

## From the Editor

### *Growing OR: Achievements and Aspirations*

In this issue, we look back at the year just past, which, according to **IFORS President Dominique**, is the best one for the Administrative Committee. After all, the three- year term ending 2012 has not only seen an AC that has gotten the hang of delivering on their assigned portfolios, but also an international OR community that has substantially benefited from programs initiated and sustained. As you go over the myriad activities of the AC committees covered in the 2012 Annual Report, I am sure you will agree that this had been a fruitful year.

We also look forward to what is ahead, and here we feature a welcome message from incoming 2013-2015 **President Nelson**. In his editorial, he lays out IFORS objectives and the general strategies by which his administration will achieve these. We also get to know the people who will be working in the new AC along with their assignments.



We cover news and features from around the world – development issues of Africa, a military operation in Afghanistan, and a short brief on OR and Ethics, contributed by a EURO Working Group (EWG). “What are EWGs?” is a question answered by the EURO Vice President in charge of the EWGs. We

take a look at the Supply Chain-Analytics link in our book review portion. For our Tutorial, we are proud to include the IFORS Distinguished Lecture delivered during the CLAIO meeting in Brazil this year.

There you have it in this issue: we look at real-life applications of OR in fishing and infrastructure planning in Africa, as well as at military operations in Afghanistan; we get an overview of the events of 2012 in Brazil, China, Iran, Japan, Korea, Nepal, Philippines, Portugal, Austria, United Kingdom, Germany, Vilnius, the United States and Canada; we tackle topics as Supply Chains, Packing Problems, Problem Structuring Methods, MCDM; we are offered food for thought about the role of OR in war-gaming and its responsibility to ethics and development; we look at the activities of the international community and IFORS towards making OR a real partner for better lives. Is it any wonder that we are excited about the thrusts lined up by the next IFORS administration? 🌐

Elise del Rosario <elise.del.rosario@stepforward.ph>

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## From The President: Programs And Players For The New Term

Nelson Maculan <maculan@cos.ufrj.br>

**E**lected by the IFORS Board of Representatives, Sue Merchant (IFORS Vice-President-at-Large) and I have taken on the great responsibility of leading IFORS from 2013 to 2015. We are fortunate to count on the invaluable advice and support of our immediate past president Dominique de Werra, our Regional Vice-Presidents Lorena Pradenas (ALIO), Ya-xiang Yuan (APORS), Elena Fernandez (EURO) and Michel Gendreau (NORAM), our former president and current Treasurer Peter Bell, our Secretary Mary Magrogan and our past president Elise del Rosario.

You, the members of the Operational Research community that IFORS serves -researchers, scholars, professionals and practitioners – will constitute the biggest part of the events and activities to be organized and supported by IFORS. The following programs supporting the IFORS statutes and bylaws approved by the IFORS Board of Representatives on December 2009, will be the center of our attention in the next three years:

1 Encourage and support the establishment of Operational Research national societies in countries where a seedling has already sprouted. Our vice-presidents will take upon themselves the task of tending these young trees.

2 Support new societies in countries or regions that they may better appreciate Operational Research and the benefits it could bring to regional development.

3 Help revitalize inactive Operational Research societies and revisit previous failed attempts to create new societies.

4 Foster the quality and the circulation of the International Transactions in Operational Research (ITOR), the official scholar journal published by IFORS, whose impact factor appeared for the first time in the JCR 2011, supporting the journal to assume a prominent position among international publications focused on Operational Research. We will continue to rely on the excellent work developed by Celso Ribeiro as its General Editor.

5 Support the publication and the circulation of the International Abstracts in Operations Research (IAOR), a historic flagship of IFORS that distinguishes our society and is very useful to our community. We will also continue to count on the devoted work of its Editor K. Preston White.

We follow with particular motivation and interest the development of Operational Research in Africa. The number of workshops, summer schools, regional and international conferences in countries such as Algeria, Benin, Burkina Faso, Cameroon, Kenya, Morocco, Senegal, South Africa, Tanzania, Tunisia and Uganda illustrate the importance of Operational Research for the region. These meetings also show the tremendous efforts made by local groups to collaborate, get organized and foster the application of OR to regional development. IFORS will continue and enhance its support towards a stronger Operational Research in Africa.

Lastly, I am pleased to introduce to you the leaders who had been entrusted to carry out these thrusts of the 2013-2015 IFORS Administrative Committee:

### **Publications: Michel Gendreau ( Vice President, NORAM)**

Oversee the IFORS publications portfolio, which includes IAOR and ITOR. IAOR and ITOR are published commercially and generate revenue for IFORS; Tasks here consist of the customary activities associated with professional journals.

### **IFORS News and IFORS Website: Elise del Rosario (Past President)**

Oversee the IFORS News and IFORS website, the tools by which the organization keeps its general membership informed of the activities of the organization and of its member societies. Conversely, these are the vehicles through which IFORS members may communicate with IFORS leadership and among themselves.

### **Developing Countries: Sue Merchant (Vice President at Large)**

Oversee IFORS initiatives in support of the extension and expansion of OR in developing countries. In the past, these have included the ICORD, the Triennial Developing Countries Prize Competition, the regional initiatives in Africa, OR Teachers Workshop, management of the Developing Countries Section in the IFORS News.

### **Meetings: Elena Fernandez (Vice President, EURO)**

Monitor preparations for IFORS-related meetings, specifically the Triennial and Special Conferences; review requests by other organizations for affiliation with their meetings.

### **Education: Lorena Pradenas (Vice President, ALIO)**

Coordinate the development and implementation of IFORS educational outreach projects. Such projects undertaken in the past include the OR Crash Course Program, and the Educational Resources Website, which aims to classify educational materials available on the web and make them more accessible.

### **IFORS Distinguished Lectures (IDL) and IFORS Tutorial Lectures (ITL):**

#### **Ya-xiang Yuan (Vice President, APORS)**

Ensure that regional meetings feature IDLs and ITLs through coordination with the regional meeting organizers, a selection committee, and the speakers themselves.

### **IFORS Regional Vice-Presidents: Lorena Pradenas, Ya-xiang Yuan, Elena Fernandez, Michel Gendreau**

1. Provide a close link between their regions and the AC (Regional VP s relay regional interests and concerns to the AC, while explaining to the regions the initiatives and decisions taken by IFORS);
2. Help encourage the formation of new societies in their regions;
3. Assist in the management and decision roles of the Administrative Committee (AC);
4. Undertake IFORS duties as may be assigned, such as chairmanship of regular and ad-hoc committees. (Regional VP s coordinate IFORS Scholarships within their regions.)

I am looking forward to YOUR inputs and participation, for only then will IFORS achieve what it has set out to do. 🌍



## Message from the Section Editor

Arabinda Tripathy <tripathy44@rediffmail.com>

It is heartening to note that the youngest member of IFORS, OR Society of Nepal (ORSN), is full of energy and enthusiasm. ORSN held its 6th annual day National Seminar in February 1 to 2 this year, on the theme "Operational Research: Applications in Developing Countries" at the ancient city of Bhaktapur, on the outskirts of Kathmandu. An interesting aspect of the seminar was a lively discussion on Hard and Soft OR stimulated by the keynote speeches. A "Frontier Analysis and its Application" discussion forum organized by a local academic institute, King's College, was attended by both academicians and officials from trade and industry. From November 25 to 30 in the previous year, ORSN conducted Training cum Workshop on Psychophysics in Operations Research and Questionnaire Construction at Kathmandu. Resource

speaker was Prof. Dr. Debu Dulal Dutta Roy from Indian Statistical Institute (ISI) Kolkata who has written a tutorial on the subject in the March 2012 issue of the IFORS News (<http://ifors.org/web/march-2012-newsletter/>).

In this March issue, we hear from our Operations Researchers about two OR applications in South Africa. Lastly, I would like to encourage our readers and OR societies to send in details of their activities related to Developing Countries for publication in IFORS News. 🌍



## South Africa

### Problem Structuring and MCDA Fight for a Place in Fishing Rights Allocation

In many parts of the world, subsistence fisheries are vitally important to poorer societies. On the other hand, many fisheries are under severe threat, both from commercial fishing and over-exploitation, leading to collapse. This is particularly true in the Western Cape province of the Republic of South Africa. Affected are in-shore fisheries of abalone and west coast rock lobster.

The government sets total allowable catch effort (to attempt to control for over-exploitation), and then this allowable effort is allocated to different sectors. Even the small scale fishers from disadvantaged communities have then to apply for fishing rights (involving payments of fees and completion of complicated forms).

Our research team from the Universities of Cape Town and The Western Cape, and the Free University of Amsterdam, worked with selected communities that were affected. Group brainstorming sessions were followed by a representation of the resulting views in terms of causal maps. A fair degree of consensus was found among different communities. Some key findings were the lack of trust in government departments (linked to a view that local communities should be involved in the allocations), and the existence of a number of social criteria related to community cohesion that were not really

taken into account by the state's allocation system.

We developed a simple scoring system that could be used to evaluate applications for fishing rights in a manner which balanced social, environmental and economic goals, both locally and regionally. Regrettably, in spite of earlier commitments to the contrary, the State made use of an alternative scoring system developed by an accounting consultant, and which appeared to violate many theoretical principles of value measurement. The resulting allocations were challenged in court, and the plaintiffs tabled our documents as an alternative, but judgement is still pending. 🌍

More details on the approaches taken and results obtained may be found in:

A R Joubert, R. Janssen, and T. J. Stewart. *Allocating fishing rights in South Africa: A participatory approach*. *Fisheries Management and Ecology*, 15:27-37, 2008.

T. J. Stewart, A. Joubert, and R. Janssen. *MCDA framework for fishing rights allocation in South Africa*. *Group Decision and Negotiation*, 19:247-265, 2010.

R. Janssen, A. R. Joubert, and T. J. Stewart. *A multicriteria approach to equitable fishing rights allocation in South Africa's Western Cape*. In P. J. H. Beukering, editor, *Nature's*

*Wealth: The Economics of Livelihoods and Ecosystem Services in Africa and Asia*, pages 104-115. Cambridge University Press (Expected publication date March 2013).

**We developed a simple scoring system that could be used to evaluate applications for fishing rights in a manner which balanced social, environmental and economic goals, both locally and regionally. ...the State made use of an alternative scoring system developed by an accounting consultant**

## Development, Infrastructure Asset Management, and OR

Dave Evans <DaveE@dbsa.org>

Anyone who has had much contact with capital intensive private sector industries like steel, mining and petro-chemicals will be aware of how essential it is to have a realistic maintenance strategy. If you don't invest an appropriate amount of your budget in maintenance every year, you will very quickly be out of business, as your physical assets (infrastructure) deteriorate and fail to function properly and the competition wipes you out.

This deterioration applies just as obviously if your assets are in the public sector, but historically, spending those funds on maintenance has often been delayed: maintenance is one of the less conspicuous areas you can skimp on, if budgets are tight, as meaningful competition is often non-existent. >>





>> This issue is neither new, nor unique to the developing world. The London sewerage system which was built in Victorian times suffered inadequate maintenance for the best part of a century. Only when disturbing signs of total collapse appeared was this realized and a major intervention initiated.

In the public sector, this area is now a major component of what has become known as Infrastructure Asset Management (IAM). Elements have obviously existed since the origins of serviced, urbanized communities, in progressively larger towns and cities, which require increasing infrastructure for the convenience, comfort, economic efficiency and physical safety of the inhabitants. That infrastructure typically covers national, provincial and municipal services such as water treatment facilities, sewerage lines, roads, electricity and water utility grids and services, bridges and railways.

In recent decades, IAM has been elevated to a recognised management science, and services are increasingly being viewed and run on a more sustainable, long term, business-like basis. This recognises that all assets, no matter how big or small, have limited lives and at some point in the future, will ultimately have to be replaced. The better they are maintained over time, the more that can be deferred, and the better the return which can be generated on the initial investment. They should be well planned, constructed, operated, cared for and maintained, to avoid them decaying prematurely, with the concomitant reduced asset lives and consequential escalation in total lifetime cost.

The scope for applying these principles and frameworks has been increasingly recognised in the developed world over the past two or three decades. Infrastructure Asset Management as a description seems to date back 25 to 30 years, to New Zealand and Australia. It is now also well recognised in most parts of the developed world. The US in particular has recognised the enormous backlog it now faces in maintenance, to sustain its extensive networks of roads, bridges, water treatment facilities and electricity grids.

The comparable situation in the developing world is exacerbated by the additional huge need for new infrastructure, which puts extra demands on the limited funds available. In this situation, it is even more blameworthy to be allowing what is built to fall into disrepair in the disturbingly short time that is often observed, due to no maintenance taking place at all.

There are widespread examples where assets have been acquired or built, but a few years later, the plant is not working due to lack of on-going maintenance. Getting such a plant back into operation requires much larger funding and use of critical resources than would have been the case with regular on-going maintenance. Better planning in terms of IAM would result in much improved value-chain management and optimum use of the limited resources.

Development financing literature routinely talks about sustainable development interventions. This is normally multi-faceted:

- financial, to repay the capital being invested, including the model for the payment by consumers for the services;
- technical, to be able to deliver the services described;
- commercial: does the municipality (or other entity) possess the skills to run the services going forward?
- is the contractor capable of delivering the project?
- is the project environmentally sound?

Historically, a total life cycle and total cost of ownership approach has not been taken to explicitly include those aspects such as long term maintenance; clearly this needs to change. An IAM approach to the long



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term maintenance and physical sustainability needs to be added to the above list.

To put this in context, one example is the EThekweni Metro, covering the Durban municipal area, one of South Africa's municipalities that has been adopting IAM recently. In late 2012, they estimated their asset base at around US\$4 billion, and assuming an average asset life of 50 years, a cost of approximately US\$100 million each year in replacing existing infrastructure just to maintain the service status quo. What is needed is obviously much more than that. The whole municipal budgeting approach has shifted significantly, as the full range of the risks and implications has been understood by the leadership.

How many municipalities in the developing world are thinking like this? More to the point, perhaps, what is the future for them and their residents if they don't, with the increasingly visible results in deteriorating service delivery? What are the opportunities for OR to help?

IAM can positively underpin service sector transformation and reform. It encourages radical new thinking about leadership and the role of management of these same assets and services.

So beyond the technical, financial and other operational practices, IAM has clear and explicit linkages into the leadership and management activities of public sector organisations who own assets and services.


IAM offers specific ways to deal with governance and accountability issues. It can identify ranges of in- and out-sourcing options in the public sector, including utility practices and opportunities for improved effectiveness and efficiency. Crucially, it can stretch asset and service focus beyond narrow functional management, into holistic performance management. It is the robust and coherent nature of IAM management frameworks that offers particular process and operational road-maps to understanding and appreciating the leadership and management which is required for overall infrastructure assets and services, including identifying gaps, trends and risks.

IAM frameworks are not just operational, but also strategic instruments for enabling and fast-tracking change, re-igniting development, and assuring paths of sustainable growth, even where existing services are in jeopardy. In this sense, IAM offers innovative approaches for service assurance, asset protection and recovery.

In short, IAM is a very powerful, penetrating and illuminating body of knowledge for dealing with broad service sector-based challenges, including the strategic aspects.

From the perspective of an OR practitioner who wants to make an impact in development, it hardly needs saying that IAM is about the optimum allocation of scarce resources – about as good a summary of 'hard' OR as you can get in five words. It also involves a very sizeable intervention in areas around monitoring, evaluation and accountability; a wonderful opportunity for all the advocates of 'soft' OR. I am assuming that most readers of this article will be experienced OR practitioners, so I will not waste your time any further with a page of possible examples which you will all be just as aware of as I am.

If you would like to make a difference in Development, what are you waiting for?

For anyone to get a broader picture of the IAM topic, Wikipedia is the obvious place to start: [http://en.wikipedia.org/wiki/Infrastructure\\_asset\\_management](http://en.wikipedia.org/wiki/Infrastructure_asset_management) This item provides links to more technical material. 

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### From Operational Research to Operational Planning: Shaping the NATO plan for Afghanistan

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#### Introduction

An agency of the UK Ministry of Defence (MOD), the Defence Science & Technology Laboratory (DSTL) delivers impartial operational analysis for MOD and UK government decision-making. DSTL also embeds scientific teams in military Headquarters in the UK and other operational areas.

During 2011, DSTL deployed to Afghanistan two civilian volunteer teams to support military planning of future NATO operations. Two major planning conferences in March and November utilised Peace Support Operations Model (PSOM), a research based decision-support tool developed by DSTL since 2004 for examining operations and outcomes in complex environments.

Originally designed to inform future UK strategic planning, PSOM was employed by the DSTL teams in Afghanistan within a new and bespoke analytical process. This process simulated the planning, execution and assessment of real world operations, giving senior military and civilian decision makers clear direction and insights that continue to influence and shape NATO operations in Afghanistan.

#### Influencing Real World Decision Making

The two planning conferences were conducted in Kabul at the request of the International Security Assistance Force (ISAF) Joint Command, responsible for planning and execution of the combined Coalition and Afghan military campaign across the whole of Afghanistan. Designed and facilitated by the DSTL analyst team, the March and November 2011 conferences each brought together over 100 key personnel including senior military and civilian decision makers from across NATO, the Afghan Government, UN and several national embassies.

In March, the PSOM model was used to underpin a wider analysis process that tested execution of the summer campaign plan for 2011. Application of the computer representation of future operations with the expert judgment of Headquarters planning staff resulted in the refinement of NATO objectives for the summer campaign. It also enabled a rehearsal of the mechanisms for delivering them by NATO and Afghan security forces.

The success of the event achieved buy-in amongst senior military

commanders for the use of this type of analytical support to real world campaign planning operations, a difficult and challenging task compared with PSOM use to examine future UK defence plans. A senior coalition commander confirmed the value of the conference and requested a further PSOM war-game to inform longer-term campaign planning by the Headquarters in November 2011.



Picture: Sergeant Chris Hargreaves, Crown Copyright/MOD 2011



Colin Marston (left) Field team leader and principal analyst, he has worked predominantly in the Support to Operations (S2O) environment, including deployments as an Operational Analyst to Afghanistan and Iraq. He has served 3 years in the Territorial Army (Infantry) and has a BSc (Hons) in Physics with Astrophysics.

trends and meaning over time, would be extremely demanding and time-consuming for even a large group of experts, and it is highly unlikely that the results produced could be as consistent and robust. >>

This second conference, jointly delivered by a UK and US analyst team, represented the first use of a large-scale model-supported analysis to assist the development of a NATO campaign plan during a decision making cycle. Taking place at a critical time in the Afghanistan campaign, it successfully delivered an evidence base of key insights that have since informed decisions on high-level campaign objectives, foreign troop commitments, and the transition of responsibility to Afghan security forces. The two conferences were the first of their type to use a computer-based war-game to evaluate and refine campaign planning in Afghanistan.

#### War-game support to Military Operations

DSTL's PSOM computer system provides a novel analysis capability incorporating complex interactions among such factors as religious beliefs, ethnic identities, socio-economic conditions, geography and terrain, as well as political and military activity. The analysis process for each event utilises PSOM's ability to simulate future military operations and civilian development activities by: placing each of these complex factors in context, describing the relationships between them, and using computer simulation to provide an objective structure to track cause and effect and generate insights for decision makers.

While it is possible for a Subject Matter Expert (SME) to effectively evaluate the impact of a significant event across all aspects captured within PSOM, this becomes difficult in an environment where more than 1000 security-related events and many thousands of human interactions occur every month. Assessing the 'so what' of these events, their pattern,





The core function of the PSOM model is to capture and represent this SME judgement in a series of algorithms that are instantiated in a computer simulation. As a result, the outcome of multiple events can be evaluated extremely quickly on the basis of a logic that generates clear, unambiguous, well-validated, and consistent results for every event. This also enables PSOM to rapidly investigate different courses of action in a given environment and assess consequences and outcomes across a number of related 'what if' scenarios. Critically, the war-games facilitated by the DSTL PSOM team in Afghanistan also involved a large number of military and civilian experts, whose knowledge and understanding was integrated with the outcomes of the computer simulation to enhance the representation of future operations.

In order to fuse expert human decision making with the PSOM computer system in an effective manner, the DSTL team developed a practical daily framework, or battle rhythm, used in each event to synchronise the activities of more than 100 war-game participants from the planning, operations and assessment communities across Afghanistan. The DSTL analysts acted as the key interface between these participants and the PSOM software, enabling military and civilian planners to assess the impact of different courses of action and test them against different challenges. The system had the additional benefit of bringing together a large number of very senior civilian and military experts in a single, coherent and comprehensive campaign evaluation.

#### Developing a Decision Support Tool for Contemporary Operations

This process used to support real world planning in Afghanistan was the culmination of extensive novel research, software model development, and analytical war gaming development in the field of stabilisation and counter-insurgency operations initiated by DSTL in 2004.

Throughout development of the PSOM decision-support capability, the DSTL Team adhered to a three step technical process. Each element of the real world environment represented within PSOM started with detailed Subject Analysis (Step 1) that developed deep understanding in specific research areas, then progressed to Specification (Step 2), involving in-depth data collection, assessment and conceptual modelling. The process concluded in Application (Step 3), where research outputs were coded into a tested and validated computer representation within the evolving model software.

Even with a mature model based on long-term research and development, a bespoke two-part Validation and Verification (V&V) process was used to prepare PSOM and its supporting war-game approach. The first part was a military evaluation by the UK-based NATO Headquarters Allied Rapid Reaction Corps, which

rated it fit to support military planning in Afghanistan. The second part was a technical scrutiny by a panel of Science and Technology experts from across the UK MOD that conducted an in-depth review of the research, concepts and evidence base of the PSOM computer model. This effort built on a long track record of prior

V&V by the PSOM team, much of it involving international peer review under a collaborative programme with the US Department of Defense. These long-standing international linkages brought additional benefits in 2011, with US organisations playing a key part in the second Afghanistan planning conference, including the deployment of skilled analytical and military staff.

#### Looking to the Future

With the effective combination of human expertise and the rigour, repeatability and simplicity provided by computer software, the PSOM war-game process successfully generated a broad range of quantitative data and qualitative insights relevant to future campaign planning in Afghanistan during 2011. The initial success of this approach demonstrated in Kabul in March paved the way for the second planning conference in November. The PSOM war-game process has been proposed to be a formal part of NATO campaign planning in Afghanistan. Whilst the challenge of sending a team of analysts to an active operational theatre is not to be taken lightly, there is potential for PSOM to continue to support operations in Afghanistan from non-deployed locations. This lighter footprint approach to supporting military operations with an analytical war gaming capability has substantial future use. Since PSOM can be tailored to examine other operational problems beyond Afghanistan, variations of this approach are currently under investigation for greater use within the UK MOD.

Delivering technical support to the two PSOM events in Afghanistan was a demanding but highly rewarding

experience for the DSTL team. The real reward was the ability to deliver added value, based on robust operational research principles, to senior decision makers leading real world operations at a critical time. Precise measurements of success in such a complex and dynamic environment are difficult to ascertain, but a letter from the ISAF Joint Command in December 2011 summarised the impact of the PSOM war-games: [they] "have directly contributed to the future campaign plan...in line with the UK main effort in Afghanistan." 🌐

References: 'MOD scientists help shape Afghanistan operations,' *A Defence Policy and Business news article*:

<http://www.mod.uk/DefenceInternet/DefenceNews/DefencePolicyAndBusiness/ModScientistsHelpShapeAfghanistanOperations.htm> (28/04/2011).

Marston, C & Body, H., 'The Peace Support Operations Model: Origins, Development, Philosophy and Use,' *Journal of Defense Modeling and Simulation: Applications, Methodology, Technology* (April 2011) 8: 6



Dr Patrick Rose (left) - Team member and senior analyst, he has an MSc Econ in International History from Aberystwyth University and a PhD in War Studies from King's College London. He has mostly worked in the area of stabilisation since joining Dstl in 2009. He is a West Point Fellow in military history, and is the co-editor of *The Indian Army 1939-1947: Experience and Development* (Ashgate, 2012) and various other books.



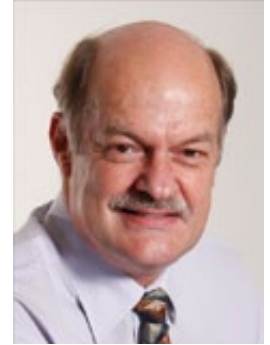
Picture: Sergeant Chris Hargreaves, Crown Copyright/MOD 2011

The real reward was however the ability to deliver added value, based on robust operational research principles, to senior decision makers leading real world operations at a critical time in Afghanistan.

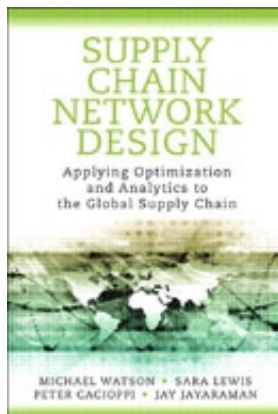


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**Supply Chain Network Design – Applying Optimization and Analytics to the Global Supply Chain** by Michael Watson, Sara Lewis, Peter Cacioppi and Jay Jayaraman, 2013. FT Press, New Jersey, USA. pp 301, ISBN-10: 0-13-301737-0. \$72.99 and Kindle edition \$51.49.



*"It is not products that compete any longer but supply chains".* This statement made more than a decade ago by a prominent logistics expert continues to be relevant today, when any company wishing to compete in the global market must ensure that its supply chains are efficient, effective and continuously improved. Strategic supply chain network design is critical in this endeavor.



Any supply chain is defined by its suppliers, different plants, warehouses, and finally the flow of products from each product's origin to the final customer. The number of facilities and where to locate them is a critical factor in the success of any supply chain. Strategic supply chain network design is about selecting the correct number, location and size of warehouses as well as production facilities. In the book *Supply Chain Network Design*, a number of very experienced professionals in the field collaborated to show how applying quantitative analysis could optimize a firm's supply chain.

Chapter 1 lists the following questions that any network design project should be able to answer:

- How many warehouses should we have, where should they be, how large should they be, what products will they distribute and how will we serve our different types of customers?
- How many plants or manufacturing sites should we have, where should they be, how large should they be, how many production lines should we have and what products should they make, and which warehouses should they service?
- Which products should we make internally and which should we source from outside firms?
- If we source from outside firms, which suppliers should we use?
- What is the trade-off between the number of facilities and overall costs?
- What is the trade-off between the number of facilities and the service level? How much does it cost to improve the service level?
- What is the impact of changes in demand, labor cost, and commodity pricing on the network?
- When should we make product to best manage and plan for seasonality in the business?
- How do we ensure the proper capacity and flexibility within the network? To meet demand growth, do we need to expand our existing plants or build new plants? When do we need to add this capacity?
- How can we reduce the overall supply chain costs?

The book answers all these questions and the reader is taken step by step through the underlying theoretical principles of network design. Principles are consistently illustrated with numerous practical and relevant applications. The depth of experience of the authors and the breadth of applications presented are evident throughout the book.

While they present techniques to decide on which products to manufacture internally and to outsource, at what locations to make these products and which suppliers to use, they continuously share actual experience which provide detailed insights and point out possible

oversights or pitfalls. The reader is guided on how to more effectively manage tradeoffs such as costs against service levels and improve operational decision-making by utilizing analytics. Moreover, the reader is shown the importance of re-optimizing regularly for even greater savings. The subject area represents possibly one of the most fertile and exciting application areas for analytics and operations research!

The book is divided into five different parts, each with a number of chapters. The first part gives an overview of the value of supply chain network design and presents the basic building blocks, with the first one covering intuition building with center of gravity models. Next topics include locating facilities using a distance-based approach, dealing with different service levels and explaining sensitivity analysis and its importance.

Adding capacity to the models is the next building block. (This is the pattern throughout, where a complication that needs to be considered is introduced in every new chapter and part.) A detailed description of how to model this, plus the applicable mathematical model, is discussed in a very logical and understandable manner. Part two covers the issue of adding costs, such as those associated with outbound transportation, fixed and variable facility costs, to two-echelon supply chains. The justification for every enhancement to, and extension of the models are explained fully.

The third part considers advanced modeling and expansion of multiple echelon supply chains i.e. where the supply chain extends from a plant facility, to a warehouse and from there to the customer. With each further chapter an additional issue to be considered is introduced. In this part, the art of three-echelon supply chain modeling is covered. The next two chapters focus on adding multiple products and multiple production sources.

Lastly, multi-objective optimization problem situations and how these should be addressed is the topic of the last chapter in part three. Stressing that there is more to just formulating models for these types of problems, the book devotes a whole chapter on the art of modeling and why it is critical. Other issues dealt with are practical concerns that include: data aggregation in network design, how to establish a project team; and how to manage such a project. The fifth and last part is a case study where most of the important concepts and aspects of supply chain network design are illustrated.

The readability of the book is greatly enhanced by the manner in which topics are introduced and the concepts, defined. One example is the chapter where outbound transportation is introduced. Here, the different modes of transport (full truckloads, private or dedicated trucks, less than truckloads and parcels as well as ocean transport, rail transport, intermodal transport and the multi-stop) and how the rates for these are typically computed are presented in detail.

Each chapter concludes with a brief summary as well as end-of-chapter questions. Use of the book is supported by a web site that contains errata, links to other useful information, downloads of the models, additional details on the case studies, spreadsheets, as well as additional case studies.

*Supply Chain Network Design* is an excellent book that would be of value not only to all supply chain executives, managers, strategists, and analysts and researchers but also to students and instructors of advanced supply chain management and/or logistics courses. It is without any hesitation that this reviewer highly recommends this book for the OR practitioner! 🌐



## 2012 IFORS Distinguished Lecture, Rio de Janeiro

## Two-Dimensional Packing Problems in Telecommunications

Silvano Martello <silvano.martello@unibo.it>, DEI "Guglielmo Marconi", Università di Bologna

I thank IFORS and SOBRAPO for the honor of this invitation. I will present a concise description of the development of an interdisciplinary research applied to real world problems, jointly developed by four teams, in chronological order:

*Nokia Siemens laboratory: research group on the IEEE 802.16/WiMAX standard;*

*University of Pisa: research group on Computer Networking (Luciano Lenzini);*

*University of Bologna: research group on Combinatorial Optimization (S.M.)*

*Technical University of Eindhoven: research group on Theoretical Combinatorial Optimization (Gerhard J. Woeginger).*

The project has been developed following the classical steps of an applied research:

1. birth from a real world problem;
2. development of mathematical models for its combinatorial aspects;
3. theoretical analysis;
4. definition of mathematical models for the real world problem;
5. evaluation of the technological constraints;
6. development of solution algorithms;
7. implementation and experimental evaluation on realistic scenarios.

A synthetic overview of these steps is presented in the following. A more complete description can be found in [1].

*The birth: an optimization problem in telecommunications.* In telecommunication systems adopting the IEEE 802.16/WiMAX standard, a fixed station transmits and receives data packets to and from other stations (e.g., our mobile phones), and all transmissions are performed using [time  $\times$  frequency] rectangular frames, called *downlink zones*, where the packets are stored as rectangles.

The fixed station must maximize the frame utilization by deciding which packets will be included in the next transmission phase, arranging each selected packet into one or more rectangular regions, and allocating the resulting regions to the frame without overlapping.

The models: new two-dimensional packing problems. In a standard two-dimensional bin packing problem one has to allocate, without overlapping, a given set of rectangles to the minimum number of identical large rectangles of prefixed width and height. In the considered real world problem the items to be allocated are instead data packets. The  $j$ -th data packet is an amount of information, in practice a number, that may be interpreted as an area of size, say,  $a_j$ . Such area must be arranged as a  $w_j \times h_j$  rectangle such that  $w_j h_j \geq a_j$  (or as a number  $m_j$  of rectangles, called sub-areas, such that  $w_{j1} h_{j1} + \dots + w_{jm_j} h_{jm_j} \geq a_j$ ). The resulting rectangle(s) must then be optimally allocated to the downlink zone. In addition, each created and allocated rectangle needs information (height, width, coordinates), that has to be included in the downlink zone, i.e., a portion of the zone, proportional to the number of rectangles it contains, is used for

the so-called *maps transmission*.

*Theoretical analysis: computational complexity and approximability.* When a new optimization problem arises, it is advisable to preliminarily answer some questions. How difficult is the problem? Can it be solved in polynomial time? If not, can it be solved in pseudo-polynomial time? If not, can it be approximated with some worst-case (or asymptotic, or probabilistic) guarantee in polynomial time? Can it be solved efficiently in practice?

To answer these questions, let us consider the simplest combinatorial optimization problem we can "extract" from the industrial problem:

**Area Packing:** given  $n$  areas, and a single rectangle ( *bin* ), is it possible to arrange each area as a rectangle in such a way that all resulting rectangles can be allocated to the bin without overlapping?

A simple transformation from a variant of Partition shows that this problem is ordinary NP-complete. Sophisticated techniques, using tools from number theory and transformation from a variant of Three-Partition, prove that it is strongly NP-complete. Hence the problem cannot be solved in polynomial time, nor in pseudo-polynomial time, unless  $P = NP$ . However, its optimization version can be approximated with worst-case performance guarantee in polynomial time as follows.

As we have seen, in the real world problem the size of the downlink zone that is wasted for maps transmission is proportional to the number of created sub-areas. It is then reasonable to assume that any area  $a_j$  can be arbitrarily split into any number of integer rectangular sub-areas (at most  $a_j$  unit squares), and to ask for packing all areas, without overlapping, into a given bin (of size no less than the sum of all areas) by minimizing the number of created rectangular sub-areas. A 3-approximation algorithm has been proposed in [2], where it is proved that it provides, in linear time, a solution that uses at most three times the minimum number of sub-areas. Such worst-case is tight.

*The real world problem: four technological variants.* There are three main differences between the theoretical problems outlined above and the telecommunication problems at hand:

- the areas (packets) cannot be split in an arbitrary way: for each of them, a list of the feasible sub-areas into which it can be split is provided as part of the input. For each area we must define one or more rectangles containing the sub-areas. Note that this can make it impossible to completely pack all areas;
- each sub-area has a *profit* (corresponding to its transmission priority), and the objective function is to maximize the total profit of the packed areas;
- as already mentioned, the mapping of the packing must be stored in the frame, and minimizing the number of rectangles leads to minimizing the size of the map. However, as an additional difficulty, the actual size of the map can only be computed once the packing has been decided. >>





>> In addition, it was requested to evaluate different technological characterizations, corresponding to different ways in which the downlink zone can be implemented. The first two options (problems P1 and P2 in the following) had a general rectangular downlink zone, with two different ways of storing the map. Two additional options (problems P3 and P4 in the following) had a more rigid way of allocating the areas.

**Evaluation of the technological constraints.** Independently of the technological variant, the planned system had to be implemented using sets of standard PCs. The technological constraints were extremely tough:

- each PC must perform 500 transmissions per second, i.e.,
- every 2 milliseconds it is necessary to read the input data, execute the optimization algorithm, produce the output (packing and map), and transmit the corresponding packets; however,
- each transmission takes 1 millisecond, i.e.,
- each instance must be completely solved within 1 millisecond!

Although real world instances are relatively “small” (they include few tens of packets) this requirement was really tough.

**Development of solution algorithms.** For problems P1 and P2, a recursive algorithm was implemented (in two versions). The algorithm is based on the alternate execution of two very fast heuristics, one of which based on the ideas behind the 3-approximation algorithm developed in the



▲ IFORS President Dominique de Werra (left) presents the IFORS award to IDL Silvano Martello.

context of the theoretical analysis. For problems P3 and P4, the particular structure imposed to the downlink zone allowed to conveniently adapt a classical heuristic algorithm (see [3]) for the generalized assignment problem.

**Implementation and experimental evaluation on realistic scenarios.** All algorithms (see [4], [5] for detailed descriptions) were implemented in C and tested on a simulator that generated (for each of the four technological variants) tens of thousands of instances representing different scenarios of transmission. The experiments were performed on a 1.66 MHz Pentium M Centrino laptop running Cygwin, and the results were extremely satisfactory. For all instances the proposed algorithms produced, within the 1 millisecond time limit, solutions of value very close to the theoretical optimum. 🌐

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## Getting to Know: The EURO Working Groups

José F. Oliveira <jfo@fe.up.pt>

For groups of researchers interested in a specific Operational Research topic, EURO provides an organizational framework in the form of EURO Working Groups (EWGs). A very important part of EURO, EWGs provide a forum for promoting research in various OR areas.

#### History

Several EURO Working Groups were established at EURO's very first conference in 1975. Since then, many have been put up and grew, while others have been disbanded. An account of the early history (up to 1983) can be found in J. Krarup, *Profiles of the European Working Groups*, EJOR 15 (1984) 13-37.

Since 1993, the liaison officer between EURO and the Working Groups is the Vice President 2. The EURO website (<http://www.euro-online.org>) EURO working group section reports on the activities of the each group. Currently, EURO hosts 29 active Groups, with the last one established January this year. This number indicates the success that EURO has achieved with this instrument. In turn, EWGs have contributed to the increasing success of EURO and IFORS conferences.

#### EURO's Commitment to the EWGs

EURO provides organizational and financial support to the EWGs. The amount of financial support is based on previous years' activity indicators (e.g. number of sessions organized in EURO K and IFORS conferences, publication of special issues in highly regarded scientific journals, number of participants in EWG's meetings) and on activities planned (e.g. EWG's meetings, organization of summer and winter institutes).

Funding can be used to cover:

- Current administrative costs related with the management and running of the EWG, including printing costs of common stationery and setting up/maintaining a group - specific webpage.
- Costs of the EWG's specific meetings, organized outside the major OR Conferences, in particular travel and accommodation costs of invited guest speakers (not members of the EWG), EWG members from weak currency countries and early stage OR researchers (actual Ph.D. students and post-doctoral researchers for a period not exceeding two years after their Ph.D. defence).
- Other costs related with the dissemination and development of the EWG's area, e.g., costs of initiating and/or publishing results of EWG activities or costs for invited survey contributions on specific EWG related topics to be submitted for publication in EURO journals.

The association with EURO enables the EWGs to create partnerships with Companies and other organizations with whom research projects are launched and from whom additional funding may be sourced.

#### Benefits of Membership

Membership is open to individual members of any EURO member society and to persons who are not members of a EURO national OR society. >>



>> Common to most of the EWGs are regular meetings, which provide an excellent means to meet colleagues working in the same field, to exchange ideas and research results, and to find new scientific partners. Promoted by their coordinators, these meetings can either be held around the time of the EURO K conferences or be set as stand-alone events, with some having a long established tradition (e.g. MCDA and ECCO conferences) and others on to promising starts (e.g. VeRoLog first meeting - June 18-20, 2012, Bologna, Italy - had more than 170 participants).

Additionally, by organizing special issues in OR-related journals, members of a Working Group have a better and more effective outlet for publicizing their ideas and results. The experience has resulted in many fruitful European research partnerships.

### Creating a EURO Working Group

A group of researchers and/or practitioners who cannot find an established EURO Working Group on the OR topic of their area may submit a proposal the EURO Executive Committee expressing their interest to create a new Group. Such a proposal must satisfy the following:

- As far as possible, the EURO Working Groups should bring together people with different professional backgrounds, i.e. researchers, practitioners and OR educators.
- The group should ideally have a European membership. This requirement is met if at least 4 European countries are represented at each meeting, and if the meetings do not take place too often in the same country.
- Any group should be open to any individual member of any EURO member society. Persons who are not members of a EURO national OR society may be accepted but cannot act as coordinators.

Apart from its one or two coordinators, each EURO Working Group has a Board, which acts as a steering committee and helps the coordinators in the strategic leading of the Group. The Board is also responsible for running the election or appointment process of the coordinator.

The Working Groups are at the same time the skeleton and the heart of EURO

### Perspectives from the VP in charge of EWGs

As EURO Vice-President 2, the last two years had been significant for me in gaining a better understanding of the overall importance of EURO Working Groups (EWGs) in EURO's life and activities. The Working Groups are at the same time the skeleton and the heart of EURO. It is the skeleton in that EWGs represent a big and stable group of people from where many EURO Executive Committee officers come and to where they return, in the process gathering much of the knowledge and culture of EURO. It is the heart, in that the continuous growth of EURO K conference attendance and quality of presentations owes much to the greater role given to EURO Working Groups in the organization of invited streams.

Over the years, I have learned two important factors that have contributed to the success of the EWGs. Firstly, funding must be made available. This gives a group the means by which to run new initiatives, attract young people and keep existing members in the OR field. Secondly, it must be recognized that the major reason for the success of the EWG lies with the EURO Working Group coordinators. By their personal effort to motivate and organize the activities of their respective Groups,

they contribute in an essential way to the organization of special streams in conferences and/or to the publication of relevant papers in special issues of highly regarded OR-related journals. As such, coordinators have to be recognized and praised for the importance of their work and for the generosity of their commitment. One simple and important way of doing this is to trust them by keeping funding and reporting requirements as low as possible, avoiding bureaucracy at all costs.

Active EURO Working Groups mean a healthy organization. EWGs help to maintain and develop EURO's well-established initiatives (EURO K Conferences, EURO mini Conferences, EURO Summer and Winter Institutes) and contribute for the growth of new ones (e.g. the Education Initiative, EURO journals or the EURO PhD Schools). 🌍

## OR and Ethics

**Cristobal Miralles** <cmiralles@omp.upv.es> Chair, EWG on Ethics and OR

The birth of Operations Research (OR) brought with it ethical concerns on societal dimensions of the discipline. OR was born in the 20th century in the aftermath of the Second World War, when scientists were engaged in making the war effort more effective in an environment where the morality of indiscriminant bombing of civilian populations, and ultimately of nuclear bombs, was hardly questioned. C.W. Churchman, one of the founders of OR, and also a philosopher and humanist, argued forcefully that OR should not only be about developing models to improve means, but should also consider ethical purposes and consequences.

The rapid economic recovery after the war saw the growth of many companies faced by complex problems that could best be solved by using sophisticated OR tools. More and more OR tools were churned out to address constantly emerging challenges. Notwithstanding its visible success in practice, OR, many researchers felt, lacked a code of ethics. This created a debate about the goals of the client organizations as well as the means for achieving such ends. Even in application domains where ethical concerns were clearly crucial (e.g., military, health, education, police, energy), an OR project may simply concentrate on making something, such as a system or a process, more effective on the assumption that this "something" is a desirable end in itself. These first



EWG on OR in Ethics Board Members (l to r): Fred Wenstop, Giorgio Gallo, Cris Miralles, Sven Diekmann. Not in photo are Pierre Kunsch, Willi Weber and Dorien de Tombe

reflections led to a growing awareness that there are always options in defining problems, and that the choice among these options has ethical implications, needing the development of problem-structuring methods. This did not go far enough for some who advocated a more critical and socially responsible approach with ethical concerns at the forefront of methodological considerations.

These pioneer researchers who first questioned the direction that the OR discipline was taking were later joined

by many other colleagues motivated by diverse but complementary concerns. Scores of references with reflections from different angles are now available in literature, but highlighted here are environmental sustainability, social justice and the need to balance the impact of decisions on the stakeholders, and Corporate Social Responsibility.

Brans (2002), in his seminal paper which contains a synthesis of these confluent concerns states, "the efficiency of mankind in producing goods and services is now so well developed that other concerns become more prominent, like issues of distributive social justice underlying accessibility to these goods and services. Similarly, the fundamental belief that this efficiency is naturally compatible with a sustainable future is significantly shaken". Indeed, it is no longer possible to ignore the Operations Researcher's responsibility as decision methods developers and even decision makers. >>

>> All over the world, rapid changes in all fields of social life, including labour, economy, finance, and environment, constantly create new unsolved problems for life in democratic society. OR has the responsibility to provide contributions for addressing these contemporaneous challenges, with the ambition of developing quantitative techniques that improve human activities in the more general sense.

Gallo (2004) synthesizes the concept of Responsibility as “considering the effects of what one is doing, whether in the short or in the long period, whether geographically near or far, whether on people or on nature; it means also always considering and respecting the dignity and the value of all people whose lives are or might be affected by one’s actions and decisions”. In response, many concerned researchers are trying to provide the means by which this general concept of Responsibility may be integrated into the tactical and operational levels of the decision-making processes.


Notwithstanding its visible success in practice, OR, many researchers felt, lacked a code of ethics. This created a debate about the goals of the client organizations as well as the means for achieving such ends.

Non-academic OR practitioners and consultants have tended to deal with ethical issues in an ad hoc intuitive way, relying on their good sense to recognize when ethical issues need special attention and when they do not. However, Rauschmayer et al. (2009) propose a systematic analysis of the argument that good intentions and best practices may not be sufficient to guarantee an ethical practice of OR/MS, basically due to the complexity, subjectivity, ambiguity and emotional content of ethical challenges. The OR practitioner is supposed to be objective and unbiased, and this is even more difficult considering that the roles of the analyst, adviser, decision maker, may rest on the same person. Arising thus are interesting questions like: Is the OR practitioner responsible for the decision, for the decision process or only for the models and tools? Is he/she responsible to himself, the decision-maker or to the wider society? These questions are often revisited and faced by Le Menestrel and Wassenhove (2004), among many others. In the cited paper that must be clearly commended, the interaction between OR models and OR process is analyzed in three clear approaches: ethics outside, within, and beyond OR models. The paper emphasizes their distinctions and their complementary character, avoiding any dogmatic approach.

In this sense, models that combine quantitative and qualitative scales offer OR researchers new opportunities to make theoretical contributions to the understanding of ethical trade-offs. However, constantly questioning these trade-offs may be difficult for decision makers and operations researchers. In fact, Wenstop and Koppang (2009) demonstrate, through an assessment of a sample of OR applications, the extent to which OR applications shy away from ethical challenges and show a preference for “value-free” problems. After this evidence, the paper digs into the issue of emotions when

confronted with “high-level conflicts of values”, resulting in five clear norms worth reflecting upon when engaging in values-laden OR applications.

After decades of reflections and debates, especially after the financial crisis mostly provoked by unethical decisions, the need for a real reflection in our “area of decisions” becomes crucial. In this sense, a first relevant question could be: if one wanted to integrate ethical considerations in OR from the start, how would one proceed? Although many authors address this issue, the last recommendation to the reader is Kunsch et al. (2009), where the different prerequisites and techniques for modeling complex ethical decisions in OR/MS are reviewed. The authors show how open OR models can be when addressing ethical issues. It is clear they believe OR should at times be “less conventional” in order to genuinely meet the ethical challenges of sustainability, social justice and diversity of values, and to demonstrate that many techniques are readily available. This positive message that underlie the work of our colleague Pierre Kunsch, board member of the EWG on “Ethics and OR”, is perfect to conclude this non-exhaustive selection of contributions in the area.

Recently, ethical thinking in OR has been very much revived in the changing world context by several contributions of OR researchers, and especially since the creation of the EURO Working Group (EWG) on “Ethics and OR”, one year after the inspiring opening lecture of Professor Jean Pierre Brans on “OR, Ethics and Decision” at the EURO XVII in Budapest in July 2000. The EWG on “Ethics and OR” understands itself as constituting an open network that gathers scientists, teachers and professionals in the field of OR who are committed to inspire researchers, teachers, students and consultants to integrate ethical aspects and considerations in their activities; assuming the need of including our responsibility within the decision-making process. 

*Note from the Author: If this brief article has interested you and provoked some internal debate, I would recommend that you go over the papers cited below and participate in our exchange of ideas. To become member of the EWG on “Ethics and OR”, drop me an email.*

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## Search for the XVII ELAVIO Summer Institute IFORS Fellow Is On

IFORS is pleased to announce its sponsorship of a participant to join the Summer School organized under the auspices of the Latin American Association of Operations Research Societies Summer School for Young Scholars (ELAVIO). The XVII ELAVIO Summer Institute will be held in Valencia (SPAIN) from 8th to 12th September, 2013.

Sponsored by ALIO (Latin American Association of Operations Research Societies) and IFORS (International Federation of Operations Research Societies), the School is organized this year by UNIVERSITAT POLITÈCNICA DE VALENCIA and will include mini-courses and tutorials, discussion panels, and conferences on advanced topics of research interest. The participants will have the opportunity of presenting their work. The areas to be covered are (but not limited to): Optimization Multiobjective and Multicriteria, Heuristics and Metaheuristics, Mathematical Programming, Fuzzy Logic, Decision Support Systems, Artificial Intelligence, Simulation, Networks, Logistics.

IFORS will cover participant’s airfare from his/her country (subject to a maximum limit)

while ELAVIO organizers will provide living expenses during the school. IFORS requires that the applicant: Must have done work in the field of Optimization, Multiobjective and multicriteria, Heuristics and Metaheuristics, Mathematical Programming, Fuzzy Logic, Decision Support Systems, Artificial Intelligence, Simulation, Networks, Logistics; Is at the early stage of career; Can present unpublished work and answer questions in English; Be highly recommended by the adviser/supervisor of the work; Agrees to file a report on the outcome of the activity and its benefits.

Those satisfying the requirements are enjoined to submit their curriculum vitae, a two-page abstract of the work to be presented, and a recommendation by the adviser on or BEFORE April 15th 2013 to the IFORS Vice President for ALIO Lorena Pradenas, [lpardenas@udec.cl](mailto:lpardenas@udec.cl). The selected applicant will be notified by May 13th 2013. Candidates from developing countries will have an advantage in the selection. 

For more info, please visit <http://ifors.org/web/call-for-ifors-elavio-2013-scholar/>





The EthOR Award is organised by the EURO Working Group on "Ethics and OR", a network that gathers scientists, lecturers and professionals in the field of Operational Research who are committed to inspire OR researchers, teachers, students, consultants and decision-makers to integrate ethical aspects and considerations in their OR research, teaching, consultancy and decision-making (info: <http://euro-online.org/web/ewg/24/euro-working-group-on-ethics-and-or>).

The Award will be given to an outstanding Master's Thesis or PhD Dissertation promoting ethical dimensions in OR-based studies, with the goal of encouraging young researchers - members of the future generation of managers and decision-makers - in developing and implementing Operations Research techniques for solving contemporary problems presenting ethical dimensions. Fields of application may include but not limited to: energy, environment, health care, peace studies, economics, CSR, finance.

The EthOR Award will be given for the first time at the EURO-2013 conference (Rome, July 1-4, 2013). To apply, the researcher should submit an extended abstract of maximum 6 pages of the MT/DD, accompanied by a letter from the academic supervisor(s) on why the work deserves the EthOR Award. Both the extended abstract and accompanying letter should be sent in pdf format BEFORE APRIL 5th 2013 to Professor Cristóbal Miralles [cmiralles@omp.upv.es](mailto:cmiralles@omp.upv.es), Chair of the EURO Working Group and president of the Award Selection Committee.

The selected finalists will be requested to present their work during a special session of the EWG held during the conference, and will receive an official certificate of excellence in developing OR techniques and/or applications contributing to ethical decision-making. The winner will get a cash prize of 500€ and full reimbursement of the

registration and gala dinner fees at the EURO-2013 conference, and will be honoured as Keynote speaker for the event of the "Ethics and OR" EWG following the EURO-2013 conference.

## Entry requirements

The entry must be a Master's Thesis (MT) or a Doctoral Dissertation (DD) officially approved during the last four years before the deadline (after 5th April 2009). Both the extended abstract and accompanying letter by the academic supervisor(s) of the MT/DD in Operations Research should be written in English. The student and the supervisor(s) of the MT/DD may or may not be member(s) of the EWG.

## Selection Process

The EWG Board will designate an EthOR Award committee of four members none of whom is related in any way to any of the applicants.

- All submissions will be screened and shortlisted to a maximum of three finalists. The following non-exhaustive aspects will be scrutinised:

1. Novelty and original contributions of the author(s).
2. Pertinence and applicability for solving contemporary issues with ethical dimensions.
3. Quality and clarity of the presented documents.

The Committee may decide that none of the entries qualify for the award. If necessary, the committee may require applicants to provide the full MT/DD in electronic form.

- The selected finalists will be informed before April 10th and requested to submit a short abstract for the Award session of the stream on "Ethics and OR", that will be held during the EURO-2013 conference.
- Finalists will be given 20 minutes to present their work, explaining details and addressing questions of the award committee.
- The decision will be announced by the president of the award committee on the last session of the stream on "Ethics and OR", when the certificate will be given. 🌐

## IFORS Prize for OR in Development Chair Announces Competition Updates

URL: <http://ifors.org/web/ifors-prize-for-or-in-development/>

Chair of the IFORS Prize, past IFORS President Andres Weintraub, has announced that the 9-member panel of judges for the 2014 competition is complete, signaling the start of deliberations on criteria and other aspects of the competition. The Prize Chair wishes to remind everyone that the November 30 deadline for submissions is not too far away, and that they should be writing up their entries by now.

The oral presentation of the selected eight finalists will be on July 14 during the 20th Triennial IFORS conference in Barcelona, Spain slated for 13-18 July 2014. The Prize has traditionally attracted a lot of papers from all over, showing the effectiveness of the Prize in getting the people who work in this area to show the world that OR addresses issues of development.

The Prize carries with it US\$ 4,000 award, with the runner up getting US\$ 2,000 - both presented during the IFORS Triennial Conference Banquet. Finalists' registration fees are sponsored by IFORS. For finalists who are nationals of developing countries, a grant for living expenses may be requested but cannot be guaranteed.

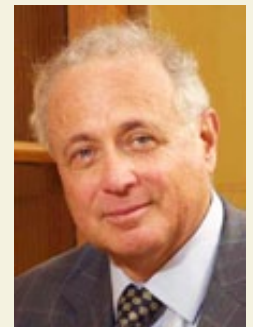
Would-be contestants are reminded that to be considered, the paper must describe a practical OR application in a developing country. The



study must have been conducted to assist a specific organization in its decision-making process with regard to education, health, and other basic services, water, technology, resource use (physical or financial), infrastructure, agricultural/industrialization, environmental sustainability with original features in methodology or implementation for development in developing countries. The idea is to optimize the development with the constraints and limited resources.

The finalist papers are automatically reviewed for the IFORS Publication, International Transactions in Operational Research (ITOR). Publication is contingent upon the usual refereeing process. Authors of finalist papers must agree that the first right to publish their papers lies with ITOR; as such, they will not submit their work for publication until and unless they receive permission to do so by the ITOR editor.

Papers submitted to the ICORD Workshop (<http://ifors.org/web/joint-icordewg-ord-workshop/>) to be held 27-28 June in Rome preceding the EURO/INFORMS conference are eligible to submit their work presented in the Workshop. 🌐



# 2012 Annual Report



## President's Report

Dominique de Werra <dominique.dewerra@epfl.ch>

2012 was the third, and hence, the final year of the current Administrative Committee. It is usually the best one, when AC members have gained a lot of experience, and plans drawn at the start have borne fruit. This is evident in the following annual reports of the AC members.

As already mentioned in the triennial report, an important progress of these last years is the remarkable expansion of IFORS News, which covered many events occurring during the year. We are very grateful to Elise del Rosario, Immediate past President and Editor of the newsletter. Her efforts at making information about IFORS activities available in the newsletters and the website, have allowed us to be more concise in this report. The website, under the expert guidance of Elise, has become a widely used source of information.

While not a Triennial Conference year, 2012 saw IFORS represented in many international meetings. Four regional meetings featured the IFORS Distinguished Lectures. The IDL gave us the opportunity to invite famous scholars who, in turn, delivered well-attended lectures at major conferences. We are very grateful to all of them who have helped us promote Operations Research in the best possible way.

The year marked the historic launch of the first IFORS Tutorial Lecture (ITL), a complement to the IDL. Even on its first year, the ITLs had been exceptionally successful in familiarizing non-specialized audiences to emerging topics in OR and in presenting original views on OR education. This strengthened IFORS belief that the ITL is essential in our efforts to promote OR inside and outside traditional OR communities. We express our gratitude to the first Tutorial lecturers whose motivating performance comprised the best possible start for this new IFORS activity. Thanks are also due to Karla Hoffman, NORAM VP, who worked hard to ensure the success of this program.

In this partial survey of the 2012 activities, one has to mention the IFORS Publications which also represent a crucial instrument for promoting OR. For health reasons, Hugh Bradley resigned as Publications Committee Chairperson during the year. We officially thanked him during the IFORS session at the EURO Conference of July in Lithuania where we also welcomed with deep gratitude for his willingness to serve IFORS again, his replacement Graham Rand.

We are also very grateful to the Editors in Chief of our publications for their

excellent work in 2012; the IFORS News has detailed the achievements of Preston White as IAOR Editor and of Celso Ribeiro as ITOR Editor.

The reports show the continuing efforts of the Federation in the Developing Countries Committee. We thank Hugo Scolnik, IFORS Vice President at Large, for having stimulated and organized the activities in this area.

Our gratitude also goes to Peter Bell, who as IFORS treasurer, has managed to keep the financial situation of the Federation stable amid the turbulent state of international finance.

From the beginning of the term of this AC, it was announced that OR education was going to be a priority. This challenge has been achieved and we are grateful to Nair Abreu, ALIO VP, who headed the Education Committee. As can be seen in the reports following this one, some of the actions of IFORS in education were linked with the activities of the Developing Countries Committee.

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IFORS was present in the celebration of several national society anniversaries, more specifically: the 30th year of membership in IFORS of the Operations Research Society of China (ORSC) held in Shenyang, which I attended; and the 25th Anniversary of the Operations Research Society of the Philippines (ORSP) where my message was relayed to the membership by Elise del Rosario. Our APORS VP, Xiang-Sun Zhang, should be thanked for his active contribution in promoting IFORS in Asia-Pacific.

In addition, I had the opportunity to spread the word about IFORS at the: ICORES meeting (Portugal, February), SEIO Conference (Spain, April), EURO conference (Lithuania, July) and CLAIO/SBPO Annual meeting (Brazil, September).

Among current undertakings having a huge future impact for the Federation is the preparatory work for the 2014 Triennial Conference in Barcelona. Our EURO VP Elena Fernandez heads the Organizing Committee of this conference in addition to her IFORS AC role of overseeing publications. We are all very grateful to her for this strong commitment and express our wishes for this conference which will undoubtedly be an additional successful event of the Federation.

Finally, on behalf of all AC members, I would like to express our deep thanks to Mary Magrogan, IFORS secretary, the unique professional IFORS actor who has helped all of us to work as efficiently as possible to reach our objectives this year.

It is now time to thank all IFORS members whose daily OR activities have allowed the Federation to live and flourish. It is also time to welcome to the new AC, which continues our mission under the guidance of Nelson Maculan. 🌐



## Report of the Immediate Past President

Elise del Rosario <elise@jgdelrosario.com>

Over the years in my tenure as Immediate Past President, my task has evolved from that of providing guidance to the incoming AC to that of mainly providing the institutional memory of the past projects. It is with pride that I became part of various initiatives put forth and implemented by the current AC under the dynamic leadership of Dominique de Werra. I continued my involvement in taking care of two important vehicles of IFORS communication: the website and the newsletter. Below are the highlights of 2012 activities.

### IFORS News

Quarterly electronic issues appeared on schedule. Alerts were sent to the national societies as soon as the issues were uploaded to the IFORS website. Apart from the electronic version, hardcopies of the June (IFORS 2011 Annual Report) issue were sent by post to all IFORS representatives and national society officers. >>



>> 2012 saw another new section launched, **OR Impact**, which has so far featured successful OR applications in Australian rail planning and UK air traffic control. Sue Merchant and John Ranyard have gracefully accepted to edit this section, which joins two others introduced the year before: **OR for Development** (edited by Arabinda Tripathy) and **Tutorials**. The latter section, along with feature articles tackled a wide range of topics: Abstract Art, Psychophysics, Pricing Decisions, Asset Liability Management, Scheduling Buses, Blogging, and Inventory Control. Meanwhile, members of the AC took turns providing thought-provoking and informative **Editorials**. **Book Review** by Hans Iltmann featured books that touch on current topics which have OR facets. **Conferences** brought to the readers various activities happening all over the world, notably IFORS-sponsored summer schools, conferences and Presidential visits to Peru, Portugal, Spain and China. Significant IFORS Publication news was also featured.

IFORS News correspondents Annibal Parracho (ALIO), Degang Liu (APORS) and Gerhard-Wilhelm Weber (EURO), enabled a complete coverage of the regional conferences in Rio de Janeiro, Xi'an, and Vilnius, respectively. The EURO office was instrumental in providing a detailed account of the historic 25th EURO conference. Karla Hoffmann ensured that news and features from NORAM activities are covered in every issue.

In order to ensure that flow of current news is not disrupted, the second issue for the year came out as a regular issue containing the 2011 Annual Report, rather than just an Annual Report issue. In the interest of providing timely information too, the new Administrative committee, which takes over in January, was introduced during the December issue.

As in the past, member societies were featured: the national societies of Croatia, Brazil, Spain, and India, which celebrated historic 20th, 44th, 50th, 55th anniversaries, respectively.

Editorial tasks involved article solicitation, collection and language editing as well as layout editing assigned to a graphic designer. It may be said that the IFORS News, as in the past years, has not slackened in its efforts to look for better ways to keep the OR international community abreast of OR issues and events in various parts of the world.

### IFORS Website

The goal of providing a website that is welcoming, easy to use, and conducive to sharing ideas and information among IFORS members and visitors was achieved by investigating and incorporating, where

appropriate, currently available technology. On the operational side, the site was kept current through daily monitoring and update of news, announcements and other information as needed. Queries by website visitors were attended to and when necessary, forwarded to the appropriate individuals. The website provided able support to specific IFORS initiatives on education, development and practice.

The website provided support to the Education Committee through the Educational Resources section of the IFORS website. This initiative aims to make available to the IFORS website visitor a consolidated and classified listing of links on OR education. It is also aimed to facilitate uploading and searching of OR materials in various languages. Jan van Vuuren has led an effort into collating and categorizing all OR education materials available in the Internet and making them available in the Educational Resources portion. This effort is on going.

In support of the Developing Countries Committee activities, the IFORS Developing Countries OR Resources Website was launched last year. The aim of the Developing Countries On-Line Resources page is to offer the OR worker all publicly available materials on the topic of Operations Research for Development. Headed by Gerhard-Wilhelm Weber, the initiative also aims to provide a venue for people who are working in the area to share their completed or in-process work, learn from others, and stimulate comments and discussions on the work. Materials were, and continue to be uploaded to the site.

The Webmaster also created a site to display the results of the IFORS Survey of OR Global Practice ([http://ifors.org/OR\\_Practice\\_Survey/](http://ifors.org/OR_Practice_Survey/)) and all the supporting data within the IFORS website itself.

New tools to more conveniently read the IFORS Newsletter on line were likewise introduced this year. Member information is also kept current as on-line updates are done upon receipt, in line with the thrust of making the website a convenient portal for visitors wishing to get information about member societies.

Improvement of the website look and feel are in the pipeline, which include, among others: a slideshow of IFORS sponsored conferences, workshops etc.; banners of the newsletter and other promoted IFORS program/resources; more convenient navigation features; a more prominent share button to encourage sharing of IFORS website contents; improved Contact Us page to assist members and visitors reach the right person for specific concerns. 🌐



## Report of the Vice President-at-Large Chair, Developing Countries Committee

Hugo Scolnik <hscolnik@gmail.com>

After the successful conference in Benin held in November 2011, the Developing Countries Committee worked on several initiatives for 2012 as follows: ICORD, IFORS Prize, website resource on developing

country issues, and a section on the IFORS News.

### International Conference on OR for Development (ICORD)

In cooperation with the EURO Working Group on OR for Development, IFORS funded the ICORD Workshop held in Tunisia from October 1-3, 2012. The intention is that these workshops should be held annually in preparation for the ICORD conference planned to coincide with the IFORS Triennial conference. This is to enable the activity and discussion about OR and development to be more continuous, and also hopefully to generate participants and papers for the conference in the succeeding year.

This first such ICORD Workshop was held on Djerba and had as its focus "Problem Structuring Methods". It was led by three tutors who among them had the advantage of extensive experience in Problem Structuring Methods (PSMs) and of working in developing country contexts: Mike Cushman, Jonathan Rosenhead -both of the London School of Economics - and Leroy White of the University of Bristol. Participants applied the methods to a realistic exercise based on fieldwork in India, enabling them to get a 'hands on' feel for both approaches. Two other PSMs, Strategic Choice, and Robustness Analysis, were covered more briefly. The workshop had an optimal number of participants for an interactive workshop of the kind. The hotel facilities encouraged interactions among the participants who came from Brazil, China, the Philippines, Portugal and the United Kingdom, as well as Tunisia itself.

Youssef Masmoudi headed the local organizing committee while the program committee was jointly chaired by Honora Smith, Gerhard-Wilhelm Weber and Elise del Rosario representing EWG ORD and IFORS. Materials of the Workshop are available at <https://www.dropbox.com/sh/ppf51fzdmok4dhf/3SoRCGC9JK>. >>





>> As a follow up, joint workshop on OR for Development with the theme "OR: Addressing Issues of Development" was planned to be held in Rome on June 27-28, prior to the EURO-INFORMS conference in Rome, June 30- July 4, 2013. All papers presented are eligible for submission to the IFORS Prize Competition. This activity will again be jointly sponsored with the EURO Working Group on OR for Development. Announcement of this activity is available at <http://ifors.org/web/joint-icordewg-ord-workshop/>.

### IFORS Prize for OR in Development

In 2012, preparations for the 2014 IFORS Prize Competition were put in motion with the appointment of Andres Weintraub as IFORS Prize Competition Chair. Announcements were released (<http://ifors.org/web/ifors-prize-for-or-in-development/>) and a search for members of the jury was started.

### IFORS News and Website

2012 saw the continuation of the regular section on OR for Development was introduced with Arabinda Tripathy as editor, covering such topics as "Problem Structuring Methods", "OR in South Asia" and a feature on the challenges of translating an OR technical article into an African language.

On the other hand, the IFORS website has continued providing a vehicle by which OR professionals interested in the topic of OR for development can share and find works of other people in the area. Chaired by Gerhard-Wilhelm Weber, the DC resources site can be found at this link: [http://ifors.org/developing\\_countries/index.php?title=Main\\_Page](http://ifors.org/developing_countries/index.php?title=Main_Page).

All these activities were very actively promoted by Elise del Rosario. 



## Report of the Treasurer

Peter Bell <[pbell@ivey.uwo.ca](mailto:pbell@ivey.uwo.ca)>

While IFORS ran an operating deficit in 2012, this was in line with our budget and the IFORS financial position continues to be strong. What follows is a summary of the unaudited results for 2012 (all numbers in \$US).


We continue to see strong revenues from our publications with IAOR and ITOR cash receipts totaling \$138,362 which was a little below budget (\$142,565). 2012 members' dues collections (\$21,903) were above budget (\$20,000) as a result of continued diligent efforts by Mary Magrogan to collect past due accounts. IFORS' interest revenue continued to decline as the economic downturn reduced the interest rate we receive on our reserves: in 2008 we received interest of \$27,280 but in 2011 this had declined to \$2,344 even though IFORS' reserves had increased. 2012 final interest receipts were \$2,442 in line with 2011. The net effect was that IFORS revenue (about \$162,000) was very close to the budgeted amount (\$165,065).

2012 spending (\$195,000) was down from 2011 (\$208,000) which was a triennial conference year, with associated higher costs to IFORS, but was below the 2012 budget (\$214,375.) Most line items were close to budget but items that were significantly above budget included the IFORS Distinguished Lectures and Tutorials (\$31,800 vs budget of \$22,000 – the Tutorials were added during the year), administrative committee expenses (\$15,373 vs. \$12,000 as a result of additional travel), and the Quebec City site visit (\$5,568 which had not been budgeted). The Education and Developing Countries committees did not spend their full budgets.

We budgeted for a deficit of \$49,310 and ended December with a cash deficit of \$32,489. The audited statements that will be available in April will be slightly different as a result of the way that the auditors handle accruals.

The 2013 budget (approved by the IFORS AC in Vilnius) shows an operating loss of \$56,000 and if history repeats the actual deficit will be a little less than this.

On balance, 2012 did not materially change IFORS financial strength. We have a very conservative investment strategy with our reserves in US dollars and so the value of our assets increases and decreases with the \$US exchange rate. In 2012 we held our own against the British pound and Swiss Franc but gained 2% against the Euro but since we cannot predict future exchange rates we do not try. Prospects for the future seem sound, particularly with recent improvements in the stability of the financial system.

In view of the Federation's financial position and prospects, no change in member society dues is recommended at this time. 

### IFORS Financials (unaudited, in US Dollars)

	Approved 2012 Budget	Cash 2012	Approved 2013 Budget
<b>INCOME</b>			
Member Society Dues	20,000	21,934	20,000
Royalties			
IAOR	87,565	85,750	76,764
ITOR	55,000	52,612	50,000
Interest	2,500	2,443	1,500
Other Income			
<b>TOTAL INCOME</b>	<b>165,065</b>	<b>162,738</b>	<b>148,264</b>
<b>EXPENSES</b>			
Triennial Conferences			
Barcelona 14		5,13	
Quebec City 17		5,568	
Activities			
Administrative Committee	12,000	15,374	12,000
Publications Committee			
IAOR Editor	34,500	27,000	34,500
ITOR Editor	22,000	23,366	23,000
Other			
Scientific Activities & External Affairs			
IDL, ITL, Fellowships, & Grants	22,000	31,791	16,000
IFORS Website	6,500	3,833	6,500
Education Committee	15,000	1,453	7,500
Meetings Committee			
Program IFORS2014		1,344	2,500
Other			
ITOR Subscriptions	20,375	20,525	20,375
IFORS Newsletter	3,500	1,184	3,500
Developing Countries Committee	26,000	14,217	26,000
General Business Operations			
Office & Secretary	46,000	44,762	46,000
Auditor	3,000	2,819	3,000
Banking	1,000	1,480	1,000
Write-off of Bad Debt from Dues			
Contingency	2,500		2,500
Exchange difference			
<b>TOTAL EXPENSES</b>	<b>214,375</b>	<b>195,228</b>	<b>204,375</b>
<b>OPERATING RESULT</b>	<b>(49,310)</b>	<b>(32,489)</b>	<b>(56,111)</b>





## Report of the VP representing ALIO

Nair Maria Maia de Abreu <nairabreunovoa@gmail.com>

For 2012, two major events were held by the *Asociación Latino-Iberoamericana de Investigación Operativa* (ALIO), namely: the **XVI ELAVIO** *Escuela Latinoamericana de Verano en Investigación Operativa*, and the **XVI CLAIO** *Congreso Latino-Iberoamericano de Investigación Operativa*.

### ELAVIO 2012

The Summer School of ALIO was held at Bento Gonçalves, Brazil, from February 6 to 10. The school was organized by Federal University of Rio Grande do Sul UFRGS (Informatics, Administration and Mathematics Institutes), Federal University of Santa Maria UFSM, and Federal University of Pampa UNIPAMPA. Chaired by Luciana Buriol, Professor of the Federal University of Rio Grande do Sul, the school was supported by CNPq (Brazilian Financial Agency), SOBRAPO (Brazilian Operational Research Society) and IFORS.

ELAVIO was organized with six 2 to 3 hour tutorials and six 60 to 90 minute talks from ten researchers. There were also 59 parallel sessions each featuring four 15-minute talks by students. The 105 participants consisted of: 80 selected students (from 162 applicants); 5 students from the organizing committee; 8 professors from the organizing committee; 10 speakers and 2 invited professors (Nair Abreu representing IFORS/ALIO/SOBRAPO and Rosiane Rodrigues future ELAVIO chair).

From the 85 students, ELAVIO provided full scholarship (including transfer, food and hotel) for 49, while 36 received partial scholarship (transfer and food). The selected 80 were composed of 1 post-doctoral, 30 doctoral, 35 master and 14 undergraduate students from 14 different countries, with women comprising more than 20% of the total.

Apart from the talks and tutorials, the students had different forms of integration: Students shared double and triple bedrooms, allocated to maximize inter-nationality interaction; the hotel facilities (swimming pool, soccer, games room, etc.) enabled various activities after classes; participants had their meals together. On the first, second, and fourth days, participants were arranged into various groups to discuss *How OR can be useful for a country in a world-cup year, and How models and solutions can remain after the world-cup*.

*IFORS Scholarship*: Juan Carlos Figueroa Garcia of Colombia, whose paper was *Linear Programming under Linguistic uncertainty an interval 2-fuzzy sets*

*approach* was selected from among 19 candidates for the IFORS Scholarship. The experience of Juan Carlos available in the June, 2012 issue of the IFORS News (<http://ifors.org/web/june-2012-newsletter/>) attests to the success of this IFORS-supported activity.

### CLAIO 2012

The main event held by ALIO, the XVI CLAIO and the XLIV SBPO (*Simpósio Brasileiro de Pesquisa Operacional*) took place between the 24th and the 28th of September in Rio de Janeiro. Venue was the Candelária branch of FGV (Fundação Getúlio Vargas-Candelária). With the theme Operational Research at Large Sporting Events, both conferences paid tribute to Professors Nelson Maculan, Andrés Weintraub and Hugo Scolnik, very important Latin American Operational Researchers. On the same occasion, the first workshop on Spectral Graph Theory dedicated to Latin-Iberoamerican researchers (LIA-SGT) took place.

With 830 participants, the CLAIO was fully packed, with 485 papers presented in 121 sessions and 112 posters. The 5 plenary talks given by world-renowned speakers, 4 tutorials and 13 special sessions coordinated by well-known specialists proved to be a major crowd-drawers. During the last two days, participants took part in the Latin-Ibero-American Workshop on Spectral Graph Theory (LIA-SGT), focusing on Graphs, Matrices and Combinatorics, all OR areas in themselves.

The XVI CLAIO/ XLIV SBPO and LIA-SGT Workshops may be accessed via SOBRAPO's homepage at <http://www.sobrapo.org.br/claioSBPO2012>, which features works about to be published along with the Complete Programme. SOBRAPO cd-roms containing all the papers in their full version were distributed in December while booklets containing all abstracts of papers accepted by the Scientific Committee and the names of the evaluating members were handed out during the event.

IFORS sponsored an IDL and an ITL for the event: IFORS Distinguished Lecturer Silvano Martello (Università di Bologna, Itália) gave his talk on *Two Dimensional Packing Problems in Telecommunications*. The 4 tutorials featured during the conference drew a large attendance and one of them was the ITL delivered by Maurício Resende (AT&T Labs Research – USA), on *Biased Random-Key Genetic Algorithms*.

Following tradition, the best Scientific Initiation Award was given to Pedro Belin Castelucci, a student from The University of São Paulo (USP). SOBRAPO conferred the *Roberto Diégues Galvão Award* for the best paper presented at SBPO to Márcia Fampa and Wagner Pimentel, of the Federal University of Rio de Janeiro (UFRJ), for their work, *Genetic Algorithm to the Strategic Pricing Problem in Competitive Electricity Market*. 🌐



## Report of the VP representing APORS

Zhang Xiang-Sun <zxs@amt.ac.cn>

Participated in by 100 delegates, the 9th triennial conference of Association of Asia-Pacific Operational Research Societies (APORS2012 was held in Xi'an, China where APORS president Yaxiang Yuan presided over the APORS Council meeting. Decisions made during the meeting include the acceptance of MSORSM (Malaysia) proposal to host the

APORS 2015 in Kuching Sarawak; election of the 2013-2015 officers with following results: Illias Mamat (Malaysia) as President, Sunity Shrestha (Nepal) as Vice President, Changwon Lee (Korea) as Secretary and Francis Miranda (Philippines) as Treasurer; and appointment of APORS President Ya Xiang Yuan as Vice President of IFORS representing APORS for the same period.

Following are reports on the activities of some of the member societies comprising APORS.

**Operations Research Society of China (ORSC)**. The 9th quadrennial ORSC National Congress (ORSC2012) held in Shenyang, with more than 400 participants in attendance. The conference featured IFORS President *Dominique de Werra*. It was also during the conference that IFORS VP *Xiang-Sun Zhang* was conferred the *ORSC Science & Technology Award* in recognition of his valuable long-term contribution to the profession and the Chinese operations research community. ORSC elected its new council. Professor Xiaodong Hu was elected president for the term 2013-2016.

Apart from its national conference, China also hosted the 5th International Conference on Optimization and Control with Applications (OCA5) in Beijing from December 4-8, 2012 (<http://science.cup.edu/mathweb/icoca2012/>). >>



**Operations Research Society of Iran (IORS).** The IORS executive council held regular monthly meetings in 2012 to discuss and coordinate the pertinent issues relating to the OR society in Iran and its international activities. In 2012, IORS coordinated the following scientific activities within Iran:

- 5th International Conference of the Iranian Operations Research Society, May 16-17, 2012, Azarbaijan University of Tarbiat Moallem, Tabriz;
- 4th National Conference on Data Envelopment Analysis, June 13-14, 2012, Mazandaran University, Babolsar;
- 1st National Conference on Mathematics and its Applications in Engineering Sciences, February 22- 23, 2012, Islamic Azad University, Jouybar Branch, Jouybar, Mazandaran;
- 4th Workshop on Optimization and its Applications, May 15, 2012, University of K.N. Toosi Technology, Tehran;
- Performance Management Strategy Workshop, BSC, BPM, DEA, May 16, 2012 Azarbaijan University of Tarbiat Moallem, Tabriz;
- Workshop on Introduction to Mathematical Programming using Software Optimization, May 16, 2012, Azarbaijan University of Tarbiat Moallem, Tabriz; and
- Supply Chain Competition with Financial Derivatives Workshop, May 17, 2012, Azarbaijan University of Tarbiat Moallem, Tabriz.

**Operations Research Society of Japan (ORSJ).** In 2012, regular executive council meetings of the ORSJ were held bimonthly to discuss various plans for society events (e.g., national conferences and symposia), budgetary issues, membership promotion activities, announcements for various research groups of the society. Symposia and conferences held were:

- Spring symposium at the National Defense Academy in Yokosuka on March 26, 2012, with 120 participants;
- Spring national conference at the National Defense Academy in Yokosuka on March 27-28, 2012, with 400 participants;
- Fall symposium at the Nanzan University in Nagoya on September 11, 2012, with 170 participants;
- Fall national conference held in Nagoya on September 12-13, 2012, with 340 participants; and
- OR tutorial on queueing theory held in Tokyo on September 21, 2012, with 31 participants.

Meanwhile, the study groups consisting of 10 to 40 members each held their regular monthly/bimonthly meetings. These 18 study groups cover the following areas:

Queueing Theory, Research Association of Mathematical Programming, Data Envelopment Analysis, Operations Research for Decision Making, Supply Chain Strategies, Infrastructure Strategy for Sustainable World, Stochastic optimization Models and Their Applications, Service Science, Optimization and Decision Making in Service Industry, Decision making Processes in Food, Agriculture and Environmental Issues, Advanced Marketing Analysis Research Division, Decision Making Science under Uncertainty, Seminar on Optimization: Theory and Applications for Mathematical Approaches, Development and Application, OR for politics, Society and Public Administration, KSMP, Defense and Security, Urban and Regional Operations Research.

For 2012, ORSJ continued the publication of: "Communications of Operations Research of Japan", published monthly



▲ IFORS President deWerra presents Certificate of Appreciation to ORSC President Yuan Ya-Xiang during the ORSC National Congress.

in Japanese and distributed to all members, and "Journal of the Operations Research Society of Japan" (JORSJ), a professional journal issued four times a year, accessible for free at the ORSJ webpage (<http://www.orsj.or.jp/~archive/>).

An international conference on Queueing Theory and Network Applications (QTNA) <http://infosys.sys.i.kyoto-u.ac.jp/qtna2012/> was also held in Kyoto, Japan on Aug. 1-3, 2012.

**Korean Operations Research and Management Society (KORMS).** KORMS held its Spring Conference from May 10 to 11. Themed "Creative Collaboration between Large Corporations and SMEs through IT Convergence," the meeting attracted around 500 participants attending various activities such as paper presentations, board meetings, and other SIG meetings.

In cooperation with 30 academic societies related to management and business, KORMS held "The Dynamic Design, The Dynamic Business" conference on August, 20-22, which was attended by 1000 participants. The Annual Fall Meeting, attended by 300 delegates, was held in November 1, with the theme "MS/OR Applications in Military and Public Sectors".

For 2012, KORMS published its three journals on schedule, as follows: Journal of the Korean Operations Research and Management (quarterly); Korean Management Science Reviews (3 times a year); and Management Sciences and Financial Engineering (MSFE) (bi-annual).

The thrust of the new leadership is to invite more international scholars for annual meetings and conferences.



▲ IFORS VP Xiang-Sun Zhang awards the ITL plaque to Prof. Xiuli Chao at the ORSC National Congress.

**Operational Research Society of Nepal (ORSN).** The 7th Annual ORSN General Meeting on September 8, 2012 had all individual and institutional members present evaluate the previous year's activities and discuss strategies for the coming year. Another regular activity held was the session on the topic "Tourism and Sustainable Development". A Workshop on "Psychophysics in Operations Research and Questionnaire Construction" conducted by ORSN was rated excellent by its 40 participants coming from various disciplines.

Organization of the National Seminar on February 1-2, 2013 with the theme "Operations Research: Applications in Developing Countries" had been started in 2012. About 60-70 participants are expected to join this event.

**Operations Research Society of the Philippines (ORSP).** ORSP celebrated its 25th Anniversary during its National Conference held in November 9. Participated in by 100 delegates, the conference capped the yearlong activities of the Society, which included a national Conference of the Federation of Student Chapters early in the year, technical forum on the topic "Application of Mathematical Modeling and Quantitative Methods in Improving Healthcare Decision-Making."

A 2-day workshop on the "Fundamentals of Mathematical Programming and Spreadsheet Modeling" was very successful in getting OR professionals more adept in the use of spreadsheets. In between, all the officers were accepting invitations to talk about OR to various audiences as part of its program to make OR better known. The officers also undertook a strategic planning session where alignment of programs and activities to aims and goals of the society were discussed. 🌐







## Report of the VP Representing EURO

Elena Fernández <e.fernandez@upc.edu>

**E**URO, The Association of European Operational Research Societies, is the regional grouping within IFORS composed of 31 member societies. EURO is regulated by a Council consisting of representatives of these member societies and an Executive Committee which constitutes its board of directors.

The 2012 Executive Committee was composed of: President Grazia Speranza (Italy), President Elect Gerhard Wäscher (Germany), VP1 Sally Brailsford (United Kingdom), VP2 José Fernando Oliveira (Portugal), Secretary Jesper Larsen (Denmark), and permanent Treasurer Marino Widmer (Switzerland); Office Manager Sarah Fores, webmaster Bernard Fortz (Belgium), and Website Editor and Administrator Marie-France Rogge (Belgium).


The EURO XXV Conference took place in Vilnius in July 8-11 2012, with 2000 presentations and 2100 delegates. The Program Committee Chair was Marielle Christiansen (Norway) and the Organizing Committee Chair Leonidas Sakalauskas (Lithuania). The conference featured the IFORS Distinguished Lecture by Ralph Gomory (United States of America) and the IFORS Tutorial Lecture delivered by Erhan Erkut (Turkey).

In addition to the annual conference, a series of smaller meetings were supported by EURO in 2012, as follows: mini-Conference on "Computational Biology, Bioinformatics and Medicine" took place in Nottingham (UK) from September 13 to 15; mini-Conference on "Variable Neighborhood Search" in Herceg Novi (Montenegro) from October 4 to 7; EURO conference for young OR researchers ORP3 (Op. Res. Peripatetic Postgraduate Programme), in Linz (Austria) from July 16 to 27; XXVIII EURO Summer Institute on Maritime Logistics in Bremen (Germany) from June 3 to 5; and the XXIX EURO Summer Institute on Cutting and Packing in Porto (Portugal) from July 16 to 27.

EURO recognizes the achievements of its members through a variety of prizes. In 2012, the EURO Gold Medal was awarded to Boris Polyak, Russian Academy of Sciences (Russia). The 2012 EURO Distinguished Service Medal Award was given to Dominique de Werra, Ecole Polytechnique Fédérale de Lausanne (Switzerland). The winners of the 2012 EURO Excellence in Practice Award are Mikael Rönnqvist, Patrik Flisberg, Mikael Frisk from the Forestry Research Institute of Sweden. The 2012 EURO Doctoral Dissertation Award was given to Carolina Osorio, Ecole Polytechnique Fédérale de Lausanne (Switzerland). The winners of the EURO Award for the Best EJOR Paper are Maria Teresa Melo, Stegan Nickel, and Francisco Saldanha-da-Gama (survey paper category); Mikael Frisk, Maud Göthe-Lundgren, Kurt Jörnsten, and Mikael Rönnqvist (application paper category); and Alexander Stepanov, James MacGregor Smith (theory/methodology category). All these prizes were awarded during the Vilnius XXV Conference.

2012 saw the launching of three new EURO journals. *EURO Journal on Computational Optimization* (EJCO) with Editor in Chief Martine Labbé (Belgium); *EURO Journal on Decision Processes* (EJDP), with Editor in Chief Ahti Salo (Finland), and *EURO Journal on Transportation and Logistics* (EJTL), with Editor in Chief Michel Bierlaire (Switzerland). The first two issues of EJTL appeared recently (<http://link.springer.com/journal/13676>) and several papers of the first issue of EJCO are available online (<http://link.springer.com/journal/13675>). The first issue of EJDP will be published in 2013.

There are 29 working groups in EURO (EWGs) which cover different areas within OR. The EWGs meet regularly during EURO-k Conferences and other events, where they organize thematic streams or sessions. For 2012, such meetings were organized and supported by EURO.

The EURO PhD School (EPS) is a new educational instrument created by EURO in 2012 to encourage organization of post-graduate education initiatives for PhD students under a school format. The first EPS has been planned for 2013. 



## Report of the VP Representing NORAM

Karla Hoffman <khoffman@gmu.edu>

**T**here are two societies that make up the North American Operations Research Societies (NORAM): The Canadian Operations Research Society (CORS) and the Institute for Operations Research and the Management Sciences (INFORMS).

Both societies were created to promote the advancement of knowledge, interest and education in operations research by providing mechanisms for the exchange of information through the organization of conferences, the promotion of advances in the field, and the production of books, journals, magazines, on-line information, videos and other media that describe these successes. A multiple of prizes are awarded by each society honoring the achievements of the successes of the field.

**2012 CORS ACTIVITIES.** The Canadian Operations Research Society serves its members through a variety of publications and services including its quarterly Bulletin, its journal, Information Systems and Operations Research (INFOR), a traveling speaker program, holding a yearly Graduate Student Conference and providing grants to attend teaching effectiveness workshops.

**Awards.** The 2012 Harold Lardner Prize was awarded to George Nemhauser for international distinction in operations research. The 2012 recipient of the Omond Solandt Award was Navtech, a leading international provider of flight operations software, in recognition of a joint-venture project with the

University of Waterloo to apply mathematical and modeling techniques to compare crew pairings solutions. The 2012 Award of Merit recipient is Oded Berman of the School of Management at the University of Toronto and the 2012 Service Award went to Taraneh Sowlati for her service to CORS.

Finally the CORS Practice Prize was awarded to Peter Vanberkel, Richard J. Boucerie, Erwin W. Hans, Johann L. Hurink, and Wineke A. M. van Lent and Wim H. van Harten (Department of Industrial Engineering of Dalhousie University).

**Meetings.** The 54th Annual conference of the Canadian Operational Research Society and the 10th International Conference on Multiple Objective Programming and Goal Programming (CORS/MOPGP'2012) was held in Niagara Falls from June 11 to 13.

**Publications.** CORS publishes the journal INFOR, a quarterly journal on Information Systems and Operational Research. The importance of combining IS and OR in one journal is that both aim to expand quantitative scientific approaches to management. The integration of these two subjects also enhances the applied orientation of INFOR, since its concepts are used in the practical implementation of OR models.

**INFORMS ACTIVITIES.** INFORMS holds two major conferences - the fall Annual Meeting for academics and the Analytics Conference for practitioners. INFORMS publishes multiple journals (13 journals as of 2012) as well as a tutorial and book series. >>



>> Other programs include a speakers program, a high-school teachers' program, and a doctoral colloquium and young practitioners' workshop. INFORMS is divided into communities: currently there are 10 societies, 22 subdivisions, 5 fora (interest groups that are neither discipline or geographical), and 31 regional groups. These entities hold their own meetings as well substantially contribute to the content of the national meeting.

**Prize Winners.** The *Doing Good with Good OR paper Competition* awardees for 2012 included: 2012 First Place: Jonathan Helm, University of Michigan ; Gregory Schell, University of Michigan ; The *George B. Dantzig Dissertation Prize* was awarded to Mazhar Arikan, Purdue University ; The *George E. Kimball Medal* was awarded to Susan Albin and Don Kleinmuntz; The *George Nicholson Student Paper Prize* to Minijao Zhang, Ohio State University; The *INFORMS Expository Writing Prize* was awarded to Uriel Rothblum, Technion-Israel Institute of Technology; The *INFORMS Impact Prize* was jointly awarded to Hohannes Bisschop, Kevin Cunningham, Robert Fourer, David gay, Brian Kernighan, Bjarni Kristiansson, Alexander Meeraus and Linus Schrage; The *INFORMS President's Award* was given to Andres Weintraub, Universidad de Chile; The *INFORMS Prize* was awarded to Memorial Sloan-Kettering Center; The *INFORMS Prize for the Teaching of OR* was given to David Rogers, University of Cincinnati, Quantitative Analysis & Operations Management; The *INFORMS Undergraduate Operations Research Prize* was awarded to Alice Paul, Harvey Mudd College; The *John von Neumann Theory Prize* was awarded to George Naemhauser, Georgia Institute of Technology and Laurence Wolsey Université Catholique de Louvain; The *Philip McCord Lectureship Award* was given to William R. Pulleyblank, United States Military Academy; The *UPS George D. Smith award* was given to The Tauber Institute for Global Operations at the University of Michigan; and the *Franz Edelman Award for the Achievement in Operations Research and the Management Sciences* was awarded to TNT Express. In addition, those inducted as INFORMS Fellows this year included: Guillermo Gallego (Columbia University), Bazlel Gavish (Southern Methodist University), Daniel Granot (University of British

Columbia), Patrick Harker (University of Delaware), Michael N. Katehakis (Rutgers University), Karl G. Kempf (Intel Corporation), Ramayya Krishnan (Carnegie Mellon University), Richard P. O'Neill (Federal Energy Regulatory Commission), Rakesh Kumar Sarin (UCLA), Yves Smeers (Université Catholique de Louvain), Marius M. Solomon (Northeastern University) and Srdihar Tavor (Carnegie Mellon Univ.)

**Certification in analytics.** In January, 2012, INFORMS' Board of Directors led by Vice President, Practice Activities Jack Levis discussed what could be done to help industry ensure people with the requisite skills and capabilities are being hired. The result was a certification program in analytics covered in the December issue of the IFORS News <http://ifors.org/web/december-2012-newsletter/>.

**INFORMS meetings.** The three major meetings of INFORMS during 2012 were the 2012 INFORMS Conference on Business Analytics and Operations Research held April 15-17th in Huntington Beach California; the INFORMS 2012 International Meeting held in conjunction with the Operations Research Society of China and Tsinghua University held June 24-27th, and the INFORMS Annual Meeting in Phoenix Arizona October 14-17th.

In addition, INFORMS held a number of Community conferences, including the INFORMS Organizational Science Winter Conference (Feb 9-12) in Steamboat Springs, Colorado; The INFORMS Optimization Society Conference (Feb 24-26) in Coral Gables, Florida; The INFORMS Telecommunications Conference (Mar 15-18) in Boca Raton Florida; The Group Decision and Negotiations Conference (May 20-24) in Brazil; The Marketing Science Conference (June 6-9) in Boston, Massachusetts; The Manufacturing and Service Operations Management Conference (June 17-19) in New York, New York; The Revenue Management and Pricing Conference (June 29-30) in Berlin, Germany; The Winter Simulation Conference (Dec 9-12) also in Berlin, Germany. 🌐



## Report of the Secretary

Mary Thomas Magrogan <secretary@ifors.org>

In 2012 membership dues invoices were issued and payments were received on schedule, with the exception of a few national member societies. Annual Reports were likewise received and followed up from its member societies. Administrative details pertaining to the IFORS Administrative Committee meetings are arranged from the office. Together with the AC members, the Secretary coordinated the update of the AC Reference Manual to reflect current policies and operating procedures. 🌐



## Report of the Publications Committee Chair

Graham Rand <g.rand@lancaster.ac.uk>

In 2012, Hugh Bradley resigned from his role as Chair of the Publications Committee. IFORS debt to Hugh is immense: his chairmanship of the Publication Committee was one of several important contributions, all of which he carried out with commitment and wisdom. Graham Rand of Lancaster

University, UK, agreed to step into the vacancy. Graham has served IFORS in various roles: as Vice-President from 1998-2000; Editor, International Abstracts in Operations Research, from 1979-91; Editor, OR 1987 Conference Proceedings; Chairman, OR 1990 Conference Programme Committee; and Managing Editor, International Transactions in Operational Research, 2001-2005.

### International Abstracts in Operations Research (IAOR)

For 2012, K. Preston White, Jr. continued to edit IAOR and continued to be published by Palgrave, which has replaced Ros Pyne (who has

served IFORS after many years) with Neil Henderson. It was another very difficult year in the academic library market, and specialised abstracting and bibliographic products such as IAOR continued to be hit especially hard. As a result, Palgrave reduced its forecast for 2012 and predicted that revenues will be flat in 2013. Profit share of IFORS declined by \$4k down to \$58K in 2012. IAOR ran under page budget, but even meeting the page budget would not provide enough space to bring IAOR up-to-date.



With inputs from David Smith and Hugh Bradley, Palgrave introduced a new cover in 2012. Also new with Volume 63 is IAOR Associate Editor Peter Whitehead's name on the masthead. Formerly a systems engineer on the senior staff at Lockheed Martin, Peter is currently a Ph.D. student at the University of Virginia. >>



>> Peter's addition to the team fulfills the original vision for the IAOR selection and classification process, with two sets of eyes reviewing every abstract. Additional improvements to the editor's workbench are under discussion, in response to efficiencies demanded by increased coverage of new journals in the field. The three central challenges are to improve: the speed of the workbench; the 'usability' of the editorial interface; and the quality of the data exported for publication.

The most challenging issue now facing IAOR is the accumulation of a significant backlog of abstracts awaiting processing—the result of expanding our coverage by more than a dozen journals. Adding to the immediate backlog are abstracts for back issues of many of these journals (in some cases covering more than a decade), a great many of which certainly belong in the database.

The approach to the backlog thus far has been to process abstracts more selectively, in order to remain current with the most important and relevant OR papers. Clearly, this approach is stopgap and additional editorial resources are being sought to expand future issues by as much as 20%. Growing issues to a nominal 600 abstracts seems a viable approach to reducing the backlog, or at least stemming its growth.

Pres White is concerned by the continued relevance of IAOR in a world where superb online search capabilities are available to anyone with a web browser. What does IAOR contribute? Using precision and modified recall metrics, a study done through Palgrave contrasted the results of several queries when entered into both IAOR and Google Scholar. Notably, these results were complementary, with very little overlap in the relevant documents retrieved in response to the same query. An edited version of the paper resulting from this work appeared in ORMS Today in October 2012.

Of concern to the publishers is the opportunity to deliver IAOR online to national societies with a suitable member-only facility on their website, and the appropriate charge to make for that service. This issue will be at the forefront of discussions with IFORS' Administrative Committee and certain national societies during 2013.

## International Transactions in Operational Research (ITOR)

The headline news concerning ITOR in 2012 was that it received an inaugural Impact Factor of 0.648 in the 2011 Journal Citation Reports published by Thomson Reuters. This puts ITOR 49th out of 77 titles in the Operations Research and Management Science category and 125th out of 166 titles in the general Management category. This is an excellent achievement, and a direct reflection of the work done by ITOR Editor Celso Carneiro Ribeiro with support by our publisher Wiley-Blackwell over the past five years. One result has been a noticeable increase in the number and quality of submissions.



ITOR is now available in 3600 institutions worldwide via the Wiley licensed sales program, and is also available for free or at very nominal cost in 6000 institutions in the developing world via the various philanthropic initiatives in which Wiley-Blackwell participates. There continues to be a significant increase in the number of articles downloaded. Full-text downloads of the journal in China rose by 126% in 2011. Indeed, ITOR's profile and usage in China is being encouraged by campaigns to Chinese students and researchers, and ensuring that the journal's content is covered by key

Chinese abstracting and indexing services.

The annual page budget has increased from 768 (in 2007) to 1062 (in 2012), but has not been used: 891 pages were published in 2012. Amount due to IFORS for 2012 are expected to be approximately \$50K.

Four new editorial board members have been appointed, Sonia Cafieri (France), José Dulá (USA), Andrew Eherhard (Australia), K. Preston White Jr. (USA) bringing the total of board members to 41 including Assistant Editor, Simone Martins.

Three Special issues have been published: "Tutorials in Operations Research" (Ribeiro & Loiseau) (double issue); "Supply chains" (Ronnqvist, D'Amours, Bernstein & Caldentey); and "Multiple Objective and Goal Programming" (Clímaco & Loukil). 🌐

## Report of the Meetings Chair

Karla Hoffman <khoffman@gmu.edu>



### IFORS Meetings

Plans are well underway for the 2014 conference in Barcelona, Spain and hosted by the Spanish Society of Statistics and Operations Research (SEIO).

The Chair of the Organizing Committee is Elena Fernandez and the Program Chair is Stefan Nickel. The theme of the conference is "The Art of Modeling" and it will take place July 13-18, 2014. Information about this meeting can be found at the following web site: <http://ifors2014.upc.edu/home/ifors>.

The 2017 IFORS meeting will take place in Quebec City, Canada. It will be hosted by the Canadian Operations Research Society (CORS) and the organizing chair for this meeting is Bernard Gendron. The meetings site-review committee consisted of President-elect Nelson Maculan, Vice-President Karla Hoffman, Treasurer Peter Bell and IFORS Secretary Mary Magrogan. They met with Professor Bernard Gendron representing the host Canadian Operational Research Society (CORS), Irène Abi-Zeid and Angel Ruiz representing the local CORS section, and Ms Marie-Élaine Lemieux, Sales Manager of the Centre des Congrès de Québec.

### IFORS Distinguished Lecture

The IFORS Distinguished Lecturer is a program to encourage international cooperation in OR and to recognize successful and influential OR

researchers. The breadth of the presentations by this year's IDLs attests to the good health of our field. Table 1 below shows the IDL lectures given this year.

**Table 1 : IFORS Distinguished Lectures 2012**

Brenda Dietrich	June 2012	INFORMS	Beijing, China
Ralph Gomory	July 2012	EURO	Vilnius, Lithuania
Silvano Martello	September 2012	CLAIO/SBPO	Rio de Janeiro, Brazil
Paolo Toth	October 2012	INFORMS	Phoenix Arizona, USA

### IFORS Tutorial Lecture

The IFORS Tutorial Lecture is intended to encourage new research in emerging areas of Operations Research or to highlight new teaching technologies and approaches. The tutorials, given by outstanding scholars, aim to present the fundamentals of emerging OR technologies, application areas or teaching approaches to a large diverse audience.

**Table 2 : IFORS Tutorial Lectures 2012**

Erhan Erkut	July 2012	EURO	Vilnius, Lithuania
Xiluli Chao	July 2012	APORS	Beijing, China
M. Resende	September 2012	CLAIO/SBPO	Rio de Janeiro, Brazil

The tutorials are geared toward non-specialists with the goal of inspiring and raising interest in pursuing these new ideas. IFORS had its first ITL recipients in 2012 as shown in Table 2. 🌐

