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IFORS NEWS
International Federation of Operational Research Societies

FROM THE PRESIDENT

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As this year ends and a new year begins, we are facing the prospect of a global recession in 2023. As we look back to 2022, we can also recall several notable natural disasters and manmade crises. The global Covid-19 pandemic persists, the Russian-Ukraine conflict erupted, another viral outbreak (monkeypox) emerged, and there were record-breaking heatwaves in Europe and deadly hurricanes in the Caribbean and North America. With global supply chains disrupted by some of these catastrophic events, we have seen that maintaining the basic necessities of life --- food security, energy security, job security, health and safety --- becomes a concern for even the wealthiest and most developed countries. In less developed regions, where the infrastructure and the economy are much more fragile, the ability to ensure these life needs for the population becomes even more challenging.

Throughout the development of the field of operational research, scientists and practitioners across the world have joined hands in applying our OR expertise to tackle such pressing society problems. From its founding, IFORS has as its core objective the promotion of knowledge and application of operational research all over the world. In particular, "OR for Development" has been on the agenda of IFORS since its early days. IFORS established a Prize, more than 35 years ago, to promote good OR practice for development issues by recognizing projects of significant impact in developing countries.

The "IFORS Prize for OR in Development" is awarded once every three years. Finalists for the prize are invited to present their work at the triennial IFORS conference, and the awardees are announced at the closing session of the conference. Since 1987, the Prize (either First Prizes or Runner-up Prizes) have been awarded to 26 projects in 10 countries across Asia, Africa and Latin America. These projects have addressed critical problems such as water, agriculture, infrastructure and energy planning, public health and emergency management, education and equality.

I am sure many operational researchers are doing excellent OR work for development issues around the world every day. I encourage you to "shine a light" on your work, to share your knowledge, so others can learn from your experience as they tackle development-related projects in their respective locales. Please consider applying for the "IFORS Prize for OR in Development" in the future or submitting an article about your work to this Newsletter. It is IFORS' duty to serve as a channel for showcasing operational research contributions to development concerns around the world.

WHAT'S INSIDE

FROM THE EDITOR-IN-CHIEF

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Welcome to the December issue of the IFORS Newsletter!

We are approaching the end of the year, the first one of my term as Editor-in-Chief of this publication, and as such, I am very happy to be part of the team which worked to publish successfully the 2022 issues. This has been possible due to the work of Section Editors and authors, who had contributed with relevant content related to Operational Research worldwide. A special thanks to them. I also would like to thank the Executive Committee of IFORS for their support, as well as both technical and administrative staff who make possible the layout, publication and communication of each issue of the newsletter. It is worth to mention that we have inherited from the previous editorial team a stable and well-organized structure of content, that we tried to keep and will try to keep as well in forthcoming issues. Nevertheless, new initiatives regarding different types of content are under consideration, so stay tuned to know them in future issues of the newsletter.

In this issue, we include content related to our classical sections. In the OR Tutorial, a colleague from Universidad de Chile shares a series of good practices in the application of OR methodo logies and tools to the salmon industry, including a summary of the historical development of this activity in the country, a description of main OR problems arisen and techniques to tackle them, and recommendations regarding the communication with decision makers. In the OR Impact article, colleagues from several organizations in Taiwan describe the application of information technologies and OR to the management of elder care services. The reported project aims to support a national plan to provide long-term at-home and community-based care, in a country which has a large proportion of aged people. At the core of the solution provided, a resource allocation problem is solved using heuristic optimization, supported by a cloud platform and mobile applications. The Conferences section reports 29 events worldwide on OR and related disciplines, while the Book Review section reports on the volumes "Model Thinking for Everyday Life - Working Wonders with a Blank Sheet of Paper" and "Lectures on Variational Analysis". Finally, in this issue you will find information about the AFROS Annual General Meeting, a report on the IFORS Webinar held in September and updated information about the IFORS Fellows 2022 and the forthcoming IFORS 2023 Conference.

We thank all contributors, authors and section editors for their work, and we hope you enjoy the reading!

OR TUTORIAL

Applied OR in the Salmon Industry

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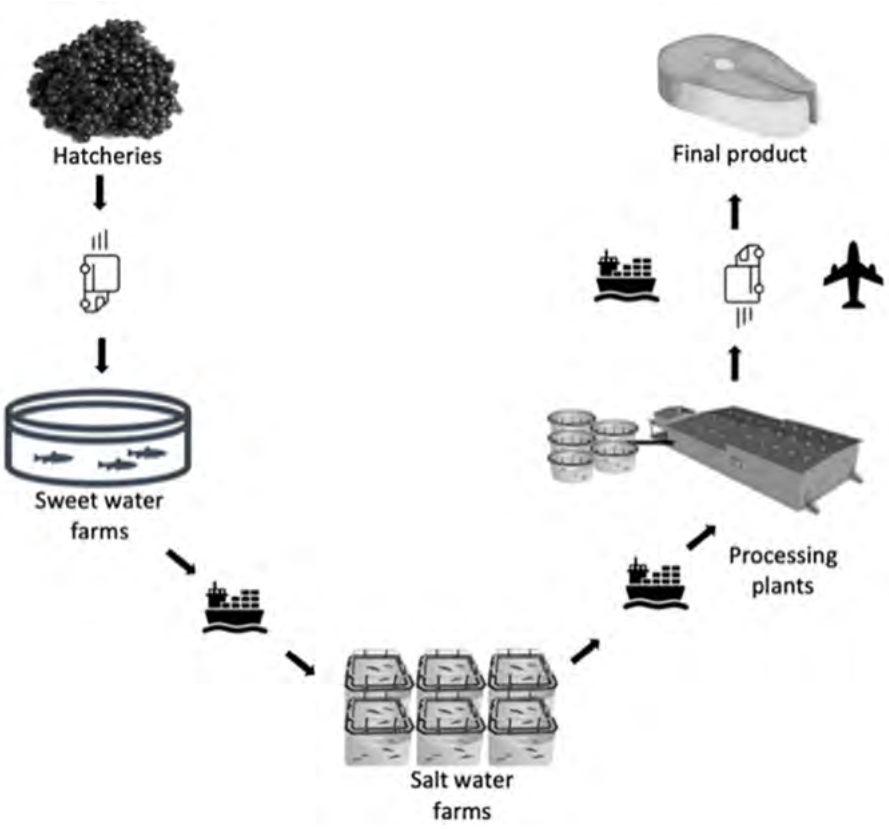
Salmon farming is one of the main pillars of Chile's economy and the main source of income of the southern regions of the country. The industry is a complex and long process chain, going from the hatcheries where the eggs are produced, the sweet water stage where the smolts are grown, salt water stage where the salmons are fattened in the ocean in special purpose cages, the processing plants where different cuts and products are produced and the export of the final product. Industrial facilities include hatcheries, sweet water farms, ocean farms, and processing plants. All water facilities are located in rivers and fjords of the Chilean Patagonia and a big portion of the time the logistics consider a combination of vessels and trucks. Transportation must include salmons at the different stages in the chain as well as final products.

The industry begun as a group of companies that were learning as they grew, without much expertise and technology. Along the journey, a great amount of knowledge was created and several university degrees and programs were developed in order to support and make the industry more professional. As time passed, larger companies acquired smaller ones and multiple mergers took place, completely changing the way processes have been approached towards a much more efficient way.

The same has happened with OR in the industry. At the beginning, Operations Research was not very well understood within the operation managers and practitioners. Firms were small, the problems were usually easy to solve, and priorities were focused more in "saving the day" than in being efficient. This landscape is quite changed nowadays. With larger firms and decision makers familiar with OR techniques, with more complex problems and less rush in the operations, OR has become very important to make a difference in the industry. A great number of professionals have been involved with optimization processes, they have a deeper understanding of the advantages of applying OR in the processes and therefore are more willing to hire professionals and services that could help them to perform better. This was much harder ten years ago.



▲ Image N°1: Salmon process chain

The *ISCI: Instituto de Sistemas Complejos de Ingeniería* along with academics from the *Universidad de Chile, Universidad de Buenos Aires,* and *Universidad Nacional de General Sarmiento* have been pioneers in applying OR in the Salmon industry in Chile. They have been involved in several successful projects that require the development of specific software tools for different problems that the industry has, such as

- routing of salmon feed vessels,
- programming the harvest and process chains,
- programming operations in processing plants,
- programming sea net maintenance, and
- programming the sweet water stage.

Previously, most of these problems were solved by an expert, an Excel spreadsheet, and tons of experience. These duties used to be easier when firms were smaller and the prolixity was not as mandatory as today. Now the companies are much larger, with more complex problems, and under more competitivity. Professionals are aware that there are better options and solutions and are in search for talent and experience to solve their problems. Note that the whole process from hatcheries to final product takes about four years, so planning the supply chain involves high levels of uncertainty.

In our experience, the most important thing when addressing these problems is to be able to make the expert's life easier with a friendly tool that provides the user the information in the format they currently use and also to show him/her that the software will provide them a benefit taking them less time to plan, getting better solutions. Also, the user has to be able to solve the problems within "a cup of coffee" time and has to be able to tackle different scenarios in a short period of time. I would say that a good quick solution is preferred over an optimal solution that takes too long to be obtained.

Usual techniques involve the statement and solution of mixed integer programming (MIP) models and ad-hoc heuristics. Large companies in this industry can usually afford state-of-the-art MIP solvers, so we have at our disposal powerful machinery for stating and solving MIP models. However, sometimes using a MIP model is not possible due to the size or the structure of the resulting formulation. When this is the case, the development and tuning of a heuristic procedure is needed.

Also, as a consideration, the industry is very influenced by the climate conditions of the Chilean Patagonia. The weather is very unpredictable, vessels sometimes cannot sail or tasks cannot be performed because a thunderstorm or big waves or wind approached the area. This situation forces to change decisions on an everyday basis, so the overall procedure has to be agile, flexible, and quick. Sometimes, the expert does not want to bother to add everything again because he/she knows the optimal solution will not be the one that will be used in practice, because he/she knows things will change. Therefore, it is extremely important for software tools to allow the expert to easily re-schedule with different scenarios and changes in the problem easily. It should be so easy that the expert will be pleased to do it with the software tool, even easier than doing it by hand.

Another story of success of these tools has been the simulation of scenarios to address different contracts or investments. Salmon companies have contracts of fleets of ships or hire different farms for performing the sweet water stage of the industry chain. Sometimes they have a hard time understanding their capacities and choosing how many/ which vessels or farms they are going to need in the future. For example, choosing not enough volume for the vessels will mean that the company will have to hire spot vessels, which are at least twice more expensive than a long-term contract. On the other hand, having too many vessels will clearly be wasteful. OR-based software tools have played a major role in simulating different scenarios for future conditions and saving these companies millions of dollars by helping them to choose the right sizes and amounts. The same happens with the sweet water stage farms, with the machinery for the processing plants, etc.

To conclude, the Salmon Industry in Chile is a very challenging and expensive industry. There has been an incremental interest in applying OR in the industry and new projects are seeing the light. Nevertheless, there are still tremendous projects that can be developed in different processes currently performed in the industry that could help be much more efficient saving huge amounts of money, energy, and CO2 emissions to the atmosphere. We will certainly witness new generations of professionals with a better understanding of the benefits of technology and OR, who will attain a fully developed optimization in the salmon industry.

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Improving the Management of Elder Care Services in Taiwan

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Introduction and Background
Taiwan is a small island but has world-class information technology companies and medical hospitals with affordable universal healthcare. However, due to a low birth rate over the past two decades, Taiwan has become one of the fastest ageing countries in the world. It is estimated that 20% of Taiwan's population will be older than 65 by 2025, when it will join Japan, Germany and Greece as a super-aged society [1]. In addition to expanding preventive healthcare and medical services, it is clearly critical to carefully manage the sharply rising cost of Long-Term Care (LTC) while improving care quality.

To meet the rapidly growing demand for long-term care and reduce the heavy burden of family care[2,3], Taiwan's government launched its "Long-term Care 2.0" initiative in 2017, which aimed to encourage private institutions to provide long-term at-home or community-based care by substantially subsidizing professional care services. To give an idea of scale, the budget for the 2022 plan is nearly $2 billion USD, a more than tenfold increase since 2016, and 14% growth from 2021[4,5].

As a result of this initiative, home care services have grown rapidly. By March 2022, there were 1,338 home care service institutions, 688 elder day care centres and 11,056 elder care community centres in Taiwan[6]. These centres and institutions are typically less than four years old, small in size and lacking digital capabilities. Many are struggling with quality of care along with care givers' recruitment, training, certification and management.

In addition, identifying suitable accommodation for patients who need LTC facilities when discharged from a hospital (e.g. Taipei City Hospital, TCH) is also a major challenge. Most matches require over 100 phone calls due to the ever changing facility availability and complex matching criteria, for example, an elder's acute care needs, chronic and mental health conditions, and even gender, all need to be considered. Thus, arranging LTC often delays the release of precious hospital beds to additional incoming patients. This problem is likely to become much greater in future years and will clearly have widespread ramifications for healthcare, social welfare, insurance policies, the workforce and overall economy for the over 2.6M citizens in Taipei city and for all 23M residents in Taiwan overall.

To help address these complex challenges, and look for business opportunities for long-term elder care, the organisation United Financial Intelligence (UFI, ufi.ai) was founded in 2020[7]. Its initial focus has been to provide low-cost digital capabilities for long term care institutions in Taiwan to help improve service management and care quality. Its progress to date and methods used are described below.

UFI's Consultation methods and initial findings
At the commencement of the project, UFI reached out to about 200 Long Term Care institutions in Taiwan over 3 months to understand their pain points and to assess the types of digital service needed by these institutions to improve care services[8]. It devised a questionnaire regarding digital capabilities in care-givers' recruiting and management, financial management, and care quality improvement which was sent to more than 200 service providers and followed up by phone interviews and dozens of on-site visits. Ten workshops were also conducted with the Taipei City Hospital and Taipei Silver Development Association to discuss the capabilities and process needed to quickly identify residential care facilities for patients when discharging from the hospital. The analyses carried out on the survey data collected, as well as workshop discussions showed that the matching of those needing care with available places took many days and much staff time, due to the complexities of caregiver/staff service management, scheduling, service reminders and tracking, in-time and accurate government subsidy claims, salary calculation and compliance across Ministry of Health, Ministry of Labor, and local governments. These findings pointed to an urgent need for an automated system with the adaptivity to greatly improve Long-Term care management and to enable effective matching of those needing care and care services of different types.

Solutions and their benefits
Using the information collected during consultation, two major SaaS (Software as a Service) cloud solutions have been developed and implemented: Long-Term Care Service Management plus a Long-term Care Map, enabling all parties to communicate beneficially via the internet. These solutions and benefits are described below along with the Long Term Care Management Public-Private Partnership Pilot and Lessons Learnt from it. Since most care givers and administrators have minimal training and experience in using digital tools, simplicity, ease-of-use, and flexibility are key design criteria, so that training can be done through video conferences and built-in help instructions and videos.

Typically, for each long term care centre that cares for 100 elders, UFI trains about 5 caregiver leaders/managers in 3 sessions. The first session is a 2-hour overview and Q&A session. The second session is a step-by-step walkthrough of each function and feature for 4-6 hours. The third session is arranged based on feedback and questions from the LTC institute. The training is done by two trainers from UFI.

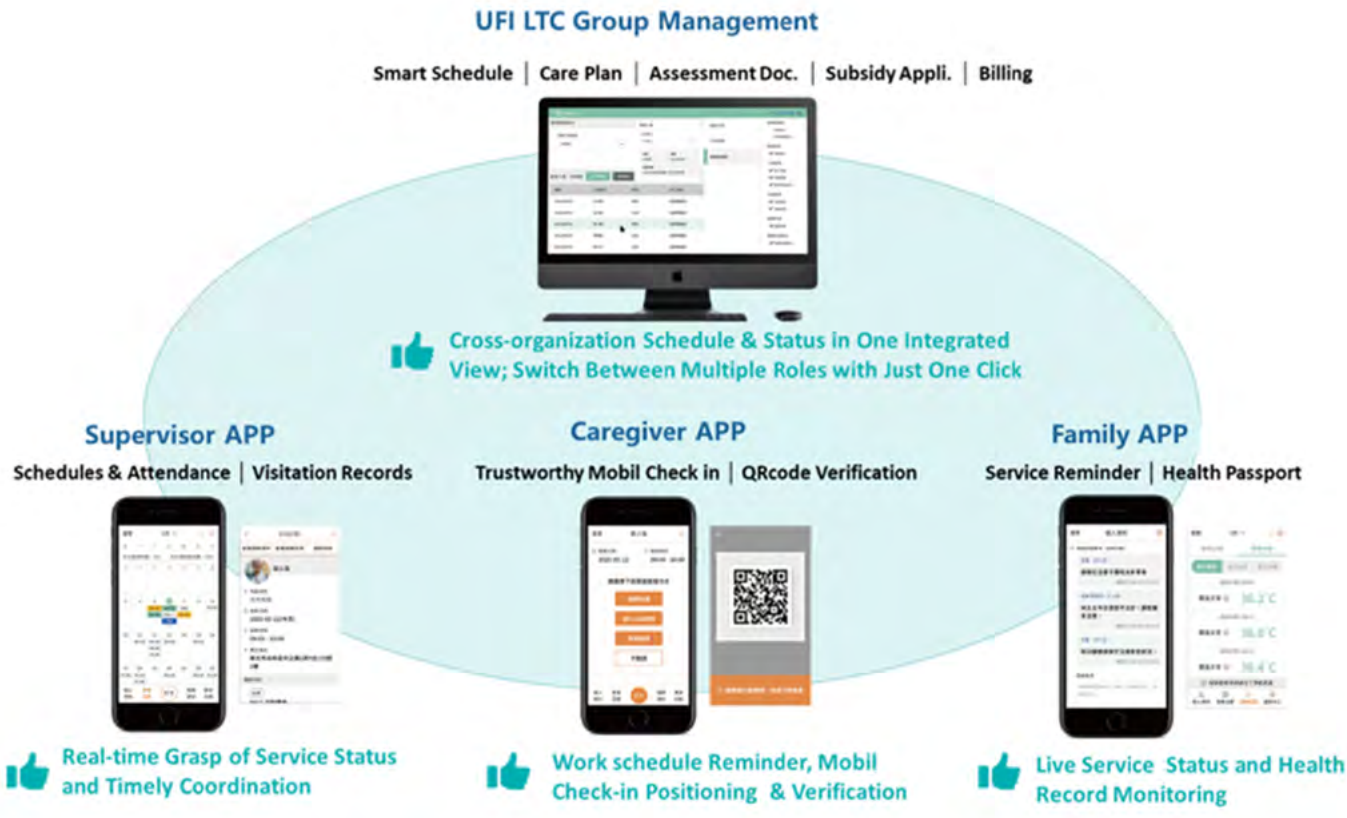
The Long-term Care Service Management System (LTC-SMS)

Following the consultations with LTC institutions, an LTC-SMS was developed to support LTC institutions, caregivers, elders and their family members. It empowers LTC institutions with smart digital capabilities [Figure 1] to improve care quality while optimizing resource usage and profitability. The system leverages heuristics & resource matching Optimization analytics[9,10] and a management dashboard to provide smart matching between care givers and elders, scheduling and rescheduling when unexpected events such as changes in patients' conditions or healthcare needs occur; care-giver performance management; compliance with government regulations; auditing and financial management, including payments (online or at supermarkets); and automatic government subsidy application and write-offs linking to the government management system. Figure 1 shows sample smart phone screens.

or out-of-pocket services requests. Smartphone apps are provided to the care-givers to record service activities, and also provided to service recipients and their families to track progress in recipients' health conditions, etc. Through actively monitoring care conditions, the system can provide timely alerts and notifications to patients and caregivers to avoid disease recurrence, reduce hospital visits and lower insurance expenses. For example, patients with chronic diseases can take precautions when blood sugar or blood pressure increase to avoid reaching the dangerous zone. Transparent care history and communication allow long-term care institutions, care providers, care recipients and their families to form a close-knit community with the best possible care.

The Long-term Care Map (LTCMap -see Fig.2)

The Long-term Care Map (LTCMap) is an interactive map backed by a solid data processing framework, which was developed based on open and web data regarding elder care facilities supplied by facilities, organizations, and governments in Taiwan. As shown in Figure 2, the LTCMap has gathered information on more than 10,000 facilities classified into 30 care categories of case capabilities and service types. To support continuous elder care facility data collection and consolidation, a data processing framework has been implemented as backbone of the LTCMap. In the data processing framework, it initially feeds with URLs which link



▲ Figure 1: LTC-SMS Capabilities and Sample Smart Phone Screens

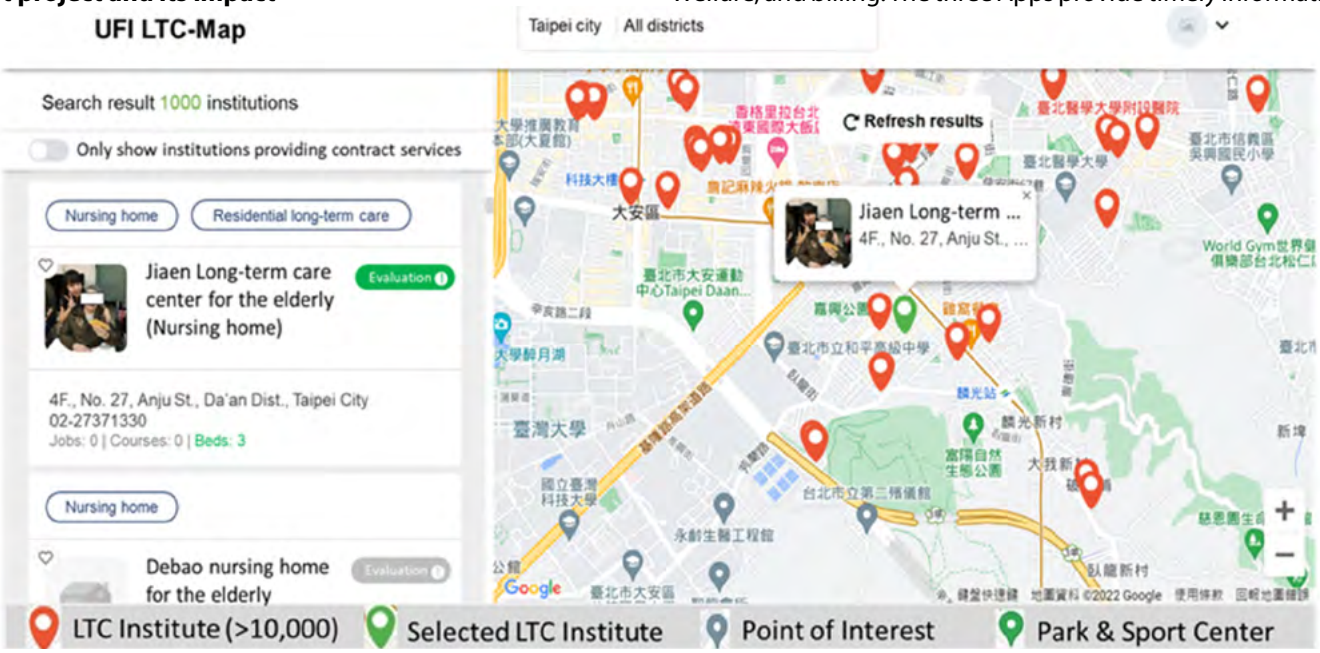
The application not only eliminates error-prone paperwork but also supports process automation and improves operational efficiency. Managers of care service institutions can optimize monthly or weekly shift scheduling of case managers and care-givers, ensure that care portfolios and corresponding services remain compliant with government subsidy policies, and make dynamic adjustments based on needs, regulations

to various facility datasheets and websites. Once processed, the contents of the datasheets and websites are transformed into standard UTF-8 encoding and then saved. Subsequently, general processing techniques such as noisy filtering, segmentation etc., are applied to the stored contents in order. Finally, key data are identified, extended, and consolidated to predefined elder care facility information models for the LTCMap.

The residential matching service then uses Multi-Criteria Decision Making (MCDM) to score facility/case candidates to provide matching recommendations for individuals. All data generated and collected by the residential matching platform are also treated as new data sources of the LTCMap to improve data quality. In the scenario, the LTCMap proves itself as an organic evolving elder care data middle platform in Taiwan.

Pilot project and its impact

Care Planning and Development Centre's at-home service organization serving about 110 elders. LTC-SMS modules deployed included the UFI LTC General Management System, Supervisor's APP, caregiver's APP, and patient/family APP as shown in Figure 1above. The General Management System consists of HR management, case management, smart scheduling, automatic subsidy calculation, report generation, validation, and submission to the Ministry of National Health & Welfare, and billing. The three Apps provide timely information



▲ Figure 2 : UFI Long-term Care Map

The LTC Management Public-Private Partnership Pilot and Lessons Learned

In mid-2021, UFI participated in a Taipei Smart City initiative[11] to launch a public-private LTC pilot partnership with the Taipei City Government's Taipei City Hospital(TCH), Zhongxing Branch and Taipei Silver Development Association which has 82 institution members in Taipei. TCH is a full-service, total-care medical institution with 10 municipal hospitals that provides comprehensive healthcare services for Taipei's 2.6 million residents. It is the largest healthcare organization in northern Taiwan.

Benefits of the system

During the three-month planning and three-month rollout period, LTC-SMS has been deployed to the TCH Long-term for supervisors, caregivers, and elders' families to track and record service time, service items, elder health condition, and to facilitate communication between elder families, caregivers, and supervisors. The timely health condition tracking, service log reporting, and information sharing has greatly improved the quality of health assessment and personal healthcare plans, and hence care quality is increased. It is also estimated that there is a 20% savings in administrative costs due to the digitisation of HR management, care service scheduling and tracking, and process automation in financial management between the institution, the Ministry of Health and Welfare's case management systems, and the elders. The survey conducted at the end of the pilot showed a 92% satisfaction rate from the TPE LTC organization. UFI LTC-SMS is now serving 12+ at-home LTC institutions with more than 1200 elders being cared for at home.

▲ Figure 4: Grace Lin (right front), Ting-Hung Shih and Wei-Chun Shen, chairman and CIO of Taipei Silver Development Association; Ching-Yao Tsai (back left in white coat), president of the TCUH Zhongxing Branch and the Nursing Department Leadership Team, frequently meet at the TCUH Zhongxing Branch.

The Long Term Care Map system was used to assist the TCH Zhongxing Branch Social Worker Group and Taipei City LTC Development Association to seamlessly transition patients from hospital care to community long-term care facilities. More than 40% of the institution members of the Taipei Silver Development Association enhanced the basic information that UFI gathered from open data by providing detailed elder acceptance criteria such as room type (single/double), gender, intubation care equipment, etc. for quality matching. Now, instead of making more than 100 phone calls to place a patient, it only takes social workers minutes to fill out a request form and receive a list of matching care institutes using LTCMap. Using the system, a social worker could now find a suitable facility for a patient after just a few phone calls, even under a severe LTC facility shortage. This successfully demonstrates the power of information and integration technology, analytics and public-private partnership (PPP) between hospitals, private companies and not-for-profit organizations.

Dr. C-Y Tsai, president of the TCH Zhongxing Branch pointed out in an interview that not every long-term care institution is suitable for every elder, and the nontrivial matching between elder needs and institutional capabilities requires a thorough evaluation of the case and is extremely difficult done manually. Dr. Tsai said that the UFI long-term map was designed to tackle this problem and has been proved through this pilot that it can greatly improve the efficiency of the matching; also, the UFI long-term care map has progressed to a stage where people can find suitable long-term care institutions by themselves, which is almost as convenient as booking a hotel. Mr. Z.D. Tsai, the head of social work at Taipei City Hospital (TCH), Zhongxing Branch, said that the UFI Long Term Care map provided efficient matching, so elderly patients can now be discharged from the hospital with peace of mind [12].

Future directions

Based on lessons learned, UFI (United Financial Intelligence) has begun to expand its solutions and services in several areas, including innovative financial management modules, a secure and trusted charity donation platform to match philanthropy with the LTC needs of vulnerable groups, and a natural language processing (NLP) based quality assurance and smart care & companionship solution to meet the growing demand for remote care in the post-covid19 new normal.

Acknowledgements

We are grateful to the editor of ORMS Today, where an earlier version of this article was published in April 2022, for permission to publish this account in IFORS News.

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▲ Figure 3: (L-R) Co-authors Ko-Yang Wang, Grace Lin, Ting-Hung Shih, Han-Chao Lee (LTCMap team member) and Wei-Chun Shen at the Taipei LTC Exhibition.

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APORS 2022 in Manila, Philippines, and Online:
Real-Time Response to Uncertain Conditions

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▲ Onsite participants with online participants shown as tiles in the screen.

Organized under conditions of extreme uncertainty, the conference of the *Asia-Pacific grouping within IFORS* (*APORS 2022*) was re-scheduled, re-located, and re-formatted in response to the ever-evolving local and regional regulations and restrictions brought about by the pandemic.

What remained constant were the commitment of the invited plenary speakers to be physically present and share their knowledge with participants who came even when the option of joining the conference virtually was available, as well as the quick response of the organizing committee to the conditions and concerns from all sides. The *13th conference of the Association of Asia Pacific Operations Research Societies* (*13th APORS*) was finally held on a hybrid format from November 9 to 12, 2022, at the *Richmonde Eastwood Hotel* in the National Capital Region of the Philippines, in Manila. A total of *120* onsite participants marched to the meeting rooms while *170* online attendees clicked their way to the sessions.

The four-day conference was opened by Commissioner of the Philippine Bureau of Internal Revenue, *Lilia Guillermo*, who outlined efforts of the government to streamline processes and procedures and to identify where these are most needed. The wide range of topics covered from decision analysis, optimization, Artificial Intelligence, teaching of *OR*, and *OR* for Development that address the theme of *"OR: Onwards to Recovery"* could be gleaned from the talks of the plenary speakers.

IFORS Distinguished Lecture (*IDL*) was delivered by *Ahti Salo*, Professor at the Aalto University in Finland drew from his experience as part of the Scientific Panel that advises the Finnish Prime Minister on the Covid response as he noted the challenges of model-assisted policy advice. He discussed at length how to deal with uncertainties in strategic decision making.

Keynote speaker Professor of Systems Engineering and *OR* at the George Mason University *Karla Hoffman* showed that optimization could still assist real-time decision-making even where solutions must be available almost instantaneously. A multi-awarded researcher who advocates use of *OR* in practice, she used two examples from the battlefield and the transport sector to show how and why hybrid optimization works.

▲ Online participants: *IFORS President Prof. Dr. Janny Leung* at top left.

Plenary speaker *James J. Cochran*, Professor of Statistics and Associate Dean at the University of Alabama established an international teaching effectiveness colloquium series and has organized these events in around 20 countries. This wealth of experience makes him a very engaging speaker on how to convince students that *OR/Analytics* is interesting, relevant, important, and enjoyable.

Representing a set of processes and methods applied to machine learning algorithms to promote trust and comprehension of the AI-produced results, explainable artificial intelligence (XAI) was the methodology explained by *plenary speaker* >>

>> *Nina Kajiji* who is a Principal of The NKD Group and an adjunct associate professor in the Computer Science and Statistics Department at the University of Rhode Island, as it applies to designing national health care models. On the other hand, *Gordon Dash* who is Professor of Finance at the University of Rhode Island, in his plenary talk presented a novel approach to optimize the behavioral portfolio management model in the presence of investor biases for ESG sustainability, loss aversion, and cognitive dissonance.

The *plenary talk* of *Gerhard-Wilhelm Weber*, Professor at Poznan University of Technology, Poland, showed examples of how *OR* could address development issues through work he did while at the Middle East Technical University in Ankara, Turkey. His theme revolved around the use of *OR* with other disciplines to improve living conditions.

The parallel sessions of *APORS 2022* brought together 42 papers from all over Asia Pacific and the world. In addition to these was one invited paper, 9 National Contributions, and 7 Youth Forum papers from *APORS* member countries India, Hong Kong, Nepal, Malaysia, Singapore, South Korea, China, the Philippines, and Iran. To recall, the *APORS Youth Forum* was started in 2021 to train and recognize early career researchers and give them a chance to present in international fora and for them to get feedback from experienced professionals.

Majority of the papers were written by authors in the academe, representing universities in the Asia Pacific region, Europe (Germany, Hungary, Switzerland, among others), the U.S., and Canada. In addition to academic research, papers from the private sector including research institutions and manufacturing companies were presented. The unique timing of the conference, shortly after the height of the pandemic but still uncertain of what is to come, made papers from healthcare facilities, national and local governments, and the WHO very popular. Consistent with the conference theme, these research not just analyzed the impact of the pandemic, but also looked forward to recovery efforts.

▲ *IFORS Distinguished Lecturer Prof. Dr. Ahti Salo.*

▲ *Keynote speaker Prof. Dr. Karla Hoffman.*

All in all, there was an enriching blend of research ranging from the theoretical (such as new problem-solving algorithms and metaheuristics) to the applied (such as analytics of the workplace, epidemiology, and vaccine deployment). All presentations provided a better appreciation of how operations research and analytics together, improves systems, and in so doing, improves lives.

Social activities enriched the experience, where participants got to know Manila. The visits to Fort Santiago, Intramuros, Rizal Park, Casa Manila, and the American cemetery gave glimpses of Philippine history under Spain, as well as some events of World War II. The whole-day tour culminated in a *Welcome Dinner* hosted by *E. del Rosario* in her house.

The conference banquet on the evening before the last day, sponsored by the Philippine Tourism Bureau, featured a cultural show that showed dances from Northern to the Southern Philippines. Belting songs out was the operatic singer who gave a flavor of different regional local songs.

▲ *Plenary speakers: Prof. Dr. James J. Cochran, Prof. Dr. Nina Kajiji, Prof. Dr. Gordon Dash and Prof. Dr. Gerhard-Wilhelm Weber.*

▲ *City tour* - at *Fort Santiago* in *Intramuros.*

▲ *City tour* - at *Rizal Park.*

▲ Plenary speakers tour *Tagaytay.*

▲ *Dinner & cultural show* at SMX Convention Center care of TPB.

▲ *APORS Conference Overall Coordinator Dr. Elise del Rosario.*

▲ *IFORS Vice President* representing *APORS* and *Conference Chair Prof. Dr. Francis Miranda.*

Overall, it was a well-rounded experience that highlighted *Operational Research* and analytics, encouraged interactions among participants, gave a chance for delegates who are still not able to travel to participate, and provided a glimpse of the host country's culture and history. Indeed, real-time adjustments in the conference organization paid off very well.

2022 INFORMS Annual Meeting in Indianapolis marks return to fully in-person Annual Meetings!

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*This article was originally posted in the October issue of the *INFORMS* member magazine *OR/MS Today*.

Start your engines! The *2022 INFORMS Annual Meeting* just wrapped in Indianapolis, Indiana! (https://meetings.informs.org/wordpress/indianapolis2022/).

All the events and activities that you have come to expect and enjoy from the *INFORMS Annual Meeting* were held October 16-19. This fully in-person event provided the ideal venue to catch the latest operations research, management science and analytics advances; network among colleagues, recruit new faculty and employees; and enjoy some great food and refreshments at the city that is best known for "The Greatest Spectacle in Racing," popularly known as the Indianapolis 500. And while we couldn't offer a victory lap at the speedway, attendees could take a victory lap around the Indianapolis Conference Center to enjoy the very best *INFORMS* has to offer.

▲ Attendees from across the globe gathered in Indianapolis for the *2022 INFORMS Annual Meeting*.

In addition to a superb collection of invited and contributed presentations and posters, the organizing committee assembled an outstanding collection of plenaries and keynotes to keep attendees informed, educated and, in some cases, entertained. These included *Cynthia Rudin* from Duke University, whose cutting-edge research on artificial intelligence (AI) won her a 2022 Guggenheim Fellowship as well as the 2022 $1 million AAAI Squirrel AI Award for Artificial Intelligence for the Benefit of Humanity, viewed as a "new Nobel."

Attendees also heard *Maxine Bédat* from the New Standard Institute, whose contributions to sustainable apparel are documented in her book, *"Unraveled: The Life and Death of a Garment." Maxine*'s trend setting and avant-garde ideas have spawned a revolution in the fashion industry, which she happily shared.

You may have heard that the biggest change in this year's meeting was NO TECHNICAL SESSIONS on Wednesday. Indeed, no one needed to present their research in a sparsely attended Wednesday technical session! To accommodate this change, INFORMS transformed how attendees delivered their presentations throughout the meeting into three formats: short flash session talks, posters with accompanying 15-minute video presentations and standard 18-minute talks. This change required approval from the *INFORMS* Board of Directors, and they endorsed our proposal with enthusiasm. We envisioned this format would provide a new direction for future *INFORMS* Annual Meetings, and possibly even Society and Section meetings. Our goal was to give *INFORMS* members what they wanted, and we hope that we have delivered with this solution.

Wednesday is now dedicated to activities that benefit *INFORMS* members. *Alvin Roth*, the 2012 Nobel Laureate in Economics, gave a plenary on Wednesday morning. *Beril Toktay*, *INFORMS* Vice-President for Marketing, Outreach and Communication, and *Jeff Cohen*, *INFORMS* Chief Strategy & Innovation Officer, created opportunities for *INFORMS* members to learn about outreach, interacting with the media, communication strategies and the *INFORMS* advocacy program. All attendees could participate and gain valuable experience to help showcase their research to a broader audience.

▲ Attendees of the *2022 Annual Meeting* were greeted by *INFORMS* staff at the first fully in-person Annual Meeting since 2019.

Indianapolis also offered plenty of entertainment opportunities for family and friends who joined attendees at the meeting. The *National Collegiate Athletic Association* (*NCAA*) headquarters and museum were only a few blocks away from the Indiana Convention Center, as was the world's largest Children's Museum, Indianapolis Museum of Art, Indianapolis Zoo and Indianapolis Motor Speedway Museum.

▲ *INFORMS* Chief Strategy & Innovation Officer *Jeff Cohen* welcomes attendees to the first of two advocacy events on Wednesday at the *Annual Meeting*, a panel consisting of five members actively involved in *INFORMS* advocacy and outreach efforts.

▲ *Maxine Bedat* shared fascinating insight on the lifecycle of our clothes in her *plenary session.*

▲ *AAAI Squirrel AI Award winner Cynthia Rudin* kicks off the *2022 Annual Meeting* by delivering the opening *plenary session*.

▲ Attendees packed sessions throughout the *2022 Annual Meeting* to hear the latest *OR/MS* and analytics research, insight, and best practices.

It was wonderful to welcome attendees to the *"Crossroads of America"* (Indiana's state motto). Building upon this, the *2022 INFORMS Annual Meeting* theme, *"At the Crossroads of Analytics,"* promised everything our members look for from the fall meeting, with so much more to make the event – the first fully in-person *INFORMS Annual Meeting* since 2019 – a success.

Sheldon H. Jacobson is a founder professor of computer science and engineering at the University of Illinois Urbana-Champaign. His research interests include data-driven decision-making under uncertainty with application in public policy and public health. His passion for service, giving back and making a difference motivated him to serve as the general chair of the *2022 INFORMS Annual Meeting*.

Cordially thanks to dear ***Ashley Kilgore***, for communication and help to make this particular reprint possible. *G.-W. Weber.*

ASOCIO 2022 in Bogotá and Chía - IV Colombian Conference on OR successfully celebrated

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During the first week of September 2022, the Colombian community of *Operational Research* celebrated the fourth version of the national conference *ASOCIO 2022*, organized in collaboration with Chapters from the *Region 16* of the *Institute of Industrial and Systems Engineers* (*IISE*) and the support of the *Colombian Association of Operational Research* (www.asociocolombia.org). The conference was held in three universities in Bogotá and Chía: Universidad de La Sabana, Universidad Sergio Arboleda, and Universidad de Los Andes.

▲ Colombian Community of *Operational Research* at *ASOCIO 2022 – IISE Region 16*

After three years of an agenda of virtual activities, and since the last *ASOCIO* conference hosted by Universidad Industrial de Santander, the *Operational Research* (*OR*) community had the opportunity to meet in person again, and to share an academic and scientific program. We had five plenary sessions with national and international speakers, who shared their exceptional works on the fields of resilient and sustainable supply chains, food supply chains, optimization of virtual machines placement problems, humanitarian engineering, and data analytics for sustainability.

Plenary sessions included: *Professor Ana Paula Barbosa* from the University of Lisbon, who talked about the sustainability of supply chains. *Professor Christopher Mejia*, from MIT, talked about food supply chains. *Professor Rubén Ruíz* presented optimization models used by Amazon Web Services. *Professor Luis Alejandro Angel* talked about humanitarian engineering. Finally, *Professor Andres Medaglia* shared his experience in analytics and operations research applied in real contexts in Latin America.

There were five tutorials, four of them coordinated by the *ASOCIO* working groups on *OR*, and one dedicated to meet the Editor in Chief of the *Sustainability Analytics and Modeling* (*SAM*) Journal. We also had a forum in open science, and a panel of experts on the future of the interaction between academia and industry. The tutorial of SAM and the forum and the panel are available in our *ASOCIO YouTube channel*. For the youngest, we had a scientific paper competition, distinguished student contests and tutorials sponsored by FLEXSIM.

Thanks to the coordinated work of the Organizing and Academic Committees of the Congress, and the support of *ASOCIO* and *IISE* members, we had 125 participants, 122 works accepted for presentation, 30 parallel sessions, and two student competitions. Works presented in the parallel sessions included the study of *Operational Research* (*OR*) and *Industrial Engineering* (*II*) in a wide set of contexts: mathematical programming; heuristics, metaheuristics, and hybrid algorithms; combinatorial optimization; stochastic programming and simulation; artificial intelligence applications; *OR* and *II* applications on healthcare, operations management, humanitarian logistics and sustainability; supply chains, transportation, and logistics.

▲ *Cristopher Mejía* from MIT and *Rubén Ruíz* from Amazon presenting at plenary sessions.

ASOCIO 2022 participants also enjoyed an academic, social and administrative program with face-to-face networking and meeting after three years. The *ASOCIO* Board of Members had the annual meeting in a hybrid format, and activities developed by the Board during 2022 were presented to the community in our *ASOCIO Newsletter*. Participants had a Networking session, where presentations of student chapters in Latin America presented their activities and future to develop the profession in their contexts.

▲ *Andrés Medaglia* plenary conference.

Conference proceedings will be published in Springer in the series "Lecture Notes in Operations Research". The publication is entitled: *"Operations Research and Analytics in Latin America - Proceedings of ASOCIO / IISE Region 16 Joint Conference 2022"*, soon to be available. Further, there is an open call for papers in the Journal *"Revista Facultad de Ingenieria"* (ISSN:0120-6230) dedicated to present extended versions of the research presented in the congress.

The Colombian community is expecting to meet again in a series of exciting conferences that will take place in different cities in the region:

- *Healthcare Operational Research Graduate School* (*HOpeR 2022*), Bogotá, Colombia. November 28th -December 2nd, 2022 (https://www.hoper-school.com/bogota2022).
- *XX Latin-Iberoamerican Conference on Operations Research* (*CLAIO 2022*), Buenos Aires, Argentina. December 12th-15th, 2022 (https://claio2022.dc.uba.ar/).
- *23rd Conference of the International Federation of Operational Research Societies* (*IFORS 2023*), Santiago de Chile, Chile. July 10-14, 2023 (https://ifors2023.com/).
- *INFORMS/ALIO/ASOCIO International Conference 2024*. Medellín, Colombia. July 16-19, 2024 (https://meetings.informs.org/wordpress/2024international/).

▲ *ASOCIO* Board of Members Meeting.

XXVII EURO Working Group on Locational Analysis meeting: 3 days full of scientific and social activities in an enjoyable friendly get-together in Aveiro, Portugal

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The *EURO Working Group on Locational Analysis meeting* (https://www.euro-online.org/websites/ewgla/ewgla-meetings/), *EWGLA meeting*, is a long-standing series of events that started in 1985 and holds meetings every one and a half years. The COVID-19 pandemic caused a small break from this cadence, forcing to postpone the meeting, which was originally set to occur in 2020. The in-person meeting finally resumed in 2022, September 14-16, in the *University of Aveiro*, Portugal: EWGLA meeting XXVII (http://ewgla.web.ua.pt/).

▲ *EWGLA XXVII* announcement with the venue.

▲ *EWGLA XXVII* welcome session.

EWGLA meetings aim to bring together researchers and practitioners working in the wide area of location science through the proposal of models and methods to solve theoretical and practical problems. These meetings traditionally combine a strong scientific value with a very enjoyable and friendly come together. In addition to presentations from academia, industry or the public sector, the meeting is intended to be a forum for exchange of recent experiences and results. These meetings have had significant success over the years, showing a continuing interest of the research community in locational analysis.

In Aveiro, there were about 60 participants from 12 different countries from America, Asia, and Europe attending the *EWGLA XXVII meeting*. The conference program (http://ewgla.web.ua.pt/index.php/accommodation/detailed-program/) had several interesting sessions on Network Design, Multi-objective, Hub Location, Location under Uncertainty, Location-Routing, Continuous Location, Covering Problems, Discrete Location, Applications, and Competitive Location. In total there were more than 40 contributions, adding to the two keynote talks on Multi-objective and Lot-sizing.

The three-day event started with a Welcoming session with the Vice-Rector of the University of Aveiro for Research and Innovation, *Artur Silva*, as well as the Organizing Committees' chairs, *Rui Borges Lopes* and *Carlos Ferreira*. Participants were greeted and a brief overview of the University of Aveiro's history, as well as some of its departments and defining characteristics were presented. The participants were then invited to enjoy the University and the city, followed by the best wishes of a productive meeting.

The first keynote session ensued, with *Anthony Przybylski* and *Xavier Gandibleux*, both from Nantes Université, France. The talk was titled *"Recent multi-objective branch and bound algorithms and an example in facility location"*. After a short coffee break, the first parallel sessions started. Unexpectedly, there was a power outage during the first parallel sessions – one of those completely unforeseeable moments that requires swift changes to the program. To avoid further delays, the lunch was anticipated, and the program resumed afterwards. In the afternoon, the parallel sessions occurred without further issues, even allowing to recover some of the lost time. The day ended with a social activity: the *Welcome reception* at *Aveiro Museum*. The welcome reception included some appetisers and a visit to the museum, an ancient feminine Dominican convent, built in 1458, where *Saint Princess Joana* lived.

▲ Participants inside *Aveiro Museum*.

▲ Group photo of the *EWGLA XXVII participants*.

In the second day of the meeting, the morning was dedicated to the parallel sessions on Network Design, Covering Problems, Discrete Location, and Applications, with the typical group photo in-between. In the afternoon, activities concerned the social program: a guided tour to salt works, a boat trip in a *moliceiro*, and a workshop and tasting of *ovos moles de Aveiro*. Finally, at the end of the day, there was an optional dinner and visit to Vista Alegre Museum.

▲ *EWGLA XXVII* conference dinner.

The third day started with a plenary session, followed by the second keynote session. The speaker, *Safia Kedad-Sidhoum* (Conservatoire National des Arts et Métiers, France) gave a talk on *"Lot-sizing and sustainability"*. The end of the scientific program occurred in the afternoon of the third day. The last parallel sessions on Network Design and Competitive Location were held, followed by the Closing Session, which included a very special thank you to everyone that made the event possible, and an intervention by *Boglárka G.-Tóth* from the *EWGLA* board, giving a brief overview of the activities of the working group and electing a new board member.

There was to be another last important activity, the conference dinner, which took place in *Casa de São Sebastião*. Participants were able to taste some of the most known local dishes and wine while enjoying a live performance by a cover band.

▲ Visit to the *Marinha da Noeirinha saltworks*.

I would like to thank all the members of the Organizing Committee for their valuable help in the organization, and we are very grateful for the colleagues of the Scientific Committee for so kindly agreeing to review the submitted abstracts. We also would like to thank the sponsors *EWGLA*, University of Aveiro, *APDIO*, *CIDMA*, and *GOVCOPP* for their support. Finally, a special thank you to all the participants, which graced us with their know-how and immensely contributed to a very enjoyable time.

I hope all involved had a successful and fruitful meeting, with new ideas and collaborations, and look forward to seeing you all in the next *EWGLA* meeting!

Operational Research on Adriatic coast again – KOI 2022 in Croatia

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The *19th Conference on Operational Research, KOI 2022*, took place in *Amadria Park* near *Šibenik*, Croatia, on September 28-30, 2022. It was organized by the Croatian Operational Research Society (CRORS) in cooperation with the Faculty of Economics Business and Tourism, University of Split, as co-organizer.

▲ *Opening Session* (from left to right): *Tea Šestanović, Mario Jadrić, Vinko Muštra, Luka Neralić, Lidija Zadnik Stirn, Marc Sevaux,* and *Tea Mijač* (presenting).

After the last *KOI Conference* in the midst of the COVID pandemic in 2020 (in the same place, actually), we were pleasantly surprised by how many participants arrived this time. Indeed, there were 141 participants from 24 different countries. In total, there were 109 presentations spread across 12 special sessions (e.g., Game theory, Applied Graph Theory) and five regular ones (Mathematical Programming, Applied Statistics and Econometrics, Multicriteria Decision Making, Machine Learning and Data Mining, Behavioral Operational Research, Optimization in Human Environment). In addition, there were three plenary speeches - by *Professor Marc Sevaux*, *President of EURO* (Université Bretagne Sud, France), *Professor Yurii Nesterov* (UCLouvain, Belgium), and *Professor Ozren Despić* (Aston University, UK). The conference program was enriched with one special lecture by Professor Luka Neralić and a workshop by *Goran Zaharija* on machine learning, deep learning, and image recognition. The workshop showed us funnily and engagingly common obstacles of such methods in real life. Last but not least, right at the start of the conference, *Professor Zoran Babić* received the *Award for Special Contribution* to *CRORS 2021*.

▲ *Appropriately celebrating* with *official anniversary cake!*

▲ *KOI 2022*: participants enjoying the social outing.

Special thanks go to the organizers of special sessions, session chairs, and those contributing through valuable presentations and discussions. The next instalment of this biannual conference is planned to be held on September 25-27, 2024, in the coastal town of *Brela* in Croatia, not far from Split. We cordially recommend that you join us there. Also it was advertised that the next Slovenian biannual conference will take place in Bled on September 20-22, 2023.

Also the meeting allowed us to celebrate the 30th anniversary of *CRORS*, which was done, of course, with cake!

The non-scientific program of the conference was rich and exciting as well. On the second day of the conference, sessions ended at 3 PM, and we were all taken by bus from the *Amadria Park* resort to the very center of Šibenik. Here, energetic and knowledgeable guides toured us across the beautiful historic city, particularly highlighting St. Jacob's Cathedral which is one of two heritage sites in Šibenik. In the end, we were invited to enjoy a sip of local brandies and try a local specialty called "fritule", a soft round doughnut sprinkled with sugar. >>

▲ *CRORS 2021*: organizers; from left to right: *Josipa Višić*, *Blanka Skrabić Peric*, *Tea Šestanović*, *Mario Jadrić*, *Tea Mijač*, *Ivana Ninčević Pašalić*, *Mario Pepur*.

>> The bus then took us away once again, this time towards the hills above the city. Here, an opulent and wonderful dinner took place together with a concert of local musicians. In the end, their traditional songs got the majority of participants, even those from abroad, not knowing the words, to dance.

And this was not the end. *Prof. Blanka Škarbić Perić* led two morning workouts of Tabata and HIIT. I hope I can speak on behalf of us all when I say that the energy shot was precisely what we needed to enjoy the conference even more. And we even got an official certificate!

The conference was, as always, exceptionally well organized and provided much needed opportunities to engage with the community; its research, its energy, and its friends.

▲ Friends and colleagues enjoying companionship at *KOI 2022*.

OR Education showcased at Diagold Nursery, Primary, and College - an innovative sparkling young workshop in Lagos, Nigeria: "OR the key to fulfilling your dreams"

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▲ *OR Education showcased*: Some graduands and their parents at the graduating ceremony/workshop.

August 4, 2022, could be described as momentous, captivating, and beguiling as the ever-golden *Diagold Nursery, Primary, and College* in Ladeboye, Lagos, Nigeria marked their graduation, speech, and prize-giving day ceremony which was heavily greased by some highly distinguished personalities like the Former Chairman Ladeboye Community Development Association (LCDA), *Dr. Olabode Adewoye*, who doubled as Guest Speaker; the Chairman of the occasion *Rev. Ayoola Aluko*; Deputy Superintendent of Police (DSP) *Esther Ijeoma*, Parent Teacher Association (PTA) Chairman, *Mr Otta*; the Chairman of Progressive Zone Ladegboye, *Wale Olatunbosun*; the Abode of love members; *Rev. Femi Oladunjoye*; *Mr. Kadri Tajudeen*, a Chemist and a friend of the Schools; Parents; Staffs; Students and other friends of the School.

The Chairman of the occasion, *Rev Ayoola* gave his welcome address. Following the chairman's speech was DSP *Esther Ijeoma*'s advice to the Students and Pupils of the Schools to take their education more seriously than their Mobile Phones, Tabs, and iPads, etc. She added that parents should monitor their children always and be mindful of what the children do with their electronic gadgets despite the fact that technology has taken over everything nowadays.

Dr. Olabode made a presentation on the topic *"OR the key to fulfilling your dreams"*. He gave some definitions of *Operational Research* (*OR*) and emphasis on the *OR Society of United Kingdom* definition. He summarized how some techniques of *OR* have affected developed countries positively. He said coming to school for education is a good decision. He told the graduates, that next the decision is key in their lives. The decision to move to higher education or to learn a skill. If higher education is the choice, the next decision is to decide on an area of specialization (*"Decision to specialize in Science"*, "*Art or commercial"*). He introduced the audience to the Decision tree and Environment of Decision making. The environment of decision making which are: economic situation, technology, Society, religion, political, and legal systems. He made mentioned some opportunities that accrue to him as a result of his decision to have higher education, despite an unfriendly environment of decision-making in developing countries like Nigeria. He further stressed how *OR* and its applications are helping in improving teaching and learning through redesigned course content, teaching strategies, technology, classroom environment, and education system general evaluation.

▲ Set of graduating pupils.

Following the presentation, was a questions and answers session. Next, was the advice from *Ayoola* to the outgoing students to continue to imbibe the much they have learned from the school in every area of their lives and that they shouldn't deviate from learning because it is a continuous process. *Kadri Taju* said that every child has a gift that needs to be discovered, so as the graduands step out of Diagold they should focus on their lives and that they are able to discover themselves.

Miss Grace Oyeboade, the Head Girl and one of the outgoing students Set 2021/2022 said in her speech that she would ever be grateful to her parents, teachers, and management of the school. She expressed her joy, saying, it is a glorious moment for her and her classmate to witness the first, second, and third inter-house sports of the school which were held at Ladeboye football field in 2017, 2019, and 2022 respectively. All such memories were available for them and they will be in their hearts as they proceed to other schools.

Master Fareed Salako the outgoing Head Boy of the 2021/2022 Set, said he is so overwhelmed and filled with joy, and thanked his parents for sending him to school. He appreciated all parents for their love and

▲ Cultural display by students at the event.

care. *Fareed* congratulated all graduands for exhibiting a high level of courage. He urged parents who did not send their children to school to do so rather than sending them to the streets to hawk because education is more important than any other thing and is the door doorway to success. Once more, to the graduands, *Fareed* said the years in this magnificent citadel of knowledge have been dramatic, tough, and challenging but all the break ups, the make make-ups, shouting, the merriments, etc are now experiences of the past which they will cherish and forever remain fresh in their memories as they disperse to a new stage of academic life.

The Proprietress of the Diagold *Schools*, *Dupe Adewoye* began her speech by first appreciating all that were present. She gave the history and progressive report on the school. She said the School was established on the 20th of September 2010, and Diagold College started in September 2019. The population of both Pupils and students of the School has continuously grown since its establishment. Our goal is to be first, in academic excellence, also established to train future leaders and provide education to all eligible pupils and students at affordable fees.

The day was full of activities, the kids had fun as the party featured lots of presentations from different groups of pupils. The first presentation was a breathtaking rendition from the wonderful School Choir followed by other activities such as instrumental harmony and synchronization, drama, news casting, cultural dancers (Yoruba and Igbo), reading of poems, and storytelling presentation. The climax of it was the presentation of certificates to the graduating pupils and students.

▲ Some academic staff of the School.

EURO Hope Mini-Conference 2022 in Istanbul

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The *EURO Working Group on Humanitarian Operations Mini-Conference 2022* was organized by *Burcu Balçık* from Özyeğin University, *Bahar Yetiş* from Bilkent University, and *Sibel Salman* from Koç University in Istanbul during October 5-7. The conference was held in a hybrid format over the *"Recent Developments in Humanitarian Operations"* theme. The organization details were provided on the conference website: https://euro-hope2022.ku.edu.tr/.

The opening speech of the conference was given by *George Fenton*, the Chief Executive of the *Humanitarian Logistics Association*. He summarized the challenges in humanitarian supply chain management in the post-Covid era and stressed the importance of being "local as possible and global as necessary". He also highlighted the need for evidence-based research to support humanitarian operations in his speech.

39 presentations from 16 different countries took place at the conference. In total, 71 attendees participated in online and physical sessions. Studies in various fields of humanitarian and healthcare operations were presented throughout the conference. Eleven sessions with different themes were scheduled after careful selection and grouping of the submitted abstracts. The sessions focused on *Healthcare Operations, Disaster Response Operations, COVID-19 and Vaccination, Disaster Preparedness, Disaster Resilience, Disaster Response Operations, Refugee and Migration Problems, Fairness in Humanitarian and Healthcare Operations, Resilient and Sustainable Supply Chains,* and *Trends and New Technologies in Humanitarian Operations*. The detailed program schedule can be found at: https://euro-hope2022.ku.edu.tr/?p=923.

▲ *Organizers* (first picture from left to right): *Sibel Salman, Bahar Yetiş, Burcu Balçık,* and the *Organizing Committee* (second picture from left to right): *Çağrı Özmemiş, Sibel Salman, Zeynep Şentürk, Bahar Yetiş, Burcu Balçık, Gizem İkizler, Ecem Yücesoy*.

Practitioner Panel

On the second day of the conference, a practitioner panel took place with the participation of *İstanbul Municipality Disaster Coordination Center* Consultant, *Prof. Dr. Şerif Barış* from Kocaeli University, Executive Director of *Needs* Map, *Evren Aydoğan*, *Support to Life Moldova* Country Coordinator, *Volkan Pirinççi*, and Director of *Istanbul Fire Department*, *Emir Fatih Akbulat*.

The main theme of the panel was *"Local Response, Coordination, and Collaboration"*. Each practitioner made a presentation to demonstrate the scope of their organization and explained how their organization is involved in with various humanitarian operations. They addressed the operational challenges faced before and after large-scale emergencies. Research questions such as "What are the main challenges in local response?", "What are the needs to improve coordination?", "What could be new tools and technologies to facilitate coordination and collaboration in local response?" were raised during the Q&A session after the presentations. The session stimulated intellectual discussions among the participants and practitioners and created opportunities for new collaborations.

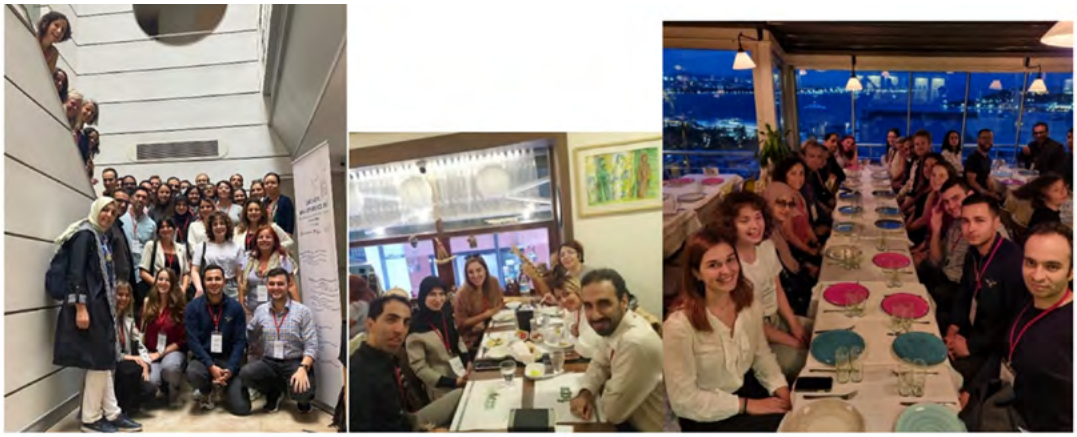
▲ *EURO Hope Mini-Conference 2022: George Fenton* delivering the opening speech.

▲ *Practitioner panel* (panelists from left to right): *Emir Fatih Akbulat, Şerif Barış, Volkan Pirinççi, Evren Aydoğan*, and *Moderator: Burcu Balçık*.

▲ *Alfonso Pedraza-Martinez* giving his speech.

▲ Presenters during the *"Disaster Preparedness and Resilience"* and *"Fairness in Humanitarian & Healthcare Operations"* sessions.

▲ Logos of the organizations that participated in the *practitioner panel.*



▲ Physical attendees, conference lunch, and dinner.

Luk Van Wassenhove Award

The *Luk Van Wassenhove Award* ceremony was held as the closing event of the first day. The recipient of the award was announced by *Maria Besiou*. Owing to his valuable efforts in humanitarian operations, *Alfonso Pedraza-Martinez* was deemed worthy of this award and gave a thank-you speech by expressing his gratitude to over a hundred people.

The conference provided the attendees with numerous social activities such as lunches, the conference dinner, and an informal walking tour. These social gatherings allowed the participants to get to know each other and connect.

Next Conference: University of Bath

The next *Euro HOpe Mini Conference* will be held at *The School of Management at the University of Bath* during September 18-19, 2023. The organizers of the conference will be *Melih Celik* and *Milad Keshvarifard*.

EUROPT Workshop 2022 in Lisbon: enjoying Continuous Optimization in person again

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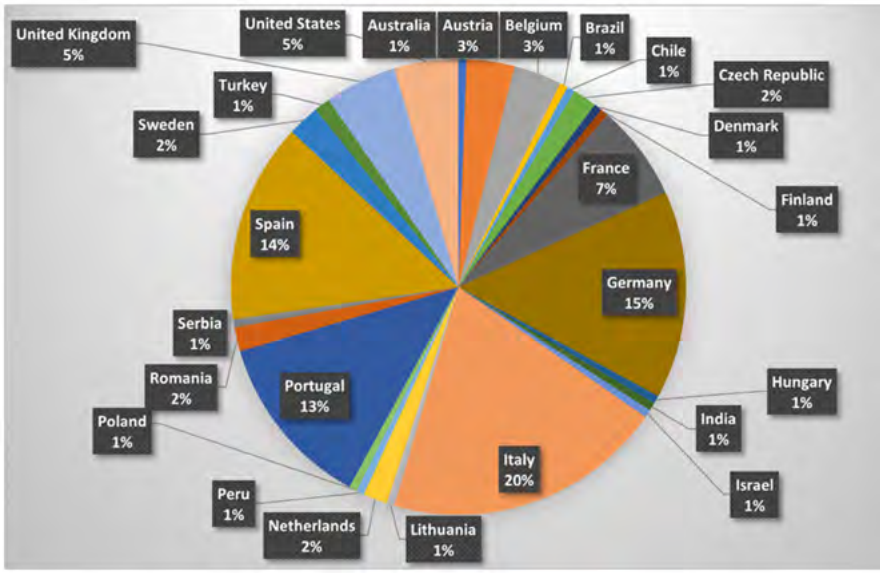
EUROPT 2022, the 19th edition of the *EUROPT Workshop on Advances in Continuous Optimization*, that is the annual conference of *EUROPT*, the *EURO* Working Group on Continuous Optimization, has been held from July 29 to 30, 2022, at Universidade NOVA de Lisboa, Portugal: https://sites.fct.unl.pt/europt2022/

Since the foundation of *EUROPT* in 2000, this conference has been held every year (except on 4 occasions) in a European city (but for 2011 in Australia and 2017 in Canada), and is one of the major events in the European mathematical optimization community. The 2021 edition was organized in Toulouse (France) and held in virtual format due to the COVID-19 pandemic.

EUROPT 2022 has been a great opportunity for the *EUROPT* community to get together in person again and enjoying sharing the latest developments in Continuous Optimization.

The Program Committee, chaired by *Giancarlo Bigi* (Università di Pisa) and co-chaired by *Paula Amaral* (Universidade NOVA Lisboa) and *Sonia Cafieri* (ENAC, Toulouse), was composed by 26 *EUROPT* members, including the *EUROPT* Managing Board, as well as some *EUROPT* Fellows and *EUROPT* Past and Honorary Chairs. The Organizing Committee was composed by 5 members from Universidade NOVA Lisboa and chaired by *Paula Amaral*.

Registered participants were 176 from 26 countries, with the geographical distribution depicted in the figure below. Among these participants, 47 were graduate students.



▲ *EUROPT 2022*: participation by countries.

Scientific Program

The rich scientific program of the conference covered all aspects of continuous optimization, and was organized in 12 special invited streams organized in 5 or 6 parallel sessions. Each session grouped 3 or 4 talks, each on a time slot of 25 minutes.

Three *Plenary Lectures* were delivered by distinguished scholars: *Marc Teboulle*, Professor at Tel Aviv University, on *Algorithms for Structured Nonconvex Optimization*; *Dolores Romero Morales*, Professor at the Copenhagen Business School, on *Transparent Machine Learning Calls For More Optimization*; and *Alper Yildirim*, Professor at The University of Edinburgh, on *Convex Relaxations of Nonconvex Quadratic Programs: A New Perspective via Convex Underestimators*.

Every year, the *EUROPT* Working Group honours outstanding researchers in continuous optimization by awarding the *EUROPT Fellowship*. The Fellowship is presented to the awarded researcher at the *EUROPT Workshop*, where the Fellow delivers the *EUROPT* Fellowship Lecture as a plenary talk. The recipient of the *2022 EUROPT* Fellowship was *Oliver Stein*, Professor at Karlsruher Institut für Technologie, who delivered the *EUROPT* Fellowship Lecture on *Branch-and-bound for Continuous and Mixed-integer Multiobjective Optimization*.

Social Program

EUROPT 2022 incorporated also a series of social events.

o A conference dinner was organized on July 29th. A nice gift was offered at this occasion to all the organizers of streams and special sessions.

o A farewell sunset barbeque was organized on July 30th on the conference site in the university campus. The participants were able to say goodbye in a friendly and relaxed atmosphere.

o The participants still on site on July 31st could enjoy also a guided visit to a wine cellar in Bacalhoa.

▲ *EUROPT 2022*: participants group picture.

The rich scientific and social programs of *EUROPT 2022* made it a great event allowing the *EUROPT* community to get together again in person after the COVID-19 pandemic, and enjoying advances in Continuous Optimization. The community is now already looking forward to the next event gathering the whole community, that was announced to be held on August 2023 in Budapest, where the working group was founded in 2000.

Experimental Science and Engineering and OR:
The 9th ICCESEN Celebrated in Antalya

Feride Kulalı Özdek <feride.kulaliozdek@uskudar.edu.tr>

▲ *Organizing Committee* of *ICCESEN* in Antalya (with their families).

The *9th International Conference on Computational and Experimental Science and Engineering* (*ICCESEN 2022*) was successfully held in Antalya at October 28-31, 2022 (http://2022.iccesen.org/). *ICCESEN 2022* was detailed in 10 different themes (http://www.iccesen.org/page/topics): Physical Science and Technology, Mathematical-Modelling - Science and Applications, Energy and Applications, Earth Science and Applications, Engineering Science and Applications, Material Science and Applications, Biological, Medical and Health Science and Applications, Social and Education Sciences and Applications, Agricultural and Food Science and Technology, Forestry and Environmental Science and Engineering.

Almost 200 participants from 17 countries shared their valuable studies both online and face-to-face sessions. During the conference, where artificial intelligence was determined as the main theme this year, general speeches were made that led to various fruitful discussions. Five plenary lectures were delivered by

Dr. Jana Lipkovski - University of Belgrade, Serbia: "*Sustainable development of dense urban areas in correlation with planning requirements of educational facilities and belonging open spaces – an issue of social welfare*",
Dr. Hayat Arbouz - University of Blidal, Algeria: *"Optimization of Lead-Free CsSnI3-based Perovskite Solar Cell structure"*,
Prof. Dr. Madjid Fathi - Dept. of EECS University of Siegen, Germany: *"An AI approaches: Integrated CPS to process Recommender System in Engineering"*,
Prof. Dr. Gerhard-Wilhelm Weber - Poznan University of Technology – Poland: *"New Contributions to Aggregate Production Planning with Outsourcing under Uncertain Seasonal Demand - Supported by Human Factors."*,
M. Shaheer Akhtar, Jeonbuk National University, Korea: *"Recent Development in Perovskite Solar Cells: Stability Issues"*.

The conference was organized by *Prof. Dr. Iskender Akkurt* (Süleyman Demirel University, Isparta, Turkey). Organizing committee members from various universities supported the chair.

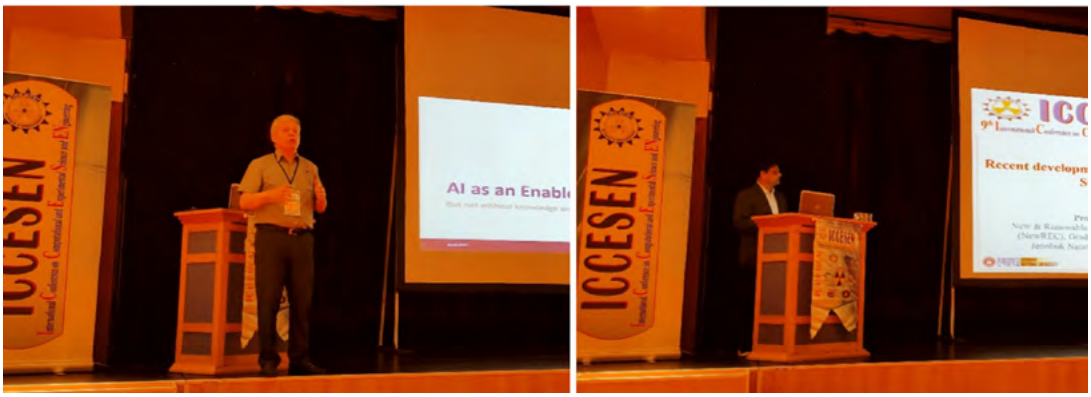
The opening speech were made by the chair of the conference to welcome all the participants and to give a brief introduction on *ICCESEN 2022*. An esteemed late colleague *Dr. Oleg Burdakov*, who attended the previous conferences as invited speaker many times, was remembered with respect. The invited speaker session has begun with the presentation focused on social welfare of *Dr. Jana Lipkovski*. Secondarily *Dr. Hayat Arbouz* had a delightful plenary talk, where she discussed Solar Cell technologies. After the invited speaker session, the presentations continued in three different halls.

During the second day invited speaker session, *Professor Madjid Fathi* gave an inspirational speech on AI approaches and shared his valuable opinions about this important scientific meeting with the participants. >>

>> Then *Dr. Akhtar* presented an enlightening talk on Recent Development in Perovskite Solar Cells. Solar cells were one of the most popular subjects of *ICCESEN 2022*, discussed in following sessions and there were quite a lot of researchers working on Solar Cells simulations.

▲ *Plenary lectures* of *Dr. Jana Lipkovski* (on the left) and *Dr. Hayat Arbouz* (on the right).

Prof. Dr. Gerhard-Wilhelm Weber was one of the distinguished speakers who could participate as online. His presentation was followed with great interest. He focused on developing a mathematical model on sustainable aggregate production planning under uncertain seasonal demand with the aim of total cost minimization, total pollution minimization and reliability maximization. He also mentioned about ongoing and future international collaborations and invited the participants at *IFORS 2023* - The *23rd Conference of the International Federation of Operational Research Societies*, Santiago, Chile, 10th -14th July 2023, and *EURO 2024* – The *33rd European Conference on Operational Research* on 30th June - 3rd July 2024.



▲ *Plenary Speakers: Prof. Dr. Madjid Fathi* (on the left) and *M. Shaheer Akhtar* (on the right).

▲ *Plenary lecture* of *Prof. Dr. Gerhard-Wilhelm Weber.*

The conference was established very well within a hospitable frame, where participants had the time to meet old and new friends, to share their experiences, to exchange their ideas and to collaborate for future studies. The talks spanned a wide variety of topics, from education to health applications. Radiation shielding, thin film and coating technologies, solar energy systems and radiotherapy were prominent topics as well. Many studies were promoted by *Operational Research* (*OR*) through Optimization, Network Data Analytics, Data Mining, Machine and Deep Learning and Artificial Intelligence. The conference provided a private environment and an international platform with exclusive access to connect attendees and share news about *OR* work and *OR* meetings.

▲ *ICCESEN 2022:* A group photo after first session.

ICO-2022 Thailand Online - A Global Research Platform on Intelligent Computing & Optimization, and OR

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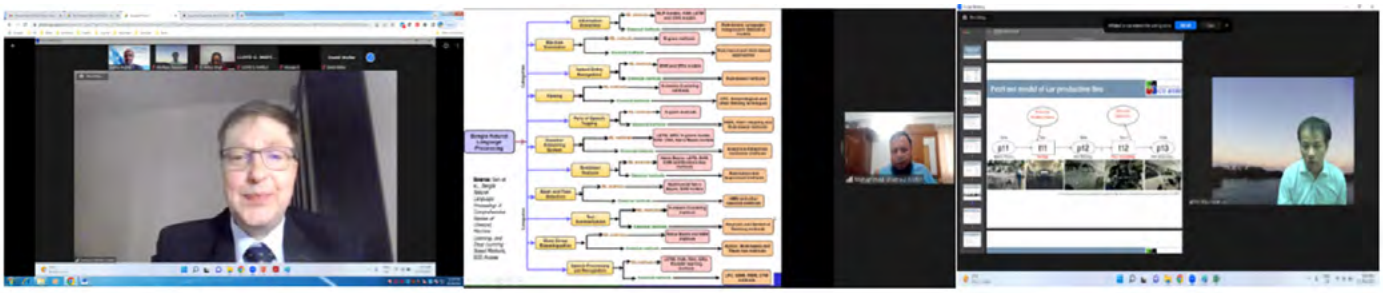


▲ Impressions at *ICO 2022* (from left to right): 1. *Professor Gerhard-Wilhelm Weber* delivering his opening ceremony talk, 2. *Professor Mohammed Shamsul Arefin* delivering his keynote talk, 3. *Professor Morikazu Nakamura* delivering his keynote talk.

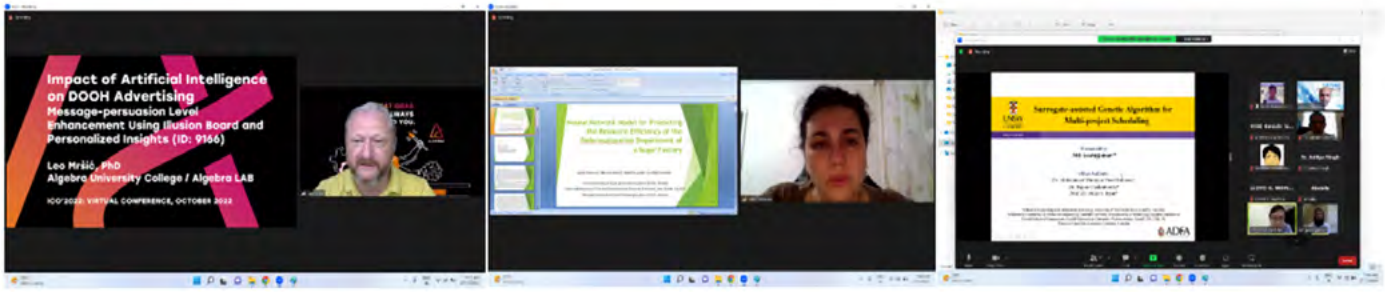
Continuing with its aim of bringing together global research academicians, scholars, experts and scientists to share their knowledge and experiences on contemporary topics in the areas of *Intelligent Computing and Optimization* (*ICO*), the 5th edition of the *International Conference on Intelligent Computing and Optimization*, *ICO 2022*, was held during October 27-28, 2022, at Thailand via Zoom through Webinar.

Professor Gerhard-Wilhelm Weber inaugurated the event with his talk on early morning of October 27. This was followed by presentations of papers by conference authors. This two-day conference comprised of interesting keynote talks by *Prof. Mohammed Shamsul Arefin* on the topic of *"Data Science and Machine Learning for Smart Applications"* and by *Prof. Morikazu Nakamura* on *"Modeling-based Optimization for Linear Integer Programming and Quantum Annealing based on Petri Nets"*.

Other interesting engaging talks included presentations by *Professor Naoshi Shiono* (Japan) on *"Planning Optimization of Cylinder Distribution via IoT"*, *Professor Vipin Balyan* (South Africa) on *"Influence of COVID and AI on Teaching and Learning"* and by research scholar *Thanh Dang Trung* on *"Economic Efficiency Of Urban Agricultural Production Models"* from Thu Dau Mot University, Vietnam.

Approximately 100 participants took part in this two-day event. Session chairs enthusiastically made notes, reviewed papers and made their comments while participants presented their papers with great passion. Young researchers from all parts of the world tried their level best to exhibit their skill and talent in presenting their novel results and findings.

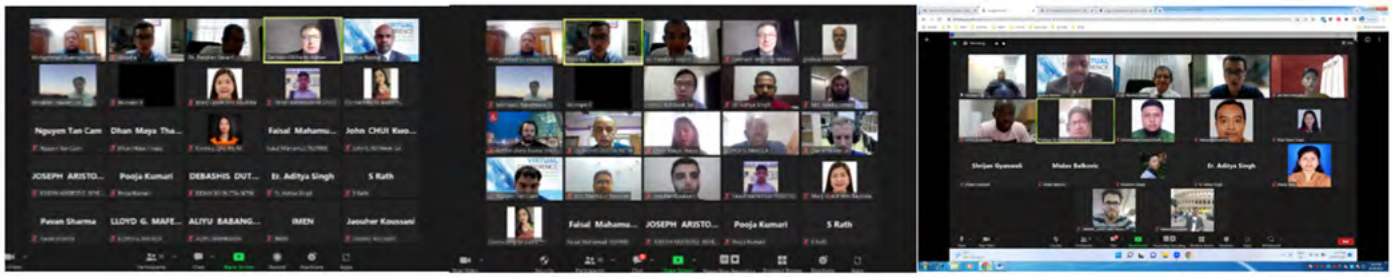
The event closed on a delightful note with *Prof. Joshua Thomas* announcing the best paper and the best presenter awards during the closing ceremony. At *ICO 2022*, the efforts, passion and contribution of the presenters were honored by felicitating them with awards for their scholarly and novel research applications presented by them at the event. These awards included:



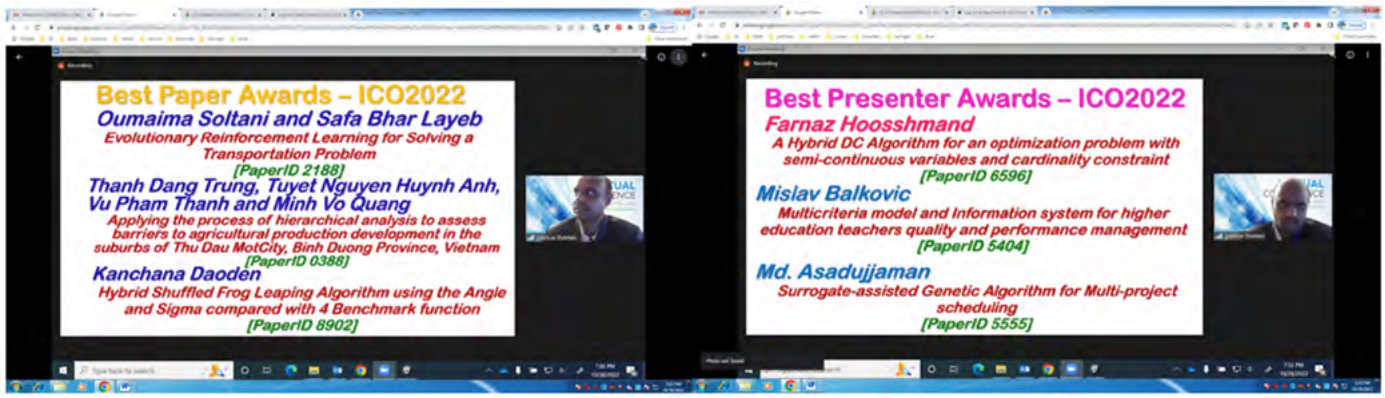
▲ Impressions at *ICO 2022* (from left to right): 1. *Professor Leo Mrsic* (Croatia) delivering his research talk on artificial intelligence for advertising, 2. *Professor Lidiia Vlasenko* (Ukraine) sharing her novel research findings and results, 3. Discussion between research scholar, *Md. Assadujjaman* from NSW, Australia, and *Prof. J. C. K. Tai* from Hong Kong.

1. The *ICO 2022 Global Champions Award Winners*: i) *Prof. Dr. Mohammad Shamsul Arefin* (Daffodil International University), Bangladesh; Chittagong University of Engineering and Technology, Bangladesh); ii) *Prof. Dr. Mohammad Shahadat Hossain* (University of Chittagong, Bangladesh) and *Prof. Dr. Karl Andersson* (Luleå University of Technology, Sweden); iii) *Prof. Dr. Elias Munapo* (North West University, South Africa) and *Dr. Vladimir Panchenko* (Department of Theoretical and Applied Mechanics; Federal Scientific Agroengineering Center VIM, Russia; Russian University of Transport, Russia).

2. *Excellence Award Winners*: i) *Dr. Nguyen Tan Cam*, University of Information Technology, VNU-HCM, Vietnam, ii) *Shahadat Hossain*, City University, Bangladesh, iii) *Prof. Dr. Mohammed Moshiul Hoque*, Chittagong University of Engineering and Technology (CUET), Bangladesh.



▲ Group photos of participants at *ICO 2022*.



▲ *Professor Joshua Thomas* announcing the Best Paper and the Best Presenter Awards at *ICO 2022*.

3. *Best Reviewed Paper (Easy Chair) Award Winners*: i) *Keisuke Tokuhira, Morikazu Nakamura, Mitsunaga Kinjo* and *Katsuhiko Shimabukuro*, Easychair ID: 0522: *"Model Formulation based on Petri Net Behavioral Description for Combinatorial Optimization Problems"* (Japan), ii) *Mary Grace Ann Bautista, Jonnel Alejandrino, Oliver John Alajas, Christan Hail Mendigoria, Ronnie Ii Concepcion, Elmer Dadios, Argel Bandala* and *Ryan Rhay Vicerra*, Easychair ID: 6052: *"8-10-gene Expression-based Atom Search for Aquaponic Lettuce Evapotranspiration Optimization Based on Photosynthetic Light Properties"* (Philippines), iii) *Arpita Chakraborty, Utpol Kanti Das, Juel Sikder, Maisha Maimuna* and *Kamrul Islam Sarek*, Easychair ID: 0327: *"Content Based Email Spam Classifier as a Web Application Using Naive Bayes Classifier"* (Bangladesh).

4. *Best Paper Award Winners*: i) *Oumaima Soltani* and *Safa Bhar Layeb*, LR-OASIS, National Engineering School of Tunis, University of Tunis El Manar, Tunisia: *"Evolutionary Reinforcement Learning for Solving a Transportation Problem"*, ii) *Thanh Dang Trung, Tuyet Nguyen Huynh Anh, Vu Pham Thanh* and *Minh Vo Quang*, Thu Dau Mot University, and Can Tho University, Vietnam: *"Applying the process of hierarchical analysis to assess barriers to agricultural production development in the suburbs of Thu Dau Mot city, Binh Duong province, Vietnam"*, iii) *Kanchana Daoden*, Smart Electronics Engineering, Faculty of Industrial Technology, Uttradit Rajabhat University, Thailand: *"Hybrid Shuffled Frog Leaping Algorithm using the Angle and Sigma compared with 4 Benchmark function"*.

5. *Best Presenter Award Winners*: i) *Farnaz Hoosshmand*; Amirkabir University of Technology, Department of Mathematics and Computer Science, Iran: *"A hybrid DC algorithm for an optimization problem with semi-continuous variables and cardinality constraint"*, ii) *Mislav Balkovic*, Algebra University College, Croatia; *"Multicriteria model and information system for higher education teachers quality and performance management"*, iii) *Md. Asadujjaman*: University of New South Wales, Australia: *"Surrogate-assisted Genetic Algorithm for Multi-project Scheduling"*.

This was followed by question-answer as well as feedback and comments sessions respectively which made the event livelier and engaging.

The next chapter of this fascinating event, i.e., the *6th International Conference, ICO 2023*, will be an *On-Site* conference and will be held at G Hua Hin Resort & Mall, Hua Hin, Thailand on 27-28th April 2023. Paper submissions for this conference are open now at the weblink https://easychair.org/cfp/ICO-2023. Like every year, it is anticipated that the *ICO 2023* conference will be able to receive around 250-300 submissions and will attract researchers, scholars, academicians and experts from various countries across the globe including Bangladesh, Russia, South Africa, Vietnam, Croatia, Iran, Ukraine, Philippines, Japan, Tunisia, Cyprus, India, Hong Kong, Thailand, Czechia, Oman, Nepal, South Korea, United Kingdom, Mexico, Australia.

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[2] The 6th ICICO-2023, G Hua Hin Resort and Mall, Hua Hin, Thailand (In Person/On Site Event), https://www.icico.info/.
[3] Special Issue "Smart Algorithms for Computing, Modeling and Optimization", https://www.mdpi.com/journal/algorithms/special_issues/Smart_Algo.
[4] Special Issue "Intelligent Computing, Modeling and its Applications", https://www.mdpi.com/journal/computation/special_issues/ICO_2021.
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Discussing Security at the Nation's Capital with INFORMS

Ashley Smith <asmith@informs.org>

Dozens of *INFORMS* members converged on the U.S. capital August 29-30, for the second *INFORMS Conference on Security*. I had the pleasure of attending the conference on Monday given its proximity to the *INFORMS* office, which is located just outside of Baltimore (https://meetings.informs.org/wordpress/2022security/).

The rooms at the Renaissance Arlington Capital View Hotel were full of attendees interested in security-related issues. The presenters spoke about key issues regarding the latest research, insights and proven applications for addressing a broad spectrum of complex security challenges at the individual, organizational and national and global levels.

The two *Keynote Speakers* I had the opportunity to listen to were outstanding.

▲ *Keynote speakers* at *INFORMS Conference on Security*, 2022 (from left to right): 1. *General Norton Schwartz*, President, Institute of Defense Analyses, 2. *Josh Lospinso*, CEO, Shift5, 3. *Johannes O. Royset*, Professor of Operations Research, Naval Postgraduate School, and 4. *Rajan Batta*, SUNY Distinguished Professor and Associate Dean for Faculty Affairs and Diversity, School of Engineering and Applied Sciences, University at Buffalo (Source: https://meetings.informs.org/wordpress/2022security/).

General Norton Schwartz is the president of the *Institute for Defense Analyses* (*IDA*). He spoke about the structure for joint warfighting and the new opportunities for analytic support to the Department of Defense. IDA works to answer U.S. security and science policy questions leveraging scientific, technical and analytic expertise. *General N. Schwartz* detailed some of the recent analyses performed by the agencies and their significant impact. After his comments, he opened the floor for questions that resulted in a slew of attendees picking the brain of the highly experienced military expert.

Later in the afternoon, *Josh Lospinoso*, CEO of Shift5, captured the audience's attention as he spoke about cyber vulnerabilities in the Department of Defense's weapons systems. He said these systems have many digital components and are network and software dependent but have many vulnerabilities to cyberattacks. He works to find and test the vulnerabilities and find solutions to address the threats. *J. Lospinoso* also discussed commercial transportation such as aircraft, maritime vessels, freight/passenger rail, satellites and road vehicles, and the cybersecurity issues related to them. He discussed these broad problems and how to fix them. The discussion that followed was robust and had to be cut off due to time constraints.

The parallel sessions offered additional detailed talks regarding more specific topics, including artificial intelligence in security, public health and emergency preparedness, power system resilience and security, security in transportation, and supply chain security, among other topics.

Overall, the first day of the conference was incredibly informative and brought together members with common interests. There was a great deal of networking from the coffee breaks to lunch and the evening reception.

The conference offered insights from highly qualified people looking to make a difference in the security space. Together, this conference brought to light how our community can work together using data and analytics to make the world a safer place.

Ashley Smith is the public affairs coordinator at *INFORMS*. She has been with *INFORMS* for more than 3 years and helps advocate for members and their research to be used as a resource to help those in positions of power to make better decisions.

Cordially thanks to dear ***Ashley Kilgore*** for communication and help to make this report possible. *G.-W. Weber*

Multi-disciplinary International Pension Conference, Poznan University of Technology, Poland, 2022 - "Social Security Systems in the Light of Demographic, Economic and Technological Challenges"

Tomasz Brzęczek <tomasz.brzeczek@put.poznan.pl> **Krzysztof Kołodziejczyk** <krzysztof.kolodziejczyk@put.poznan.pl>
Marek Szczepański <marek.szczepanski@put.poznan.pl>

▲ *International Pension Conference*: photo with some of the participants.

VII International Pension Conference "Economic, demographic and technology challenges to social security systems" took place on 28-29 September 2022 at Faculty of Engineering Management of Poznan University of Technology (PUT), Poland. It was chaired by *Prof. Marek Szczepański*.

The main objective was the discussion of challenges to pension system, long-term care about the old and labour market (with a special focus on population aging).

Also issues of optimization of investment strategies for pension funds under risk and uncertainty and longevity risk management have been discussed during the conference.

Participation could be in person (cf. photo) or by online presentation according to participants' choice. Sessions in Polish and English were transmitted through *YT Channel* of PUT. We also welcomed professionals from financial institutions including *Polish Social Insurance Institution* (*ZUS*). There were 55 participants from 6 countries and 3 continents. Further information can be found at https://mke2022.put.poznan.pl/.

The scientific and implementation topic of modern *pension fund systems* is of a highest importance for our societies of tomorrow worldwide and recognized as one of the great challenges of modern *Operational Research*.

Keynote speakers invited to the conference included:

o *Prof. Marek Góra*, Warsaw School of Economics, *"Longer Economic Activity. The Economic and Social Challenge for Decades to Come"*,
o *Prof. Agnieszka Chłoń-Domińczak*, Warsaw School of Economics, *"Impact of changes in years 2004-2020 on projections of aggregated lifecycle deficit and public transfers based on the national transfer accounts"*,
o *Prof. Dana Muir*, University of Michigan, "*The Pandemic's Effect on Occupational Pension Schemes - the U.S. 401 (k) Plans"*,
o *Prof. Yaman Ömer Erzurumlu*, Bahçeşehir University, *"Deteriorating Effect of Macroeconomic and Social Turbulence on Private Pension Fund Management and Participation"*.

The conference concluded with an expert panel on *"Employee Capital Plans – today and tomorrow"*. According to its participants' discussions, questions and comments, long-term assessment and planning of pension systems and their reforms is a multi-disciplinary research issue which will remain politically crucial and vital for our societies. Therefore, the organizers appreciated very much the presented novel research on microeconomic, macroeconomic, finance, operational research and management science of pension economics aspects disseminated at the conference. At the end of the conference, *Prof. Gerhard-Wilhelm Weber* (FEM, PUT, Poznan, Poland, and IAM, METU, Ankara) invited the participants, their colleagues and friends to the future *OR* conferences of *IFORS 2023* in Santiago, Chile (https://ifors2023.com), and *EURO 2024* in Copenhagen, Denmark (https://euro2024cph.dk/).

Returning attendees from our conference in Poznan and the joining of new attendees will be welcome in future editions. The organizers thank for general patronage of pension fund *TFI PZU SA* and supplementary patronage of: pension trust association *Izba Gospodarcza Towarzystw Emerytalnych* (*IGTE*) and Polish economics association *Polskie Towarzystwo Ekonomiczne* (*PTE*).

Summer School Course on Interactive Multiobjective Optimization in Jyväskyla, Finland, given in an integrated format

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Bhupinder Singh Saini <bhupinder.s.saini@jyu.fi>

The University of Jyväskyla (Finland) has organized international summer school courses in various areas of science, mathematics and information technology for 31 years already. As a part of the *Jyväskylä Summer School*, a one-week course was given on *Interactive Multiobjective Optimization* on August 15-19, 2022.

The course *"Interactive Multiobjective Optimization: Applications and Tools to Support Decision Making"* was given by the members of the *Multiobjective Optimization Group* at the University of Jyväskylä: Dr. Babooshka Shavazipour, *Dr. Bekir Afsar, Dr. Giomara Lárraga Maldonado, Giovanni Misitano* and *Bhupinder Singh Saini* supervised by *Prof. Kaisa Miettinen*.

▲ Logo of *DESDEO*: The Modular and Open Source Framework for Interactive Multiobjective Optimization.

The motivation to study multiobjective optimization is the fact that real-life optimization problems seldom have only a single objective function to be optimized. Instead, to make meaningful decisions, we must account for multiple objective functions (objectives, for short) to be optimized simultaneously. Furthermore, the considered objectives are often in conflict. This means that there are trade-offs among them. To resolve the conflicts and to find a satisfactory solution, we need preference information from a domain expert, also known as a decision maker. Based on these preferences, we can search for solution(s) that best match the wishes of the decision maker. With interactive multiobjective optimization methods, the decision maker directs the solution process, provides preference information iteratively and learns about the trade-offs as well as about the feasibility of one's preferences. How a decision maker provides one's preferences and how they are used to generate solutions reflecting them as well as possible are important questions.

▲ *Jyväskyla Summer School*: members of the Multiobjective Optimization Group; from left to right: *Babooshka Shavazipour, Bekir Afsar, Pouya Aghaei Pour, Juuso Pajasmaa, Risto Heikkinen, Jana Burkotova* (visitor from the Palacký University, Olomouc), *Bhupinder Singh Saini, Giomara Larraga, Kaisa Miettinen* and *Giovanni Misitano* (missing from the photo: *Adhe Kania* and *Johanna Silvennoinen*). Photo taken by *Michael Emmerich* (from Leiden University).

In the course, the students were introduced to different interactive multiobjective optimization methods. Moreover, as many real-life problems are based on data nowadays, they were also instructed on how to model data-driven multiobjective optimization problems. An important element of the course was giving examples of and solving various kinds of real-life multiobjective optimization problems, both data-driven and simulator-based ones.

The course offered insights into various kinds of interactive multiobjective optimization methods, such as, scalarization-based methods and methods based on evolutionary algorithms. The possibility of combining different types of methods was also explored as well as how to create one's own methods. Since a decision maker plays an important role in applying interactive methods, graphical user interfaces are needed. Thus, the course also offered understanding of how to implement them.

A unique feature of the course was ***its integrated format***: besides lectures, the students had an opportunity to work on all the topics considered with the open source software framework *DESDEO* [1]. It offered the necessary tools to get a hands-on experience on the methods and topics discussed. *Each day was devoted to a central theme* in interactive multiobjective optimization. The first half of the day was started with an *introduction to the key concepts* related to the day's theme. During the second half of each day, a *hands-on experience* was obtained in applying the ideas discussed by utilizing the DESDEO framework. During this time, the students experimented with the DESDEO framework to solve their own multiobjective optimization problems with guidance from the lecturers. The students also had an opportunity to contribute to the open source software framework DESDEO in Python.

The course was given in a hybrid mode, enabling fourteen students from around the world to participate besides local students. It was a great success, and the students were highly motivated and committed. They appreciated the integrated format of the course and the insight obtained thanks to the opportunity of putting lessons learnt immediately into practice with DESDEO. Because of the modular structure of DESDEO, it is convenient to be tailored to different needs.

Reference

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OR2022 in Karlsruhe – Three full days of Operational Research and a return to an in-person conference

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Guido Voigt <guido.voigt@uni-hamburg.de>

After two years of the COVID19 pandemic, this year's annual of the *German Society for Operational Research* (*GOR*; http://www.gor-ev.de) finally took place in presence again. From September 6 to 9, 2022, diverse, interesting, and challenging ideas and contributions were presented at the *Karlsruhe Institute of Technology* (*KIT*), especially on the topics of *energy, information, and mobility*.

More than 625 participants could choose from a conference program that included over 425 contributions in 113 sessions. The program was complemented by 3 exciting plenary and 9 semiplenary talks, 4 workshops and the accompanying *Dokt!OR program* meeting (https://www.or2022.de).

▲ *OR 2022:* Awesome *Welcome Reception.*

On Tuesday afternoon, the conference started, especially for young scientists, with the *Dokt!OR program*. Here, *Manuela Schnaubelt* from KIT gave a talk on *"Slow down and gain time - an introduction to stress and time management for doctoral researchers"*. In the subsequent panel discussion, interested doctoral students could inform themselves about career paths in science. *Prof. Dr. Christina Büsing* (RWTH Aachen), *Dr. sc. ETH Stephan Bütikofer* (ZHAW Zurich University of Applied Sciences) and *Dr.-Ing. Uta Mohring* (KIT) were available to answer questions. The moderator *Christian Füllner* (KIT) led through the event. At the concluding get-together in the mathematics building 20.30, there was the opportunity to make new contacts in science or deepen previous contacts with other scientists while enjoying cool drinks and tasty snacks.

▲ *GOR Dissertation Awards*: Congrats! From left to right: *Dr. Pascal Notz, Sebastian Kraul, Dr. Thomas Kleinert, Dr. Daniel Rehfeldt* and *Prof. Dr. Peter Letmathe*.

On Wednesday, the scientific program was opened by *Prof. Dr. Stefan Nickel* and a video welcome by *Prof. Dr. Steffen Rebennack*. Afterwards, *Prof. Dr. Michael Decker* introduced KIT, the research university in the Helmholtz Association, and *Prof. Dr. Alf Kimms* introduced the German Society for Operational Research. Furthermore, four prizes were awarded.

For the *GOR Master Thesis Award*, sponsored by *GAMS Software GmbH*, the selection committee, led by *Kevin Tierney*, chose the following theses: *"A Two-Stage Stochastic Optimisation Model for Urban Same Day Delivery with Micro Hubs"* by *Charlotte Ackva* (M.Sc., Georg-August-Universität Göttingen, Faculty of Mathematics and Computer Science, Supervisors: *Prof. Dr. Russell Luke, Prof. Dr. Marlin Ulmer*), *"Solving Customer Order Scheduling Problems with an Integrated Greedy Algorithm"* by *Julius Hoffmann* (Dipl.-Wi.-Ing., Dresden University of Technology, Faculty of Economics, Supervisor: *Prof. Dr. Udo Buscher*) and *"The stochastic bilevel selection problem"* by *Jannik Irmai* (M. Sc., Dortmund University of Technology, Faculty of Mathematics, Supervisor: *Prof. Dr. Christoph Buchheim*).

Just as challenging was the selection of the winners of the *GOR Dissertation Award*, which was financially supported by *Gurobi Optimization GmbH*. The selection committee headed by Peter Letmathe chose the following papers:

- *"Algorithms for Mixed-Integer Bilevel Problems with Convex Followers"*, *Dr. rer. nat. Thomas Kleinert*, Friedrich-Alexander University Erlangen-Nuremberg, Faculty of Natural Sciences, Supervisor: *Prof. Dr. Martin Schmidt*,
- *"Resident scheduling in teaching hospitals"*, *Dr. rer. pol. Sebastian Kraul*, University of Augsburg, Faculty of Economics, Supervisor: *Prof. Dr. Jens O. Brunner*,
- *"Prescriptive Analytics for Data-driven Capacity Management"*, *Dr. rer. pol. Pascal Notz*, Julius-Maximilians-University of Würzburg, Faculty of Economics, Supervisor: *Prof. Dr. Richard Pibernik*,
- *"Faster algorithms for Steiner tree and related problems"*: From theory to practice, *Dr. rer. nat. Daniel Rehfeldt*, Technical University Berlin, Faculty II - Mathematics and Natural Sciences, Supervisor: *Prof. Dr. Thorsten Koch*.

The selection committee headed by *Alexander Martin* chose *Dr. Elisabeth Gaar* (*"An SDP-based approach for computing the stability number of a graph"* - co-authored with *Melanie Siebenhofer, Angelika Wiegele* - *published in Mathematical Methods of Operations Research*), *Dr. Arne Schulz* (*"An ALNS algorithm for the static dial a ride problem with ride and waiting time minimization"* - together with *Christian Pfeiffer* - published in OR Spectrum) and *Dr. Stefan Schwerdfeger* (*"Last-mile delivery concepts: a survey from an operational research perspective"* - together with *Nils Boysen, Stefan Fedtke* - published in OR Spectrum) for the *GOR Young Researcher Award*, sponsored by Fraunhofer IWTM.

▲ *GOR Company Award for Optano*: Congrats, too!! From left to right: *Dr. Ingmar Steinzen, Dr. Jens Schulz, Dr. Jens-Peter Kempkes* and *Prof. Dr. Alf Kimms*.

The *GOR Company Award* went to the founders of *Optano GmbH, Dr. Stefan Bunte, Dr. Jens-Peter Kempkes* and *Dr. Ingmar Steinzen*. On behalf of the selection committee, *Dr. Jens Schulz* (FICO) presented the award.

Afterwards, *Prof. Dr. Maria Grazia Speranza* (University of Brescia, Italy) gave an inspiring lecture on *"Optimization in transportation & logistics: yesterday, today, tomorrow"*. In an exciting arc about the origin and development of the field of Operational Research, she pointed out future-oriented application areas of Operational Research. The second plenary talk, entitled *"Sensing Applications as a Driver for Edge-AI Solutions"*, was given by *PD Dr. Victor Pankratius* (Bosch Sensortec) during Thursday. The talk showed many use cases where sensing applications become an important driver for artificial intelligence in ultra-low power context. Furthermore, the importance of formalizing and incorporating expertise into machine learning was discussed, which creates optimization potentials such as reducing memory requirements. The third plenary talk, entitled *"Lessons for OR from the Covid-19 Pandemic"*, was given by *Prof. John R. Birge* (University of Chicago, USA) during the closing session on Friday. Based on the lessons of the Covid-19 pandemic, this talk addresses new research challenges and the role of operational research in addressing global policy issues.The nine semiplenary talks also reflect the diversity of operations research: Wednesday's program included semiplenary presentations on *"Algorithmic Developments in Multiobjective Optimization"* by *Gabriele Eichfelder* (TU Ilmenau), *"Steiner Cut Dominants* by *Volker Kaibel* (OvGU Magdeburg) and *"Improving Cancer Treatment Logistics"* by *Nadia Lahrichi* (Polytechnique Montréal, Canada). On Thursday, the semiplenary presentations included *"Network Design in Humanitarian Logistics"* by *Bahar Yetiş Kara* (Bilkent University, Turkey), *"Automated Design of Algorithms"* by *Thomas Stützle* (National Science Foundation, Belgium) and *Rapid Optimization Projects"* (Optano GmbH). On Friday, the program included the following semiplenary lectures: *"Moving Consumer Goods, Not Vehicles"* by *Virginie Lurkin* (University of Lausanne, Switzerland), *"50 Years Club of Rome - OR Challenges and Perspectives on Energy Security and Complex Resource Conflicts"* by *Stefan W. Pickl* (Universität der Bundeswehr München), and *"Additive Approximation and Approximation Schemes for Load Balancing"* by *Tjark Vredefeld* (University of Maastricht, The Netherlands).

After the *GOR* member event, the conference dinner took place on Thursday evening in the atrium of *BGV Badische Versicherungen*. In a pleasant atmosphere, new contacts could be made and existing contacts deepened during the champagne reception and the subsequent exquisite buffet.

On behalf of all the conferees, we would like to thank especially *Prof. Dr. Steffen Rebennack* (Chair), *Prof. Dr. Oliver Stein* (Co-Chair), *the entire Organizing Committee and Program Committee, as well as Dr. Marcel Sinske*, for the well-designed conference program as well as the entire on-site organization team for the excellent and smooth organization. We are looking forward to equally enjoyable conference days at *OR 2023* in Hamburg!

How Operational Research can help in achieving inclusion and equity: the experience of ODS 2022, Florence, Italy

Fabio Schoen <fabio.schoen@unifi.it> **Paola Cappanera** <paola.cappanera@unifi.it>

The *International Conference on Optimization and Decision Science* (*ODS2022*) took place in Florence (Italy) from August 30th to September 2nd, 2022. The Conference has been organized by the *Global Optimization Laboratory* within the *University of Florence*, with the support of *DINFO* (*Dipartimento di Ingegneria dell'Informazione*) and the support of *AIRO* (the *Italian Association for Operations Research*). The Conference has been organized by a local team composed by *Paola Cappanera* and *Fabio Schoen* (Conference Chairs) and by *Matteo Lapucci, Marco Sciandrone, Fabio Tardella* and *Filippo Visintin*. The conference program has been subdivided in streams of invited as well as contributed sessions and the quality of the presentations has been verified by the Program Committee, composed of several well-known researchers in the field.

Based on the feedback received, we can state without any doubt that the conference was very successful. We decided to take some risks, by organizing a large meeting rigorously in person, with no remote participation allowed. Our aim was to re-start, after so many months of forced distance participation, with a real "old style" conference fostering face-to-face time. Our decision turned out to be a good one, as we had a much greater participation than forecasted in the most optimistic scenario. >>

>> More than 250 participants presented their research work during the conference, organized in 5 parallel sessions. Even larger was the total audience. The sessions dealt with relevant topics in Operational Research. We had invited sessions on: Multiobjective Optimization; Equilibria, Variational Models and Applications; Global Optimization; Health Care Management; Knapsack Problems; Discrete Optimization; Machine learning-based Optimization; Multicriteria Optimization for Sustainability; Numerical Optimization for Data Analysis and Imaging; Nonlinear Optimization and Machine Learning; Optimization for Machine Learning; Optimization in Public Transport and Shared Mobility; Optimization under Uncertainty; Path and Routing Problems. Many contributions added significantly to the above as well as other topics, some of which strictly connected with the conference main theme: *Operational Research, inclusion and equity*.

▲ *ODS 2022 logo.*

During the conference a special session was devoted to teaching and another one was composed of industrial presentations. One of the companies supporting the conference, *Verizon Connect* Italy, offered a grant to two young female researchers - the grant was attributed to *Marta Lazzaretti* (Genova University) and *Marta Tessitore* (Roma Tre University). Another special session, organized by *AIRO Young* with the support of *AIRO*, was devoted to the *Best PhD Dissertation Award*: four finalists were selected and had the opportunity to present their work. The winner was *Serena Fugaro* (CNR-IAC, Rome).

Part of the success of the conference is surely due to the very high quality of our keynote speakers: *Prof. Anna Nagurney* (Amherst University - *"Labor and Supply Chain Networks: It's All About People"*), *Prof. Dimitris Bertsimas* (MIT – *"HAIM: Holistic AI for Medicine"*), *Prof. Dick den Hertog* (University of Amsterdam - *"Analytics for a Better World"*), *Prof. Maria Paola Scaparra* (University of Kent - *"Leveraging OR to build more sustainable, resilient, and equitable communities in Southeast Asia"*). All of them, whom we deeply thank, offered wide, deep, stimulating points of view, strictly connected among each other, on how Operational Research, Analytics, Machine Learning can, and in fact do, have a very strong impact on improving the quality of life in such diverse fields like health care, the support of developing countries, the "no hunger" UN objective and much more. For those who did not have the possibility of enjoying the very high quality presentations from these world-known speakers, a recording of their presentation is available, after a free registration, on the *AIRO* channel of the Cassyni system.

▲ The four Keynote Speakers of *ODS 2022*: L-R: *Anna Nagurney*, *Dimitris Bertsimas*, *Dick den Hertog*, *Maria Paola Scaparra*.

▲ *Great energy in this group of participants!* Final phase of the treasure hunt on the themes of inclusion and equity in Renaissance Florence, organized by the fabulous ward clowns (VIP) in the beautiful setting of *Piazza Duomo*.

Finally, we would like to mention that, as in any conference, a social program was organized and proposed to participants in order to build connections and promote networking. Our choice was, in this conference, to try to support non-profit organizations: coffee breaks were organized by a social cooperative, Zenzero; the conference kit was contained in bags hand-made by Flo, a social cooperative employing fragile people whose production uses surplus tissues; >>

>> the welcome cocktail and the first keynote speech took place at the Istituto degli Innocenti, a public institution operating for more than 500 years assisting, educating and protecting children. One night, VIP, a non-profit organization specialized in clown therapy inside hospitals, organized a fantastic and very successful treasure hunt in the center of Florence; they also put us in contact with ADMO, that promoted bone marrow stem cell donation at a stand during the conference.

Info on the conference are available in our website http://www.airoconference.it/ods2022/, including the program, the abstracts and, coming soon, pictures as well as calls for special issues of scientific journals.

▲ Closing session of *ODS 2022*; from left to right: *Fabio Schoen, Paola Cappanera* (conference chairs), *Maria Paola Scaparra* (keynote speaker), *Matteo Lapucci* and *Fabio Tardella* (Organizing Committee).

OVA11 Celebrating Optimization and OR in Spain and Worldwide

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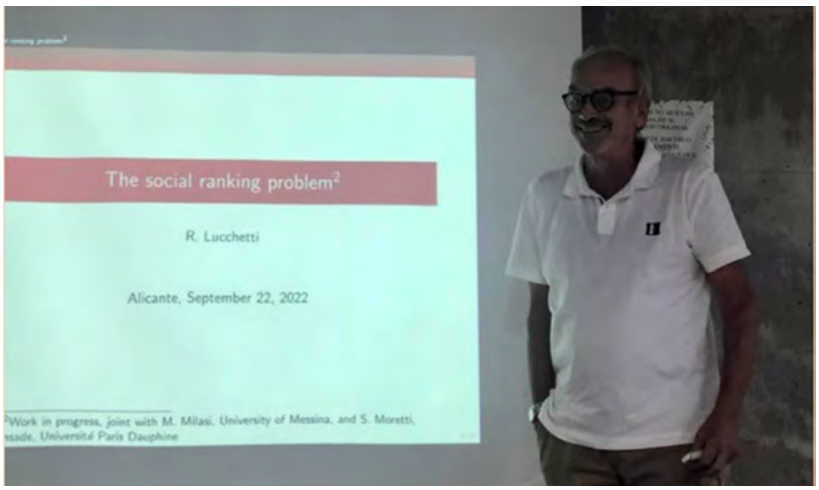
On September 22nd and 23rd, the 11th edition of the *International Seminar on Optimization and Variational Analysis* (*OVA11*) was held in Alicante, Spain. Organized by the *Optimization Laboratory of the Department Mathematics* of the *University of Alicante*, it brought together more than 30 researchers, junior and senior, working in variational analysis, optimization, and operations research. There was also a poster session where doctoral students presented their research achievements.



▲ *OVA11*: *Prof. Roberto Lucchetti* (Photo: courtesy of *Prof. Michel Thera*).

Alicante is located in the south-east of Spain with a long and beautiful coast, called *Costa Blanca*, (*White Coast* in English), because generally the sand of the beaches is white. This region of Spain has a Mediterranean climate and September is usually very nice. So, the participants enjoyed good weather with temperatures about 25°C.

This event brought together more than 30 participants from many European countries and from far away, like Australia and Chile. For many attendees, this was the first face-to-face post-Covid conference. Maybe, we did not feel like we had not seen each other for more than two years because of our virtual life during the pandemic, but we were all happy to get back to our habits, to cross smiles, share real coffees, make unavoidable jokes, and ask about colleagues.

▲ *OVA11: Sorin-Mihai Grad, Samir Adly* and *Alexander Kruger* (Photo: courtesy of *Prof. Michel Thera*).

There were many very interesting talks, exchanges, and discussions, and not only about optimization and operations research. All the given talks were interesting and of high quality. For example, we learned that the Moreau-Yoshida regularization of a convex function inherits the second-order properties of the original function, that a function can be determined using only its slopes, and not necessarily derivatives as it is usually thought, that James Theorem has a recent proof of 13 pages (two pages less than the last known proof; James' original proof was about 30 pages), that a general democratic vote is mathematically corrupt, and many other nice facts. Other interesting topics covered in the lectures included metric regularity (transversely) of sets and functions, epi-differentiability, inverse problems, trees in Banach spaces, projection algorithms, and so on.

On a less serious note, we learned that the number one country for coffee consumption per capita is Germany, and not Italy as you might have expected. An Italian colleague argued that Italians drink a lot of coffee but in small cups as they care about the quality. We also learned about the largest ski slope, the country with the largest cheese production, the country with the largest number of bicycles, etc. Of course, this was not the conference subject, but a quiz conducted by our friend and colleague *Prof. Jean-Baptist Hiriart-Urruty* during the conference dinner in a nice Spanish restaurant close to the university. The prize to the winning team was his book on "Mathematical Tapas".

More details about the conference as well as the abstracts of the talks can be found here: https://sites.google.com/gcloud.ua.es/ova11.

We hope to see you in the next OVA and promise nice weather and great beaches.

PATAT is back on the rails! The Timetabling Community was happy to meet again in Leuven, Belgium, for the silver edition of its biannual conference

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Exactly 25 years after its first edition in Edinburgh, Scotland, UK, in 1995, the 13th International Conference on ***P**ractice **a**nd **T**heory of **A**utomated **T**imetabling* (***PATAT***) was planned to take place in *Bruges*, Belgium in 2020. A pandemic disturbed things slightly but *PATAT* had its silver edition in *Leuven*, *Belgium*, 30th of August, till 2nd of September 2022, approximately 25 years after its conception. The *CODeS* research group at *KU Leuven* together with the *Sports Scheduling Research* group at *UGent* joined forces to make this edition a success and a fruitful restart of the bi-yearly tradition of this highly interactive and successful series of conferences. *PATAT 2022* was hosted in the historical *Irish College* in the center of *Leuven* and supported by the *KU Leuven Conference Organisation* unit. This 13th edition had been postponed twice but the peer-reviewed accepted submissions from 2020 and 2021 were published online in two proceeding volumes. Today, the accepted submissions from 2022 are also publicly available online as the third volume of the conference proceedings at the *PATAT* website (https://patatconference.org). Despite of the uncertainty that still existed in 2022, about 80 participants from all over the world, including 4 plenary speakers and the laureates of two international competitions, enjoyed four days of pleasant, intensive, and fruitful high-quality interaction.

▲ *PATAT 2022*: Part of the group of attendants posing in the Irish College Garden.

The conference welcomed 52 talks in 16 sessions organized in two parallel streams throughout the conference. Main subjects were Timetabling in general, University Course Timetabling, Sports Timetabling, Personnel Timetabling and Scheduling. Special attention was given to two, *PATAT*-supported, competitions and their laureates: *ITC2019* on University Course Timetabling and *ITC2021* on Sports Timetabling. In his plenary, *Andrea Schaerf* (University of Udine, Italy) presented a brief history, *"From Edinburgh to Leuven"*, of research in educational timetabling, and in his three talks, *Jeffrey Kingston* (University of Sydney, Australia) elaborated on results and prospects of the timetabling domain. Together, they brought a comprehensive overview of what the conference series has realized and of what is yet to come. >>

▲ *PATAT 2022:* Relaxed atmosphere during coffee breaks.

>> Both *Andrea Schaerf* and *Jeffrey Kingston* are among the four all-time attendants of *PATAT*, the two others being the chair of the steering committee *Edmund Burke* (Bangor University, Wales, UK), and *Patrick De Causmaecker* (KU Leuven, Belgium), member of the steering committee and of the organizing team.

▲ *PATAT 2022*: Organizers and laureates *ITC2021* on Sports Timetabling (left to right: *Carlos Lamas-Fernandez, David Van Bulck, Roberto Maria Rosati, Luca Di Gaspero, Andrea Schaerf, Dries Goossens*).

Celso Ribeiro (Unversidade Federal Fluminense, Brazil) opened the conference with a plenary on *biased random-key genetic algorithms*, a discussion on an algorithmic approach for intractable combinatorial problems among which most timetabling problems resort. In his plenary, *Deepak Ajwani* (University College Dublin, Ireland) talked about a machine learning framework, *"Learning to Prune"*, for solving combinatorial optimization problems, with examples in personnel rostering. And *Peter Nightingale* (University of York, UK) presented *"A Constraint Modelling Pipeline"*, abstract specifications to Optimized Constraint Models. These three talks addressed methodological issues in modelling and solving computationally hard optimization problems, linking with the fields of data science, machine learning and constraint programming which have not been used too much in timetabling so far but are promising for the future.

▲ *PATAT 2022*: Organizers and laureates *ITC2019* on University Course Timetabling (left to right: *Kadri Sylejmani, Zuzana Müllerová, Tomáš Müller, Hana Rudová, Dennis Holm, Rasmus Mikkelsen, Thomas Stidsen, Alexandre Lemos, Efstratios Rappos*).

In the last session on *University Course Timetabling*, the laureates of the 2019 competition on university course timetabling presented their results. In the closing session, the organizers of this competition, *Hana Rudová* (Masaryk University, Brno, Czech Republic), *Thomáš Müller* and *Zuzana Müllerová* (both UniTime, Purdue University, Indiana, USA) handed over the prizes. The winners of the 2021 competition on sports scheduling were honored by organizers *Dries Goossens* and *David Van Bulck* (both from Ghent University, Belgium).

Without sponsors, the conference could not have happened. Support was welcomed from *"The Research Foundation - Flanders"* (*FWO*), "*EVENTMAP*" (the timetabling company of near all-time attendant *Barry McCollum* (Queen's University of Belfast, Northern Ireland, UK), *"The Belgian Operational Research Society"* (*ORBEL*). Research in timetabling is well received and supported by *EURO* and *IFORS*, *with successful streams at their yearly conferences*. The plenary of *Celso Ribeiro* was sponsored by the "EURO Working Group on the Practice and Theory of Automated Timetabling" (EWG-PATAT) chaired by *Sanja Petrovic* (University of Nottingham, UK) and *Greet Vanden Berghe* (KU Leuven, Belgium). The plenary of *Deepak Ajwani* was sponsored by the *"EURO Working Group on Data Science meets Optimization"* (*EWG-DSO*) chaired by *Patrick De Causmaecker* (KU Leuven, Belgium), *Ender Özcan* and *Andrew Parkes* (both University of Nottingham, UK)

As is the tradition in *PATAT*, the many long coffee and lunch breaks stimulated deep as well as broad discussions: the ring of a bell was needed to announce the end of the breaks. All attendants were welcomed at the *Leuven City Hall* where the *Major* showed his great ability to quickly understand what this conference was about, and the beer-reception stimulated lively dialogs. The diner, again for all participants, took place in the World Heritage *Faculty Club*, the restaurant of the *Leuven University* situated in the *Leuven Beguinage*. >>

▲ *PATAT 2022*: Saturday *social trip*: at the top of Concertgebouw in Bruges.

▲ *PATAT 2022*: *Edmund Burke* and *Barry McCollum* enjoying the *conference dinner* (left to right).

▲ *PATAT 2022*: Left to right: *Ender Özcan, Greet Vanden Berghe* and *Patrick De Causmaecker.*

>> And finally, those participants who stayed until Saturday could visit the historical city of *Bruges* including a guided city tour, a lunch in *'Concertgebouw' - Bruges' concert hall* - and a guided visit to the *Gruuthusemuseum*, highlighting the important aspects of this city's history.

At the meeting of the steering committee chaired by *Endor Özcan* (University of Nottingham, UK) it was decided that the next *PATAT* will be organized in August 2024 by the *Danish University of Technology* in *Copenhagen*. *Thomas Stidsen* (Danish University of Technology, Denmark) warmly invited us all in the closing session. We are looking forward.

▲ *PATAT 2022*: All-time attendant *Jeffrey Kingston* and the second law of thermodynamics.

Latest research developments of OR in discussion:

SEMIT2022-Sep Ankara, Turkey, online

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The *International Conference on Science, Engineering Management and Information Technology 2022-Sep* (*SEMIT2022-Sep*; cf. https://semit.refconf.com/) was held between the 8th–9th of September 2022. The goal behind the international conference *SEMIT2022-Sep* was to provide a forum for depicting scientific and research findings and to promote discussions on new challenges and possible solutions in both theory and practice of *Operational Research* (*OR*). The event brought together industrial and academic experts in various engineering, management, and research fields. *SEMIT2022-Sep* was held with the collaboration of Yildirim Beyazit University from Ankara, Turkey.

The Conference Chairs were *Prof. A. Mirzazadeh*, from Kharazmi University, Tehran, Iran (https://eng.khu.ac.ir/cv/326/english), and *Dr. I. Yilmaz* from Ankara Yildirim Beyazit University, Turkey (https://aybu.edu.tr/aybu/en), and the Conference Coordinator was *Leyla Chehrghani* from Kharazmi University, Tehran, Iran.

The *SEMIT2022-Sep* online meeting featured plenary speeches given by world-leading researchers, workshops, and panel sessions with a broad coverage within the *OR* field, from data science, artificial intelligence, metaheuristic algorithms and applications, decision making and support systems, knowledge management, supply chain management, to applied soft computing in engineering management.

Prof. Janny M.Y. Leung was present in most sessions in two days of conference and had a brilliant speech in the first session after the opening ceremony. She is a Professor at the University of Macau affiliated with the Faculty of Business Administration and the State Key Lab of Internet of Things for Smart City. She is currently the President of the *International Federation of Operational Research Societies* (*IFORS*). In her speech, she talked about IoT technologies and data analytics as well as the importance of transport and logistics in smart cities. She mentioned the traffic problem, environmental concerns and the challenges in network design, operations planning, scheduling and management of smart public transportation systems.

The opening session was addressed by *Prof. Hasan Okuyucu*, Dean of the Faculty of Engineering and Natural Sciences at the Ankara Yildirim Beyazit University. After the welcome words, the *Opening Ceremony* proceeded with the speech of *Prof. Gerhard-Wilhelm Weber* from Poznan University of Technology, Poland. >>

▲ *SEMIT2022-Sep: Prof. A. Mirzazadeh, Dr. I. Yilmaz, and Mrs. L. Chehrghani* (from left to right).

>> The *Opening Ceremony* of the Conference concluded with the presentation of the *SEMIT2022-Sep* Scientific Report, conducted by *Prof. A. Mirzazadeh*. The scientific report includes some information of SEMIT 2022 which are stated in subsequent

The conference involved 200 participants from 46 countries, with 123 paper submissions, from which 69 were selected for presentation and incorporated into 18 panel sessions. Selected papers will be published in Springer's CCIS book series and will be indexed in Scopus, SCImago, EI-Compendex, etc., and will be considered for possible publication in peer-reviewed Journals, e.g., the Central European Journal of Operations Research (CEJOR), the International Journal of Supply and Operations Management (IJSOM), the Journal of Turkish Operations Management (JTOM) and the Researcher Journal.

SEMIT2022-Sep was accounted for special scientific sponsors including the universities from the Czech Republic, Morocco, UK, USA, India, and Turkey and the *OR Society of Tunisia*.

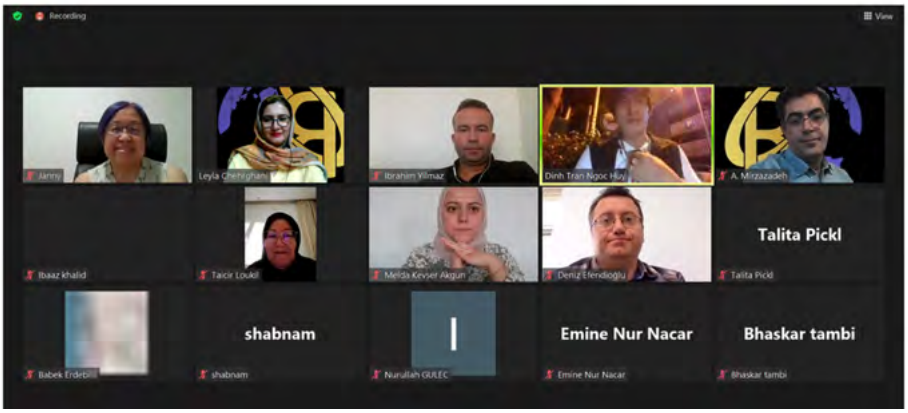
The *Organising Committee* (*OC*) prepared a very rich scientific program which included six Invited Talks: *"Public Transport for Smart Cities"*, by *Prof. Janny M.Y. Leung*, from the University of Macau, Macau, and also serves as the *President of IFORS*: *"Optimal Control Computation for Nonlinear Time Delay Systems"* by *Prof. Kok Lay Teo* from Curtin University, Australia, and Sunway University, Malaysia; *"Public Logistics Networks for Home Delivery"* by *Prof. Michael G. Kay* from North Carolina State University, USA; *"Energy-Efficient Scheduling in Robotic Manufacturing Cells"* by *Dr. Hakan Gultekin* from Sultan Qaboos University, Oman; *"50 Years Limits of Growth, Management Science Challenges and Perspectives on Energy Security and Complex Resource Conflicts"* by *Prof. Stefan W. Pickl* from Universität der Bundeswehr München, Germany; *"How Can We Mind the Gap Between Theory and Practice in Prescriptive Analytics?"* by *Prof. Bernardo Almada-Lobo* from the University of Porto, Portugal.

There were also various workshops during the *SEMIT2022-Sep* conference covering different main topics: *"Revamping Low Carbon Performance in the Green Practices for a Sustainable Society: an Empirical Analysis"* by *Dr. Sadia Samar Ali* from King Abdul Aziz University, Saudi Arabia; *"Approximation Methods under uncertain environments"* by *Prof. Souhail Dhouib* and *Prof. Taicir Moalla Loukil* from the University of SFAX, Tunisia; *"Machine Learning: Select and Implement"* by *Prof. Safa Bhar Layeb* from National Engineering School of Tunis, Tunisia, and *Dr. Marwa Hasni* from the University of Gabes, Tunisia; "*Assessing the impact of information and communication technology implementation on regional economic development and growth*" by *Prof. Svetlana Rastvortseva*, from the National Research University Higher School of Economics, Russia; and *"Metaheuristics for Combinatorial Optimization Problems: from Design to Implementation"* by *Dr. Roya Soltani* from the Khatam University, Iran, and *Dr. Shahla Paslar* from the Islamic Azad University, Iran.

At the *Closing Ceremony*, special words were given by *Dr. Ibrahim Yilmaz* and *Prof. Josef Jablonsky* from the University of Economics and Business, Czech Republic, delivered his speech. Concluding statements were made by conference organizers, who thanked everyone present.

▲ *SEMIT2022-Sep*: The conference *keynote speakers* (from left to right): *Prof. Janny M.Y. Leung, Prof. Kok Lay Teo, Prof. Stefan W. Pickl, Prof. Bernardo Almada-Lobo, Prof. Hakan Gultekin* and *Prof. Michael G. Kay*.

The *SEMIT2022-Sep* organization is grateful to all that allowed for the discussion among the speakers that was further enriched by the contributions of the participants. The speakers focused on prominent hot topics and challenges and contributed to the success of the conference by establishing a wide range of topics covered. The organizers expect that the conference can be considered a much-valued forum for sharing knowledge, solutions, and collaborative projects, gathering together academia and industry.



▲ *SEMIT2022-Sep*: Snapshot from the *closing ceremony*.

Applications of OR through Math and Machine Learning:
Autumn School on Model Reduction and Control in Trier

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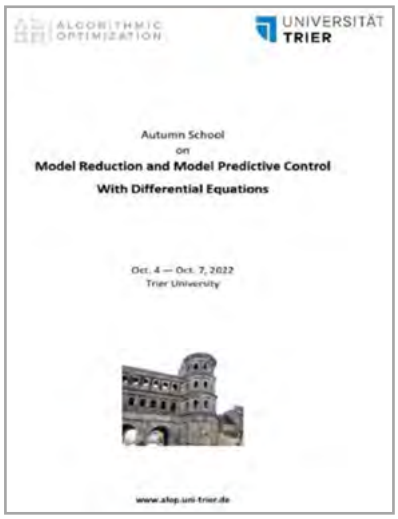
The *Autumn School on Model Reduction and Model Predictive Control with Differential Equations* was successfully held during 4-7 October, 2022 (https://alop.uni-trier.de/event/autumn-school-on-model-reduction-and-model-predictive-control-with-differential-equations/). This autumn school which was organised by *Prof. Nicole Marheineke* and *Dr. Björn Liljegren-Sailer* (Trier University, Germany) had 36 participants from German and Croatian Universities. It provided an apt platform for discussions on *OR*-related applications in physics and engineering through machine learning and mathematics. This event, hosted at the *ALOP* (Algorithmic Optimization) - RTG (Research Training Group) at *Trier University*, a research center funded by the German Research Foundation (DFG), was attended by young researchers, distinguished professors and well-known experts in the areas of model order reduction, model predictive control, and allied topics (especially from an *operational research*, systems theory and control perspective).

▲ Group photo of the participants of the *Autumn School* (Trier University, Germany).

This event focused on applying theoretical concepts of *OR* to real-time optimal control problems to numerous applications in engineering and industry. One strategy for approaching these problems is to model predictive control, which is based on solving a series of online problems over small time periods. A major advantage of this approach is that constraints can be easily incorporated. However, the computational complexity can become very high for certain real-time problems, for example, when the underlying dynamical system is a discretized partial differential equation. In such cases, model order reduction becomes necessary to reduce the computational costs. The idea is to construct a low-dimensional surrogate model - typically in an offline phase - to replace the overly computationally expensive system underlying the optimization problem in the online phase.

The *invited speakers* included *Prof. Tobias Breiten* (TU Berlin):*"Model reduction and optimal control of bilinear control systems"*, *Prof. Tobias Damm* (TU Kaiserslautern): *"Linear Systems, Balanced Truncation, and Optimal Control"*, *Prof. Jan Heiland* (OVGU Magdeburg, Max Planck Institute for Dynamics of Complex Technical Systems): *"Proper Orthogonal Decompositions in Optimal Control"*, and *Prof. Benjamin Unger* (University Stuttgart, Independent Junior Research Group Leader for Dynamic Systems): *"Dynamic Mode Decomposition and Data-Driven Control"*.



▲ The *Autumn School Program* (Trier University, Germany).

To begin with, the participants were provided with detailed information about Trier University and the program. This was followed by an ice-breaker session wherein the ALOP members briefly presented their ongoing projects and specific research interests in the areas of model reduction, optimization, and control studies. Thereafter, participants from different universities were provided an opportunity to share their research interests through talks and poster presentations. This in turn gave them a chance to learn about each other's current research interests and discuss future collaborations.

The *second day* of the school was a little different from all other days as on this day, the participants were provided with a socializing opportunity after their regular lectures and hands-on sessions. This was done by inviting them to a social event followed by offering them with a guided city tour (with different language options) so as to enhance their experience with the beautiful city of Trier. In addition to this, to make the participants' experience more remarkable, they were invited to dinner at a centrally located restaurant of historical significance and elegant ambience at Trier.

On the *third day*, the participants got a chance to learn applications of Python and MATLAB hands-on. This was followed by an open discussion session which gave an opportunity to them to not only discuss their research interests in a friendly environment but also to interact and network with professionals having similar or allied research interests.

Like all other days, interesting lectures and hands-on sessions were organised on the last day of the school too. *Professor Marheineke* closed the event by sharing her closing remarks, presenting souvenirs from Trier and expressing her appreciation for the speakers as well as for the participants.

The autumn school, thus, provided the participants with a rigorous and holistic experience comprising lectures, exercises, hands-on sessions of applications in addition to providing them with various socializing and networking opportunities. While it promoted new topics in mathematics and presented the participants with various machine learning techniques for advanced data-driven control in physics, astronomy, medicine, biology, environmental science and engineering applications, it also introduced them to real time *OR* applications through different model order reduction techniques by combining numerical models with observations.

It provided a magnificent forum for researchers who are working or are willing to work in the current dynamic *OR* environment wherein *OR* works in tandem with an array of interdisciplinary and evolving areas viz. engineering, physics, astronomy, medicine, and environmental science, etc. The studies discussed at the forum may be particularly important to those participants who intended to or are looking forward to gain a comprehensive understanding of applications of *OR* to pressing problems faced by the world today in the emerging fields of healthcare systems, machine learning applications, climate change, environment, etc., and therefore are also given quintessential importance by various *EURO* Working Groups (EWGs) as mentioned in their respective contents viz. - Combinatorial Optimization (*EWG ECCO*), Decision Support Systems (*EWG DSS*), Continuous Optimization (*EWG EUROPT*), Stochastic Modelling (*EWG STOCHMOD*), Computational Biology, Stochastic Optimization, Data Science meets Optimization (*EWG DSO*); and additionally, the Societies of INFORMS: Computing, Data Mining, Information Systems, Optimization, and Simulation.

After 2 years of virtual meetings: ENDIO-EPIO 2022 in Buenos Aires celebrated the return to in-person format

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The 35th National Meeting of Operations Research Teachers (*ENDIO*) and the *33rd Operations Research Training School* (*EPIO*) took place in the Autonomous City of Buenos Aires (Argentina) during September 21-23, 2022, and was jointly organised by the *National Technological University*, Buenos Aires, Regional Faculty, and *EPIO* (https://www.epio.net.ar/).

Although virtuality made it possible to successfully carry out the meetings in 2020 and 2021, in this year of 2022 the completely *in-person* modality which was so much missed in recent years became resumed.

Due to their federal character, the *ENDIO-EPIO* editions are held every year on a rotating basis in different universities of Argentina and attract a growing number of researchers, professionals, teachers, undergraduate and postgraduate students from different university careers, both in the country of Argentina and abroad.

During the three days of the congress series and as its main characteristic, a cordial atmosphere, experiences and knowledge in the areas of *Operational Research* and related disciplines were shared. The programme of the 2022 meeting included two conferences, two courses and nine sessions in practically all of the called areas, in which 28 contributions were presented, herewith generating a rich and wide-ranging exchange of ideas. (For the summary programme please cf. https://www.epio.net.ar/noticias/endio-epio-2022/.)

▲ *ENDIO-EPIO 2022*: our conference on teaching at the university in an unforeseen scenario.

The *35th National Meeting of Operations Research Teachers*

The meeting was an excellent opportunity to recognise the long career of *Prof. Engineer Horacio Rojo* in *EPIO* and to thank him for his tireless vocation for work, his permanent contribution to the school and his immense human qualities.

▲ *ENDIO-EPIO 2022* : the traditional family photo.

The social programme included a *Welcome Cocktail* and the traditional *Gala Dinner*.

Cordially thanks to dear ***Prof. Dr. Antonio Mauttone*** for communication to make this report possible. *G.W. Weber*

15th International Conference on Advanced Systems in Public Transport solemnly and successfully held in Tel Aviv

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The *15th International Conference on Advanced Systems in Public Transport* (*CASPT2022*) was held *DAN* hotel in Tel Aviv (Israel) between 6th to 10th of November 2022, and was in conjunction with the *8th International workshop and symposium on research and applications on the use of passive data from public transport* (*TransitData*). Detailed program and information on this conference can be found at the conference website www.caspt.org. In what follows are the summary and highlights of the event.

▲ Group photo of *CASPT2022* participants in the main conference hall.

The conference covered 5-day, with a technical visit to the Tel-Aviv metropolitan area light-rail red line on day 1 (6th Nov), professional sessions on days 2 (7th Nov),4 (9th Nov) and 5 (10th Nov), and a tour to Jerusalem on day 3 (8th Nov). In the opening session, on day 2, there were two speeches of two Ministers of Transport: of Chile (*Prof. Juan Carlos Muñoz*) and Israel (*Merav Michaeli*), and on day 4 there was a speech by the Deputy-Mayor for Transportation of Tel Aviv (*Meital Lehavi*).

Three *Keynote Lectures* were delivered, in the beginning of days 2, 4 and 5 for about 60-minute each. That is,

Keynote Lecture 1: *"Public Transport Policy Challenges in Chile"*
by *Professor Juan Carlos Muñoz*, Minister of Transport and Telecommunications of Chile, Professor at the Department of Transport Engineering and Logistics of the Pontificia Universidad Católica de Chile.

Keynote Lecture 2: *"Behavioural insights on transit ridership futures post COVID-19"*
by *Professor Graham Currie*, Professor of Public Transport, Director Public Transport Research Group, Monash University Australia.

Keynote Lecture 3: *"Using game theory to understand public transport in the age of autonomous vehicles"*
by *Professor Nicole Adler*, Dean of Hebrew University Business School and a professor of Operations Research and Operations Management, Israel.

In each day there were nine professional sessions, with 2-4 presentations in each session. There were 75 papers presented in three parallel sessions, each for 30-minute. Their themes are listed as follows:

Day 2:
- COVID impacts on ridership and performance I
- Travel behavior for access modes and ride-hailing
- Service reliability and bus drivers
- Congestion management and valuation
- Empirical analysis of demand and travel times
- Transit assignment models
- Transit network design
- Ride-hailing service modelling
- BRT and bus priority lanes

Day 4:
- Passenger data analytics and inferences I
- On-demand service design
- Timetable design
- Robustness and resilience analysis
- COVID impacts on operations and crowding perceptions
- Vehicle and crew scheduling I
- Vehicle and crew scheduling II
- Modular vehicle operations
- Electric bus fleets: optimal charging location and service design

Day 5:
- Passenger data analytics and inferences II
- Transit service design
- Passenger demand predictions
- Innovative solutions: perceptions and pathways
- Real-time dispatching and control
- Real-time railway operations
- Equity and fairness in public transport
- Public transport data handling
- Ride-hailing platform operations

The conference initially was intended for 2021, but because of Covid-19 was postponed to 2022. As the result, we had two rounds of call-for-submission. In the first round there were 27 full papers and 95 extended abstracts; total of 122 submissions. In the second round there were 6 full papers and 30 extended abstracts; total of 36 submissions. Overall, there were 158 submissions where 27 of them were rejected based on a review process. Some accepted (review-based) submissions were invited for three journals: *Public Transport, Transportation Research Part C: Emerging Technologies, and Transport Policy*.

Total of 107 registrations were received from 24 countries, all continents except for Africa.

▲ Group photo of *CASPT2022* participants in the *Western wall*, Jerusalem.

There was a best-paper award process. The paper-award committee was comprised of *Prof. Dr. Anita Schöbel*, Chair (Technical University of Kaiserslautern, Germany); *Prof. Raymond Kwan* (University of Leeds, UK); and *Prof. Dario Pacciarelli* (Roma Tre University, Italy). The committee selected 1st and 2nd best-paper award, and best student-paper award. The results attained were:

• The *1st best-paper award* was given in recognition of research excellence for the paper entitled: *"Path-Oriented Synchronized Scheduling Using Time-Dependent Data"* authored by *Kelvin Lee* [Presenter, Student], *Yu Jiang*, Avishai (Avi) *Ceder, Justin Dauwels*, *Rong Su*, and *Otto Anker Nielsen*.

• The *2nd best-paper award* was given in recognition of research excellence for the paper entitled: *"Real-time forecasting of metro origin-destination matrices with high-order weighted dynamic mode decomposition"* authored by *Zhanhong Cheng* [Presenter, Student], *Martin Trépanier*, and *Lijun Sun*.

• The *best student-paper award* was given in recognition of research excellence for the paper entitled: *"What is the market potential for on-demand services as a train access mode?"* authored by *Nejc Geržinič* [Presenter, Student], *Oded Cats*, *Niels van Oort*, *Sascha Hoogendoorn-Lanser*, and *Serge Hoogendoorn*.

As said, more information can be found at www.caspt.org or by contacting the organizers.

The authors, ***Dr. Yuval Hadas***, ***Prof. Avishai (Avi) Ceder*** and ***Prof. Oded Cats***, were also the Conference Organizers of CASPT2022.

Operational Research at ICONMAA 2022 in Medan, Indonesia: Innovatively Advancing

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2022 ICONMAA
International Conference on Mathematical Analysis and its Applications

ICONMAA is an international conference for sharing knowledge and research in *Operational Research* and Mathematical Analysis, and provides a platform for researchers and practitioners from both academia as well as industry to meet and share the cutting-edge development of *OR*, the field of mathematical analysis and its applications, to satisfy researchers' needs to be actively involved in research programs.

The conference took place at *Grandhika International* hotel, Medan, North Sumatra, Indonesia collaboration with Mathematics *Post Graduate program*, the *Universitas Sumatera Utara* (*USU*) and with the *Indonesian Mathematical Analysis Community* (*KAMINDO*) during 14-16 October 2022. As the vaccination process in many countries in the world has been successful to prevent the spread of Covid-19. Therefore the conference was conducted onsite. There were six Keynote Speaker came to present their papers. The topics of the conference were dedicate to the motto from *OR*: *"Analysis, Uncertainty and Optimization"*, which is of vast of importance worldwide, especially, for an emerging people like the Indonesians with its young population. This conference aimed (*i*) to bring together the scientists, engineers, researchers and practitioners, academicians, and civil society organization representatives in the scientific forum; (*ii*) to share and to discuss theoretical and practical *OR* knowledge about innovation in Analysis and applied mathematics. Specifically, this conference can be used as a scientific forum for accommodating discussion among young researchers that mostly originated from Indonesia in the field of Analysis, Applied Mathematics and, especially, *OR*. >>

▲ The opening Ceremony of the Conference *ICONMAA 2022*.

>> Therefore, some of the invited speakers and many of the regular participants at this conference were young and promising researchers that are becoming more and more well-known and reputable in the world. In fact, *OR* and Computer Science have contributed at *ICONMAA 2022* as our special interface to the real-world with all of its industrial, economic, developmental and educational challenges, and as a precious opportunity of the youth to getting further introduced into modern research and the international scientific community.

The keynote talks focused especially on the *OR*, Mathematical Analysis and Applied Mathematics. They discussed main areas of latest *OR*, mathematical analysis and applied mathematical issues and developments, for example, in Optimization, Uncertainty theory, Computing, and Theoretical Foundations of Mathematics - with a future promise to *OR* applications.

There were six keynote speakers of the conference: *Mhelmar Avila Labendia* (from the Philippines): *"Henstock-Kurzweil Approach to Fuzzy Stochastic Integral"*; *Ho Weng Kin* (from Singapore): *"Continuous Valuations: Tailoring Measure Theory for Topology and Order"*; *Gerhard-Wilhelm Weber* (from Poznan University of Technology, Poland): *"Maximum Principle for Stochastic Optimal Control of a Markov Regime-Switching Jump Diffusion Model with Delay - Application to Finance and Extension to Games"* (with *Dr. Emel Savku*, from Norway); *Parkpoom Phetpradap* (from Thailand): *"Discrete-Time Branching Processes and Their Applications to Epidemic Models"*; and *Mahyuddin K. M. Nasution* (from Indonesia): *"Mathematics for Understanding the World"*.

▲ *ICONMAA 2022*: Opening remarks from Conference Chair *Prof. Elvina Herawati*.

ICONMAA 2022 became a great success event, attracting researchers from ten countries and provided a remarkable academic experience for the participants. It was attended by 150 participants, and there are more than 120 abstracts were accepted for presentation at *ICONMAA 2022*.

The conference organizers and many of the participants have a long and cordially friendship within *IFORS* and *EURO*, especially, at their conferences with streams and sessions. In reverse, many of our *EURO* and *IFORS* friends have been invited to North Sumatra, to the city of Medan and to nearby Lake Toba, and received hospitality in recent ten years. During the conference, *Prof. Gerhard-Wilhelm Weber* kindly invited to the next conference highlights of *IFORS 2023* Santiago, Chile, and *EURO 2024* Copenhagen, Denmark.

▲ *ICONMAA 2022*: Keynote Speech by *G.-W. Weber*.

As the *Editor in Chief* of the conference, we would like to extend my deepest appreciation to all local organizers who worked very hard and showed a great care and warmth, to all the keynote speakers, participants and all the many friends from near and far. Without their support this conference was not a success. Finally, I wish you all a great success in the years to come.

Modeling and Simulation of Social-Behavioral Phenomena in Creative Societies: MSBC-2022 successfully held again in Vilnius and Online

Leonidas Sakalauskas <leonidas.sakalauskas@mif.vu.lt>

The *2nd international conference "Modeling and Simulation of Social-Behavioral Phenomena in Creative Societies"* (*MSBC-2022*) has been held on September 21-23, 2022, Vilnius, Lithuania, http://msbc.tech.

The conference has been organised by Vilnius Gediminas Technical University (Lithuania), Hamburg University of Applied Sciences (Germany), Lithuanian Operations Research Society, EWG on Ethics and *OR*, EWG on *OR* for Development in co-organisation with Harbin University (China), Ghent University (Belgium), Klaipeda University (Lithuania), National Technical University of Ukraine.

The scientific program of *MSBC-2022* has been created by the International Program Committee chaired by *Professor Nitin Agarwal*, University of Arkansas, Little Rock (USA). The scientific and social programs have been managed by the Organizing Committee chaired by President of the Lithuanian Operations Research Society, *Professor Leonidas Sakalauskas*, Vilnius Gediminas Technical University (Lithuania).

The *MSBC-2022* conference brought together more than 50 participants from 10 countries around the world, who communicated during 6 invited lectures, delivered by key-note speakers in three plenary sessions, and 36 contributed presentations in 9 parallel contributed sessions.

The *MSBC-2022* encouraged and facilitated interdisciplinary communication, emphasising those areas that present the new results having potential for simulating and modeling social-behavioral phenomena in creative societies as well as practical applications by analyzing the relevant data. The presentations at the conference covered a wide range of phenomena of social behavior, from the recognition of emotions in anonymous comments on public portals to the research of the behavior of social network users, the study of population behavior during pandemics, the prediction of voter voting results, cyber security technologies, computational social science, artificial society modeling, etc.

The invited lectures have been delivered by well-known keynote speakers, who put the special emphasis on those areas that mostly contribute to the appreciation of modeling and simulation of social-behavioral phenomena in creative societies, and that became valuable tutorials for young promising researchers, who took an active part in the conference.

The following invited lectures have been delivered at *MSBC-2022*:

o *"Modeling Deviant Cyber Behaviors: Bots, Trolls, And Information Operations"* by *Prof. Nitin Agarval*, Arkansas Little Rock University, USA;
o *"OR behind modeling and simulation of social-behavioural phenomena in creative societies"* by *Prof. Leonidas Sakalauskas*, Vilniaus Gedimino Technikos Universitetas;
o *"Belt and Road' modelling and simulation cases under Business statistics course framework"* by *Dr. Zhinan Wang*, Harbin Engineering University, China;
o *"Equilibrium in the strategic bargaining"* by *Prof. Vladimir Mazalov*, Institute of Applied Mathematical Research, KarRC of the RAS, Russia;
o *"Education for sustainable development: trends and perspectives"* by *Prof. Dr. Walter Leal*, Hamburg University of Applied Sciences, Germany;
o *"Numerical infinities and infinitesimals"* by *Prof. Dr. Yaroslav Sergeyev*, University of Calabria, Italy.

Dissemination of knowledge discovered in *MSBC-2022* is a very important task. The volume of articles, strongly selected by the International Board of reviewers from those delivered at *MSBC-2022*, will be published at the beginning of 2023 in the Springer Proceedings series *"Communications in Computer and Information Science"*, eds. *N. Agarwal, G. Kleiner, L. Sakalauskas*. The selected papers of the conference will be published in *"Mathematics"*, eds. *M. Ribachuk, K. Kleiner, V. Mazalov*.

The conference took place with a great enthusiasm of participants, who decided to launch the series of biannual international *MSBC-20xx* conferences, to organize the next *MSBC-2024* conference on September 21-23, 2024, and to explore about a possible new *EURO* working group.

ORSSA 2022 - 51st Annual Conference of the Operations Research Society of South Africa, Cape Town, South Africa

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ORSSA 2022 was the first in-person conference since 2019, and provided a well-appreciated opportunity for attendees to meet and catch up in the beautiful city of Cape Town from 11 to 14 September. South Africa offers analysts, consultants, and OR specialists some of the most interesting and challenging environments within which to contribute to systemic improvement. In this vein, the organisers, under guidance of UCT's *Prof Leanne Scott*, put together a conference programme that challenged participants to move beyond their disciplinary boundaries and to engage with complexity in new and innovative ways.

▲ *Prof Leanne Scott*, University of Cape Town Department of Statistical Sciences, Conference Chair of *ORSSA 2022 Local Organising Committee*.

The conference theme, *Transdisciplinary OR: Agile, Actionable, and Inclusive*, attracted the interest of 100 delegates (including 15 online attendees), who had the opportunity to attend any of 44 presentations in 12 parallel sessions, in addition to three plenary presentations. The conference also included two tutorial sessions.

The keynote speakers embodied the essence of the conference theme in their respective talks, and provided unique and much-needed perspectives on transdisciplinarity and innovation. *Dr Lisa Scholten* of Delft University of Technology gave the first plenary talk of the conference, titled *"Transdisciplinary OR to improve decision-making in the water sector"*. Day 2 of the conference was introduced by the plenary session of *Prof Helena Ramalhino* of the Universitat Pompeu Fabra, with the theme *Optimisation for Social Good*, and P*rof Sara Grobbelaar* of the University of Stellenbosch delivered the closing plenary session on Day 3 with the title *"Opening the black box: Systems thinking and the dynamics of innovation"*.

▲ Cape Town's V&A Waterfront
(Source: https://capesplendour.co.za/wp-content/uploads/2020/10/The-VA-in-all-its-glory-1-1024x640.jpg).

Breakwater Lodge, 20 minutes from the airport and within 1.5 km of Cape Town's CBD, providing conference attendees with easy access to transport, some of Cape Town's best attractions, places to dine and, of course, some of Africa's most well-known and beautiful views.

The conference was well supported by industry, amongst others through supporting attendance of early-career Operational Researchers. The South African Council for Natural Scientific Professions were equally generous in sponsoring the attendance of three undergraduate and postgraduate students from the University of Limpopo, the Sol Plaatjie University, and Stellenbosch University, respectively. The conference succeeded in bringing together academia and industry, providing exposure for students and early career researchers and, importantly, focusing the minds on innovative approaches to South Africa's complex challenges and opportunities.

Presentations were arranged into sessions that addressed the decidedly quantitative (optimization principles and theory, finance, inference and statistics) topics to decision support systems, data science, and a number of streams on social and behavioural modelling. Application-specific sessions addressed production and logistics, and health management. As per tradition, the conference hosted presentations of the National Student Competition finalists, who had the opportunity to put forward their nominated papers for the Honours and Masters student awards. The full conference programme can be found at https://www.orssa.org.za/_files/ugd/568002_e53718ed46f14e77a52e2894991ed358.pdf.

The conference was held at UCT's Graduate School of Business, situated at the Breakwater Campus in the Victoria and Alfred Waterfront. This historic site was developed in 1859 to serve as prison for convicts from Britain at the suggestion of *John Montagu*, the colonial secretary to the Cape of Good Hope at the time. It housed male convicts who were destined to work on the breakwater in Table Bay. While walking through the corridors between the modern lecture halls, one is constantly reminded of harshness endured by past generations, contrasted with the hope of progress through learning and debate. The conference facilities are co-located with the *Protea Hotel*

▲ *Keynote speakers* (left to right): *Dr Lisa Scholten, Prof Sara Grobbelaar* and *Prof Helena Ramalhino*.

Mexicans return to face-to-face conferences:
SMIO 2022 in beautiful Yucatan, Mexico

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The *Tenth National Congress of the Mexican Society of Operations Research* (*SMIO*) took place in Merida, Yucatan, from 19th to 21st of October. It was a great opportunity to gather *OR* specialists after pandemics. Those 3 intensive days were full of scientific experiences, recent research updates and interesting discussions.

The Congress formed a part of 100th anniversary celebrations of Autonomous University of Yucatan as well as 10th anniversary of *SMIO*. The event gathered 78 participants among them students, professors, researchers and professionals. It was successfully organized by *Luis Fernando Morales* (UADY, Mexico) and *Iris Martínez-Salazar* (UANL, Mexico).

The majority of the attendees were obviously Mexicans, but there were also participants from Spain, Colombia and Peru. The congress consisted of 72 oral presentations divided in 3 parallel sessions and 3 plenary conferences. The first plenary was titled *"Contributions on discrete facility location under uncertainty"* given by *María Albareda Sambola* (Universitat Politècnica de Catalunya, Spain), the second one was titled *"Heuristic optimization"* given by *Abraham Duarte* (Universidad Rey Juan Carlos, Spain), and the last but not least was given by *Laura Cruz-Reyes* (Instituto Tecnológico de Ciudad Madero, Mexico) on multi-objective evolutionary algorithms that consider the preferences of the decision maker. >>

▲ *SMIO 2022*: the traditional group or "family" photo.

>> The *SMIO* member *Javier Ramírez* (UAM, Mexico) was in charge of ensuring the high quality of the scientific content in the program.

Moreover, attendees had an opportunity to enjoy cultural and social activities prepared for the event, such as *Welcome "Brindis"* with Mexican wine and food degustation. *Kibis* stuffed with ground beef, *colado* beans with tostadas, *brazo de reyna* and *salbutes* were just some of the specialties served to the guests. The musical band of the Chemical Engineering School accompanied the reception which was celebrated in the fresh air under the starry sky of Merida. To conclude the second day, the guided visit through the modern museum of music and the Gala dinner on the terrace had taken place.

▲ *SMIO 2022*: impression from one of the sessions; presentation by *Aranzazu González* (on the right) along with session chair *Emilia Gutiérrez* (on the left).

▲ *SMIO 2022*: the solemn opening session; from left to right: *Luis Morales* (local organizer), *Julio Sacramento* (head of graduate programs and research at the host school), *Fernando Camacho* (president of SMIO).

The *prizes for the best thesis* in *OR* for bachelor, master and PhD degree were delivered, consecutively for the 2nd year.

It is worth mentioning that during the annual assembly General Committee members were chosen. We would like to highlight the fact that the new president of the General Committee is *Marta Cabo* (ITAM, Mexico), the first female president in the history of *SMIO*.

The event concluded with a closing ceremony where current president *José-Fernando Camacho-Vallejo* thanked attendees and invited them for the next year's congress in the beautiful Cholula, Puebla.

Argentine Symposium on Industrial Informatics and OR 2022 successfully held virtually

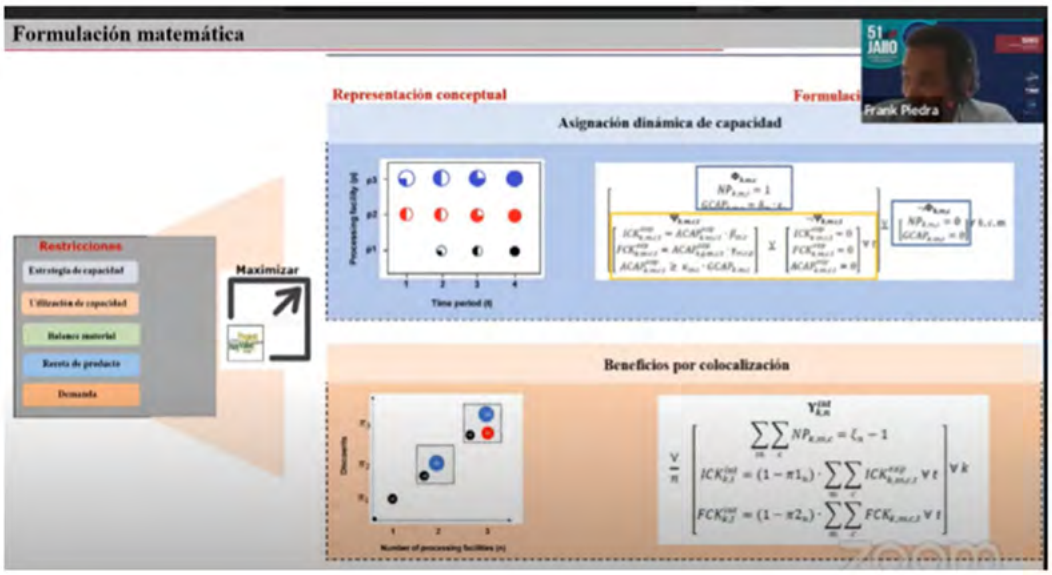
Mariana E. Cóccola <marcoccola@santafe-conicet.gov.ar> **María Laura Schuverdt** <schuverd@mate.unlp.edu.ar>

Argentine Symposium on Industrial Informatics and Operations Research (*SIIIO*) is an annual event intended to be the main forum of the *Operations Management* community in Argentina. The symposium aims at providing a forum for academicians, researchers, and industrial practitioners to discuss and exchange ideas, knowledge, and experiences on diverse topics of operations management, process systems engineering, and industrial computing.

SIIIO accepted two types of submissions: regular (full) papers and oral communications (one-page abstracts). Discussion topics included (but were not limited to): Linear, Integer linear, Nonlinear, Combinatorial, Stochastic, Robust and Dynamic Programming, Multicriteria analysis, Simulation, Game and Graph Theory, and Heuristics and metaheuristics.

The *2022 Edition* (*SIIIO 2022*) was held *virtually* from October 19 to 21, 2022; we kindly refer to https://51jaiio.sadio.org.ar/simposios/SIIIO. The Symposium was part of the 51st edition of *JAIIO*, the *Argentine Conference on Informatics*, organized by the *Argentine Society of Informatics* (www.sadio.org.ar). >>

>> JAIIO is organized as a series of thematic symposia including topics such as software engineering, artificial intelligence, technology, agroinformatics, high performance computing, industrial informatics, free software, law, health, information society and students contest



▲ *SIIIO 2022*: excellent presentation by *Dr. Frank Piedra.*

The *Symposium Chairs* were *Professor Mariana E. Cóccola* and *Professor Maria Laura Schuverdt*. After a rigorous double-blind reviewing process involving 27 programme scientific committee members, 21 contributions were accepted for presentation. These papers cope with a wide range of topics including applications related to Supply Chain Management, Scheduling, Circular Economy, Industry 4.0, and so on. The *SIIIO 2022 Proceedings* book will be soon available online on the Conference website https://51jaiio.sadio.org.ar/. All presentations were broadcast live through the *YouTube* channel and can be accessed from https://www.youtube.com/SADIOSala1.

Cordially thanks to dear ***Prof. Dr. Antonio Mauttone*** for communication to make this report possible. *G.-W. Weber*

OR64: The OR Society's annual conference in 2022
Successfully celebrated in Warwick

Rob Chidley <rob.chidley@theorsociety.com>

In September 2022, *The OR Society in the UK* hosted its annual conference at The University of Warwick, in the West Midlands region of England. Operational researchers from academia, consultancy and business joined together for three days of knowledge exchange and catching up with friends new and old.

It felt wonderful to be back together again, in person, after the enforced break caused by COVID-19. The atmosphere felt both welcoming and energised, as colleagues greeted each other warmly, with some delegates meeting face-to-face for the first time despite having known each other and worked together for a few years, remotely.

Sponsored by *Datasparq*, the official theme of the conference was *OR for a Better World Together*, and it was visible throughout the conference, from the plenary talks to the streams and sessions.

One of the *Plenary* speakers was *Dick den Hertog*, Professor of Operations Research at the University of Amsterdam and Science-to-Impact Director of the Analytics for a Better World Institute. With the talk title being 'Analytics for a Better World', his talk could hardly have been more fitting for the theme!

Having spent "half [his] time on theoretical research and half [his] time on analytics for a better world, particularly optimisation", *Prof den Hertog* fascinated delegates with his talk on how such work can support the United Nations' sustainable development goals such as solving food insecurity for the world's poor.

▲ *OR64*: the venue.

The theme was equally visible in the *Making an Impact* (*MAI*) sessions that ran on the second day of the conference. Designed to answer local problems using operational research, the *MAI* session invited local businesses and third-sector organisations from the nearby city of Coventry to share their challenges with delegates in order to collaborate in finding solutions using *OR*. The relationships created at the conference have already borne fruit in the form of projects that are improving operations and supporting decision-making in workplaces and charitable activities.

The *Systems Thinking* community was well-represented the conference, with a busy schedule of talks. I was lucky enough to attend a session by *Daniel Edds*, an American management consultant with 25 years' experience serving local government, state government, healthcare, education (at school and college ages) and non-profits in the US.

Drawing on research and personal experience in a long career, *Mr Edds* discussed a systems approach to organisational leadership. He described how a business strategy without a values-based understanding or employee engagement elements may become inhumane, and how prioritising employee experience and engagement without the pursuit of the core business opportunity may result in an organisation becoming moralistic and aimless. Leadership is required to hold all parts in the appropriate tension with one-another, and may contribute to creating a better world.

▲ *OR64*: The *MAI* session in full swing.

The conference was not all *work, work, work*. Our *Early Career Researcher Network* and our *Women in OR and Analytics Network* hosted drinks receptions. Delegates had the chance to explore the local area with a guided tour of Coventry, a trip to a local brewery and a visit to Coventry Transport Museum. Our Executive Director *Gavin Blackett* also ran a 'pub quiz', with certain members of the *OR* community getting highly competitive in their bids to win!

Two of the high points of the conference were the *Gala Dinner* and the *President's Medal competition*, the latter being won by the *Tesco Data Science* team's project, presented by *Dr Ramon Fuentes Esquivel*.

▲ *OR64*: Plenary Speaker *Prof. Dick den Hertog*.

Prior to the death of Her Majesty the Queen, *Elizabeth II*, the UK had celebrated her Platinum Jubilee year in style. Next year (2023) is a jubilee year for *The OR Society*, with its annual conference entering its 65th year! The celebrations will not be on the same scale as the Royal celebrations, but we will work hard to make it an occasion to remember. Stay in touch with us via our website for news of what is going on! www.theorsociety.com/events.

Rob Chidley is *The OR Society*'s Senior Marketing Manager.

▲ *The OR Society* staff with *President Edmund Burke* (far left) and *President-Elect Gilbert Owusu* (left of centre).

Emerging Domains of OR at the 5th Annual TORS Conference in Sousse, Tunisia

Taicir Loukil <loukilt@gmail.com>

The *Tunisian Operational Research Society* (*TORS*) aims to share and exchange knowledge on the operational research field in Tunisia and to promote theoretical developments and applications in this domain. This is performed by: Supporting education, training, research and practices in this field; Organizing conferences and workshops in national and international levels to enhance and promote the exchange of knowledge, the collaborations and the interactions between researchers and industrials; Establishing and maintaining scientific cooperation with national and international institutions and other *OR* societies; Providing professional consultancy services to decision-makers in industry and administrative fields.

The 5th International Conference of the Tunisian Operational Research Society (*TORS*) purposed to share and exchange knowledge in the field of *Operational Research* (*OR*) and to promote collaborations and interactions between researchers and industrials. (https://torsconference.wixsite.com/tors22). It was held on November 1-3, 2022, in the beautiful city of

The scope of *TORS'22* included: Theoretical developments, recent developments in linear, nonlinear, integer, stochastic, multilevel and multi-objective optimization; Business Analytics; Simulation, Learning and Statistical methods; Information Systems, Decision theory, Game theory and Multi-Criteria Decision Aid; Constraint Programming and Artificial Intelligence; Heuristics and Meta-Heuristics; DEA and Performance Measures; Risk Management and Resilience; Management Quality and Integrated Management Systems; Healthcare Logistics and Supply Chain; Sustainable and Resilient Supply Chain; Uncertainty theories, Belief Functions, Probability, Possibility and Fuzzy Sets theories; Applications of *OR* such as in Planning and Scheduling, Logistic and Routing problems, Timetabling, Cutting problem, Knapsack problem, Portfolio Optimization, Set Covering / Clustering / Packing, Reliability and Maintenance, Data Mining, Health and Environment and Bioinformatics, Supply Chain Management, Industry 4.0, Sustainable Renewable Energy, Circular Economy and Sustainability; Economic Intelligence and Firm Performance; Macro-Economic Institutions and Performances.

▲ *TORS 2022: Participants on-site and some online.*

▲ Some members of the *OC* (from left to right): *Prof. Diala Dhouib, Dr. Soulef Smaoui, Prof. Taicir Loukil, Dr. Raoudha Kammoun, Dr. Sameh Chtourou, Dr. Nessrine Halouani, Dr. Ines Kanoun, Prof. Mohamed Ayman Boujelbene* (*TORS* Past President), *Dr. Mohamed Ali Elleuch, Dr. Maroua Malleku* and *Dr. Bassem Chaker*.

The conference hosted 81 participants from Tunisia, France, Canada, Algeria and the UK, and consisted of 42 presentations spanning a wide range of topical themes. It is the collective efforts of all presenters, session chairs, scientific and organizing committee members', which led to a smooth and enjoyable conference.

The *Organizing Committee* (*OC*) was chaired by *Hela Frikha* and consisted of *Aida Kharrat, Bassem Chaker, Bilel Ammarz, Ines Kanoun, Mariem Masmoudi* (who was also webmaster & submission manager), *Mohamed Ali Elleuch, Mohamed Haykal Ammar, Safa Bhar Layeb, Sameh Chtourou* and *Soulef Smaoui*.

General Chair *Prof. Taicir Loukil* gave a very sincere and warm *Welcome Message* which was very much appreciated. *Prof. Lotfi Belkacem*, President of the University of Sousse, *Prof. Ali Baklouti*, Vice-President of the University of Sfax, and P*rof. Sawsan* Krichen, President of CCK and CPU, participated in the Opening of the conference.

The six *plenary sessions* presented distinguished *Keynote Speakers*:

o *Prof. Souhail Dhouib* (University of Sfax, Tunisia): *"Novel Optimization Methods for Combinatorial Problems"*;
o *Prof. Rémy Houssin* (University of Strasbourg, France): *"The relations between optimization and invention from the point of view of the TRIZ Methodology"*;
o *Prof. Imed Kacem* (University of Lorraine, France): *"Polynomial approximation schemes: When Standard Techniques Become Unavailable?"* (absent for health reasons);
o *Prof. Zied Babai* (Kedge Business School, France): *"Some contributions to forecasting and inventory control of fast and slow moving products within supply chains"*;
o *Prof. Samir Elhedhli* (University of Waterloo, Canada): *"Supply chain planning at times of crisis"*;
o *Prof. Juergen Branke* (Warwick Business School, UK): *"The relationship between optimisation and machine learning"* (online).

The following individuals chaired this conference:

Prof. Taicir Loukil, President of TORS

Prof. Diala Dhoui, Conference co-Chair.

Prof. Ahmed Frikha, Publication Chair.

Prof. Hela Moalla, OC Chair.

▲ *From L-R: Prof. Juergen Branke,* UK; *Prof. Souhail Dhouib,* Tunisia; *Prof. Ziad Babai,* France; *Prof. Samir Elhedhli,* Canada; *Prof. Remy Houssin,* France; *Prof. Imed Kacem,* France.

The *2022 TORS Price* has been awarded to two best works that are evaluated by the session chairs based on seven criteria: 1. Quality of talk, 2. Quality of the discussion, 3. Quality of slides, 4. Quality of the short paper, 5. Originality of the work, 6. Subject relevance, and 7. Respect of time.

A selection of extended papers will be considered for publication in special issues of the following journals: Annals of Operations Research, International Journal of Supply and Operations Management (IJSOM) and Operations Research Forum.

The conference was supported by the Research Laboratories: *MODILS* (Modeling and Optimization for Decisional, Industrial and Logistic Systems) and *OLID* (Optimization, Logistics and Decision Support).

Our main sponsors have been *IFORS, EURO, INFORMS Bahrein, AFROS, University of Sfax, University of Sousse, University of Carthage,* and *CCK*: *Computation Center Khawarizmi*. For more information about the *Tunisian Operational Research Society*; please visit www.tors.tn.

WOTA@WaterFront 2022 - Optimization and Operations Research in Australia

Reinier Díaz Millán <r.diazmillan@deakin.edu.au>
Alexander Kruger <akrugeremail@gmail.com>

On October 12 and 13, the *first Workshop on Optimisation Topics in Australia* (*WOTA*) was held at the Waterfront campus of Deakin University in the beautiful city of Geelong, Victoria, Australia. The organising team was composed of *Julien Ugon*, *Reinier Díaz Millán* and *Vinesha Peiris* from Deakin University, and *Nadezda Sukhorukova* from Swinburne University. The workshop brought together around 20 participants, junior and senior, working in Optimisation, Operational Research, and related topics. There were four one-hour keynote lectures and a series of 30-minute contributed talks.

Geelong, a city in Victoria, Australia, is located on the western shores of Port Philip Bay, about 75 km from Melbourne. It is one of the most beautiful cities in Australia with a population of around 287 thousand. The Waterfront Campus of Deakin University is one of the best sea-view campuses in Victoria. During the workshop, the weather was not perfect because of the continuous heavy rain, but still, the participants could enjoy the fantastic view of the bay from the windows of the conference room.

With participants from Victoria and New South Wales, for most of us, this was the first face-to-face meeting after the COVID pandemic. Meeting colleagues in the same room and being able to discuss research and other topics was the most enjoyable part of the event.

The lectures and talks covered various topics in Optimisation and Operational Research: quadratic problems, set-valued problems, forward-backward and Frank-Wolf algorithms, polytopes, abstract convexity, and many others.

We learned about a novel technique to solve nonconvex mixed-integer quadratically constrained quadratic programming with separable structures, presented by *Andrew Eberhard* (RMIT University). A revision on radius theorems by *Alexander Kruger* (Federation University Australia and RMIT University). A discussion of a recently discovered modification of the forward-backward splitting algorithm, which converges without requiring the cocoercivity assumption, presented by *Matthew Tam* (University of Melbourne). A study about polytopes with excess degrees was given by *David Yost* (Federation University Australia).

For more details about the workshop and the abstracts of the talks, visit http://www.mocao.org/workshop-on-optimisation-topics-in-australia-wotawaterfront- 2022/.

Next year, we are planning to organise the second *WOTA*, also at the Waterfront campus. We hope to see you there. If you would like to co-organise an edition of *WOTA* in the subsequent years, please let the organisers know.

▲ Waterfront, Geelong, Victoria, Australia (photo: courtesy by *Mrs. Mariana Neves Ferreira*).

"Model Thinking for Everyday Life - Working Wonders with a Blank Sheet of Paper"

by Richard C Larson

INFORMS, Catonsville, Maryland 21228, https://www.informs.org,
Expected date of publication: first quarter of 2023

OR-Analytics using Model Thinking for Everyday Life

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This book by *Richard C Larson* on "Model Thinking for Everyday Life" is an interface between (i) *Operations Research* - "the world's most important invisible profession," (ii) *Mathematical modelling* and (iii) *Physics*. It is a passionate attempt by the author to develop critical thinking skills of the readers "to learn how to learn". Throughout this book, which adeptly attempts to bridge the gap between theory and practice, model thinking has been considered to have two equally important and related interpretations: (1) thinking aided by mathematical models and (2) exemplary thinking - which directs one to fully comprehend and model the problem from the stage of its formulation to the stage of its analysis.

▲ *Author, Professor Richard C Larson*
Source: https://idss.mit.edu/staff/richard-larson/.

The overriding theme of this book is to demonstrate that computers are often not helpful in developing and maintaining critical thinking skills. In fact, only *'a sharpened pencil and a blank sheet of paper'* are sufficient to do so. The author stresses the importance of problem framing and formulation in addition to emphasizing that – "The answer is not the answer, the process is the answer!" The author has cited numerous examples from everyday life throughout the book to exhibit the importance of "discovery learning" which aims to find out answers through exploration. A brief overview of the highlights of the chapters in this book follows:

Chapter 1 - Why Models, presents an overview of the importance of models and model-thinking by quoting interesting analogies of models from our daily lives ranging from driving a GPS enabled car to experiencing rains while driving. The author describes the pivotal role of model-motivated thinking to be both conceptual and critical by citing the work of some erudite scholars like *Jay Forrester*, *Martin Luther King, Jr*, *John Dewey*, *David Hitchcock*, *Edward Glazer*, etc. It states that putting problems on a blank sheet of paper helps to "motorize one's learning", and that the multistep process helps to structure and solve them.

Chapter 2 - First examples of Model Thinking, introduces the readers to both mental and math models. Two key topics viz. "selection bias" and "orders of magnitude" are discussed using daily-life examples like driving to work, shopping, attending a sporting event, seeking medical care, agreeing to fill out a survey questionnaire, etc. It is deftly supplemented with Newton's laws of motion and Moore's law of exponential shrinkage.

Chapter 3 - Devious Means discusses apparently easy but brain-jolting potholes of deceiving averages. It dexterously elucidates some interesting topics like *The Lake Wobegon effect, The Will Rogers paradox, Simpson's paradox, and the friendship paradox*.

Chapter 4 - More Means, Still Devious advances the mean theme by explaining the devious nature of means through some significant outcomes like *"The average of a function is not always the same as the function of the average"* and exhibiting some interesting applications like marriages & divorces, life expectancies, Miles Per Gallon (MPG), etc.

Chapter 5 - It's Certainly an Uncertain World introduces applied probability concepts which serve as a foundation for the remainder of the book. The applications included range from lightning strikes and all sorts of risks to one's personal safety, to a discussion of the synergistic relationship between data and models, to the formal elements of applied probability modelling to analysing various interesting and often counter-intuitive applied probability models in a stepwise manner.

Chapter 6 - Urban Emergency Services proficiently demonstrates - "How to frame, formulate and model planning problems of an operating organization?" using interesting anecdotal evidences (including the author's own) from urban emergency services of the police department. It covers topics like randomness, continuous random sample spaces, probability density function, response times, response distances to emergencies, the square-root law, etc.

Chapter 7 - The Physics of Queues presents the physics of queues, a delightful yet sometimes complex and rich combination of math-oriented physics and human behaviours. Topics covered include arrivals in queuing systems, Poisson processes, the history and attempted categorization of queues, how uncertainty affects queue behaviour, steady state, Little's law, Wall of Doom, Types of queuing models, etc.

Chapter 8 - Mini case studies on Queue Modelling describes three mini cases in applied queueing: the New York City 911 system, the hypercube queueing model, and the university faculty retirement queue.

Chapter 9 - Psychology of queuing explicates the "psychology of queuing" by addressing some quintessential questions about queuing that delve into human behaviour.

Chapter 10 - Looking back, look forward, subtly winds up the modelling journey undertaken by the readers in *Chapters 1 through 9* by stimulating them to reflect and sample their learning so far. It further directs them to stimulate their minds to think about how they may incorporate model thinking into their everyday lives.

Strength-Conditioning Workout Annex following *Chapter 10* comprises diverse problems intended to build-up and stretch the readers' model muscles!

Given its interdisciplinary and applied perspective, this book can be an enriching resource for a diverse set of audiences who want to learn and/or develop critical thinking skills including high-school students studying Science, Technology, Engineering & Management (STEM) subjects, university students, working adults, and retired adults.

This book reinforces the crucial role that *OR modelling* plays by citing examples from daily-life. The author has supplemented in-book arguments in an insightful, entertaining way by adding interactive open-source educational videos produced in *MIT BLOSSOMS* project (https://blossoms.mit.edu) at multiple points throughout the book with a noble intent of making math and science education free yet interesting and engaging.

While this book provides an extant portrayal of the vital role of *OR modelling* in critical thinking, the author may consider appending this book by further research extensions and advancements in theory, methods and applications in other novel and emerging *OR* areas.

"Lectures on Variational Analysis"

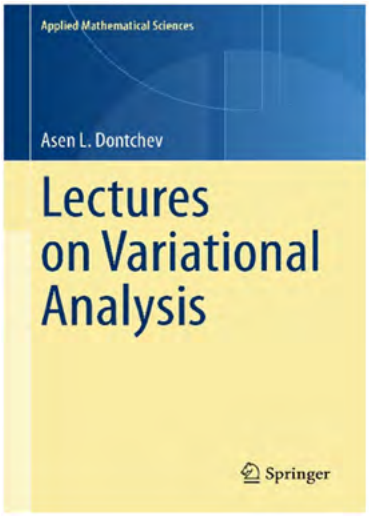
by Asen L. Dontchev

Applied Mathematical Sciences
Springer Nature Switzerland AG, Switzerland, 2021,
ISSN 0066-5452, ISSN 2196-968X (electronic), ISBN 978-3-030-79910-6,
ISBN 978-3-030-79911-3 (eBook), https://doi.org/10.1007/978-3-030-79911-3

OR-MS for Tomorrow

Vladimir M. Veliov <vladimir.veliov@tuwien.ac.at>
Gerhard-Wilhelm Weber <gerhard-wilhelm.weber@put.poznan.pl>

The origin of *variational analysis* can be traced back to the 17th century as a method of investigation of extremals of functions by variations around a point, and approximations using differential calculus. This method, applied to integral functionals, gave the name of a whole area of mathematics – *calculus of variations*. However, the present understanding of *variational analysis*, that emerged in the past few decades, encompasses a much larger area of the contemporary mathematics, including convex analysis, non-smooth analysis, set-valued calculus, and topics of the non-linear analysis. Optimality conditions in constrained optimization involve finding equilibria of set-valued mappings, operations of minimum or maximum of differentiable functions, that often appear in optimization, lead to non-differentiable functions. Therefore, variational analysis provides powerful conceptual and technical instruments for investigation of problems of optimization and equilibria, hence it is also an important methodology in *Operational Research*.



▲ *OR-Analytics* for Management of Tomorrow.

The author of the reviewed book, *Asen L. Dontchev*, passed away in September 2021, just having finished the manuscript. He was one of the leading specialist in the field of variational analysis and its applications in mathematical programming and optimal control, in particular, stability of solutions of optimization problems with respect to various kinds of perturbations, and convergence and error analysis of numerical methods. Many of A. *Dontchev*'s earlier contributions in the area culminated in the path-breaking book *"Implicit functions and solution mappings"* co-authored by *Ralph Tyrell Rockafellar* - one of the founders of the modern variational analysis, to whom the reviewed book is dedicated.

Optimization problems with constraints were in the focus of *A. Dontchev*'s research, and of the book under review, which leads to involvement of non-differentiable functions and set-valued mappings. Therefore, the book includes introductory material on set-valued and non-smooth analysis. In contrast to previous books related to variational analysis, *A. Dontchev*'s book is introductory and tutorial. It is based on a one-semester graduate course given by the author in the past years, and is structured as a sequence of lectures, as the title indicates.

▲ *Book Author: Professor Asen L. Dontchev* (photo from *Variational Analysis Down Under Conference 2018, In honour of Professor Asen Dontchev's 70th Birthday*, Ballarat, Australia, February 19-21, 2018; courtesy by *Prof. Dr. Alexander Kruger*).

The twenty lectures comprising the book can be split in the following groups.

The first three lectures are preparatory and include formulation of standard optimization problems, necessary optimality conditions regarded as variational inequalities, basic notions and facts about continuity and Lipschitz continuity of set-valued mappings.

The next nine lectures are devoted to regularity properties of set-valued mappings. A main motivation for this subject comes from optimization: the system of first order necessary optimality conditions (such as the Karush-Kuhn-Tucker conditions for mathematical programming problems) can be written as inclusions involving set-valued mappings. Therefore, several types of regularity of these mappings are related to corresponding notions of stability of the solutions of optimization problems with respect to perturbations.

These chapters provide an introduction to the theory of matric regularity of mappings acting between metric spaces and include some fundamental results, such as the *Lyusternik-Graves theorem*, *Robinson-Ursescu Theorem*, etc. The *strong metric regularity* is then introduced, together with far reaching extensions of the classical *Implicit Function Theorem* that apply to non-differentiable and set-valued mappings. Special attention is attributed to strong regularity of mappings appearing in *quadratic optimization* problems in *Hilbert spaces* and in *nonlinear programming*. Next, the property of *strong subregularity* is introduced and discussed, which is a powerful tool for error analysis of approximation methods for optimization problems.

A separate lecture is devoted to the important notion of *radius of regularity* of mappings. Roughly speaking, the radius of regularity of a mapping is the maximal number, such that linear disturbances with smaller norm do not destroy the regularity property (the notion is clearly related to the *condition number* of a matrix in the case of a linear mapping acting in finite dimensional spaces). Hence, the importance of the radius of regularity for mappings associated with equations, inclusions or optimization problems. An additional lecture utilizes the regularity theory to establish convergence and error estimates for the Newton method applied to generalized equations with mappings having appropriate regularity properties.

The last five lectures are devoted to applications of variational analysis to optimal control. The exposition in this part begins with linear-quadratic optimal control problems with control constrains, for which basic facts are reminded to readers not familiar with optimal control theory. Then more general nonlinear optimal control problems are considered, for which the theory presented in the previous lectures is applied for obtaining conditions for (strong) metric regularity of the feasibility and optimality mapping associated with these problems. The issue of convergence and error estimates for discrete approximations is addressed in a separate lecture. A key requirement, on which the presented results are based, is the metric subregularity of the mapping associated with the first order optimality conditions for the considered problem. The author also recalls a recent result about existence of a Lipschitz continuous optimal feedback. Finally, the widely used method of *model predictive control* for approximate *optimal feedback control* is briefly presented, together with a recent error estimate for its accuracy. Because of the tutorial purposes of this book, the exposition of this last group of lectures is mainly focused on linear-quadratic problems. However, the utilized ideas and techniques, based on the regularity theory of mappings, provide the ground for extensions to nonlinear problems, available in the professional literature.

▲ *Prof. Dr. Vladimir M. Veliov*: first author of this review and a coauthor of *Prof. Asen L. Dontchev* (photo: August 2022).

The content of book can be useful for lecturers of graduate courses in the area of optimization and control, as well for students and researchers who want to broaden their knowledge and pursue a deeper understanding of the contemporary ideas, approaches, and techniques in variational analysis. The readers should be familiar with basic calculus and linear algebra. All needed background material about optimization, optimal control and elementary functional analysis is included in the book. Proofs of all mathematical statements are given, together with examples, exercises and discussions. This makes the book appropriate as a base for graduate courses on optimization and optimal control with emphasize on issues of regularity and stability of the solutions. The book can be a valuable and stimulating reading for graduate students, researchers and practitioners with interest in mathematical optimization, including operational research, and applications in engineering and economics.

The African Federation of OR Societies' (AFROS) 2022 Annual General Meeting

Dave Evans, President, AFROS: <davevans@gmail.com>

AFROS held its 2022 annual general meeting at the end of October online. Key points discussed and results of the 2022 elections are listed below.

The major activity of the year was finalising AFROS' strategy, which is now being implemented, and will be supported by the use of a Balanced Scorecard and key performance indicators.

At a more local level, several working groups have been actively operating in areas such as agriculture, healthcare, MCDM and logistics, and member societies and chapters have held an extensive series of webinars, conferences and spring and summer schools.

Considerable work has gone into improving communication among OR practitioners across Africa, particularly in countries where their numbers are small, and support is being provided to the establishment of national chapters, and to uplifting existing chapters to the status of full societies which we hope will apply in due course to become members of IFORS.

Rose Karimi Kiwanuka

Dr. Umar Modibbo

Safa Bhar Layeb

The newly elected executive committee is as follows:

President: Dave Evans
President Elect: Rose Karimi Kiwanuka
Secretary and Treasurer: Youssef Masmoudi
Database Manager, Webmaster and Public Relations Manager: Serigne Gueye
Representative of each full IFORS member society:
Institute for Operations Research of Nigeria: Umar Modibbo;
OR Society of South Africa: David Clark;
Tunisian OR Society: Taicir Loukil
Representative from associate members: OR Practice in Africa - Serigne Gueye
Representative from chapters: Jules Degila
Representative from working groups: Safa Bar Layeb
Representative from regional alliances: ORSEA - Gituro Wainana

Dr. Rose Karimi Kiwanuka, the incoming president elect, has a PhD from the State University of New Jersey, Rutgers Business School and an MBA from the University of Nairobi Business School, Kenya. She is currently an Adjunct Instructor at both the Multimedia University of Kenya, and the Africa Nazarene University, Kenya. She has many published papers and is active in the public and private sectors as well as academia.

Dr Umar Muhammad Modibbo became president of the Nigerian OR Society in August 2022, and was welcomed to the committee, replacing Philips Obasohan, the previous Nigerian OR Society president. He holds a B.Tech and M.Tech in Nigeria and a PhD. in OR in India. He is currently a lecturer in the Department of Statistics and Operations Research of the Modibbo Adama University, Yola, Nigeria. He has received several OR related awards, published more than 20 research articles and is a reviewer and editorial board member of journals.

Safa Bhar Layeb is an associate professor of industrial engineering and a member of the OASIS Laboratory at the National Engineering School of Tunis, Tunisia. She is the founding chair of the African Working Group in Health Systems. She is particularly interested in industrial engineering and optimization approaches and their applications in logistics and healthcare organizations.

The following members are standing down at the end of 2022 and were thanked by the President for the substantial contributions they have made to the Federation since its foundation:

- Past President Hatem Masri (AFROS' second president), who took AFROS' activities to a new level during his term of office;
- Hans Ittmann, an IFORS Fellow and ex-officio AFROS committee member, who was involved in the setting up of AFROS, as well as being highly active in African OR matters for several decades;
- Phillips Obasohan, who represented INFORN Nigeria as its president.

Other existing members of the committee will serve a second term and we are grateful for their continuing support.

The President looks forward to working with the new committee to take AFROS forward during his second year in office in 2023.

This article was communicated by Sue Merchant (AFROS' Action Manager).

IFORS Fellows

M. Grazia Speranza <grazia.speranza@unibs.it>

Founded in 1959, IFORS has a long history and is the only global organization in the OR field. The IFORS Administrative Committee approved in 2020 the establishment of the IFORS Fellows Award which serves to recognize a distinguished individual's contribution to international operational research and its communities.

Every year nominations are invited. Individual members of IFORS member societies can act as nominators. The nominator is responsible for compiling and sending to the IFORS Secretariat a nomination letter, 3 reference letters and a nominee's resume (of at most 4 pages) highlighting accomplishments as called for by the criteria stated at https://www.ifors.org/ifors-fellows-nomination-information/. The evaluation of impact of the nominee's accomplishments will be strongly driven by the international aspects of the contributions.

The IFORS Past President on the IFORS Administrative Committee coordinates the entire selection procedure. The last three IFORS Presidents, chaired by the IFORS Past President, comprise the Selection Committee. The list of nominees pre-selected by the Selection Committee is made available to all the current IFORS Fellows. Each Fellow is entitled to one vote. All votes are tallied and submitted to the Selection Committee that makes the final decision.

The 2022 Selection Committee was composed by myself, Mike Trick and Nelson Maculan. This year we had a large number of excellent nominations. The competition for the designation was fierce, and, with the fundamental contribution of the current IFORS Fellows, the Committee selected the following nominees for the designation:

Hugh Bradley, IFORS Treasurer (1998-2006)

Jean-Pierre Brans, IFORS Vice-President representing EURO (1989-1991)

Michel Gendreau, IFORS Vice-President representing NORAM (2007-2009)

Hans Ittmann, President of the Operations Research of South Africa (1987, 2002-2003) and Chair of the Organizing Committee of the IFORS conference in Sandton in 2008

David Schrady, IFORS Treasurer (1988-1997)

Roman Slowinski, Co-ordinating editor-in-chief of the European Journal of Operational Research (1999-today)

Helle Welling, Secretary of IFORS (1976-1997)

Warmest congratulations and our gratitude to the 2022 IFORS Fellows!

ITOR Best Paper

The flagship journal of IFORS is ITOR, International Transactions in Operations Research. Yearly, the journal, represented by editor-in-chief Celso Ribeiro, announces a best paper award in two categories, one in the category Surveys and Tutorials, and one in the category Methodology and Applications. On Sept 29, 2022 IFORS organized a Global Webinar on this topic, and authors from the winning papers were invited to give a presentation concerning their work.

The winning paper in the category Surveys and Tutorials is:

Franco Basso, Sophie D'Amours, Mikael Rönnqvist, Andrés Weintraub, "A survey on obstacles and difficulties of practical implementation of horizontal collaboration in logistics", ITOR 26 (2018), 775-793.

The winning paper in the category Methodology and Applications is:

Guo Li, Huamin Wu, Shuang Xiao, "Financing strategies for a capital-constrained manufacturer in a dual-channel supply chain", ITOR 27 (2020), 2317-2339.

The webinar, hosted by IFORS President Janny Leung and moderated by Vice President Frits Spieksma, had as presenters Franco Basso and Huamin Wu.

There were thirty participants in the Webinar, and a lively discussion followed after the two presentations. It will become available free of charge at https://www.ifors.org/ifors-global-webinar-series/

Submissions are open!!

We are excited to announce that contributions can be sent now for the 23rd Conference of the International Federation of Operational Research Societies (IFORS 2023), which will take place in Santiago, Chile, next July. The conference is locally organized by ICHIO, the Chilean Institute for Operations Research, together with ISCI, the Institute of Engineering Complex Systems, and with the support of the University of Chile and the Pontifical Catholic University of Chile.

Sessions are being organized right now. If you want to organize a session in one of the many topics of the conference, you should contact the relevant cluster chair. All information is available in the conference webpage, www.Ifors2023.com

Abstracts can also be submitted directly following the instructions in the conference webpage. All submissions are being handled through the EURO system, so it is important to be registered at www.euro-online.org in advance.

We are assembling an exciting scientific program which will feature the following plenary speakers:

• Margaret Brandeau, Stanford University
• Juan Carlos Muñoz, Minister of Transportation of Chile and Pontificia Universidad Católica de Chile
• Paolo Toth, Università di Bologna
• Andrés Weintraub, University of Chile

In addition to the plenaries, there will be a number of invited keynote talks covering a wide range of Operational Research and Analytics subjects as well as tutorials on current topics.

The conference will be a great opportunity to meet with researchers from all over the world and discuss about the diverse potential of state-of-the-art Operations Research techniques. We also highlight the opportunity to visit Chile and explore its culture and diverse nature and landscapes.

We look forward to seeing all of you in person in Santiago in July 2023!

IFORS 2023 Organizing and Program Committees

IFORS NEWS Editor in Chief: Antonio Mauttone