

IFORS

NEWS

International Federation of Operational Research Societies

From the Editor

Meetings Matter!

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

I had the fortune of meeting Rolfe and Maurice, whose obits are featured here, through my participation in several conferences. It is then I realized that it is through these meetings that you get to know more about the person coming up with all the brilliant work that you read about. These made me realize how important conferences are, not only in updating one's knowledge about the discipline but also in creating networks and picking the brains of people who have contributed in their own ways to the discipline.

Conferences have a definite role to play, and this issue takes a closer look at what happens on the preparation side of conferences, through the interview of Tamás Terlaky, chief architect of the INFORMS 2015 Annual meeting. Maybe not along the same magnitude in delegate numbers, other such conferences were prepared for painstakingly in Algeria, China, Iran, Nepal, Nigeria, Slovenia and Sri Lanka, as we will read in this issue. And there are still the ones to happen – the IFORS conferences in Poznan, Mexico, Cape Town, Quebec and in 4 years, in Seoul*.

These conferences let us pick up hints of the future to come (the likes of the Tutorial article), and issues that are plaguing the developing world (such as the one covered in our Book Review). Of course, all the materials you will be reading in this issue were made possible through the efforts of our community.

Who compose the IFORS community? Do read the thoughtful insights of our President. From my end, thanks have been sealed and delivered to Editors and Correspondents (listed in the Editorial Box) all over the world. Though not in this list, you are most welcome to contribute and let us hear about happenings in your part of the world, in your area of OR work! 🌐



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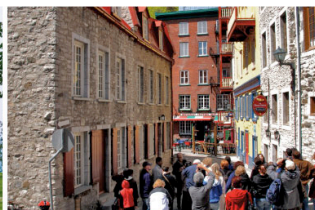
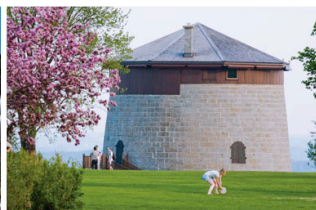
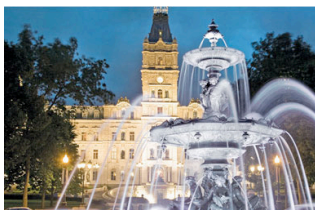
Canadian Operational Research Society
Société Canadienne de Recherche

21st Conference of the International Federation of Operational Research Societies

OR/ANALYTICS FOR A BETTER WORLD

Quebec City Convention Center, Canada

July 17-21, 2017 | URL: <http://ifors2017.ca>



Breaking News: IFORS 2020 will be hosted by the Korean Operations Research and Management Science Society. Read the IFORS President's announcement of the bid result @ <http://ifors.org/web/presidents-welcome/>

The Members of IFORS

Mike Trick <trick@cmu.edu>

I recently received an email from some conference organizers asking for IFORS to co-sponsor their conference. As part of the incentive for us to do so, they offered a reduced registration fee for “all your members”. I spent some time pondering what that might mean for IFORS. The IFORS membership consists of 52 member societies. Did they mean to offer reduced registration to the nearly 30,000 members of our constituent societies? That would certainly put a dent into their regular-fee registrations! Or perhaps they had in mind that our societies might register on their own? “Hi, I am France. Can I get a room for 440 please?” Clearly the concept of “society of societies” is not common, and an aspect that makes IFORS unusual in the operational research world.

I have been thinking of this in the context of “member services”. When I was President of INFORMS (our United States-based society) 15 years ago, a major theme of my presidency was examining why people joined societies and what services a society should provide to encourage membership. The year 2002 was a year in which membership in INFORMS continued to decline, and some worried that this was a harbinger of the death of operations research. In retrospect, nothing could be further from the truth with many societies showing recent increases in membership, not least due to the rise of “analytics”. But spending time thinking about members and their needs was a good thing to do. During that retrospection, we identified services that we lacked and services that were mispriced. By concentrating on the members, INFORMS became, I believe, a society more relevant to its membership.

What does it mean for IFORS to consider member services? While some IFORS services are aimed at the 30,000 members of our membership, I do believe we need to think more about what we offer two distinct groups. The first is the membership itself: how is IFORS helping the national societies and regional groupings be stronger? What services are we offering that make it clear why a society should be a member of IFORS? How

are we helping our four regional groupings of EURO, ALIO, APORS and NORAM? Of course, given the range of societies and their needs, it is clear that different members need different things. IFORS members range in size from those with thousands of members to societies whose membership can be comfortably seated around a restaurant table, and it is unlikely that any service will be relevant to all.

As a step towards understanding the needs of our members better, the IFORS Administrative Committee will be doing a series of breakfasts at major OR conference (EURO, INFORMS, and CLAIO this year). On a personal level, I am eager to meet with the various societies during my travels over the next years. I can't promise to get to all 52 member countries, but I am going to try to visit as many as I possibly can!

The second group that we need to provide services for are those in operational research without a national society. We know that OR is everywhere, so IFORS should play an active role in encouraging the development of OR communities where none currently exist. There are 193 members of the United Nations which means IFORS has at least 141 members to go.

These are great times for operational research. There is increased interest in our field, and those whose skills encompass OR and analytics are increasingly successful. IFORS can play a strong role in a corresponding success for operational research societies, both existing and those to come. 🌍



Views from an Outgoing Immediate Past President

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

The value of an Immediate Past President (IPP) decreases extremely fast with the passing of years: it takes only three years to become a PPP (Posthumous Past President). Nevertheless, before leaving the boat, I would like to take this opportunity to express some views on IFORS, without forgetting that experience is like a toothbrush, not very useful for others since each one prefers his own.

One of the most important tasks of an IPP is to chair the TOP Club (Three Old Presidents) in charge of proposing nominees for the positions of IFORS President and Vice President. I can proudly claim that our hard work with Tom Magnanti and Elise del Rosario yielded a bumper harvest, as Mike Trick and Luciana Buriol accepted to be candidates for IFORS President and IFORS Vice President, respectively. Subsequently elected, they start this year to be in charge of the destiny of the Federation. I am sure that they will rise to the challenge of leading IFORS amid the many challenges and changes facing us.

The new IPP Nelson Maculan has conducted the Federation during the last three years with efficiency while extending

the active presence of IFORS to the world and developing the practice of OR in countries in which its use was not a standard matter. We are grateful to him and to the entire AC for having performed one of the major tasks of our Federation: be actively present in countries where OR has to be promoted.

Changing every third year, the AC has to guarantee some continuity in its actions, which may be a challenge, in particular when setting its priorities. Until now, this seems to have worked out in a satisfactory way and there is no reason why this would not be possible in the near future. I recall with gratitude the essential role of the IFORS secretary and the treasurer in ensuring that all transitions occur with smoothness and a reasonable level of continuity even as changes and improvements of the new team are adopted.



Among the important areas of our Federation I would rank education as first! During my years in the AC, I have repeated at every opportunity that IFORS must help its member societies in spreading the knowledge of OR. Having a presence in more than fifty countries, IFORS is in an excellent position to detect new trends, gather information about emerging fields of applications or simply encourage collaboration among members as they organize and conduct educational programs or hold joint OR meetings.

Our familiarity with the concept of “networks” as an academic topic should encourage us to develop connections and foster collaboration. As graph theorists say, “it is only by creating links that one can be on the edge of knowledge”.

One of the most popular actions of IFORS is the triennial conference which attracts an ever increasing number of OR practitioners and researchers. These gatherings offer a wide array of presentations, which should hopefully cover most of the current efforts in developing or applying OR throughout the world. Facing such a huge diversity of original and technically advanced communications, one may sometimes feel lost and desperate about keeping abreast of new and exciting developments within OR. To meet such difficulties, we introduced some years ago the IFORS Tutorial Lectures (ITL) as a basic instrument of the Federation to promote OR education. Such lectures have already been given by outstanding scholars or researchers able to present in simple, pleasant, motivating and widely understandable terms the essence and the basic ideas of their domain of expertise within OR. Such lectures have focused on both theory and practice.

I strongly believe that these Tutorial Lectures will provide an additional motivation for OR specialists seeking continuing education to attend our conferences. These lectures will also

serve well the young participants looking for inspiration for their work. So the ITLs will definitely be part of the efforts of IFORS to encourage both students/newcomers and experienced OR practitioners to attend our conferences and discover surprising and attractive facets of OR.

In the same spirit, our efforts in OR education for developing countries should continue with the same high priority as before. Some adapted forms of tutorials would certainly be needed in these countries. IFORS may keep contributing to collect and spread such educational modules.

Apart from the Triennial IFORS and Regional Conferences, there is a plethora of more specialized meetings. Many people active in OR regularly attend such congresses and sometimes tend to prefer these to large world-level conferences. One should examine how IFORS could get more involved in such smaller meetings focusing on specific OR topics and how it could support such events and the concerned communities.

Let me finally thank all those with whom I had a chance to collaborate during my IFORS years. It has been an immense pleasure to work for the promotion and development of OR. Not all problems have been solved, but Providence has given us a new AC under the expert guidance of Mike Trick, which will tackle the remaining problems while taking new initiatives to serve OR in the best way.

And we remember that IFORS is a community, which provides us with an ideal opportunity to take advantage of the unity in diversity of our members. Participation of all members is crucial, since joint efforts will be needed to conduct all our actions. In terms of graphs, which is likely to be one of the favourite languages of the new President, this is expressed as, “Even if you are a vertex, you need at least another one to create a nontrivial and efficient network”. 🌐

Obituary

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ROLFE CARTWRIGHT TOMLINSON (1 September 1925 - 10 October 2015)

Rolfe Tomlinson was for many years a leading figure in Operational Research both in the UK and internationally. He was President of the UK OR Society in 1974-75, and President of EURO in 1981-82. The OR Society inducted him as a Companion of Operational Research in 1990 and awarded him the Beale Medal in 2005. He died on 10 October 2015 a few weeks after his 90th birthday. Rolfe influenced OR by his direct contribution and by his stimulation and encouragement of others. He projected high aspirations which he sought to attain by persuasion and co-operative working. He had the

happy knack of inspiring people, drawing the best out of them and stimulating their development. Many of those who worked with and under him went on to occupy significant positions in the worlds of academe and practice.

Rolfe graduated from Cambridge with a first-class degree in mathematics before his twentieth birthday just as the Second World War was drawing to its close. He went on to obtain a Diploma of Imperial College in Aeronautics and his first job was as an aeronautical engineer at the National Physical Laboratory. In 1950 he started work at the UK National Coal Board as a statistician, before moving into the OR Group in 1960 as its Deputy Head before becoming, in 1965, its Head. He left in 1977 to be head of the Management and Technology Area at the International Institute for Applied Systems Analysis in Laxenburg, near Vienna. In 1980, he was appointed the first Professor of Operational Research and Systems at the University of Warwick, from where he retired in 1990.

He was an influential leader and made a huge contribution to OR throughout his lifetime. In the course of his career he published extensively and, in particular, wrote and spoke authoritatively about the process and management of OR. He also edited important texts including an influential series published under the auspices of the OR Society.

(With thanks to Robert Dyson and George Mitchell, who have written an obituary for the *UK's Inside OR and the European Journal of Operational Research*)

MAURICE FRANCIS SHUTLER

(30 December 1931 - 27 December 2015)

Maurice Shutler was treasurer of the UK OR Society from 1983-91 and President of EURO in 1993-94. The UK OR Society inducted him as a Companion of Operational Research in 1996 and EURO awarded him their Distinguished Service Medal in 2010. He died on 27th December 2015, three days before his 84th birthday. Maurice earned a classics degree (called "Greats") from Balliol College, Oxford a few years after the Second World War drew to its close.

Starting work in the steel industry, he was seconded as Manager to the National Board for Prices and Incomes to help investigate the efficiency of nationalised Industries, and then recruited as a Special Adviser in the Civil Service Department with responsibility for setting up new OR groups in government. He then became OR Manager and Chief Industrial Adviser for the Price Commission and when that body's powers were transferred to the Monopolies and Mergers Commission in 1979 he moved there and remained in the same post until he retired in May 1996. In 1982 he became a visiting Professor at the London School of Economics, an appointment he held until 2006.

It is the significant contribution that he made to the OR Society and EURO for which he is best known, and for which he is held in great esteem by colleagues all over Europe. For the OR Society he occupied many roles, ultimately serving as Treasurer. His principal achievement was the negotiation in 1988 (with the Society's General Manager, Ray Showell) of a contract with Macmillan Press for the publication of the

Journal of the Operational Research Society. This brought a tenfold increase in the Society's revenue from that source.

During his term as EURO President he established a Permanent Secretariat and introduced two new instruments aimed at promoting collaboration between OR societies in Western Europe and those in Central and Eastern Europe. Drawing on his experience of the potential financial benefits of publications, he played a leading role in discussions that resulted in EURO receiving financial benefit from Elsevier for EJOR. Following the collapse of the Berlin Wall and the disintegration of the Soviet Union, several OR Societies in post-communist countries wished to be in the EURO community. EURO experienced a considerable expansion: new national OR societies were welcomed and Maurice was one of those who delivered the necessary obstetric aid.

It can be seen that Maurice contributed greatly to EURO, the UK OR Society and the profession of OR.

(Longer obituaries will be published in the *UK's Inside OR* and the *European Journal of Operational Research*)



CONFERENCES



MOGP2015 Attains Multiple Objectives

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With co-sponsorship of the Association of European Operational Research Societies (EURO) and the Tunisian Decision Aid Society, the Faculty of Economics, Business and Management at University of Tlemcen, Algeria organized the International Conference on Multiple Objective Programming and Goal Programming (MOPGP'15) from 13 to 15 December 2015. The MOPGP'15 is eleventh of the series and provides an international forum for presentations and discussion of research in all areas of Multi-objective decision analysis and Multi-Criteria Decision Aid.

Chaired by Amal Kazi Tani Hassaine, the conference was held at the University of Tlemcen and received 110 manuscripts. After screening by national and international reviewers, the papers were pruned down to 54. They included both theoretical and application works from very diverse areas of Multiple Objective Programming and Goal Programming coming from all over the world, i.e., Algeria, Bahrain, Colombia, Kuwait, Morocco, Poland, South Africa, Tunisia and Turkey and.

A Doctoral Workshop to increase interest among the students in the area and to assist graduate students in developing and improving their research projects was held on the first day. Workshop leaders Fouad Ben Abdelaziz (NEOMA Business



▲ Participants gather for a group photo during the Closing Ceremonies

School, France) and Mehrdad Tamiz (Kuwait University, Kuwait) presented key concepts related to multi-objective programming as well as Goal Programming and its main variants. This was followed by an interactive session chaired by Hatem Masri (University of Bahrain, Bahrain) to address concerns and questions raised by the students.

Recent progress made in the field of multi-objective combinatorial optimization was presented on the second day by Matthias Ehrgott (University of Lancaster, UK), while the third day featured a talk by Jacques Teghem (University of Mons, Belgium) dealt with real life multi-objective scheduling problems through several problems.

Presentations covered the areas of MOP/GP Theory and Application, Meta-heuristics, Finance and Accounting, Economics and Game theory, Health Care, >>

>> Telecommunication, Supply Chain Management, Uncertainty, Fuzziness, and Invited Session on Islamic Finance.

On the administrative side, MOPGP 2015 hosted a kickoff meeting of the African Operations Research Society (AFORS), a non profit association domiciled in Tunisia and regulated by a Council consisting of representatives/alternates of all its members as well as an Executive Committee, which constitutes the board of directors. Its aim is to promote Operational Research throughout Africa.

A sightseeing tour was organized on the third day and included Tlemcen City Museum, Mansourah Minaret, and the El-Mechouar Palace. The Citadel of "El-Mechouar in the Old Town of Tlemcen is an 8th century witness of the Arab-Islamic civilization. Near this citadel is one of the most important museums of Tlemcen. The ruins of "Mansourah" built by the Marinid Prince "Abou-Yacoub" in 1299 include a 40 meter mosque minaret and ramparts - all that were left of the city

walls. From the Plateau of "Lalla Setti" Mausoleum offered a view of the city of Tlemcen.

MOPGP'15 would not have been possible without the generous support of its sponsors. The untiring efforts of the Organizing and Scientific Committees along with those of the University of Tlemcen staff, faculty and students made it an excellent conference and a real research experience for all participants. The next conference site is France for 2017.

MOPGP history goes all the way back to 1994 when the first conference took place at the University of Portsmouth, UK. Since then, the conference had been held every other year: Torremolinos, Spain (1996); University of Laval, Quebec City, Canada, (1998); Beskid Mountains, south of Poland (2000); Nara, Japan (2002); University of Tunis, Hammamet, Tunisia (2004); Loire Valley, City of Tours, France (2006); University of Portsmouth, UK (2008); University of Sfax, Tunisia (2010); and Niagara Falls, Canada (2012). 🌐



POP conference on Optimization and Control Held in South Central China

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The International Conference on Optimization and Control with Applications (OCA) 2015 was held at the International Academic Exchange Center of Changsha University of Science & Technology (CUST) from December 11 to 14, 2015. Jointly organized by Changsha University of Science & Technology (China) and Curtin University (Australia), it was opened by Conference Chair and CUST President *Mingyong Lai*. This was followed by the plenary speeches, which included: Franco Giannessi (University of Pisa, Italy) *A Fixed Point Approach to Vector Optimization Problems and Related Fields*; Ian Peterson (University of New South Wales at the Australian Defence Force Academy, Australia) *Coherent Optimal Control for Quantum Linear Systems*; Panos Pardalos (University of Florida, USA) *Computational Models and Challenging Optimization Problems*; Shinji Mizuno (Tokyo Institute of Technology, Japan) *Strong Polynomiality of the Simplex Method*; Shige Peng (Shandong University, China) *BSDS, Nonlinear Expectations and their Application to Stochastic Controls*; and Sree Hari Rao (Jawaharlal Nehru Technological University, Hyderabad, India) *Time Dependent Stimulations in Simple Dynamical Systems*.

The 300 participants from all over the world engaged in presentations and discussions of high scientific quality. New emerging research trends were introduced, cross-relations between academic interests made, application opportunities explored, and future collaborations established. A sincere invitation to the **EURO 2016** conference in Poznan, Poland was conveyed to the OCA 2015 conference community. The conference Closing Ceremony on December 14 left everyone convinced of the academic and networking success achieved. Participants had the chance to experience Changsha, the capital of Hunan Province in central south of China made famous by its culture and its delicious and spicy dishes known as one of the eight classical cuisines of China. OCA brings the next conference to Malacca, Malaysia.



▲ Participants pose for the traditional group photo.

The success of the conference owes much to the care and hard work of the co-organizers *Mingyong Lai*, *Yingqiu Li*, *Ryan Loxton* and *Jiao Li*, along with the coordination among the committees which included International Organizing, Local Organizing, Advisory and the International Program Committee.

Participants are invited to submit their full papers to be considered for possible publication in one of the following journal's special issues: *Optimization Letters*, *Pacific Journal of Optimization*, *Numerical Algebra*, *Control and Optimization*, *Journal of Industrial and Management Optimization*, *Differential Equations and Dynamical Systems* and *Cogent Mathematics*. All submissions will be subject to rigorous peer-reviewed process.



▲ (L to R) OCA 2015 Chairs and POP leaders Kok Lay Teo and Jie Sun in one of the organizational meetings.

Past OCAs were held in Erice, Italy (2001), Tunxi, China (2002), Jiuzhaigou, China (2004), Harbin, China (2009), and Beijing, China (2012). OCA 2015 is one of the official conference series of Pacific Optimization Research Activity Group (POP) (<http://bschool.nus.edu/DecisionSciences/pop/>), an Internet-based group of researchers who aim to promote optimization research activities in the Pacific Region. Founded

in October 2000, during the First Sino-Japanese Optimization Meeting in Hong Kong by *Masao Fukushima*, *Masakazu Kojima*, *Liqun Qi*, *Jie Sun*, *Kok Lay Teo*, and *Alex Rubinov*, the group has about 560 members from more than 40 countries and regions in Asia, Europe, North America, Oceania, and South America. POP looks for fruitful scientific relations within the international family in Science, Engineering, Economics and Operational Research. 🌐



OR Conference in Iran: A First in Many Ways

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Organized by Kharazmi University, the 12th International Conference on Industrial Engineering (ICIE 2016) was held in Tehran on January 25-26, 2016. Of the 1,031 submitted papers, 735 were accepted and presented orally, digitally or online. For the first time, IEEE indexed all accepted papers of ICIE 2016.

The conference was held at the National Library of Iran, one of the largest library campuses in the Middle East, appropriate for the big number of participants which numbered 700 coming from 45 countries including Germany, France, Italy, Japan, Sweden, UK, USA, Brazil, China, India, Hungary, Czech, Portugal, Mexico, Algeria, Tunisia, Turkey, Nigeria, and Netherlands. The papers covered optimization (models and algorithms), decision making under uncertainty, production and inventory management, quality engineering/management and productivity, OR in logistics and supply chain, financial engineering/management and economic analysis, firm management systems, healthcare systems engineering, maintenance and reliability, project control and management, application of information technology in decision making and firm management, design of service, manufacturing and automation systems, safety engineering and ergonomics and industry-specific case studies (e.g., on oil and gas, energy, automobiles).

Keynote talks were given by Gerhard-Wilhelm ("Willi") Weber (METU, Ankara, Turkey) *Optimal Control Of Stochastic Systems with Regime Switches, Economics, Finance And Nature*; Josef Jablonsky (University of Economics, Prague, Czech Republic) *Efficiency Analysis and Ranking of DMU's in Multi-Period Production Systems: Theory and Applications*; Mitsuo Gen, (Tokyo University of Science, Japan) *Hybrid Evolutionary Algorithms for Manufacturing Scheduling*; Stefan Minner (Technical University of Munich, Germany) *Strategic Supply Chain Design under Uncertainty with Application to the Automotive Industry*; and Suporn Koottatep (Asian Productivity Organization, Japan) *Application of Green Productivity Program in Asian Countries: Concepts, Methodology, Steps and Tools*.

Twelve prestigious journals, including the Journal of Manufacturing systems (Elsevier), Management Research Review (Emerald), and International Journal of Supply and Operations Management (EBSCO) supported the conference by publishing selected papers. The International Scientific Committee (composition shown in Fig.1) of eminent professors of Industrial Engineering from more than 18 countries such as Germany, France, Japan, UK, USA, China had much to do with the sixty-fold increase (vs the average in the past 11 conferences) in the number of papers received from



▲ The speakers, shown alongside the flags of ICIE 2016 participants outside of Iran.

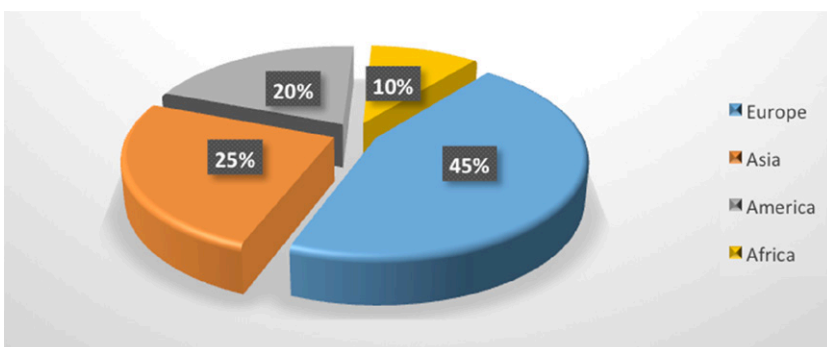
In order to attract and encourage young Industrial Engineering researchers, an international PhD Thesis Award competition was organized and participated in by competitors from Denmark, France, Italy, USA, Poland, Hungary, Iraq, India, Kazakhstan and Iran. The jury of prominent professors from Iran, Germany, Japan, Czech, and Portugal selected six theses from which two, from the University of Pécs, Hungary, and



▲ Young delegates taking selfies.

from Sharif University of Technology, Iran, won the award.

The careful preparation of the Scientific Committee manager Kharazmi University Associate Professor A. "Nima" Mirzazadeh, along with efforts of the Executive Committee manager Nasim Tehrani, assisted by the enthusiastic young people, greatly contributed to the academic and networking success of the conference. The featured Iranian traditional music and the Gala dinner provided an excellent opportunity for interactions. Based on feedback from participants and historical data, the ICIE2016 has in many ways exceeded the achievements of the previous conferences.



▲ Fig. 1. Geographical distribution of foreign members of the ICIE 2016 Scientific Committee

Various channels of Iranian TV and a local channel from Shiraz covered the affair. Media coverage helped promote the event and the discipline. Invited speakers had the chance to visit Shiraz University as well as the Shiraz city of as the city of exceptional history and beauty.

During the associated One-Day Workshop at Shiraz University, G. Weber took the opportunity to introduce EURO and IFORS and their forthcoming events, especially, EURO 2016 in Poznan, Poland. 🌐



Scaling the Challenges of Sustainable Development

Sunity Shrestha Hada <sunity.shresthahada7@gmail.com>

Operations Research and Sustainable Development was the key theme of the 6th international conference held in Kathmandu Nepal from February 1 to 2, 2016. The Operations Research Society of Nepal (ORSN) organized this as part of celebrations of its 9th anniversary.

Keynoting the conference was Kirit Shantilal Parikh who talked on *Modelling for Sustainable Development*. The chief guest for the inauguration ceremony was Yubaraj Khatiwada, Vice Chairman of the National Planning Commission of Nepal. Around 120 delegates came from India, Canada, Brazil, Australia, China, the Philippines, and of course, Nepal. Presentations consisted of 4 invited and 28 technical papers, with presentations from PhD and Master level students.

The conference followed the January 4 lecture also organized by ORSN on *Land Use Planning in Nepal* delivered by Saroj Gyawali. 🌍



▲ (l-r) Y. Khatiwada, Nepal National Planning Commission, G. Bhakta Joshi, National Planning Commission for Education, T. Keshar Nanda Baidhya, University of Brazil, and K. Nakarmi, ORSN, listen to the keynote of Kirit Shantilal Parikh.



INFORN Holds 7th Conference; Celebrates IFORS Membership

Alabi, Samuel Oluwatoyin <samttoyinalabi@gmail.com>

The 7th conference of the Institute For Operations Research Of Nigeria (INFORN) was held from the 3rd - 5th of November 2015 at Babcock University in the Ogun State of Nigeria. President/Chairman of the Council of INFORN, Obasohan, Phillips Edomwonyi welcomed the ninety-five delegates from four out of six geo-political zones of Nigeria.

In his talk, he recalled the origin of Operational Research (OR) then went on to discuss the evolving face of OR from structured systems using mathematical tools (models) to unstructured or 'messy' situations, the latter coming under the names 'Community OR, Soft OR, Rudimentary OR and Public Sector OR'.

He identified as an immediate step towards recognition of OR as an important tool for government and business the necessity of getting universities, colleges and research institutes to proliferate courses and curricula in institutions with OR. He further shared IFORS VP Sue Merchant's thoughts that "institutions especially those already offering OR as a discipline can forge relationships with business communities by offering cheap or free summer projects by their postgraduate students which often lead to longer term collaboration".

He informed the delegates that INFORN would be seeking affiliation and collaboration with one of the nation's Universities to run a program in OR, and also sponsor a bill at the National Assembly to seek charter status that would grant regulatory mandate to the Institute over the practice of OR by professionals in Nigeria.

The lead paper was delivered by Solomon A. Adebola (Dean, Babcock University Business School) who tackled the conference theme of *Operations Research and National Development: Issues and Challenges*.

He said development goals must be defined in terms of progressive reduction and eventual elimination of malnutrition, disease, illiteracy, squalor, unemployment, and inequalities and that it is therefore inadequate to use narrow economic models of development. While addressing challenges, Adebola quoted the view of Ackoff (1977) that "obstacles to national development are not 'economic' or



▲ INFORN President with conference lead presenter Solomon A. Adebola and delegates.

"technological" but justice or lack of it. The cultural constraints are seen as manifesting in corruption, paternalism, patronage, conformity and waste". He outlined his views of how OR can aid national development, as follows: Begin with insightful models; Encourage the culture of factual, system probing, and systematic, system-oriented, and formal analysis as the basis for decision making; Encourage data collection and processing, which will build up to a stage when more sophisticated operations research can be used; Apply strategic OR techniques to facilitate corporate decision making.

On the first day, five members were elected as Fellows. On the second day, twenty papers were presented, which include among others, *Knowledge, Attitude and Practice of Immunization Processes on its Coverage in Rural Communities of Bida Emirate Area of Niger State; An Empirical Analysis of the Impact of Supply-Chain Breakdown on the Performance of Some Selected Manufacturing Enterprises in Katsina State; and Weber Location Model for the Optimization of Health Care Facilities*.

The third day was spent touring the expansive campus of Babcock University. Delegates visited the teaching hospital, water processing plant, hydroelectric generating plant, bakery, shopping mall, halls of residence for students, staff quarters, block making industry and stadium. The Annual General Membership meeting then followed, where a discussion on various developments, in particular, the recently secured membership in IFORS and the need to meet the expectations of the world body of the profession.

The Meeting concluded and directed the Registrar, Abdulfatai Oyeyemi Lawal (who is the appointed representative to IFORS) to initiate the process of forming a Regional Association of Operational Research in Africa. The meeting also appointed a committee to pursue sponsorship of the Institute's charter bill in the National Assembly and report back to the Council by the 1st quarter of 2016.

It was also agreed that the next Annual National Professional Conference would be held in Niger State from November 8th-11th 2016. A banquet provided an opportunity for further interaction as well as celebration of the just-concluded successful event. 🌍



OR Blooms in Bled

Lidija Zadnik Stirn <lidija.zadnik@bf.uni-lj.si>, **Samo Drobne** <samo.drobne@fgg.uni-lj.si>

The 13th International Symposium on Operations Research in Slovenia (SOR2015) was a joint effort of several organizations, namely: the Slovenian Society INFORMATIKA, Section of Operations Research (SDI-SOR), University of Maribor- Faculty of Organizational Sciences (FOV) and Faculty of Information Studies (FIS) - and the Mediterranean Institute for Advanced Studies (MEDIFAS). The symposium was held from 23 to 25 of September 2015 in Bled, a popular destination that attracts visitors from all over the world, known for its glacial lake with an island and an iconic castle perched on a rock overlooking the lake.



▲ Participants gather for a photo after a session.

A day before the SOR2015, a scientific meeting on two topics, big data and multi-criteria decision making (qualitative and quantitative), was held at FOV, Kranj with W. Weber, Mirjana Kljajic Borstnar and Lidija Zadnik Stirn speaking to research staff and students of FOV, members of SOR15 Program and Organizing Committees and members of Slovenian Section of Operations Research.

The SOR2015 opening address was delivered by President of the Slovenian Section of Operations Research *Lidija Zadnik Stirn*; General Director of Science Directorate at Ministry of Education, Science and Sport *Urban Krajcar*; Director of Slovenian Research Agency *József Györkös*; President of Slovenian Society INFORMATIKA *Niko Schlamberger*; Dean of FOV *Marko Ferjan*; EURO Manager *Sarah Fores*; and President of Croatian OR Society (CRORS) *Marjana Zekic-Susac*.

Keynote speakers were: *Aharon Ben-Tal* (William Davidson Faculty of Industrial Engineering and Management, Technion - Israel Institute of Technology, Haifa, Israel); *Sergio Cabello* (University of Ljubljana, Faculty of Mathematics and Physics, Ljubljana, Slovenia); *Stefano Cozzini* (Centro Democritos, Istituto Officina dei Materiali CNR-IOM, Trieste, Italy); *Nebojša Gvozdenović* (University of Novi Sad, Faculty of Economics, Subotica, Serbia); *Gerhard Wilhelm Weber* (Middle East Technical University, Institute of Applied Mathematics, Ankara, Turkey); and *Ou Tang* (Linköping University, Department of Management and Engineering, Linköping, Sweden).

The 93 presentations were distributed among special sessions in the following areas: Qualitative Multi-criteria Decision Making (6), Inventory Research (7), Meta-heuristics (7), and Big Data (4), Mathematical Programming, (7), Graphs and their Applications (5), Multiple Criteria Decision Making (5), Econometric Models and Statistics (10), Production (7), Finance and Investments (7), Location and Transport (7), Environment and Human Resources (9), OR Perspectives (6).

During the closing session, L. Zadnik Stirn invited the authors to submit extended versions of the SOR2015 papers for publishing in special issue of the journals CEJOR, Business Systems Research, and Organizacija (<http://sor15.fov.uni-mb.si/sor-publications/>). On behalf of EURO and IFORS S. Fores and W. Weber announced two highlights of international OR, i.e. EURO 2016 (<http://www.euro2016.poznan.pl>) and IFORS 2017 (<http://IFORS2017.ca>), while M. Zekic-Susac invited to KOI 2016 (<http://hdoi.hr/koi2016/>).

Published Proceedings of SOR2015 (<http://sor15.fov.uni-mb.si/sor-publications/>) includes the 93 papers written by 191 authors from Slovenia, Croatia, Slovak Republic, Czech Republic, Turkey, Italy, Greece, Israel, Poland, Spain, Sweden, Bulgaria, France, Hong Kong, Iran, Russian Federation, Hungary, Ireland, Serbia and The Netherlands.

The high quality scientific and professional sessions were complemented by the social events, which included an excursion to medieval town Radovljica and to visitors' center of Triglav National Park.

Participants were also given the opportunity to visit Avsenik museum and to enjoy a traditional Slovenian dinner with music at the Avsenik restaurant. The three-day event certainly put a highlight on OR against the backdrop of beautiful Bled.



▲ SOR2015 participants in Triglav National park visitors' center, welcomed with "kremšnita" (pastry)

SOR2015 gratefully acknowledges the financial support extended by the Association of European Operational Research Societies (EURO), the regional grouping to which SDI-SOR belongs.

SOR2015 is part of the traditional series of biannual international

OR conferences first organized in Slovenia by SDI-SOR in 1993. The conferences aim to advance OR knowledge, interest and education in Slovenia, Europe and the world in order to strengthen the intellectual and social capital that are essential in maintaining the identity of OR. 🌍

Making a Big Conference Great



IFORS News December 2015 issue covered the 2015 INFORMS Annual Meeting held November 1-4 at the Philadelphia Convention Center. Over 5,000 operations research professionals from academia, industry, and government enjoyed a wide range of the plenary and keynote presentations, panel discussions, tutorials, oral and poster presentations. By all accounts, it was a great conference. How does one go about managing such a big conference and make it a great experience for all the participants? Here are behind-the-scenes perspectives from the General Chair, Tamás Terlaky (TT) as interviewed by IFORS Correspondent, Jim Cochran (JC)

JC: Tamás, thank you for taking time for this interview and congratulations on a successful INFORMS Conference. What was your original reaction when you were approached about serving as General Chair of the 2015 INFORMS Conference? Did you experience any trepidation?

TT: My first thought was that it was nice and an honor that the INFORMS Meeting Committee, my friends and colleagues thought of me for this important job. My second thought was that the INFORMS Annual Conferences has grown to about 5000 participants and over 70 parallel sessions, so making a great conference would require a lot of time and work. I questioned for a short while if, as ISE Department Chair, I would have the proper time to commit. Because I have organized many conferences and workshops, it was clear to me that there are two critical components to successfully organize such a major meeting – first, a reliable and experienced staff and second, an effective and enthusiastic Organizing Committee or OC.

I worked with INFORMS for many years, so I had no doubt that I could always rely on the superb, highly professional INFORMS meetings group. That first component was a given. My most critical task was the second component of building a great OC who I could delegate major tasks to and whose members were highly capable and willing to invest substantial time and energy to the success of the conference. Without the exceptional work of these two groups, the INFORMS 2015 conference could not have happened.

Having both of these in place gave me peace of mind, so I was confident that the 2015 INFORMS Conference would be a memorable event. I am taking this opportunity here to thank the INFORMS conference staff for their excellent and highly professional work. Without them, the 2015 Philadelphia meeting would have been impossible. I also thank the dedicated OC – and in particular, the Program Co-Chairs Larry Snyder and Jeff Linderoth – for the impressive program they helped to organize. My thanks go also to the student volunteers, led by my department's Communication Specialist Abby Barlok, who worked closely with the INFORMS personnel to ensure the smooth flow of the participants to the presentations and events.

JC: Chairing a large meeting such as the annual INFORMS Conference is a major commitment. What motivated you to take on this responsibility?

TT: Indeed, to chair any of the INFORMS Annual meetings is a major commitment, so first I had to verify if it would be possible at all. After completing my feasibility study after a few phone calls with previous General Chairs, I did not hesitate long to tackle this journey. It was nice to hear that

all of the past General Chairs had good memories of their conference, all emphasized that INFORMS provided incredible support, and all encouraged me to say yes.

I was also considering the role of INFORMS in my life. Personally and professionally I got a lot from INFORMS in the past quarter century. I met the founders of OR at INFORMS conferences and I made many friends through INFORMS. During my career, I got a lot of help and support and I had the chance to support others, and serve in INFORMS sections, societies, and various committees. So, on one hand I thought that this was my turn to make a major contribution to INFORMS. On the other hand, I like new challenges, new adventures, and this was a major organizational responsibility I did not have before.

Thus, it did not take much time to accept this responsibility enthusiastically.

JC: What were the most difficult issues you and your organizing committee had to work through in organizing this conference? What surprised you the most as you and your committee went through this process?

TT: As mentioned earlier, my first and most important task was to assemble a strong, active OC. I worked hard to get that together as quickly as possible. From that time on, nothing struck me as difficult. The OC delivered an excellent program. They worked hard and innovatively to resolve all issues. It was a great experience for all. Many of us were already good friends, and the joint effort bonded all of us further.

Working with the INFORMS meeting group, led by Laura Payne, and the INFORMS Meeting Committee went as expected. They were always there to help, to support the OC, and to remind what the next steps were.

The biggest surprise came, in the Spring of 2015, from the INFORMS Board. The issue was to set a limitation of one oral presentation for each registered participant. INFORMS' tradition at the Annual Meetings is that everyone was allowed to present his/her work at the Annual Meeting, and many of the participants give several talks. At the 2015 Philly Conference, the number of presentations exceeded 5000, the number of parallel sessions was about 80, and everyone in the community acknowledged that we needed some reasonable rules to limit the number of talks, or at least tie it closely to the growth of the number of attendees. Almost all major societies, such as SIAM and the Mathematical Optimization Society imposed the rule that every participant can give, at the most, one oral presentation. Far ahead of time the PC, through the INFORMS Meeting Committee, asked the Board if we could enforce the one talk per participant rule. First the policy was approved and all session and stream organizers were informed accordingly. Much later in the process, when half of the abstracts were already submitted, the PC was told that the Board's new decision was that the previously approved policy couldn't be implemented. Then, the PC moved on to focus on getting a great program of the 2015 Philly meeting.

While it is great to see that INFORMS is growing, the INFORMS conferences are growing and growth of the conferences has to be managed. Thus, the conversation about the number of oral presentations, possibly through elevating the prestige of poster sessions, will go on in the coming years.

JC: What pleased you most about the conference?

TT: I am obviously biased, but my opinion is that the 2015 Philadelphia was a highly successful one. We had one of the largest INFORMS Annual meeting ever in a great facility. We had a great collection of presentations addressing all aspects of analytics, operations research and the management sciences. We also had a healthy mix of plenary, keynote, and tutorial speakers, an intriguing collection of panel discussions, and a rich selection of topical talks were offered. The Philadelphia Convention Center and the connected Marriott hotel provided excellent facilities to meet, mingle, and network. It was a great rewerfully well run conference. *You know in academia we like to complain, we say everything is great, but This time I hardly heard any "but ...", so seems to me that this time everyone really enjoys without second thoughts.*

JC: What advice would you give a colleague who has been approached about chairing a major conference?

TT: Conferences are critical for the community, both in the process of progressing and promoting science, and because they provide unparalleled networking opportunities, including recruiting opportunities and job fairs. To be the General Chair of a major conference is a huge commitment both in time and energy, but it is a highly rewarding experience.

This is my advice for those friends who are approached and who consider chairing a major conference. First, you should have chaired a few smaller conferences before considering a major one. Experience matters.

Second, do your homework before accepting. Understand the time commitment you are going to make, and know what are the most demanding time periods. Make early arrangements that you have the time when most needed.

Third, assemble a great OC. If possible, invite co-chairs for each key position. Delegate and empower the committee, but inject regular checkpoints. In the last twelve months, we had monthly phone conferences, including ones with INFORMS Director of Meetings Laura Payne to make sure everything would go as planned.

Finally, rely on a professional support staff – like the exceptional staff INFORMS has.

If all these align - the conference is going to be a success, and the general chair's workload will remain reasonable. 🌍



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



28th European Conference on Operational Research Poznań, Poland / July 3-6, 2016

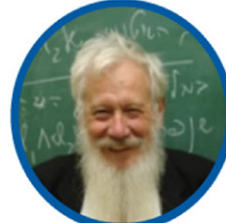
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ICORD 2015 Strengthens OR in Sri Lanka

R. A. Ranga Prabodanie <ranga@wyb.ac.lk> **John NLC FERNANDO** <fernando.jnlc@gmail.com>



▲ Participants arrive early on the first day.

The International Conference on OR for Development (ICORD-2015), with the theme “OR for Development”, was held in Usvatakeiyawa, Sri Lanka on 3rd and 4th December 2015. This was the 9th ICORD, and the first OR conference held in the island laying the foundation for the Operations Research Society of Sri Lanka. The beautiful coastal hotel, *Palm Village*, provided the ideal surrounding for collaboration among OR professionals, practitioners, and students representing eleven countries.

During the two day conference, ten research papers were presented and plenary speeches were given by three invited scholars, Kirit Shantilal Parikh from Integrated Research and Action for Development (IRADe), New Delhi, India; Nina Kajiji from the University of Rhode Island, USA; and Ali Emrouznejad from Aston University, UK.

The conference commenced with an inspirational talk by TSG Peris, the local organizing committee chair, by Elise Del Rosario who talked about IFORS and AKW Jayawardane from University of Moratuwa, on the significance of OR as a discipline. John NLC Fernando, the founding president of ORSSL, thanked IFORS for selecting Sri Lanka as the venue of the ICORD2015. This fast-tracked the formation of the ORSSL the objective of which is to promote the use of OR in Sri Lanka by providing a forum for practitioners, academics, students, institutions and those interested to interact and to propagate the use of OR for decision making. ICORD Chair Arabinda Tripathy from India was unfortunately caught in a flood in Chennai and was not able to secure a flight to SL. It must be mentioned that Krishnamurthy Ramanathan played a great role in getting the local and international organizers together.

The first invited speaker Kirit Shantilal Parikh gave a very informative resenation on the use of models in policy analysis. He discussed two different types of policy models: an econometric vector auto-regressive model to examine the impacts of raising diesel price in India and a programming model to explore the consequences of low carbon growth strategies. The second invited speaker Nina Kajiji shared her knowledge and experience in various models that are recognizably in use to promote *Good Governance*. These examples included the areas of primary and secondary education, socially responsible investing, the development of smart cities, and the importance of sovereign investing. In the first technical session, papers were given on nutrient trading, supply chain risk management, poverty alleviation, water distribution network design, and application of Six Sigma methodology.

On the second day, the invited speaker, Ali Emrouznejad discussed the use of Data Envelopment Analysis (DEA) for measuring efficiency and productivity of large organizations using some examples from developing countries and presented a standard process for performance measurement in large and complicated organizations. His tutorial session on the basics of DEA and the use of Performance Improvement Management Software (PIM-DEA) was found useful by everyone present. In the second technical session, few more scholarly papers on efficiency of Telco markets and ease-of-doing-business indicators, DEA for mission efficiency of microfinance institutions and analysis of performance across various sections of a university.

The conference was memorable for the wide range of knowledge shared on the application of OR for social well-being. The use of participant reactors provided an avenue for deeper insight on the papers presented. In addition, the presence of DEA expert Emrouznejad provided a lot of useful inputs to the authors who presented papers on DEA. Four students' registration was sponsored by Wiley, through the efforts of Jim Cochran. They truly appreciated the learning and experience from the ICORD.

Social activities included a half-day city tour of Colombo covering Dutch Hospital Shopping Precinct Galle Face Promenade, Colombo Harbour, Old Colombo, Slave Island Area, Gangarama Seema Malakaya, War Memorial, Public Library, National Museum, Nelum Pokuna Theatre, Vihara Maha Devi Park, Colombo Town Hall, Race Course Shopping Area, Arcade Independence Square, BIMCH and the Replica of Aukana Buddha Statue. The last night sumptuous buffet dinner was served at the rooftop of the nearby The ClubHouse, operated by the SL Navy. Here, people had the chance to say their goodbyes and thank yous as they prepared to do their own tours of Sri Lanka on their way back to their countries, which include: Czech Republic, Philippines, Indonesia, Nepal, India, US, UK, Bangladesh, China and South Korea.

The conference was jointly organized by IFORS, EWG – ORD and the Department of Mathematics, University of Moratuwa. The local participants were excited about newly formed ORSSL which aims to promote OR/MS in Sri Lanka. The organizers, participants, presenters, reactors, and the hotel staff played their role in making this event a very successful one. The Sri Lankan hospitality, cultural heritage, and particularly the pleasantness of young OR students from Sri Lanka made everyone feel comfortable and relaxed amidst a scientific knowledge sharing experience. 🌍



▲ Some participants enjoying the pre-conference city tour of Colombo.

Registration Still Open for ICORD 2016 Participants

International Conference on OR for Development, ICORD 2016

Constructing pathways to advanced societies through OR



Chair of ICORD 2016 Adrian Ramirez Nafarrate announced that while the deadline of paper submissions has passed, participant registration is still open. Twenty eight papers submitted to the conference coming from Mexico, Colombia, Peru, Cuba, Chile, Argentina, Brazil, Puerto Rico, Turkey and the United Kingdom discuss a wide variety of topics relevant to development (e.g., healthcare delivery, humanitarian logistics, transportation).

ICORD 2016 will take place at the facilities of Instituto Tecnológico Autonomo de Mexico (ITAM), in Mexico City on June 9 & 10, 2016. This is the 11th to be sponsored by the IFORS Developing Countries Committee (<http://ifors.org/web/icord-history/>) headed by Sue Merchant. Other sponsors are the EURO Working Group on OR for Development and the Mexican Society of Operations Research (SMIO).

Three guest speakers recognized for their contributions to OR for development will be featured, as follows: **Rafael Epstein**, Universidad de Chile, winner of the 1998 Franz Edelman Award and the 2002 IFORS Prize for OR in Development; **Andres Medaglia** Universidad de los Andes, Colombia, recipient

of the 2015 EURO Award for the Best EJOR (Review) Paper and the First Prize in the 2011 INFORMS Railway Application Section Problem Solving Competition; and **Gilberto Calvillo** Instituto de Matematicas, Mexico, former President of the National Institute of Statistics, Geography and Informatics of Mexico and Chair of the Statistical Commission of the United Nations.

The remarkably high quality of submitted papers and guest speakers will make this conference a unique opportunity to discuss issues faced by developing countries and how OR can contribute to their solutions. Registration is accepted at <http://ifors.org/icord2016>. 🌐



ICORD 2016 Chair Adrian Ramirez Nafarrate ▲

EURO Working Group on OR for Development Announces Workshop Speakers



Prof. Cathal Brugha ▲

In its second Call for Papers, the EWG ORD (co-sponsored by IFORS) announced the partial list of speakers who will be featured in the upcoming Workshop in Poznan from June 30 to July 1, just before the EURO Poznan Conference.

Speaking at the Workshop is Professor Cathal MacSwiney Brugha, Emeritus and Adjunct Professor at the University College Dublin Centre for Business Analytics. The speaker will help participants tackle the question of: *What should be done to help O.R. and O.R. researchers / practitioners / consultants become more effective in addressing development problems in education, health, basic public services, infrastructure, sustainability, climate change, etc?*

Dr. Ashley L. Carreras of De Montfort University, a Principal Lecturer in Economics and Decision Analysis joins as Lecturer and Workshop leader. He will give a lecture that will help OR analysts gain a better appreciation of the potential of Problem Structuring Methods (PSM) to support their work, and how to 'sell' PSMs to their clients. He will then conduct a Workshop on Causal Mapping.

The list of invited speakers can be found at <http://ifors.org/ewg-ord/speakers/>, which is expected to grow as

confirmation from other invited speakers are received.

The Organizing committee is arranging the Conference Schedule and is encouraging those who wish to submit papers not to wait till the March 16 deadline, as slots are limited. Details about fees, accommodation, and paper submissions can be found in its website at <http://ifors.org/ewg-ord/>.

The format of the Workshops, which calls for a small number of participants, encourages interaction and deep discussion of papers accepted for presentation. Participants are assigned to react to at least one paper of their choice (if possible). However, one does not need to submit a paper in order to participate. Workshops offered in the past had been beneficial especially for authors working in the same area. Opinions of the Workshop leaders on the work in progress had also been beneficial.

The theme of the Workshop is **Highlighting 10 years of Work on OR for Development**, in celebration of EWG ORD's 10th year of bringing together OR workers in the early stages of their careers with the more experienced mentors. The first EWG ORD conference was held in Iceland during the EURO 2006. 🌐



▲ Dr. Ashley Carreras

EURO in Poznan, Poland (July 3- 6, 2016)



28th European Conference on Operational Research

Still undecided about attending the largest and highly reputed European conference of Operational Research, in the lovely City of Poznan within hospitable Poland, in early July? Tarry no more and consider what you'll find at EURO 2016 happening on July 3-6, 2016:

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Early bird registration is until April 1. Please visit our homepage at <http://www.euro2016.poznan.pl>. Find us also at Facebook and Twitter.

We are looking forward to personally welcome you in Poznan!

Message from EURO 2016 Chairs,
Joanna Jozefowska (Joanna.Jozefowska@cs.put.poznan.pl)
and Daniele Vigo (daniele.vigo@unibo.it)

BOOK REVIEW:

Towards Delivering More than Lip Service

Hans W. Ittmann, University of Johannesburg <hittmann01@gmail.com>

In developing countries, governments and its institutions are almost constantly criticized for being bureaucratic, slow to respond, inefficient, ineffective and lacking in service delivery. Communities lose patience, resulting in protests characterized by violence, destruction and loss of life. In South Africa for example, there are on average eight daily protests concerning service delivery. Efforts to improve the lives of people by rendering quality services have very little sustainable effect. The book **Developing Country Perspectives on Public Service Delivery** attempts to gain a better understanding of this essential function of government in a developing country

Public service delivery is perceived to be the key task of government. These services, funded by taxes, include, among others: public order, safety, infrastructure, education, health service, housing for the marginalized, management and maintenance of public roads. Providing these services involve: use of resources - material, goods, personnel, buildings, funds, etc.; public information and awareness on the availability and location of the service; an efficient delivery mechanism integrating services, technology, outputs, performance measure and indicators, etc.; and accountability and responsibility for how well all the policies, plans, programmes and people offering the service are performing.

In many developing countries, the informal sector starts operating to compensate for the bad service delivery by government. Tax collection suffers as a result, less public funds are then available, impacting proper service delivery further – a vicious cycle. This brings the need to ensure that service is performed effectively and that there is an appropriate balance among the services performed by the government, NGOs and the private sector.

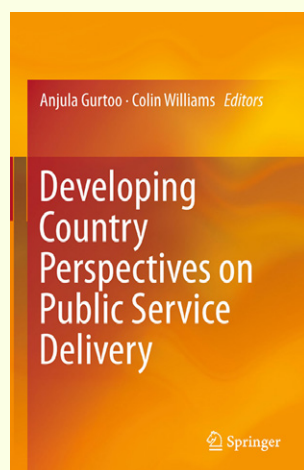
The book is divided into four main parts, namely Public Health; Infrastructure Development and Delivery; Administrative Capacity and Performance; and Rural and Marginalized Populations. Each part consists of a number of

chapters and addresses specific cases from a diverse spectrum of different countries,.

The first part on *Public Health* has four chapters covering India, Ethiopia, Colombia and the Philippines. Access to free medicine in West Bengal in India is investigated. The objective was to determine the state of access to medicine at hospitals and identify barriers to access. A whole range of issues was discovered, including problems regarding data, data integrity, decision on the medicines to purchase, stock levels, distribution, etc. For Ethiopia, the reproductive health service, characterized by a high level of maternal deaths, is tackled. Main impediments to quality services revealed by the analysis include: how people are treated, the environment within which they are treated, and widespread corruption. Colombia introduced a health reform system and stakeholder satisfaction with this reform was achieved. The financial and organization complexity was noted while political power, political will and distrust are obstacles to the public policy reform and implementation. Policy reform and governance in the Philippine health regulatory system is discussed as the final chapter on public health.

In *Infrastructure Development and Delivery*, the issue of technology diffusion with specific reference to cloud computing in India and how it should be treated in a developing country is addressed. In most developing countries, the establishment of small and micro enterprises (SMEs) are the future lifeblood of the economy, as this is where most new jobs will be created. A case study focusing on SMEs in Fiji on how public service impediments can be

unlocked provides insight into problems SMEs face. The next two chapters relate to: urban mobility trends in India and their implications; and water security considering the role of Independent Regulatory Authorities.



Developing Country Perspectives on Public Service Delivery by Anjula Gurttoo and Colin Williams (eds.), 2015. Springer India, New Delhi. pp. 293, ISBN: 978-81-322-2159-3, 129 US dollar (Hardcover) and ISBN: 978-81-322-2160-9, 99 USA Dollar (e-book).

Administrative Capacity and Performance describes a case in Russia, where a health reform process was initiated with main emphasis on purchasing expensive equipment. Little attention was given to the status, prestige and remuneration of doctors. The reform in the health sector suffered from this oversight and lack of proper prioritisation. The quality of the Philippine public service delivery with the associated lack of trust in local government is a situation that is typical in many developing countries. Proper performance indicators, quality assurance of service provided goes hand in hand with trust levels in public service delivery. Accountability of the police in an Indian state illustrates the importance of proper procedures in handling complaints against the police, corruption, interaction between police and the public, etc.

Topics of the chapters in *Rural and Marginalised Populations* are: housing for orphans in Russia; the role played by public sector technology innovation in extending agricultural activities; cash grants for the homeless in a metro; and the introduction of credit delivery facilities to farmers

through technology. The lack of support and attention by the government for rural populations and those who are marginalised is the central theme of this part. Public service delivery in developing countries requires performance, using funds in an optimal way, transparency, accountability and timely response in a sustainable fashion. A framework to achieve this is developed in the last chapter.

OR professionals from developing countries, and those aiming to contribute to public service delivery can benefit much from the different examples discussed in the book. The book offers a detailed understanding of a wide range of issues within this sphere. Going through the cases, one would marvel at the endless opportunities for applying OR. However, we accept the reality that authorities are typically not knowledgeable, if not totally unaware, of how the tools, approaches and “the OR way of thinking” could help address, improve and enhance both these services and decision-making. This adds to the challenge of making inroads and contributing to this area. 🌍

TUTORIAL: Computation and Visualization of Complex Networks

Stefan Wolfgang Pickl, UBw München, COMTESSA <stefan.pickl@unibw.de>

Society depends on the availability of infrastructures such as energy, telecommunication, transportation, banking, finance, health care, government and public administration. A disruption in any of these may result in disruptions of governmental, industrial or public functions.

Vulnerability of infrastructures to natural disasters as well as criminal actions have both primary and cascading effects as result of increasing dependencies and interdependencies of our technological and societal systems. This calls for intelligent simulation and optimization techniques and a comprehensive safety and security management for complex networks.

Critical Infrastructure Protection

This survey gives a short overview on the simulation and optimization of distinguished complex networks. Different methods of Operations Research (OR) like computational intelligence, system dynamics and data analytics are presented to master such complex networks via modern command & control systems. It presents some decision support approaches, which could be applied in the area of modern transportation systems, energy networks, aviation management in combination with innovative sensor networks, network control and reachback architectures to support an adaptive information and smart management system.

Visual Analytics and Management Cockpits

Critical urban infrastructures, such as transportation and traffic systems need increased resilience. For this, decision makers have to understand the network itself and be aware of critical regions. From a business intelligence (BI) perspective, there is a need for smart analytic tools of OR. The theory of complex networks is an adequate basis for visual analytics for imbedding in suitable management cockpits. As an extension of classical BI, special visual analytics should now be used to identify vulnerable regions from different perspectives.

Our research group in Munich, develops such a new network of networks analysis for the multiple vulnerable areas of

the transportation system and integrates it into suitable management cockpits. In general, the analysis of complex networks is an on-going research field for various disciplines [1,2]. The concept of a complex network is used as a simplified frame for a complex system (e.g. a public transportation system). The nodes and the links of a network are represented by the entities and their interrelations in a system [3]. However, finding suitable visualization techniques providing the structural information of complex networks and quick insight is still a great challenge for Operations Research.



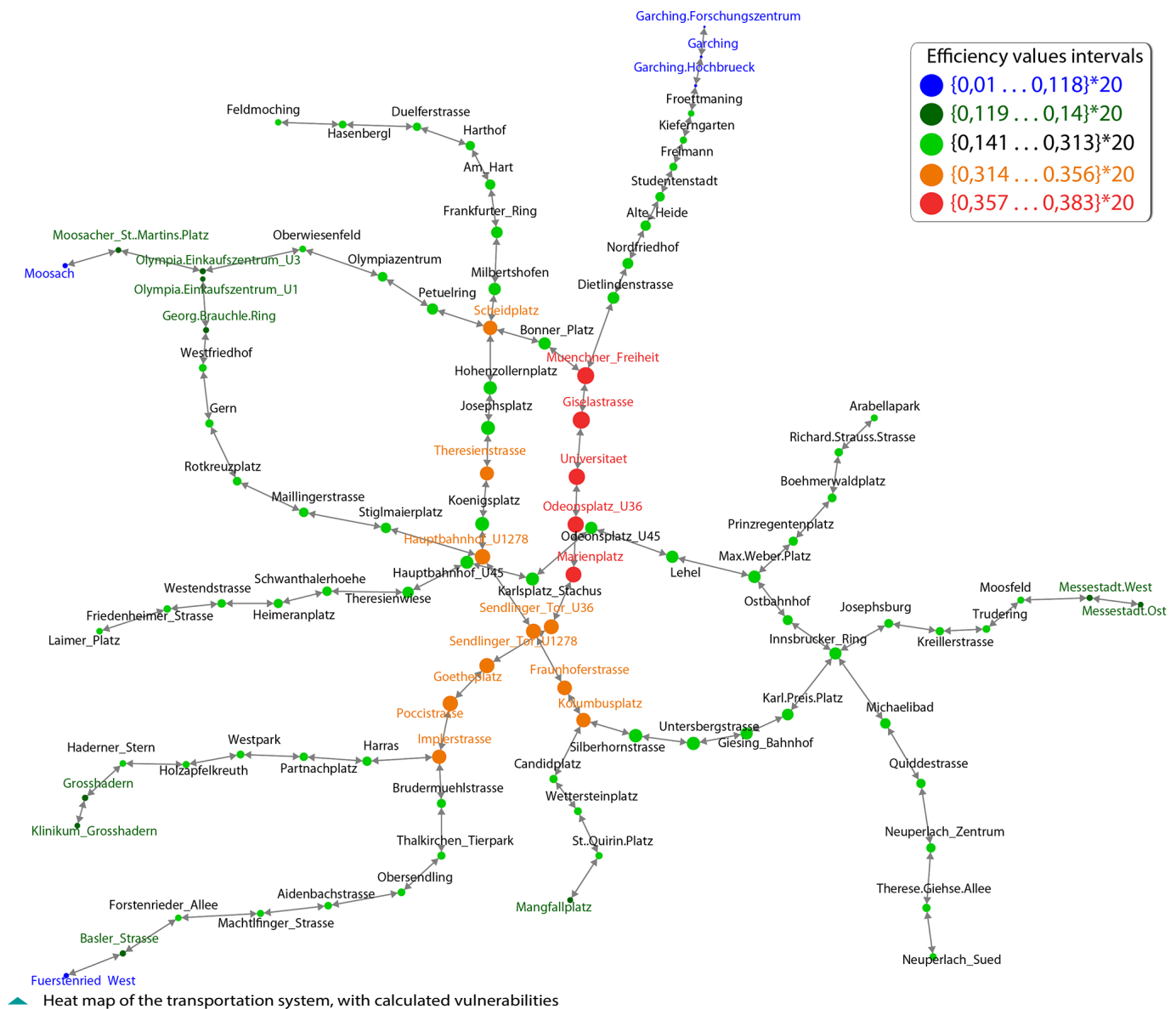
Vulnerability and Network Analysis - Big Data

Transportation networks are often the target of sudden disturbances and attacks, which make knowledge about their vulnerability and resilience even more important. Origins of such analytic attempts can be found originally in the interdisciplinary field of biological network analysis.

We apply these specific techniques to the field of transportation networks in order to analyze and visualize critical regions and spots. In the last decade, an additional interdisciplinary branch of visualization arose: visual analytics. The reason for this is the strong need to understand, and visualize, huge amounts of data (big data). Visual analytics is an adapted version of information visualization, which combines advanced data analysis algorithms. As a new field of OR, Visual Analytics can be defined as “an integral approach to decision-making, combining visualization, human factors and data analysis” [9] as well as simulation-based optimization.

Simulation and Optimization of Topology Measures

In (8) the visual analytics process is described as an adaptive process, where the user can be quite involved in the visual data exploratory loop, or in the automated data analysis loop. The process itself is applied in our research group to simulate and optimize complex (transportation) networks.



In several research projects, network analysis combined with visual analytics is a key element for a proper understanding of a network from an OR perspective. Classical network topology parameters can offer important structural information of the analyzed networks. These are recognized as relevant for network vulnerability measures [10,11]. Topology parameters, such as the number of nodes and links, diameter, network connectivity, girth, nodes and links connectivity, and cohesion, are compiled components for heuristic reliability indexes [12] and algorithms. These indexes offer a quicker and more insightful overview of the entire network vulnerability.

Structural measures, such as network entropies, can be considered reliable measures to determine the structural properties of a network. These measures capture the information structure of the complete neighborhood and the centrality properties of each node in the network. Entropy measures have been successfully applied to transportation networks by using this information-theoretic method [13]. Furthermore, flow-weighted efficiency measure calculates the efficiency of a transportation network by assessing two metrics weights: the length of links and the train traffic on each link. There are further interesting links between classical graph theory (Claude Berghe) and information theory (Claude E. Shannon), although they never met in person.

Serviceability: Managerial Decision Making and Reachback Architectures

In this, the most efficient nodes are considered most vulnerable, as losing their regular flow results in a serious

disturbance to the general serviceability of the network. In a first step, we propose applying the visual analytics technique to the flow-weighted efficiency measure. This enables the detection of network vulnerabilities from different visual perspectives: modularity, distances, train flow, and efficiency. For further profound managerial decision making, each analysis might make sense and give additional insights into the network structure. This shows that measures from biology could be applied to our networks. However, the special architecture and design of a transportation network demands further improvements of the measures, like special heat zones.

Details on Demand - PUMAA

A more convenient solution than working with heat zones is the extraction of highlighted nodes. This leads to creating another network: the network of networks. Combined with a multilayered cluster analysis, the last step of the visual analytics mantra "Details on demand" can be fulfilled. The development of new sensor systems and in general, the deployment of sensors for complex buildings like train stations and subway systems are challenging. In addition, specific OR approaches can further support optimal decision making by addressing questions like optimal sensor placement, communication within the sensor network and evaluation of sensor signals. The integration leads to a holistic Reachback Architecture. Reachback Architecture and distributed operations have the advantage of representing a more efficient process but requires an expanded communication infrastructure.

Within the research program IRIS (Integrated Reachback Information System) we apply these concepts to complex (information) networks like humanitarian logistics, smart grids and special system dynamics approaches in order to support modern public management analytics (PUMAA) via OR.

Acknowledgement

The author thanks the competence center COMTESSA, constituted during the preparation and duration of the „dynamic“ project RIKOV*, and his colleagues Matthias Dehmer, Max Moll, Sorin Nistor and Martin Zsifkovits for fruitful discussions within the context of network-of-networks thinking. RiKoV stands for strategic planning and intelligent scenario development for the security of public transport. Efficient measures were developed and embedded in an intelligent decision support tool which is based on an automatically generated scenario process. The successful final presentation of RIKOV in January 2016 in Munich led to this short overview article on the resilience of complex networks. RIKOV was supported by the BMBF (Bundesministerium für Bildung und Forschung) within the special program “Sicherheitsforschungsprogramm der Bundesrepublik Deutschland”.

*RIKOV consists of several institutes and departments from Universities (Karlsruhe Institut für Technologie KIT, Technische Hochschule Köln) as well as partners from industry (Airbus). RIKOV stands for Optimization of Resilience of Infrastructures via OR.

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OR IMPACT

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Optimizing Moveable Ambulance Station Location and Vehicle Repositioning for the City of São Paulo Using the ‘Bees’ Algorithm*

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Sao Paulo is the largest city in South America with a population of nearly 12 million and much traffic congestion. Consequently, the emergency medical services have struggled to maintain an acceptable emergency response time. In 2007, it was 27 minutes for 98% of requests, compared to, for example, a US legal requirement for 95% of requests to be met within 10 minutes. To tackle the problem, the managing authority in São Paulo (SAMU-SP) initiated an improvement programme in 2009. At that time, 140 active ambulances were used, plus back up vehicles to cover those under maintenance and for cases of exceptional demand such as big events. Seventy-seven fixed ambulance stations were in use but because of the difficulty of finding sites for new stations and the associated costs, movable stations were being considered. These have the advantage of lower cost and flexibility to be installed in public spaces



▲ Movable station with ambulance
 (This first appeared in Impact magazine and is reproduced here by kind permission of Palgrave Macmillan.)

*Awarded the 2014 IFORS Prize for OR in Development

(such as parks and squares) and moved in case demand patterns change.

The problem was to determine how many movable stations should be purchased, where they should be sited, and where ambulances should be based both for fixed and movable stations in order to minimise response times.

Approach

The problem is a large one for São Paulo. Ambulance dispatchers take and prioritise around 8,000 calls per day and send a response to about 1,500 patients.

Ambulance location models are generally defined on undirected graphs, where nodes denote both demand points due to a medical emergency and potential ambulance location sites; edges represent the shortest travel times between two points (see Daskin, 1995). Typically, these models are either deterministic or stochastic, the latter aiming to address the probabilistic nature of emergency services, i.e., the probability of a vehicle not being available when needed to attend to a call.

Previous work showed that it is important to explicitly take into account ambulance speed and travel time variations at different times during the day. However, variability within the chosen time periods could not be incorporated initially because of the lack of historical data, although it would be easy to incorporate a normal distribution. Thus, the problem was formulated as an integer programming (IP) model.

Preliminary computational experiments indicated that real-sized instances of the problem, with typically around 100 nodes and 21 time periods, could not be solved to optimality using a commercial IP package. The number of decision variables and constraints is very large, and optimal solutions could be found for instances with only up to 25 candidate station locations. This makes it practically impossible to solve medium and large instances, similar to those found in the case of SAMU-SP. Additionally, it was not certain if SAMU-SP, as a public service subject to several restricting regulations and limited resources, would be able to acquire and maintain a licence for an efficient commercial solver. These factors led to a decision to adopt a heuristic to solve the problem.

Using the Bees Algorithm for Locating Emergency Stations

The Artificial Bee Colony (ABC) algorithm is a particular class of nature-inspired or swarm-based meta-heuristics, that is, algorithms that aim to mimic biological behaviour found in swarms, colonies, or any cooperative group of living organisms. It was proposed by Karaboga (2005) for optimizing numerical problems.

In the ABC algorithm, a food source represents a possible solution to an optimization problem, and the nectar amount of a food source measures the quality of the associated solution. The colony consists of three groups of artificial bees:



Authors shown receiving the 2014 FORS Prize (l to r): Nelson Maculan, IFORS President, Luiz Andrade and Claudio Cunha, Prize Winners and Andres Weintraub, Chair of the Jury.

employed bees, onlookers, and scouts. Each employed bee explores the neighbourhood of a food source in search for new improved food sources (i.e., having more nectar); the number of the employed bees is equal to the number of solutions in the population.

Unemployed bees consist of onlookers and scouts. A scout is a former employed bee whose solution cannot be improved after a predetermined number of trials, leading to solution abandonment. The scout carries out a random search to discover new food sources in the vicinity of the hive, and once finding a food source, changes behaviour to become an employed bee exploring the referred food source. Onlooker bees wait in the hive and probabilistically choose their food sources based on attractiveness information shared by the employed bees in a process called the 'waggle' dance, which conveys both the quality of the food source and the distance from the hive.

Although other meta-heuristic approaches were considered, the choice of the ABC algorithm was influenced by a relevant non-technical aspect: SAMU-SP officers, particularly the managing director found the bee colony approach more appealing. It was intuitive and easy to understand for other authorities and the general public, who are usually averse and impervious to complex mathematical and computational concepts. In other words, the ABC algorithm was deemed to be not only an efficient and robust approach, but also intuitive - "a sophisticated computer code that mimics the complex and efficient way bees behave in their search for food".

In order to apply this approach, the problem was decomposed into two sub-problems; one of locating stations and allocating vehicles across a planning horizon called problem L; and a second problem R, of relocating vehicles given their required locations in different time periods. The ABC algorithm solves the first problem L, and its results are taken as inputs for the solution of problem R, which uses a transportation simplex method to find optimal solutions. More details are provided in Andrade and Cunha (2015)

Once station locations and ambulance assignments for each time period of the planning horizon have been determined by the ABC-based heuristic, vehicle relocations between successive time periods are easily determined by solving a minimum cost flow problem in a bipartite graph using the transportation simplex method.

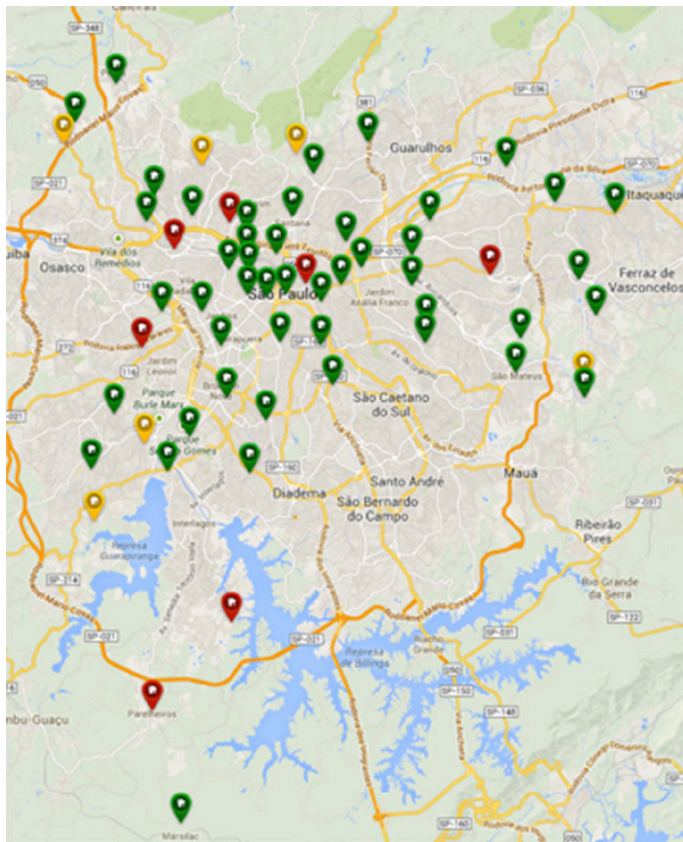


Figure 1**. Suggested station configuration after first analysis

To test the efficiency of the ABC-heuristic, the commercial solver ILOG CPLEX version 12.0 was used to determine the optimal solutions for smaller instances using the proposed formulation. These instances considered different numbers of nodes, stations to be located, and available vehicles. Demonstrating the effectiveness of the approach, results showed that the optimality gap (the value of the best ABC solution found relative to the optimal solution) was below 5% for most of the instances evaluated, with a maximum of 8.24%.

Implementation

Under the guidance of SAMU-SP officials, a range of scenarios for improving ambulance response times was investigated. Figure 1 shows the results of an initial analysis: green dots represent permanent stations; red dots represent already placed movable stations and the yellow dots represent six extra movable stations placed in the most suitable districts in order to obtain a 16-minute coverage.

Figure 2 illustrates the trade-off between the number of bases and the response times that can be achieved; with no restriction on location (fixed and movable stations), nearly 100% coverage in 15 minutes can be achieved using the current number of

ambulances, demonstrating the potential for improvement. At that time, a plan for the next 4 years with the main option to invest in more vehicles or more movable stations was being considered.

Analysis showed that additional movable stations are not only more effective than fixed stations but also much more effective than additional ambulances. As a consequence, 37 new movable stations have been established and the number is likely to increase further. The aim is to achieve 95% coverage for a 10-minute response time, and as a long-term aspiration, to reduce the response time to 5 minutes. The plans also include improvements to data collection in order to better estimate time-dependent travel times. This decision support tool can be extended to other emergency services in large urban centres, especially in developing countries, that face situations similar to São Paulo's.

Outcome

Between 2007 and 2012, under the guidance of its managing director, SAMU-SP cut its average response time from nearly half an hour to 10 minutes. It also became the first Latin American ambulance service to be recognised as an *Accredited Centre of Excellence*. "The concept we proposed wasn't an easy sell," admits Dr. Cunha. "We had to clearly demonstrate the benefits that movable stations, if properly located, could bring when compared to traditional facilities in fixed buildings – and we had to do it in the context of a limited budget. Fortunately, our ABC-heuristic enabled us to do precisely that. We were able to show how SAMU-SP could cope with fluctuating demand, and we were able to show how it could make the most of its resources during different time periods. The decision support system, based on the ABC heuristic, has been made available to the SAMU-SP planners, to enable them to update the system to match changes in demand caused by São Paulo's continuing growth. The bottom line is that we were able to show how, just like a bee colony, SAMU-SP could constantly adapt to its surroundings."

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**Source of figures: Andrade, L. A. C. G. and Cunha, C. B. (2015), An ABC heuristic for optimizing moveable ambulance station location and vehicle repositioning for the city of São Paulo. *International Transactions in Operational Research*, 22: 473–501. doi: 10.1111/itor.12160.

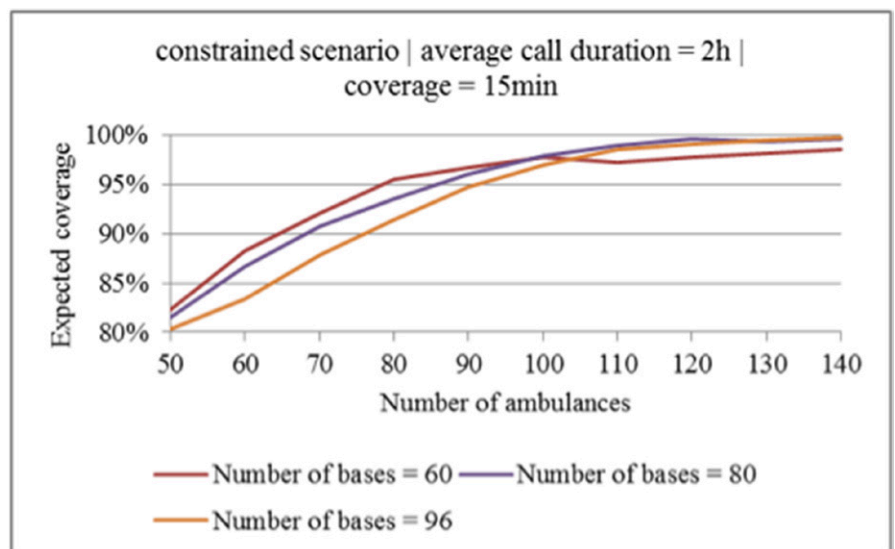


Figure 2**. Results for constrained scenarios with two hour call duration and 15 minute vehicle coverage

Editor's Note: In the December 2015 issue of the IFORS News, we featured Operational Research Society of Turkey, one of two bidders for IFORS 2020. Here is now the feature on the other bidder, KORMS.

At 40, KORMS Fortifies Position as a Leader in Asian OR

Chang Won Lee < leecw@hanyang.ac.kr >

Origins from 1976

The Korean Operations Research and Management Science Society (KORMS) was established in 1976 to provide a venue for Operations Research (OR)/Management Science (MS) academicians and practitioners in Korea to get together, exchange ideas and expertise in the field, provide service to the nation, and nurture the young professionals in the field.

The society was established on June 23, 1976 and incorporated as a nonprofit organization on June 28, 1977 under the jurisdiction of the Ministry of Science and Technology, Korea. Consistent with the military roots of OR itself, it was a military OR man who first presided over KORMS. Vice secretary of Korea Department of Defense (DOD) General Eung-Kyun Shin was the first President of KORMS and led it in the next four years. Hae-Hyeong Cho, who was Chairman of Nara Holdings took over the position of President in 1981.

During its 40 years, KORMS has contributed to the professional and international development of the discipline. It is worth noting here that KORMS' own Dr. Woong Bae Rha, professor, vice prime minister, and a secretary of Korean government was elected as the first president of the Association of Asia-Pacific Operational Research Societies (APORS) in 1985. The first APORS meeting held in Seoul on August 24 to 26 in 1988. Among the other international conferences in the field held in Korea include the INFORMS-KORMS international meeting on June 18 to 21, 2000, as well as International Symposium on Forecasting (ISF) of Annual Institute of Forecasters (IIF) in June 23 to 26, 2013.



▲ 2015 Spring Conference attracted 1,000 participants.

That it could embark on huge undertakings owes much to its active membership composed of over 3,600 individual, 29 special, 12 group, and 145 library members as of 2015.

Fast Forward to 2015

KORMS held its Spring joint conference in Jeju from April 8 to 11. Four OR-related academic societies joined under the theme of "Implementing New Management Paradigm in Creative Economy". A total of 513 papers were presented with over 1,000 participants. Dr. Dirk Helbing (ETH Zurich, Swiss Federal Institute of Technology,

Switzerland) gave a plenary talk on *Social Simulation and Scientific Policy Decision Making*. As a collaborative platform between industry and academia, Creative Economy Summit was also organized. Jeju Governor, Vice Secretary of Ministry of Science, ICT and Future Planning (MSIP), and President of KISDI delivered welcome speeches, followed by the presentations of Samsung SDS, KT, SKT, and LGU+ on their visions and business strategies.

The KORMS Fall conference was held on October 23 at Hanyang University, Seoul, Korea with the theme *Role and Responsibility of OR/MS as a New Collaborative Growth Model*. About 200 attendees participated in the meeting and 79 papers were presented. On the publication side, four issues of Journal of the KORMS Society (Vol 40), four issues of Korean Management Science Review (Vol 32), and two issues of Management Science & Financial Engineering (Vol 21) were published this year.

KORMS has a lot to show for its 40 years of existence. This fact gives it great confidence that it can host another international conference, namely, the IFORS 2020 successfully. 🌐

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