world.

Teams from schools and other associations will compete to map systemic issues within their local communities, design/prototype proposed solutions, and validate/implement their ideas while measuring the resulting qualitative and quantitative impacts.

Participants partner with experienced mentors, systems/OR practitioners from organisations such as the ORS (Operational Research Society), SCiO and INCOSE (International Council for Systems Engineering), actively sharing their learnings via social media and other platforms.

The program will encourage activities that sustain long term positive benefits. Entries will be judged on ingenuity, leverage, engagement, and quality of evaluation.

See the Systems aims to empower young people by introducing tools and supporting agencies, so the participants make a real difference in their worlds.

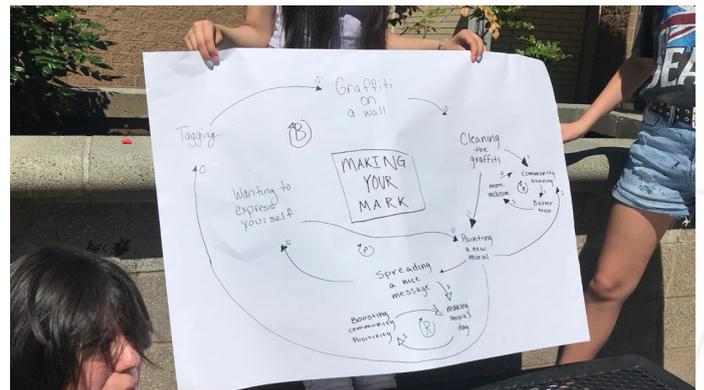
How is it different/complementary to other initiatives?

See the Systems was inspired by Oxford University’s “Map the System” competition for university students and Kerry Turner’s involvement with systems since 1987. See the Systems extends Map the System to a bigger community of children and the general public. It extends the scope from systems mapping and analysis to systems intervention and evaluation.

Kerry has been on a track to bring the systems perspective to children since 2018 when she enrolled to do a PhD evaluation study of the potential impact of students understanding systems on UK education. She has worked in schools and home ed groups in the UK, India and Colombia. See the Systems synthesises and integrates the learning from these initiatives and continues to learn with the participants and collaborators.

What is the benefit?

See the Systems fosters individual agency and empowerment, inclusive creativity, cross-domain collaboration and social



citizenship among marginalised youth. It fosters the next generation of systems thinkers/modellers, building relationships for future internships and employment opportunities. It democratizes systems thinking for young people as they begin their academic careers and engages young people in systems thinking and action.

How is it to be structured, organised and funded?

See the Systems is being energised by a small team of people passionate about systems. In addition, the team manages a network of engaged organisations providing support and advocacy. As the initiative grows over time, we envisage employing some of the bright young people who have participated in the programmes.

See the Systems will be operated by volunteers. Creative patterns are emerging where employees in organisations can have paid time off work to mentor in the programme.

Trials

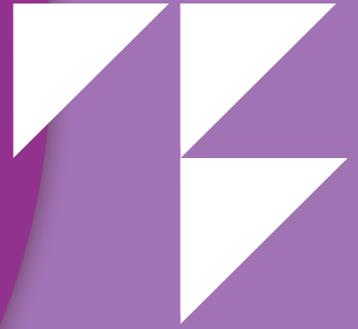
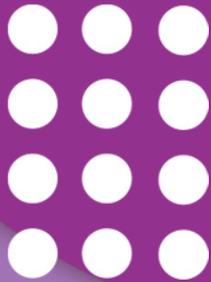
As I write, we are running a trial of the scheme in a school in Oregon, USA. We are planning a trial with the OR Society and STEM Ambassadors in the UK later this year. We anticipate further trials in India and Australia.

To find out more and get involved

We are actively seeking OR practitioners to mentor in the scheme, and Kerry will be presenting a workshop on See the Systems in the Making an Impact stream at OR63. 

You can find out more via her fed wiki pages here: bit.ly/seethesystems

You can also contact Kerry directly via email: kerry.i.turner@googlemail.com or mobile: +44 7853896127.



Planning the next online Careers Open Day

Taking place on 17 November, planning for this year's Careers Open Day is now underway. We chat with Evelyn Hardy, Education Manager at The OR Society, to learn more about what this year's event has in store.

Who is Careers Open Day for?

Our event is open to anyone looking for a career, or change of career, in operational research or a related discipline. We bring together the leading employers in OR with students looking for a career that allows them to use their analytical, problem-solving skills in a meaningful way.

What are the highlights of the event going to be?

This year, employers can upload videos to their profiles. This means that the careers talks employers usually offer can be made available on-demand, allowing them to reach more students. It also means we have more time in the schedule to offer skills sessions, such as interview tips and advice on writing a strong CV. This will help attendees stand out from the crowd when applying for jobs and will help employers improve the quality of candidates they receive.

Is anything else new this year?

Like last year's event, this year Careers Open Day will be online. However, this year we have a brand-new platform. Employers will be able to customise their profiles, upload videos and pdfs, and set a schedule so attendees can book one to one video chats at convenient times. I'm really excited

to use this platform because there is also a matchmaking element. Attendees and employers will be matched based on the tags they add to their profile, which I think is a great way to get useful and insightful conversations flowing.

What else do you want readers to know?

I think most people reading this will know somebody at university or considering a career change. It could be that your niece is studying maths, or your best friend's son wants a career change, or maybe you work at a university! Whoever you know that could use some careers insight; please encourage them to attend Careers Open Day. It's free to attend and is the only careers event in the UK that offers such a deep dive into OR and analytics careers. This unique focus makes it an invaluable opportunity.

Any final thoughts before the big event?

I feel very strongly about the power of this event. Anyone who knows why I love my job knows that I wish I knew about careers in OR as a student, and it's a fantastic feeling to offer this event to attendees who might also be looking for that 'lightbulb' moment. I also know first-hand that Careers Open Day achieves its aims. At the first Careers Open Day I worked on, one of our speakers talked about her OR career. She was there because she attended Careers Open Day as a student the year before, and it helped her to start her career. 

For more information on Careers Open Day, and to book your place, visit www.theorsociety.com/COD21



ONLINE TRAINING CALENDAR 2021

SEPTEMBER

- 01/09/2021 - Foundations of OR: Delivering OR for Practitioners online
- 06/09/2021 - Foundations of OR: Statistical Methods in OR: Multivariate Models
- 07/09/2021 - Behavioural Frameworks and Methods for Operational Research Practice
- 13/09/2021 - Foundations of OR: Statistical Methods in OR: Forecasting Online
- 14/09/2021 - The Science of Data Visualisation
- 16/09/2021 - The Art of Data Visualisation
- 17/09/2021 - Statistical Methods in OR: Forecasting with ARIMA (New for 2021)
- 20/09/2021 - Developments in Credit Scoring
- 22/09/2021 - Foundations of OR: OR and the OR Process
- 27/09/2021 - Data Wrangling with Python Introduction
- 28/09/2021 - Introduction to the Viability and Sustainability (V&S) Methodology
- 29/09/2021 - Data Wrangling with Python Foundation Plus

OCTOBER

- 04/10/2021 - Foundations of OR: Optimisation and (Meta-) Heuristics
- 04/10/2021 - Improving and evaluating performance with the Public Sector Scorecard

- 05/10/2021 - Data Visualisation with Tableau Online
- 06/10/2021 - Introduction to Soft Systems Methodology
- 07/10/2021 - Foundations of OR: Simulation
- 07/10/2021 - Geospatial Data Visualisation with Tableau Online

NOVEMBER

- 10/11/2021 - Artificial Intelligence Deployment Through Cloud Computing
- 22/11/2021 - Consumer Willingness to Pay Using Conjoint Analysis
- 25/11/2021 - Foundations of OR: Data Envelopment Analysis
- 30/11/2021 - How to design and deliver high impact data analytics projects

DECEMBER

- 01/12/2021 - Introduction to Cognitive Mapping

For more information and to book onto a course visit: www.theorsociety.com/training

Research and Publication News

CAROL MCLAUGHLIN, PUBLICATIONS AND RESEARCH OFFICER

New member for the OR Early Career Research Network

We are very pleased to announce that Dr Wendy Jiao (Loughborough University) has joined Dr Lucy Morgan and Dr Laura Boyle on the ECR Network Committee. Wendy is a Lecturer in Operations Management with interests in revenue, inventory and capacity management.

Wendy said: "I attended the ECR workshop in 2018 and was very impressed with this well-organised event. There were some quite interesting and informative talks about funding applications, journal submissions and knowledge transfer partnerships. Besides, it was a very good opportunity of knowing other ECRs. I benefited a lot from this workshop which is really helpful for my career development. It is an honour to become a committee member of the ECR network."

Before joining Loughborough, Wendy was a post-doctoral fellow at The Hong Kong Polytechnic University. She holds a Master's degree in Logistics Management and Engineering from Beijing

Jiaotong University and a PhD in Supply Chain Management from The Hong Kong Polytechnic University.

We look forward to having Wendy on the panel! If you want to find out the latest news and events for OR ECRs do join us on LinkedIn here bit.ly/LinkedInECR or get in touch with carol.mclaughlin@theorsociety.com 



An Open future for UK research

The OR Society's publishers, Taylor & Francis and Jisc – the digital information services non-for-profit, who negotiate deals with publishers on behalf of UK universities – have recently signed a new three-year agreement that will have significant implications for UK research.

The new agreement is a Read & Publish deal that enables participating research institutions to continue accessing subscription journals whilst also providing a route to Open Access (OA) publishing.

"The agreement is part of Taylor & Francis' wider commitment to open research and will accelerate open access transition

in the UK. We look forward to working with Jisc in supporting the needs of the UK's researchers." Christoph Chesher, Chief Commercial Officer at Taylor & Francis Group.

What does this mean for The OR Society? It means that the vast majority of UK academics will now be able to publish in The OR Society's journals on an Open Access basis and also continue to access the journals' subscription archives.

This transformational arrangement will make it easier for researchers in both humanities and social sciences, and science, technology and medicine disciplines to make their research more accessible for greater impact. 

EJIS promoted in the Chartered Association of Business Schools (CABS) Academic Journal Guide 2021

On 24 June 2021, the latest iteration of the CABS Academic Journal Guide was released. The CABS guide is particularly influential in business schools and often holds equal weighting with the infamous Journal Impact Factors.

Publishing in 'ranked' journals is often a necessity for many researchers, with publications acting as justification for promotion and funding even though there is a growing shift away from using journal-level metrics in research assessment. The better the rank of the journal, the more kudos for publishing in it and the more likely a journal is to attract the top research.

Therefore, it is quite the coup that the *European Journal of Information Systems* (EJIS) be promoted from a three to a four. The journal rankings are only revised sparingly (every three years) and only eight out of 100 journals in the Information Management category are ranked four or four*. These journals are generally considered to "...publish the most original and best-executed research".

This is great news for EJIS and recognises the great efforts of the editors to develop and publish the most interesting and exciting information systems research. 

Find out more here bit.ly/academicjournalguide

Join our Problem Structuring Methods Webinar

Observations on issues of the commons – how systems thinking with a forum might succeed

Date: 1 September

Time: 5.00 pm

Many organisations have partial responsibility for problems that are in the 'commons' – the shared resources of the planet that are often taken for granted – the atmosphere, the land, the watercourses, and the seas. Governments establish agencies to deal with these problems through regulation and persuasion, but these are negotiations that continue over long periods. Other organisations are also stakeholders, including the independent concern groups that raise awareness of the problems and lobby for change.

A forum approach is one way to bring representatives from these different groups into a space for discussion and exchange of worldviews. This talk will reflect on the experiences of a systems study for a forum charged with tackling agricultural pollution in Wales.

Book your place here: bit.ly/PSMwebinar 

Women in OR and Analytics Network Online: forthcoming events

WORAN online meetings aim to make women visible as role models and contributors to OR, to explore issues affecting women, to help build and consolidate professional interaction and networking, to make sure that women's voices are heard, and to be an enjoyable opportunity to 'get out and about'. These goals and issues are relevant to the whole community, not just to women, so the meetings are open to everybody.

OR for a better world: in 5 minutes

Hazal Muhtar, Head of Analytics for Consumer Products, Transfer Wise

Date: TBC (August 2021)

Time: TBC

If your August plans are vaguer than August plans normally are, this session offers another way of meeting new people and hearing new things. A series of lightning talks displaying the work being done by women at all career stages, from leadership to new(ish) entrant, to use OR to improve the world. More details coming soon. 

More details will be available on the WORAN website.
Book here: bit.ly/WORANgroup

WORAN 'Spotlight': Cynthia Barnhart (first female chancellor of MIT), plus networking

Date: 13 September 2021

Time: 4.30 pm

Join us on the eve of the annual conference to hear from Cynthia Barnhart and to meet and compare notes with other WORAN members and fellow travellers. You can find out more about this event on page 17. 

Past WORAN talks are all available on the ORS YouTube channel here bit.ly/woranvideos via the WORAN webpage here bit.ly/woran-sept

The future of work, work relationships and HR

22 June 2021

NIGEL CUMMINGS

The AGM of the People Analytics SIG was hosted by Katie Groom and provided a number of insightful, thought-provoking talks on the future of work, work relationships and HR.

"The analytical challenge: the arc of change" was given by Jill Dixon, ACAS who shared her observations on the immediate challenges faced by people, society and work during this time of the global pandemic.

There are areas brought to light by the pandemic such as reopening, rebuilding and reimagining. There will need to be a period of adjustment and a need to achieve change in a safe and harmonious way.

Attention will have to be given to mental health issues after the strain of enduring pandemic restrictions too - there will be a need to achieve parity between mental health and flexible or remote working.

We are entering a period where change management will be an important factor in dealing with data and overcoming the considerable stresses and strains that hospitals and their staff are having to manage. These stresses and strains were not confined to the medical sector either, with so many venues reopening for the first time in months, there will be a need to meet and manage the fears of staff and allow them to innovate to restore productivity to sustainable levels.

Employers will need to ask, "How can we keep our workers? We know there is a strong correlation between good work and good productivity, how best do we manage this, promote inclusivity and promote wellbeing?"

The pandemic has provided an opportunity for growing common interests in work and increasing transparency between employers and employees, but to optimise these opportunities, structurally we need to think about changes in the labour market and reskilling for some individuals. As for analytics during this time of change, it is important that we capture the baseline and consider behaviours behind the statistics.

Dr Matthew Davis, Associate Professor in Organisational Psychology at Leeds University Business School spoke about "Adapting offices in response to COVID-19 and hybrid working".

He believes the 'new normal' will be a hybrid, where people choose to spend some time in the office and some time working from home. Today, only approximately 20% want to spend all of their time in the office. So, there was a need to consider the well-being and other impacts on workers and to understand that e-working was consistently linked to higher levels of job satisfaction and better work-life balance.

There is evidence of higher organisational commitment among workers and office-based workers who adopt a hybrid form

of working between home and office. It is likely that when “normality” returns, many will opt for flexible working, though this could result in an imbalance between genders and their specific needs in employment.

There is evidence that suggests women benefited more from homeworking because they can work around other commitments. There is emerging evidence too, that women will be less likely to be returning to offices. This might well entrench gendered roles.

Homeworkers are more likely to extend working hours, but recent data showed evidence that increased hours in such environments could see overall reductions in productivity. (Gibbs, Mengel & Siemorth (2021) calculated a 20% drop in productivity).

Recognising these impacts is important and should be taken into account, but there is a need to understand these impacts more satisfactorily. There will be a need to measure the impact of different working patterns.

There is evidence that job satisfaction increases non-linearly as time working at home increases. It is thought the balance is at around 15 hours of homeworking. Beyond that, it is thought the benefits may be offset by difficulties in maintaining work relationships.

Employees placed in homeworking positions reported greater professional isolation than office-based colleagues, there was a sense amongst them that they were missing out on networking opportunities, informal learning and mentoring.

Consideration will have to be given to workers who, due to the restrictions of the new normal have to work from adapted offices too. Up to 28.5% of the UK’s professional, scientific and technical workforce are working in adapted offices.

Offices will need a certain level of ventilation to maximise the flow of fresh air and minimise airborne virus transmission. New recommendations on occupancy levels have been introduced to reduce overcrowding and adapted office spaces have to be

equipped with sanitisers and PPE, specifically at key ‘touch points’ such as workstations, meeting rooms and printers.

Additionally, there will be a need for enabling air quality monitors, installing UV air sanitisers and space monitoring sensors to manage sanitisation performance and control the flow of personnel through office spaces. Touchless entry to buildings and the encouragement of contactless payments in canteens /coffee bars should also be considered and there should be updated IT which would include fitting up meeting rooms to allow for hybrid meetings, laptops for hybrid working employees and investment in new software.

In conclusion, Matthew said, “The post-pandemic workplace will hardly look like the one we left behind. It will have to change to accommodate the needs of hybrid working and new ways of working within the office to minimise the transfer of infection.” 

Serendipity and roads less travelled

DR CHRISTINA J PHILLIPS, UNIVERSITY OF LEEDS

On 24 June 2021, we had the Women in OR and Analytics Network's (WORAN's) first meeting with the Southern OR group (via Zoom, of course). Ruth Kaufman gave us a summary of WORAN's progression to date from its inception at OR60, three years ago. Fittingly we even had a visit from one of our colleagues' small person.

The next speaker was Sally Brailsford, who gave us an inspiring tour of her weird and remarkable career. I think we can all relate to her telling us about how she felt like an impostor in the first year of her mathematics degree. I remember feeling something very similar when I began as a mature student on my mathematics degree programme. Sally had come from nursing before studying mathematics, which led to an enduring interest in improving health and health systems. By choosing a career in OR, she fulfilled both her love of mathematics and her interest in healthcare. As she pointed out, we are so fortunate in OR that we get to solve real-world problems and perform research.

Sally's story spoke to many of us, as for years, she chose to work part-time while looking after her children. During this time, she spoke another language, as opposed to mathematics, and took up work translating Russian. This had followed from a short stint at GCHQ. Her work in OR followed taking a position at Southampton University, where she also met her future second husband. She has stayed at Southampton to this day, where they also conferred her professorship, a big deal at the time as she was one of few female professors, and it even got in the local paper. I am glad to say she is still with her second husband, I may be biased, but I think this is because he is also an operational researcher. They even write papers together, sometimes!

Sally's career has been so varied, and I think this is something that many women can relate to.

I, too, chose to work part-time while looking after my son, teaching physics and working as an artist. She also pointed out the amount of serendipity necessary for her to find her way into operational research. I had to comment at this point as when I was a school leaver I was asked to design and perform work for one of the large breweries looking at bottle returns from individual landlords. This work was done on early computers, and I had to have a manual as thick as a Bible by my side. The final report that I produced was essentially an analytics presentation. However, I did not pursue this initially; although the brewery offered me further work, it was a short-term contract. Furthermore, I had just been offered a secretarial position, having trained as a secretary after leaving school. I said no to the job and took up the secretarial position, which, just three months later, I was let go from because they deemed I was not suitable. I look back now and find it ironic that my career in later life went down the path of mathematical modelling, OR, and problem structuring and design.

Sally's work in nursing was what led her to specialise in OR and health, particularly in simulation. In this role, she has solved many problems, helping to improve systems whilst also informing pedagogy and driving research in this area. If she had not been brave enough to keep on doing her maths degree even while feeling like an impostor, if she had not accepted the position at Southampton or been a nurse in her early career, would we now have the contributions of Prof Sally Brailsford?

It seems that women frequently have non-linear and varied career paths. Perhaps this is due to having children. Perhaps it is because expectations of, and by, women have changed in our lifetimes, and we have grown with those changes. Or perhaps it is just because the women of OR and analytics are not particularly linear! 



William A. Donaldson, OBE (1927-2021)

Bill Donaldson, as he was known, Vice President of the Operational Research Society (1978-80), has died at the age of 94. Bill joined the Royal College of Science and Technology in Glasgow in 1962 as Senior Lecturer in the Department of Industrial Administration. This institution became the University of Strathclyde in 1964. The Department of OR was created in 1968, with Doug White as first Head. Bill became Professor of Operational Research and Head of the Department in 1971, a post he held until his retirement in 1983. In the New Year's Honours List earlier that year, he was awarded the OBE to recognise his contribution to Health Services Computing, having chaired several review and advisory committees. His successor as Head of Department, Norman Lawrie, commented that Bill's leadership of the Department had been "marked by sustained good humour."

Strathclyde first offered courses in OR at undergraduate level, but in 1965 an MSc in Operational Analysis was introduced. It was Bill who had argued persuasively for that title on the grounds that it was a better description than research of what OR people did. However, it was changed in favour of OR a couple of years later because it was believed SRC studentships would be more readily available for courses given the dominant title.

During his time as Head, Bill published five papers in the *Operational Research Quarterly/Journal of the Operational Research Society* on various aspects of Inventory Control. This research topic followed from his previous appointment at Rolls-Royce, where he started as Chief Mathematician (Computing) in Derby before becoming Data Processing Manager for their Scottish factories. At Rolls-Royce, he developed a modulo 11 check digit calculation method to validate a series of numbers whose accuracy you want to ensure. Ironically, on his retirement, he abandoned computing and happily lived without a computer and email.

His path to Rolls-Royce in 1955, for which he was headhunted, was a first-class mathematics degree at Glasgow University in 1950, from which he obtained a scholarship to Cambridge University, graduating with an MA in mathematics in 1951. He then became a lecturer in mathematics at Glasgow University.

Apparently, he had intended to study English literature at University before being seduced by the prospects arising from the study of mathematics. But interest in the arts continued: playing jazz piano, enjoying classical music and opera. He loved poetry and frequently amended others' poems. His version of a Christina Rossetti poem was read at his funeral. He was a regular entrant to the Times crossword competition, winning once, and appeared on TV in Countdown and The Weakest Link. Other interests included squash, he continued playing (against his students) into his sixties, bridge, skiing, which he actively pursued until he was 85, and mountaineering: he climbed all the Munros.

Bill was Glaswegian through and through and lived there throughout his life, having been born in Cathcart. He was married to Connie for 56 years until she died three years ago. He is survived by his son, Alan, and daughter Laura. 



William A. Donaldson (1927-2021)

OR Minus 20

Letter: You write on

(THIS IS A RESPONSE TO THE LEADER ARTICLE WHICH WE FEATURED IN THE JULY 2021 OR MINUS 20 COLUMN.)

Apathy rules, OK?

We've all been told that apathy rules, and our members are probably no exception to this. So, to get things buzzing in the debate about new categories of membership, I think we should inject a bit of controversy. Taking a lead from the general election, perhaps it would help if one of the 'big beasts' of the OR jungle took it upon himself to beat up one of our ordinary members. I'm not talking about a hospital job here, just a minor softening up in front of a decent-sized crowd.

As well as finding a suitable beast, we would need a dozen eggs, a video camera and Nigel (who else could do justice to the post-fight interviews and the subsequent special report in the Newsletter?). I suggest a Society training course for the venue. Our man would take his seat in the audience and, at a pre-arranged and carefully-timed point in the proceedings, a volley of eggs would rain down on him from somewhere nearby (another job for Nigel?), to be followed in quick time by a smack on the chin for the unfortunate fellow sitting next to him (next to the beast, that is, not Nigel!). For the particular training course that we use I'm thinking Consumer Relationship Management.

Taking a completely different tack, perhaps the membership could be rattled out of their apathy if we kicked off the debate in the Newsletter with a one-sided leading article. It goes without saying that nowhere in the same issue of the Newsletter would there be any hint of a balancing reply. How nice, how piquant, if the author were the President-Elect, James Gibb, bouncing us all into his particular camp as he rides the wave of his election success.

To rub salt into the wounds, James should copy the smooth politician who tells us we are all too intelligent to be swayed by his, or anyone else's, inadequate remarks, with something along the lines of: "It would be impertinent (and futile) of me to suggest how any of you should vote in September". Of course, this should come at the end of a piece which tells everyone how to vote in September. (I find that it helps if, when reciting these words to yourself, you imagine you are one of those old-school Conservative leaders like Ted Heath or Harold Macmillan.)

But the members are a contrary lot; telling them to vote one way is a sure-fire way of getting them to do the opposite. So, you won't need me to tell you, James, that the one-sided case that you put should be the opposite of the one you actually support. Now you did remember to do that, didn't you, James? ... On second thoughts, perhaps we should ask Nigel to write it.

Ben Atkinson, University of North London. 

OR Minus 30

JOHN CROCKER

Gavin Blackett has drawn my attention to the OR Minus 20 article in the August 2001 issue of Inside OR. In other words, this article is looking at what appeared in the August 1981 issue of Inside OR. It refers to the very first OR Minus 30 article written by none other than Graham Rand (currently Editor of Impact). So in 1981, Graham was looking back 30 years which would have taken us to 1951. However, as the first volume of *Operational Research Quarterly (ORQ)* (the forerunner of the *Journal of the Operational Research Society – JORS*) was published in 1950, he naturally decided to start at the very beginning. He wrote his article based on the editorial that appeared in the first issue of Volume 1.

Ever since I first joined the ORS nearly 50 years ago, there has been an ongoing debate about the definition of OR. Indeed, this was the subject of four of the papers in the first issue. These were written by Sir Robert Watson-Watt, Charles Kittel, L.H.C. Tippett and Sir Charles Goodeve. From these definitions, the Editor decided “that the Quarterly may usefully regard as within its field the application of the scientific method to the provision of bases for executive action, in particular when the behaviour of people, either by themselves or in relation to their environment and equipment is involved.” He goes on to say, “It is possible that the Quarterly’s scope will become more precisely defined as experience is gained.”

The current definition, which has undergone several subtle changes over the years, used to appear on the inside cover of JORS, but that practice was discontinued several years ago. As you will have seen and heard from various presentations made under the auspices of WORAN, many OR people suffer from “imposter” syndrome – “Is what I have been doing really OR?” “I never appreciated that what I was doing was OR.” “Does what I do really entitle me to become a member of the ORS?” “Would you become a

member of a society that would have you as a member?” Sorry, I got a bit carried away.

Many of the early pioneers of OR argued that OR’s multi-disciplinary approach to problem-solving meant that it could not be taught, and its knowledge could only be acquired through on-the-job training. I would argue that OR is not so much a job as a way of life, although I would also be the first to admit that OR people are only human and often make decisions unscientifically.

Actually, I would also argue that OR is extremely good at evaluating alternatives but not very good at making decisions. Many of my recommendations to senior management have been overturned very often because I had not been given all of the facts. For example, one of my sponsors explained that he had asked me to do the study to find out how much it was likely to cost the company by taking the decision he had made (for political reasons). 

Total Membership: 3336

Validate AI conference

There's no question that data and algorithms are now part of our everyday lives. Their use is well established across almost all areas of society, from banking and taxation to agriculture and healthcare. However, with the increasing adoption of AI systems in all aspects of our life, it has become critically important to be confident that they perform in a safe, reliable, timely, and trustworthy way. The Validate AI conference explores how such systems can depart from this ideal, examining tools and methods for ensuring sound and appropriate behaviour in various application domains.

We are delighted to confirm the Validate AI Conference will be held online on the afternoons of the 2 & 3 Dec 2021 (1 pm - 5 pm GMT) to continue to address these vital issues of AI in partnership with The OR Society alongside others.

The conference was inspired by discussions at the Royal Society on the development of data science skills in May 2019. It also follows on from the successful inaugural Validate AI Conference in 2019 with leading speakers in the field from organisations such as The Alan Turing Institute, Oxford University, Google Deepmind and the Office for National Statistics.

The 2021 conference will focus on regulation, standards, and frameworks in AI to validate AI. We will highlight the importance of robust AI assurance systems and the role of checklists to validate AI, giving examples of where such an approach has had transformational success.

Since early 2021, the COVID-19 crisis has been a particular challenge for many sectors, requiring a review of existing AI/

ML systems. We will address this important topic of population drift and how organisations have attempted to resolve the related complex issues.

We are pleased to have experts from a variety of different sectors, along with experts in the field of AI. This diverse representation aims to foster cross-sectoral learning and encourage subsequent collaboration between private, public (including charitable) and academic sectors.

So why should you consider attending the conference?

If you're a policymaker and AI practitioner in industry, academia, and government, this conference will help you to:

- Obtain industry-leading technical tacit knowledge surrounding deployment and maintenance of AI systems.
- Identify and adopt more robust validation processes as senior decision-makers and practitioners, to help evidence the AI System can be trusted.
- Develop networks across academia, government, and industry to consider validate AI standards and frameworks.
- Boost new areas of academic research in AI to explore more effective and reliable applied AI systems.

How do I register for the conference?

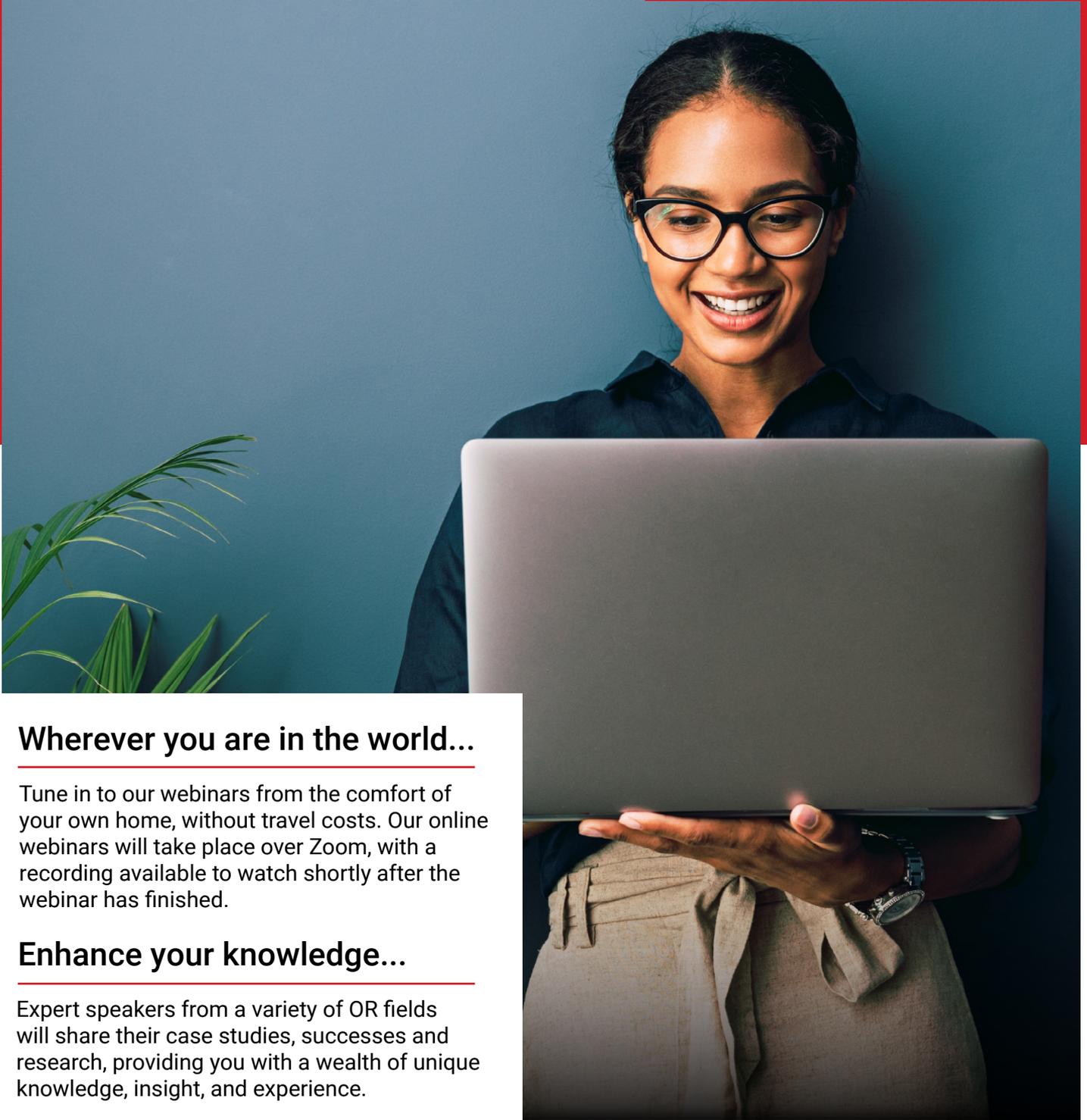
Further information on how to book a place will be announced in August and posted on The OR Society and Validate AI websites. You can also find further information on Twitter at #ValidateAI or by visiting www.validateai.org 



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