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IFORS NEWS

INTERNATIONAL FEDERATION OF OPERATIONAL RESEARCH SOCIETIES

FROM THE PRESIDENT

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In the past fortnight, the Paris Olympics had been the focus of attention around the world. Millions of people watched the many competitions intently, cheering on the representatives of their region and country. Each athlete's story is one of dedication, perseverance and striving for perfection. Some of the most heart-warming scenes are the emotional celebrations between competitors and their coaches at the culmination of good performances, happy that the years of tough training have been worthwhile. Kudos to them all!

One thing that I noticed is that many athlete-coach partnerships are international. The coaches of the two Hong Kong fencing Olympic champions are from France and Romania. The coach of China's female boxing champions is Cuban. The Philippines' first Olympic gold-medal gymnast trained in Japan. The Danish badminton two-time Olympic champion had a Chinese coach. Even the sports world has become truly globalised as athletes seek to learn and train from the best coaches. For each sports discipline, this "cross-national" training has the added benefit of increasing visibility and popularity in countries where the sport is not traditionally played.

According to the IFORS Statutes, the objective of the Federation shall be to advance operational research to all the nations of the world. IFORS is dedicated to this mission of promoting the education and growth of operational research, especially to countries where OR is an emerging field. Similar to sports, IFORS devotes much effort to providing cross-national training. Every year, IFORS sponsors students or early-career researchers from developing countries to attend the EURO Summer Institute and the ELAVIO Summer School organised by ALIO. IFORS has a budget to support initiatives for the promotion of operational research in developing countries – proposals are welcome! Since 2020, IFORS offers free Global Webinars, where speakers from each of the IFORS regions provide our worldwide community with updates on exciting new challenges, methodologies and solution approaches. (See https://www.ifors.org/ifors-global-webinar-series/). Since 1999, IFORS has sponsored a Distinguished Lecture at each regular meeting of its regional groups. These IDLs bring a world-renown operational researcher (usually from a different IFORS region) to share his/her expertise to participants of the conferences in all four IFORS regions. In 2024, Prof. Charles Corbett of UCLA gave the Distinguished Lecture at the EURO conference in Copenhagen in July. In the next months, we look forward to IDLs of Prof. Chung-Piaw Teo (National University of Singapore) at the Seattle Informs conference in October, Prof. Tava Olsen (Melbourne Business School) at the ALIO conference in Guadalajara Mexico in October/November, and Prof. Stein Wallace (Norwegian School of Economics) at the APORS conference in Hangzhou China in November. I very much look forward to these IFORS Distinguished Lectures.

WHAT'S INSIDE

From the Editor-In-Chief

Antonio Mauttone <mauttone@fing.edu.uy>

Welcome to the September issue of the IFORS Newsletter!

This issue is particularly rich in terms of conference reports since many relevant OR events are held in the middle of the year. By reading this section, one finds out the high level of activity and diversity of our discipline across the world. This is reinforced by articles in the regular sections, which present successful experiences reported by researchers from different parts of the world. Moreover, this issue includes a farewell message from the former Treasurer of IFORS, Richard Hartl, and an obituary dedicated to Helle Welling, who served as IFORS Secretary for twenty years.

In the OR and Development section, colleagues from Erasmus University, Netherlands, report a project aimed at improving the provision of health products in rural communities in low- and middle-income countries. The case study was developed in Kenya, Africa, where innovative ideas such as “stock-hubs” and cashflow games were implemented since classical supply chain and inventory management methodologies are not valid due to specific local constraints. In the Tutorial section, a colleague from Universidad Nacional de General Sarmiento, Argentina, presents the Zimpler tool, which enables loading data in several formats like CSV or JSON, to be used by the SCIP open-source optimization software. Examples of usage are provided, by using classical optimization problems. In the OR Impact section, colleagues from several institutions in Canada present a Machine Learning (ML) based method to forecast the aftermarket demand of spare parts at a large aircraft manufacturer. The overall problem is a complex one since it involves the management of a global supply chain of products, some of which are refurbished. The ML method allows for considering more features in the forecast, like information related to flight activity and clusters of parts. When compared to the previous approach used by the company, the ML-based method provides better estimations with less computational time, leading to improved customer satisfaction, savings on inventory, and better production planning.

Moreover, the Conferences section reports 22 events worldwide on OR and related disciplines, while the Book Review section reports on the volume “The Sustainability of Operations – Past, Present, Future”.

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

OR AND DEVELOPMENT

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HEALTH PRODUCT AVAILABILITY IN THE PRESENCE OF CASH CONSTRAINTS: A STUDY OF COMMUNITY HEALTH ENTREPRENEURS IN RURAL KENYA

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Worldwide, nearly two billion people lack access to essential medicines (World Health Organization, 2017). Despite considerable progress on United Nations Sustainable Development Goal 3.8, which targets universal health coverage (UHC), including access to essential healthcare services, medicines, and vaccines, we are far from achieving UHC targets by 2030 (World Health Organization and The World Bank, 2023).

Access to healthcare is particularly constrained in rural areas in low- and middle-income countries because of a scarcity of health facilities and medicine retailers, health worker shortages, and frequent stock-outs of medicines. Stock-outs of medicines pose a major threat to global health because they can lead to delayed or interrupted treatments.

Social enterprise Healthy Entrepreneurs (HE) aims to revolutionize health access in Africa's most hard-to-reach areas. By training and empowering Community Health Entrepreneurs (CHEs), HE ensures that health products reach rural communities. These CHEs, locals from rural communities, are trained in healthcare and entrepreneurship, enabling them to sell essential health products within their communities. This proximity translates to faster, more affordable access to health services and products, while also providing CHEs with a source of income. Currently, HE's impressive network spans seven African countries, with 15,000 CHEs reaching 18 million people.

HE manages the supply chain to source health products at affordable prices. Upon arrival in a country, the products are stored in warehouses. The operating area in a country is divided into clusters, with on average 15 CHEs working in each cluster. HE regularly visits clusters to resupply CHEs and to provide additional training. The CHEs determine their own order quantities and frequencies and the timing of their orders which they submit using an ordering app. Figure 1 provides an overview of HE's operations.

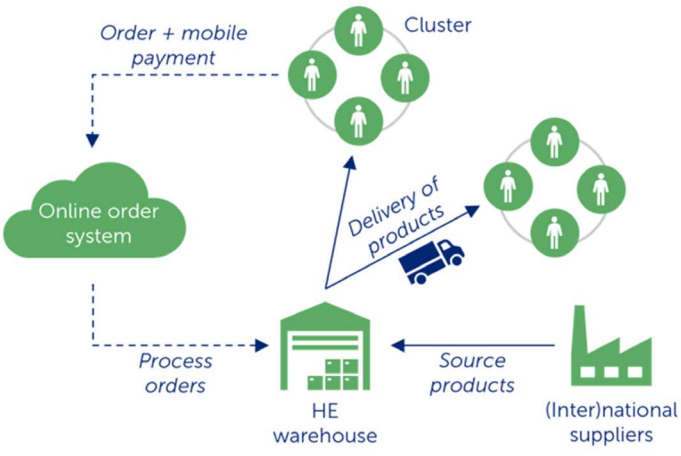

Figure 1 Overview of HE's operations

Though this approach improves access to health products, challenges with availability of health products persist. In a preliminary study in Kenya, it is found that many CHEs frequently experience stock-outs of health products, a problem that significantly impedes their ability to serve their communities. In our study, we collaborated with the HE team in Kenya to find out how to improve the availability of health products.

Approaching this problem first from an OR perspective, we considered solutions such as optimizing the delivery schedule. However, a substantial challenge for HE is the substantial travel time to and between CHEs and limited transportation capacity. This makes frequent resupply difficult, resulting in lead times of one month in Kenya at the time of the study. Transportation capacity could not be increased because of an associated increase in transportation costs, meaning there was limited possibility to change the delivery schedule. Stock-outs can also be reduced with improvements in inventory management. However, operations are not sufficiently matured yet to implement formal inventory management policies on the CHE side. There is currently limited visibility into CHE sales to customers and CHE's inventory levels, as they tend to not keep formal records of their sales and inventory. We therefore looked beyond traditional OR solutions, to identify interventions appropriate for the context.

Initial discussions revealed that the root cause of stock-outs often lies in cash constraints faced by CHEs, meaning that they lack funds to purchase new health products to sell. CHEs' sales volumes are low due to the low population density and high poverty levels typical in rural areas and profits generated from sales are often allocated to personal expenses. Long lead times further exacerbate the negative effect of cash constraints on availability of health products, because CHEs need more cash on hand to purchase sufficient stock to meet the demand during the resupply interval.

To address this, we tested two innovative interventions through a field experiment. First, we introduced "stock-hubs" in a cluster – small consignment stocks close to the CHEs, where they can replenish their stocks on-the-spot. This set-up allows CHEs to replenish their stocks more frequently and in smaller quantities, which requires less cash on hand. Second, we implemented a cashflow game. The game is designed to help CHEs understand the importance of reinvesting cash in their business, thereby improving the cashflow resulting from increased sales.

We selected 26 clusters for the field experiment: six for the stock-hubs, 10 for the cashflow game, and 10 control clusters. Initial pilot implementations took place in late March 2022, followed by full implementation in May and June 2022 (Figure 2). We collected data on CHE order values until February 2023 and performed a difference-in-difference regression analysis to determine the impact of the interventions on CHE order values.

Figure 2 game play during cluster meeting

The field experiment provided invaluable insights into how these interventions could alleviate cash constraints and improve health product availability in areas with high resupply costs and long resupply intervals. Research on this topic is much needed to ensure continued progress towards the Sustainable Development Goals. Interviews with CHEs and HE staff confirmed the positive impact, leading to the integration of the cashflow game into CHE training programs.

References

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OR Tutorial

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ZIMPLER: USE NATIVE INPUT DATA WITH ZIMPL

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1 The Zimpler Tool

To benefit from powerful mathematical optimization solvers, models must be coded in a suitable language, such as AMPL[1] or GAMS[2]. These languages shine when supporting tools combine their expressive power with heterogeneous data sources. Zimpl[3] is such a language, capable of modeling problems as mixed-integer mathematical programs. It's also a piece of software, able to read such models, for other programs to use or to translate them into different modeling languages, like .lp or .mps. The SCIP[4] open-source solver uses Zimpl as an external library to read .zpl Zimpl models.

The Zimpl language requires that model data elements are strictly **defined**; i.e.: *Parameters* and *Sets* have to be assigned concrete values. In this tutorial we present a tool called "Zimpler", which builds on the Zimpl language, allowing for data elements to be **declared** but left undefined. In addition, it can load a variety of popular native input formats and bind their data with the declared elements, producing fully compliant Zimpl models that can be further fed to the Zimpl software.

The separation of data declarations from their definitions eases the integration of Zimpl models with new tabular data formats, such as Properties[5] files, Spreadsheets or Database queries, and also non tabular data such as JSON or graph formats like DOT[6] and DIMACS[7], without requiring custom translation scripts for the most common use cases.

The Zimpler tool is free to use, under the GNU GPLv3 license. Native binaries and source code can be downloaded from https://gitlab.com/zimpler-tool. It includes a growing set of extensions for reading data in different formats, currently including DOT, CSV and Properties, with Excel and JSON to follow soon.

This tutorial shows how to use the Zimpler tool to help solve well-known problems.

2 Usage

After installation, typing `zimpler` on the command line gives usage information. This includes a list of currently loadable input data formats and their expected filename extensions. Zimpler reads Zimpl models from .zpl files and recognizes data files from their file extension. If model.zpl, model.ext1 and model.ext2 exist in the working directory for known extensions ext1 and ext2, running `zimpler` will find undefined data elements in model.zpl and bind them to appropriate definitions from either model.ext1 or model.ext2.

A Zimpl data element is considered *undefined* if it is declared but no expression is immediately assigned to it. For example:

- `set A := { 1, 2, 3 };` # defined
- `set B;` # undefined
- `param c[A] := 4;` # defined
- `param d;` # undefined

The process of finding and assigning values to existing **data elements** is referred to as *resolution*, with generated models referred to as *resolved*. These terms are not to be confused with *solution*, *solving* or *solved*, referring to the process of finding and assigning values to **variables**, performed by software often called *solvers*. The following two sections will present selected examples that highlight the resolution capabilities of the Zimpler tool.

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[1] https://ampl.com/

[2] https://www.gams.com/

[3] https://zimpl.zib.de/

[4] https://www.scipopt.org/

[5] https://docs.oracle.com/javase/tutorial/essential/environment/properties.html

[6] https://graphviz.org/doc/info/lang.html

[7] http://dimacs.rutgers.edu/archive/Challenges/

3 Shortest Path Example

This is the problem of finding a path between two vertices in a graph such that the sum of the weights in its edges is minimized. A Zimpl formulation for this problem is:

Listing 1: File shortest-path.zpl

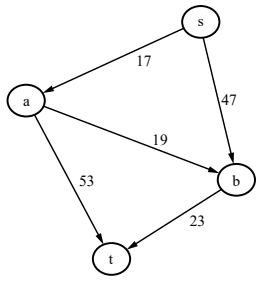
```
# Shortest Path
# set V;            # default graph vertex set name
# set A;            # default directed edge/arc set name
# param c[A];  # cost or weight associated to an arc
defset dminus(v) := {<i,v> in A};
defset dplus(v)  := {<v,j> in A};
var x[A] binary;
minimize cost: sum <i,j> in A: c[i,j] * x[i,j];
subto fc: forall <v> in V - {"s","t"}:
     sum <i,v> in dminus(v): x[i,v] ==
     sum <v,i> in dplus(v): x[v,i];
subto uf: sum <s,i> in dplus("s"): x[s,i] == 1;
```

This problem highlights the use of non-tabular data. An example DOT graph file, with a cost attribute c associated to the arcs is:

Listing 2: File shortest-path.dot

```
digraph {
     s -> a [c=17];
     s -> b [c=47];
     a -> b [c=19];
     a -> t [c=53];
     b -> t [c=23];
}
```

(a) Content



(b) Representation

With files shortest-path.zpl and shortest-path.dot in the current directory, running `zimpler shortest-path.zpl` on the command line yields:

Listing 3: Resolved extract from shortest-path.zpl

```
set V := { read "graph_nodes.txt" as "<s+>" comment "#" };
set A := { read "graph_arcs.csv" as "<1s,2s>"
         skip 1 comment "#" };
param c[A] := read "graph_arcs.csv" as "<1s,2s> 3n"
              skip 1 comment "#";
...
```

Command line option `--output=shortest-path-resolved.zpl` can be used to save the resolved, fully Zimpl-language compliant model. This result is now ready to be solved with the SCIP solver or translated to another format with the Zimpl tool. Note that, in addition to model resolution, Zimpler also generated the following two files:

Listing 4: File graph_nodes.txt

```
# This is the node set of graph
# in file shortest-path.dot
s a b t
```

Listing 5: File graph_arcs.csv

```
# This is the arc set of graph
# in file shortest-path.dot
# There are 5 arcs and these attributes: [c]
source,target,c
s,a,17
s,b,47
a,b,19
a,t,53
b,t,23
```

4 Lot Sizing Example

This is the problem of identifying when and how much of an item to produce, given expected demands in a time horizon and limited production capacity. A simple formulation for this problem is:

Listing 6: File lot-sizing.zpl

```
# Single Item Lot-Sizing
set T;              # time periods
param demand[T];    # demand for <t> in T
param cost[T];      # cost of unit production, for <t> in T
param max_prod;     # max production capacity
param s0;           # initial stock
var x[T] >= 0;
var s[{0}+T] >= 0;
minimize cost: sum <t> in T: cost[t] * x[t];
subto stock: forall <t> in T:
     s[t] == s[t-1] + x[t] - demand[t];
subto max_prod: forall <t> in T: x[t] <= max_prod;
subto init_stock: s[0] == s0;
```

This problem highlights the combination of different data sources and use of tabular data. Example Properties and CSV data files are:

Listing 7: Lot-sizing data files

```
# Simple parameters
# max production capacity
max_prod = 100
# initial stock
s0 = 0
```

(a) lot-sizing.properties

```
# Data series
T,demand,cost[T]
1,50,5.00
2,55,5.10
3,60,5.20
4,70,5.20
5,80,5.40
```

(b) lot-sizing.csv

With files lot-sizing.zpl, lot-sizing.properties and lot-sizing.csv in the current directory, running `zimpler lot-sizing.zpl` on the command line yields:

Listing 8: Resolved extract from lot-sizing.zpl

```
set T := { read "lot-sizing.csv" as "<1n>"
         skip 1 comment "#" };
param demand[T]:=read "lot-sizing.csv" as "<1n> 2n"
                 skip 1 comment "#";
param cost[T]  :=read "lot-sizing.csv" as "<1n> 3n"
                 skip 1 comment "#";
param max_prod := 100;
param s0 := 0;
```

The result is now ready to be solved or translated. Note that values in Properties files are inlined, while data in CSV format is resolved as read expressions.

5 Limitations

Zimpler is still under development. Previous examples show some of its capabilities but there are important input data formats not currently supported. There are also a few needed improvements, from usability to compatibility and beyond. Feature request and problem reporting are encouraged as new Issues at https://gitlab.com/zimpler-tool/main/issues.

OR Impact

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BOMBARDIER AFTERMARKET DEMAND FORECAST WITH MACHINE LEARNING

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Overview

Intermittent demand is a common feature of aircraft spare parts supply chains. Because of infrequent arrivals and large variations in demand, aircraft aftermarket demand is difficult to forecast, which often leads to shortages or overstocking of spare parts. The inventory planning team at Bombardier Aerospace in conjunction with IVADO Labs have developed a tool that combines Machine Learning (ML, a branch of Artificial Intelligence) and traditional time series models to make better use of information on demand patterns and flight data to forecast demand, resulting in a significant improvement in forecast accuracy. This improved system was successfully deployed and used to forecast the aftermarket demand at Bombardier, which amounts to more than 1 billion Canadian dollars annually.

The Problem

Bombardier Aerospace is a manufacturer of aircraft for the business and defence market. An important part of their business is providing after-sales support, including the provision of spare parts. This operation is carried out by Bombardier Aftermarket, henceforth referred to as Bombardier.

Aircraft are complex machines and their safe operation requires a continuous process of maintenance, servicing and repair. This makes for a difficult world-wide inventory problem, with 70,000 different spare parts being required across a multi-layered system of depots according to a schedule driven by time, wear and miles flown. Most of these parts are 'expendable' and are simply replaced from stock but around 2000 items are 'rotable', which are refurbished and re-used, adding to the complexity.

Bombardier's spare parts are stored and distributed across a global network with three regional hubs, eight service centres, and six depots as illustrated in Figure 1.

A Bombadier Aircraft

Previous Approach

The previous aftermarket demand forecasting process at Bombardier relied on internal forecasting software from a third-party software provider which made use of the exponential smoothing model of Croston (1972, reference 1), a simple univariate time-series model (SES). This model was combined with other proprietary algorithms to produce demand forecasts.

This system required frequent manual adjustment, which was cumbersome, unsystematic and very time consuming, a significant problem given the number of parts involved. The existing approach also did not account for available data on flight

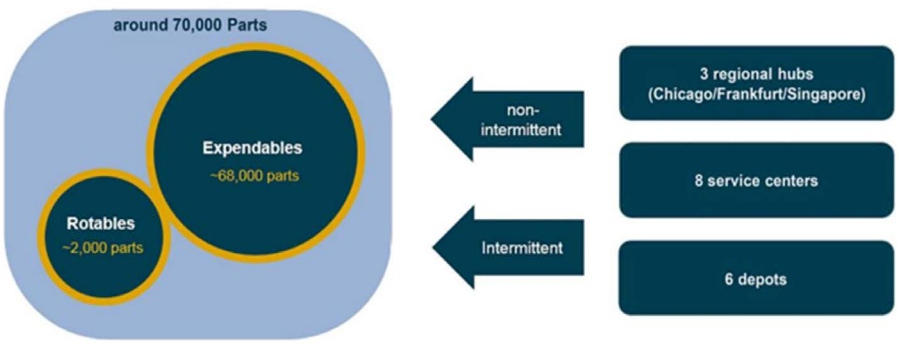

Figure 1 - Overview of the problem

activity, which could help to identify those aircraft that were being used more heavily and were therefore more likely to need spare parts. It also treated demand for parts as independent, not recognising that some parts tended to be required at the same time and for the same reason, forming natural groups.

Developing a new Approach

The limitations of the legacy system had accumulated over the years and a team was set up with representation from both Bombardier Aerospace and IVADO Labs to see how the system could be improved.

This process, which is termed Feature Engineering by IVADO, is carried out in two steps. The first step involves a series of workshops, with the Bombardier team and their subject matter experts to create a list of potential input features for the ML models. This is combined with a review of the available data to assess its quality. At the end of this step, sets of input features are created, based upon various combinations of parameters and transformations of the data.

In the second step, a modelling pipeline is set up and preliminary tests conducted, using different combinations of these features to evaluate the models' performance and to determine the most appropriate ones to use for the ML models. This feature engineering process is flexible and can easily be reconfigured by the users if necessary.

The features chosen are designed to capture the key characteristics of demand patterns, including different lengths of lag and rolling demand windows, intermittency and volatility parameters, seasonal and regional indicators plus flight hours and landing cycles, based upon the flight activity data. Also considered were the number of aircraft using that part and the age of the part.

Building Alternative Predictive Models

Two different frameworks were developed, an RML (rotable machine learning) framework for rotable parts and an IML (intermittent machine learning) framework for expendable parts. Both frameworks combined the outputs of an ensemble of underlying models to forecast demand.

The RML framework used a combination of Elastic Net, a linear regression-based model which models linear combinations of data, and LGBM (light gradient boosting machine) for RML, a tree-based machine learning model that can capture complex non-linear relationships between features. These two models in combination worked better than the tree-based model alone, which tended to under-forecast demand.

The IML framework combined three underlying models, the first of which was LGBM for IML, a tree-based model like that used in the RML framework. The other two models were both decomposition models, comprising a component estimating the time to the next demand pulse and a component estimating it's magnitude. The first of these was the traditional Croston Simple Exponential Smoothing (SES) model but the second was an LGBM tree-based model using ML approaches to estimate these two components of the demand. These approaches are illustrated in Figure 2.

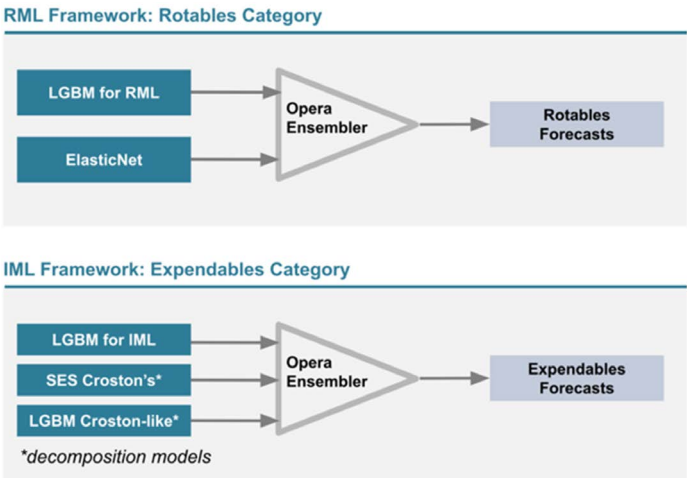

Figure 2 - Overview of the Framework

Testing the Frameworks

Testing the frameworks used two different measures of forecasting accuracy, the root-mean-squared scaled error (RMSSE) and normalized forecasting bias (NFB). The first is a standard measure used in the forecasting literature and the second was the Bombardier management's preferred measure of forecasting accuracy which incorporates a measure of under and over-forecasting to estimate the cumulative implications of the errors on the inventory held.

The model was tested using four-month 'folds' of data, with an initial training fold starting in September 2015 and a set of 5 test folds covering the period from May 2018 to December 2019.

The results of these tests are shown in Table 1 below, with the frameworks and their components shown in comparison to the legacy software and alternative approaches.

The results show that the ML-based approaches outperformed both the legacy approach and the popular alternatives. As a further benefit, the computer time needed for the ML approaches was only 8 hours, compared to the 30 hours needed for the legacy approach.

Impact of the ML- based Forecasting Systems:

Based on these results, Bombardier Aftermarket decided to adopt the ML-based approaches for their spare parts demand forecasting. The new forecasting system was fully deployed in early 2021 and has been regularly used to generate

Part class	Model	RMSSE		NFB		
		Average	DIFF vs. legacy	Unbiased	Over	Under
Rotable parts (RML)	Legacy software	0.55	—	72.4%	20.4%	7.2%
	SES Croston	0.61	+10.9%	67.7%	23.0%	9.3%
	Syntetos-Boylan approximation	0.58	+5.5%	69.4%	18.6%	12.0%
	LGBM for RML	**0.49**	−10.9%	64.9%	7.2%	27.9%
	Elastic Net	0.62	+12.7%	76.8%	18.7%	4.5%
	RML ensemble framework	0.51	−7.3%	**77.5%**	10.3%	12.2%
Expendable parts (IML)	Legacy software	0.55	—	69.2%	24.4%	6.4%
	SES Croston	0.59	+7.3%	67.1%	24.1%	8.8%
	Syntetos-Boylan approximation	0.56	+1.8%	68.6%	19.1%	12.3%
	LGBM for IML	0.52	−5.5%	72.8%	15.5%	11.7%
	LGBM Croston-like	0.57	+3.6%	68.9%	24.7%	6.4%
	IML ensemble framework	**0.49**	−10.9%	**74.2%**	16.5%	9.3%

Note. Best results are indicated in bold.

▲ *Table 1. Results from Testing Alternative Forecasting Approaches (Table 2 in Reference 2)*

spare-parts demand forecasts amounting to more than 1 billion dollars.

The result of introducing the new system has been an increase in forecasting accuracy of some 5.3% relative to the legacy software, leading to improved customer satisfaction, savings on inventory and better production planning due to better estimates of future demand. In addition, obsolescence of spare parts is likely to be reduced.

Inventory turnover has improved more than 4% and the refurbishment cycle for the rotable parts has become more efficient by being better aligned with actual demand patterns. There have also been significant reductions in financial and currency risk, due to not needing to adjust inventory through shipments of expensive and fragile parts from one depot or region to another. There has also been a three-fold reduction in the number of personnel hours required for the demand planning process.

Client Endorsement

"This project started in September 2020 and was completed in February 2021. The team has designed, implemented, and deployed an AI-based forecasting system that yields significant improvements in terms of forecasting performance and run-time scalability. In the validation phase of the project prior to deployment, the new AI-based system has improved the overall accuracy and normalized biases, which are our key performance measures, by approximately 7% and 5%, respectively. The team has then successfully deployed this new system in February 2021, and it is being used regularly to create monthly forecasts for our aftermarket demand and inventory planning since then. Throughout February to July 2021, after deployment, Bombardier Aftermarket successfully improved the overall forecasting accuracy by approximately 5.3% with an overall unbiased forecast of 75.8% by using this new AI based system. This new process also saves more than 70% of forecasting run-time compared to the legacy software, which required approximately 30 hours to complete the process. These results translate into more efficient and responsive inventory planning as well as improved customer satisfaction.

Patrick Lemieux, Director, Parts Operations & Inventory Planning, Bombardier

Concluding Comments

The outcome of this very successful project is that the Bombardier Aftermarket team can now quickly obtain forecasts, make necessary adjustments and use these forecasts to communicate and create fulfilment orders in a much more timely and accurate fashion. A key feature of the new approach is the engagement of subject matter experts in suggesting key criteria that influence demand.

This project can also serve as inspiration for those hoping to apply exciting new approaches drawn from techniques such as machine learning to hard practical problems that have previously been dominated by traditional solutions.

This article is based on Reference 2 and is published here by kind permission of the editor of the Journal of Advanced Analytics.

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Conferences

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EURO 2024 IN COPENHAGEN, DENMARK – AN INCREDIBLE EXPERIENCE IF YOU WEREN'T THERE, YOU MISSED SOMETHING!

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What a conference! With 3029 registered participants from 70 countries across the globe and 2458 presentations, *EURO 2024*, held in Copenhagen, Denmark, from 30th June to 3rd July, 2024, was the second largest *EURO-k* conference ever held.

As in tradition, the program began with an *opening ceremony* on 30th June, 2024, Sunday afternoon with an opening speech by *Rasmus Larsen*, Provost, Technical University of Denmark, followed by a *welcome speech* by *EURO* President, *Anita Schöbel*, followed by the presentation of the prestigious *EURO awards*. *Prof. Lidija Zadnik Stirn* received the *EURO Distinguished Service Award* and *Prof. M. Grazia Speranza* was awarded the *EURO Golden Medal* this year.

EURO 2024 (top-down, left to right): *Tivoli Gards* marching towards the welcome party; EURO President *Anita Schöbel* Ceremonies: left: *EURO Distinguished Service Award*, and right *EURO Golden Medal.*

The conference's official opening was celebrated with a welcome party in which a marching band of children, *Tivoli Gards*, dressed in traditional royal military uniforms escorted the participants to the party venue.

EURO 2024 showcased a diverse program, ranging from classical operational research (*OR*) topics to modern integrations with AI technologies, which was evident in its invited talks. The conference featured three *plenary speakers* including industry speaker *Berit Brouer* (Maersk), *IFORS Distinguished speaker Prof. Charles Corbett* (UCLA), and *Prof. Pascal Van Hentenryck* (Georgia Tech). They delivered outstanding presentations, offering insights into *OR*'s impact on life, its practical applications, and the integration of AI into *OR*.

Additionally, the conference included 12 *keynote talks* by *Javier Alonso-Mora* (University of Technology, Netherlands), *Pedro Amorim* (University of Porto, Portugal), *Maria Besiou* (Kühne Logistics University, Germany), *Péter Biró* (Corvinus University of Budapest, Hungary), *Immanuel M. Bomze* (University of Vienna, Austria), *Emma Frejinger* (Université de Montréal, Canada), *Bahar Yetiş Kara* (Bilkent University, Turkey), *Miloš Kopa* (Charles University of Prague, Czech Republic), *Veronica Piccialli* (Sapienza University, Italy), *Graham Rand* (Lancaster University, UK), *Rubén Ruiz* (Universitat Politècnica de València, Spain), and *Pascale Zarate* (Toulouse Capitole University, France). Their presentations encompassed all aspects of *OR* represented at the conference.

The program featured special events such as *award sessions*, including the *EURO Doctoral Dissertation Award (EDDA)*, the *EURO Excellence in Practice Award (EEPA)*, and the *EURO Prize for OR for the Common Good (EPOCG)*. Additionally, it included *EURO* forums like "*Making an Impact - the EURO Practitioners' Forum*" and "*The EURO WISDOM Forum - Women in Society Doing Operational Research and Management Science*". There was also a *memorial session* dedicated to the late *Prof. Dr. Jakob Krarup*.

In the *conference dinner* that took place at the *Langelinie Pavilion*, situated in the heart of Copenhagen, the participants were entertained by a female choir performing traditional Danish songs. After dinner, the participants hit the dance floor to music played by the *EURO* unofficial DJ, *Bernard Fortz* (Professor at

EURO 2024: Impressions from the Gala Dinner.

HEC Liège and EURO IT manager). Kudos to *Bernard* for his outstanding performance!

Given the size of the event, a *second gala dinner* venue was also set up at *Kayak Bar* in the Copenhagen harbor area. *Prof. David Pisinger* from the organizing committee, entertained the crowd present here by making a grand entrance at the venue by sea by arriving on his own kayak!

The conference ended with a "bang", a spectacular *farewell party* in which the Copenhagen Drummers delivered a mesmerizing percussion performance using drums, trash cans, ladders, water, and fire. Participants enjoyed local beer and the lively atmosphere that invariably accompanies the conclusion of a successful conference.

EURO 2024: Impressions from the *Farewell Party.*

CELEBRATING CONNECTIONS ! A SPLENDID GATHERING OF THE AMERICAN OR COMMUNITY AT THE INFORMS/ALIO/ASOCIO CONFERENCE IN MEDELLÍN, COLOMBIA

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Jinal Parikh <jinal.parikh@ahduni.edu.in>, **Gerhard-Wilhelm Weber** <gerhard.weber@put.poznan.pl>

The INFORMS/ALIO/ASOCIO International Conference is a biennial conference organized by *INFORMS*, *ALIO*, and a local society from *ALIO*. The last one was in Cancún (2018) and was organized by the *Mexican OR Society (SMIO)*. The 2024 edition which happened in Medellín, Colombia, during 16th-19th June 2024, was organized by the *Colombian OR Association- ASOCIO*, (https://www.ifors.org/colombia/). *Michel Gendreau*, Polytechnique Montreal, Canada, and *Fernando Ordonez*, University of Chile, Chile, were the general chairs of the event, while *Kathryn Stecke*, University of Texas at Dallas, USA, was the program chair.

This event series was originally established to strengthen the regional network of researchers and practitioners who focus on operations research and analytics within the associated organizations across the Americas. The 2024 conference with its unique blend of cutting-edge research, developments, and best practices, along with valuable networking opportunities, against the vibrant backdrop of Medellín, beautifully served its purpose!

Professor Kathryn Stecke along with *Professor Michel Gendreu, Professor Fernando Ordonez* and the entire team of committee members of the conference (https://meetings.informs.org/wordpress/2024international/advisory-committee/) were instrumental in bringing together an exceptional line-up of speakers and sessions that not only enriched the participants' knowledge but also inspired them to push the boundaries of *OR* and allied fields.

The conference featured three plenary talks delivered by distinguished scientists: *Tamás Terlaky* from Lehigh University, USA, *Augustine O. Esogbue* from Georgia Institute of Technology, USA, and *Andrés Medaglia* from Universidad de los Andes, Colombia, representing *ALIO. Andrés Medaglia* shared insights into his work on the shortest path structures, which underpin solution methods for complex combinatorial transportation and logistics problems. For the details regarding invited speakers from academia and industry please refer to https://meetings.informs.org/wordpress/2024international/keynotes/.

From left to right: Plenary speakers *Andrés Medaglia* (Universidad de los Andes, Colombia) presented by *Michel Gendreau* (CIRRELT, Canada) and *Augustine O.Esogbue* (Georgia Institute of Technology, USA), and keynote speaker *Zelda Zabinsky* (University of Washington, Seattle, USA).

Impressions of the Program Chair (*Professor Kathryn Stecke's*) reception.

The conference also featured eight tutorial talks, delivered by experts in various fields. Among them were two highly recognized practitioners: *Claudia Rave* from Fluir Laboratorio de Decisión, Colombia, and *Ruslan Shaydulin* from JPMorgan Chase, USA, who introduced the participants to quantum computing. *Emilio Carrizosa* from Universidad de Sevilla, Spain, discussed group counterfactual explanations related to AI classification, whereas *Kannan Ramanathan* from the University of Texas at Dallas, USA, talked about Visual Basic. *Ko-Yang Wang* from National Sun Yat-Sen University, *Taiwan*, conducted a tutorial on the applications of generative AI in the financial industry.

From left to right: *J. Camilio Serpa* (McGill University, Canada) and *Yasmín Ríos Solís* (Tec. De Monterrey, Mexico) giving the tutorial talks on Sustainable Data Hub and Public Transportation in Developing Countries respectively.

Yasmín Ríos-Solís from Tecnológico de Monterrey, Mexico, demonstrated how various algorithms and solution methods are crucial for public transportation systems in developing countries. The conference concluded with a talk about sustainable data hub by *J. Camilo Serpa* from McGill University, Canada.

Cordially thanks to dear ***Grace Lin*** (United Financial Intelligence Corp. (UFI), Taiwan) and dear ***Yasmín Ríos Solís*** for sharing photos of the conference.

A. Mauttone, J. Parikh and G.-W. Weber

From left to right: *Beatriz García* (Tec. De Monterrey, Mexico), *Diego Delone* (ESSEC, France), *Jenny Díaz* and *Yasmín Ríos Solís* (Tec. De Monterrey), *Guillermo Villegas* (President of *ASOCIO*, Colombia).

2024 INFORMS SECURITY CONFERENCE
SUCCESSFULLY HELD AT ARLINGTON, VIRGINIA

Nathaniel Bastian, Robert Dell

*This article has been modified and was previously published in *OR/MS* Today magazine.
Nathaniel Bastian, CAP, and Robert Dell were the General Chairs of the *2024 INFORMS Security Conference*, Arlington, VA, July 28-30, 2024.

As the quantity and complexity of security challenges that impact daily life continue to escalate across the globe, operations research, analytics and other disciplines within the science and technology of decision-making provide the necessary tools to understand and combat these challenges to create a more secure world.

On July 28-30 in Arlington, Virginia, the third *INFORMS Security Conference* was held just minutes from downtown Washington, D.C. This year's conference explored the latest research advancements, and proven applications for addressing a broad spectrum of complex security challenges at the individual, organizational, national, and global levels.

Attendees connected, networked, contributed, and gained valuable insights from researchers, practitioners, decision-makers and others from across industry, academia and government on the front lines of addressing our world's most significant security risks.

Content and Events: Distinguished *keynote speakers* for this year's Security Conference included *Laura Albert*, professor and the David Gustafson Department Chair of Industrial & Systems Engineering at the University of Wisconsin-Madison, and *Sheldon H. Jacobson*, founder professor in the Department of Computer Science at the University of Illinois Urbana-Champaign. *Albert's* keynote, "*Smarter Decisions for a Secure World: A Roadmap for Operations Research,*" offered "*guidance into challenges that the research community can tackle, with the goal of motivating new research that can help move homeland security research forward over the next decade.*" *Jacobson's* keynote was titled, "*The Future of Aviation Security includes Facial Recognition. Are you ready for it?*" He presented a "*roadmap for the future of airport security … that will transform airport security from a process of stopping prohibited items from entering the air system to reducing air system risk by better knowing the population of air travelers and keeping risky passengers away from entering the air system.*"

The logo of the *2024 INFORMS Security Conference*.

In addition, a *panel* of program managers from diverse government funding agencies shared their insights on funding opportunities available to support research on critical problems across the security landscape.

The *2024 INFORMS Security Conference* featured five tracks that broadly covered the spectrum of security, including Homeland Defense; National Security; Medical and Humanitarian Assistance; Data, Artificial Intelligence and Cyber; and Supply Chain, Energy and Transportation.

This was also the first Security Conference to hold a *poster session and competition*, in which attendees shared their security-related research and applied analytical insights.

Distinguished keynote speakers for this year's *INFORMS Security Conference*: *Laura Albert* and *Sheldon H. Jacobson*.

Cordially thanks to dear ***Ashley Kilgore***, for communication and editing assistance that make this partial reprint possible.
A. Mauttone, J. Parikh and G.-W. Weber

THE ANNUAL OPERATIONS RESEARCH SOCIETY OF ISRAEL (ORSIS) CONFERENCE SUCCESSFULLY HELD IN BE'ER SHEVA, ISRAEL

Adi Sarid <adi@sarid-ins.com>

Some of the 100 participants in the *ORSIS 2024* conference during the social event, touring the old city of *Be'er Sheva*, experiencing the rich history and vibrant culture of the Negev region.

The annual *ORSIS conference* was held during 27th-28th of May 2024. This vibrant and intellectually stimulating gathering brought together over 100 prominent researchers and scholars in the field. The conference included 4 parallel sessions centered on Game Theory, Stochastic OR, Continuous Optimization, Combinatorial Optimization, Applied OR, Operations & Supply Chain Management, as well as four plenary lectures.

The conference was hosted by Ben Gurion University of the Negev. The organizing committee included *Professors Yoav Kerner* (chair), *Dvir Shabtay*, and *Moran Koren*. As usual, the meeting provided a platform for attendees to engage in cutting-edge research presentations, thought-provoking tutorials, and networking opportunities.

Four insightful plenary lectures were held during the conference. The *plenary lectures* addressed challenges, trends, and methodologies in *OR. Roie Zivan* from Ben-Gurion University talked about "*Service Oriented Multi-Agent Optimization Problems*", *Noam Shamir* from Tel-Aviv University discussed "*Research in Supply Chain Management: From Inventory Optimization to Platform Economics*", *Niv Buchvinder* from Tel-Aviv University discussed "*Chasing Positive Bodies*", and *Kfir Levy* from the Technion presented "*Beyond SGD: From Variance Reduction to Variance Expansion*".

From left to right: The *Rothblum and Mehrez Prize* winners. *Prof. Snitkovsky (Rothblum Prize winner), Dr. Cohen (Mehrez Prize winner),* and family members.

From left to right: Awarding the prestigious *ORSIS Life Achievement Award to Prof. Avishai Mandelbaum. Prof. Yechiali, Prof. Mandelbaum* and spouse, *Prof. Nahum Shimkin.*

Professor Emeritus Avishai Mandelbaum from the Technion was honored with the triennial *ORSIS Life Achievement Award*, for his exceptional contributions to the field of queueing theory and stochastic processes, spanning over a period of forty-five years. *Avishai's* fundamental contributions cover both deep mathematical analysis as well as well as application oriented research, such as call center analysis. *Avishai* is also a pioneer in the use of data in service science, establishing the Service Enterprise Engineering Laboratory (SEE Lab) at the Technion, which made real-life data available to many research groups worldwide.

Two annual *ORSIS* prizes were awarded. *Dr. Ran Snitkovsky* was awarded the *Uriel Rothblum Award for Excellent Work in Operations Research*, for his paper "*Stochastic Approximation of Symmetric Nash Equilibria in Queueing Games*", co-authored with *Liron Ravner* and published in Operations Research (2023). *Dr. Eyal Cohen* was awarded the *Abraham Mehrez Prize for Excellent Work of a Graduate Student in Operations Research*, for his paper "*Alternating and Parallel Proximal Gradient Methods for Nonsmooth. Nonconvex Minimax: A Unified Convergence Analysis*", co-authored with *Mark Teboulle* and published in Mathematics of Operations Research (2024).

One of the highlights of the conference was an evening event that captured the rich history and culture of the *Negev* region. Participants embarked on a captivating tour of the old city of *Be'er Sheva*, a place steeped in ancient heritage and modern vibrancy. The cobblestone streets, historical landmarks, and vibrant atmosphere served as a backdrop for casual interactions and cultural exchange among conference participants.

We already look forward to the next *ORSIS* conference, which is expected to take place in *Tel-Aviv University*, on May 5th-6th, 2025. For further information see the *ORSIS* website.

2ND COPENHAGEN SCHOOL OF STOCHASTIC PROGRAMMING SUCCESSFULLY HELD AT COPENHAGEN, DENMARK

Giovanni Pantuso <gp@math.ku.dk>

From June 25th to June 27th 2024 the *Department of Mathematical Sciences* at the *University of Copenhagen*, Denmark, organized the 2nd *Copenhagen School of Stochastic Programming*. The *School* was attended by 120 PhD students (the majority) and postdocs/professionals (a few) eager to learn about optimization under uncertainty. It also had the status of a satellite event of the subsequent *EURO 2024* conference.

Some of the participants at the *2nd Copenhagen School*.

Over the four days of the course the *School* offered an intense program consisting of lectures provided by the organizers and by international experts on the topic. The program was thought to provide the students both the theoretical background and some hands-on experience on the topic. In addition, the first two course days featured a small number of selected student presentations.

The first day began with *Trine Boomsma* giving an introductory lecture on *Stochastic Programming*. She touched upon some of the central modeling and solution concepts as well as ongoing challenges. The second day, *Giovanni Pantuso* introduced the *L-Shaped Method,* one of the most popular and widely used methods for solving two-stage Stochastic Programs. The third and fourth days were dedicated to the international lecturers. The first guest lecture was given by *Michal Kaut* from Sintef, Norway. *Michal* presented an overview of the different available *scenario generation techniques* and discussed how to evaluate scenario generation methods. The second guest lecture was given by *Asgeir Tomasgard* from the Norwegian University of Science and Technology. *Asgeir* talked about stochastic programs with multiple time horizons. This type of problem emerges every time there are multiple sources of uncertainty which follow different time resolutions, such as yearly and daily. *Asgeir* presented various solution techniques as well as practical applications of the theory presented. The fourth, and last, day featured two additional guest lectures given by *Francesca Maggioni*, University of Bergamo, and *Alois Pichler*, TU Chemnitz. *Francesca* introduced various techniques to obtain bounds on stochastic programs. She started from elementary bounds based on the so-called wait-and-see solution, passing through bounds derived from Jensen's inequality and the so-called Edmunson-Madansky upper bound and slowly built upon that with progressive refinements. The final lecture was given by *Alois Pichler* who talked about risk aversion in stochastic programming. *Alois* started by motivating the need to address risk and provided a brief overview of the historical development of methods to hedge against risk. He then provided an axiomatic characterization of measures of risk introducing so-called coherent risk measures. He continued with an overview of stochastic dominance and with the conceptual difficulties of dealing with measures of risk in multistage problems.

The course was attended by 120 students from various countries. The majority of the students was affiliated with a European university, but several students came from far-away countries such as South Africa, India, New Zealand and Brazil. The organizers were impressed by the active participation and curiosity of the students who greatly contributed to the success of the course.

More information about the school can be found at the *Copenhagen School of Stochastic Programming's* website https://www.math.ku.dk/english/calendar/events/cssp_2/ or by contacting the organizers.

CPAIOR 2024 AT UPPSALA UNIVERSITY, SWEDEN: MIXING CONSTRAINT PROGRAMMING, ARTIFICIAL INTELLIGENCE, AND OPERATIONAL RESEARCH WITH A DASH OF VIKING HISTORY

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CPAIOR 2024 Organizing Commitee.

The *21st International Conference on the Integration of Constraint Programming, Artificial Intelligence, and Operations Research (CPAIOR 2024)* was held at *Uppsala University* from May 28th to 31st. *CPAIOR* aimed to bring together researchers from Constraint Programming (CP), Artificial Intelligence (AI), and Operational Research (OR) to showcase advancements in each field and promote interdisciplinary collaboration. The conference series has a long tradition of promoting hybrid techniques in optimisation at the intersection of mixed integer programming, machine learning and constraint programming. This year, *CPAIOR* hosted 111 participants from 19 countries and four continents. Thanks to very generous sponsorships, the PhD registration fee was significantly reduced, leading to nearly 35% of attendees being young researchers currently pursuing their PhD. As part of its diversity and inclusion initiative, *CPAIOR 2024* (https://sites.google.com/view/cpaior2024) also provided scholarships to sponsor student presentations.

The scientific program began on Tuesday with a master class focusing on how emerging Quantum Computing technology can impact the fields of Constraint Programming (CP), Artificial Intelligence (AI), and Operations Research (OR), and vice versa. From Wednesday through Friday we enjoyed the single-track program at Uppsala University's Humanities Theatre, featuring three keynotes, 42 presentations of accepted papers, and 2 poster sessions for extended abstract.

The participants were greeted with exceptionally sunny weather on Tuesday evening to help kick off the social program of the conference with an opening reception. A guided tour of Uppsala University's main building provided an ideal setting to connect with old colleagues and meet new faces. The weather remained wonderful throughout, and on Thursday evening we all gathered for the conference banquet at *Norrlands nation*. Known for being the largest student nation in Uppsala, Norrlands' main building dates back to the 1880s and is located by the Fyris River in central Uppsala.

Participants in front of the *Humanities Theater*

Hosting the *CPAIOR* community in Uppsala was a great honour for our team. We thank everyone who contributed to the conference's success. We look forward to meeting again at *CPAIOR 2025* in Melbourne, Australia!

ECCO XXXVII - THE EUROPEAN COMBINATORIALISTS MEET IN GHENT

Silvano Martello <silvano.martello@unibo.it>, **Greet Vanden Berghe** <Greet.VandenBerghe@cs.kuleuven.be>

ECCO XXXVII: the traditional group photo.

66 participants from Austria, Belgium, Brazil, Canada, England, France, Germany, Italy, Spain, Turkey, Poland, Scotland, and the United States got together for *ECCO XXXVII* (https://ecco2024.euro-online.org/) from June 6 to June 8, 2024 at KU Leuven, Ghent Campus (Belgium). This was the annual conference of the *European Chapter on Combinatorial Optimization* (*ECCO*). The scientific program included 47 talks on several aspects of combinatorial optimization, covering its main theoretical and application aspects. Thanks to the financial support of *EURO*, reduced registration fees were offered to all PhD students.

Four *plenary lectures* were delivered by:

- *Stefan Irnich* (Johannes Gutenberg University Mainz, Germany) on "*Shortest Path Problems With Resource Constraints*"; supported by FWO Sci. Res. Community OR4Logistics (grant W001321N);
- *Thomas Magnanti* (Massachusetts Institute of Technology, United States) on "*Designing Transportation and Telecommunications Networks*";
- *El-Ghazali Talbi* (Université de Lille, France) on "*Metaheuristics for the automated design and configuration of Deep Neural Networks*";
- *My T. Thai* (University of Florida, United States) on "*Accelerating Viral Marketing: From Combinatorial Strategies to Learning-Based Solutions*".

(from left to right) *ECCO XXXVII*: the plenary speakers *Stefan Irnich, Thomas Magnanti, El-Ghazali Talbi* and *My T. Thai.*

The Program Committee and the Organizing Committee, both chaired by *Greet Vanden Berghe* and co-chaired by *Tony Wauters*, crafted a wonderful social and academic programme. The social program included authentic Belgian fries paired with locally brewed beer on Thursday, 6 June. The conference dinner on Friday 7 June took place in the unique art nouveau architectural environment at restaurant *Pakhuis*. After the closing session, the delegates were invited to participate in a guided walk in the city center.

A special issue of the Journal of Combinatorial Optimization on "*Latest developments in combinatorial optimization*" was launched, with a submission deadline of December 1, 2024.

The *EWG ECCO*, see https://en.wikipedia.org/wiki/European_Chapter_on_Combinatorial_Optimization, created in 1987 by *C. Roucairol*, *A. Rinnooy Kan*, and *D. de Werra*, is chaired since 1987 by *Silvano Martello*. With over 1700 members, *ECCO* is currently one of the largest working groups of *EURO*. *ECCO* has a tradition of conferences held in charming locations: The latest conferences (2000 -) were held in Capri, Bonn, Lugano, Molde, Beirut, Minsk, Porto, Limassol, Dubrovnik, Jerusalem, Malaga, Amsterdam, Antalya, Paris, Munich, Catania, Budapest, Koper, Fribourg, St Julian's Malta, Madrid (online), St Petersburg (online), and Chania, Crete.

The next *ECCO* conference, organized by *El-Ghazali Talbi*, will take place in the beautiful city of Marrakesh, the kingdom's historic capital city of Morocco, from May 8 to May 10, 2025.

NEWS FROM THE EURO WISDOM FORUM: W4OR WEBINAR ON MACHINE LEARNING AND OPERATIONS MANAGEMENT

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The *EURO WISDOM* Forum (*Women In Society: Doing Operational Research and Management Science*) was launched in January 2020, and since that time it has been actively working on promoting gender equality in *OR* through different initiatives and events. Among the events organized by *WISDOM,* thematic virtual webinars have become a meeting point for young and senior researchers to introduce the awardees of the *WISDOM Young Women for OR* (*YW4OR*) initiative and provide insightful discussions on timely research in *OR*. As a rule, webinars are held via Zoom, and a subject matter expert is invited to comment on the three *YW4OR* presentations and reflect on potential future research directions. Webinars are planned by the Events Subcommittee under the guidance of the *WISDOM* chairs.

WISDOM
WOMEN IN SOCIETY:
DOING OPERATIONAL RESEARCH
AND MANAGEMENT SCIENCE

On May 17th 2024, *WISDOM* hosted the last *YW4OR webinar* on Machine Learning and Operations Management. The participants assisted short talks from three *YW4OR* awardees: *Shany Azaria* ("*Consequences of Long Lead Time - Empirical Evidence of Adverse Effect of Delay on Effort in Court Systems*"), *Fatima Ezzahra Achamrah* ("*Solving Inventory Routing with Transshipment and Substitution under Dynamic and Stochastic Demands using Genetic Algorithm and Deep Reinforcement Learning*") and *Kseniia Kurishchenko* ("*Explainable and Fair Machine Learning by Means of Mathematical Optimization*"). The webinar was moderated by *Vanesa Guerrero*, Universidad Carlos III de Madrid (Spain), who is a member of the events subcommittee. *Prof. Coralia Cartis*, University of Oxford (United Kingdom), commented on the problems presented in the *YW4OR* talks and highlighted interesting future research directions and challenges to be met on the topics related to machine learning and operations management.

Top row, left to right: *Kseniia Kurishchenko, Shany Azaria;* bottom row, left to right: *Coralia Cartis, Fatima Ezzahra Achamrah.*

21ST CONFERENCE EUROPT 2024 ON ADVANCES IN CONTINUOUS OPTIMIZATION, PRECEDED BY A SUMMER SCHOOL, SOLEMNLY CELEBRATED IN VENERABLE LUND UNIVERSITY, SWEDEN

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The *EUROPT 2024* (https://europt2024.event.lu.se/) conference - The *21st Conference on Advances in Continuous Optimization* - concluded successfully at *Lund University* in Lund, Sweden. Organized by the *Department of Automatic Control* under the leadership of *Pontus Giselsson* and *EUROPT* chair *Giancarlo Bigi*, the event spanned from June 26 to June 28, 2024, preceded by a *Summer School* on June 24-25, 2024.

The *Summer School* sessions were very well-received, featuring comprehensive lectures by *Gabriel Peyré* (CNRS and École Normale Supérieure, Paris) on computational optimal transport and *Gabriele Eichfelder* (Technische Universität Ilmenau) on multiobjective optimization. Engaging over 60 participants, these sessions set a foundation for the subsequent conference.

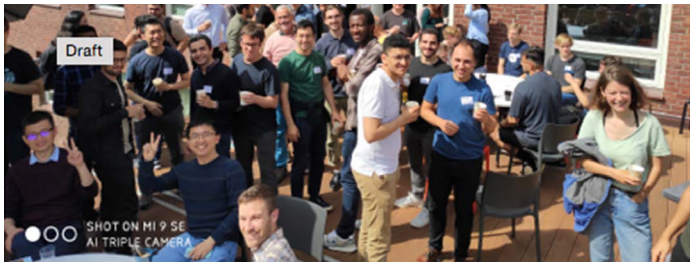
The main conference commenced with insightful plenary talks by distinguished speakers *Gabriel Peyré*, *Amir Beck* (Tel-Aviv University), and *Sebastian Stich* (CISPA Helmholtz Center for Information Security, Saarbrücken), complemented by the *EUROPT Fellow Plenary* delivered by Gabriele Eichfelder, who was recognized as the *2024 EUROPT Fellow*. With a vibrant participation of more than 200 attendees from 34 countries, *EUROPT 2024* hosted six concurrent sessions covering diverse facets of continuous optimization, including global optimization, conic optimization, multiobjective optimization, optimization for learning, nonsmooth optimization, first-order methods, monotone inclusions, and performance estimation.

Notably, the conference welcomed a significant contingent of young researchers in the PhD and postdoctoral stages, fostering an atmosphere of collaboration and curiosity. Their contributions greatly enhanced the conference's dynamic and inclusive environment.

Looking ahead, the *EUROPT* community eagerly anticipates the 2025 edition, poised to build on the successes of *EUROPT 2024*. We extend our heartfelt thanks to all participants and contributors for making this conference a resounding success, and we look forward to gathering once again in Southampton, UK, next year on June 27-28 (summer school) and June 30 - July 2 (conference).

EUROPT 2024 Fellowship: (from left to right) *Pontus Giselsson, Giancarlo Bigi, Gabriele Eichfelder, Oliver Stein.*

EUROPT 2024 *conference* group photo.



Summer School coffee break.

HEALTHCARE SYSTEMS DAY 2024: A DISTINGUISHED EVENT FOR APPLIED OR IN TUNISIA

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The *Healthcare Systems Day 2024* was the seventh event organized by the *African Working Group in Healthcare Systems*, held on May 11, 2024, at the *National Engineering School of Tunis*, Tunisia. This hybrid conference (https://sites.google.com/view/hsd2024/home), dedicated to Operational Research for Healthcare Systems Optimization, marked the first in-person gathering following a series of six online events, which included an *Online Winter School of Data Analytics* and four *Healthcare System Seminars*. The insights gained and connections made at the previous online editions continued to flourish, and the *African Working Group in Healthcare Systems* was thrilled to welcome both returning and new attendees. The event, which attracted 207 registered participants, saw 70% attending in person and 30% participating online. It brought together *OR* researchers, doctors, decision-makers, healthcare administrators, and health experts from 16 countries: Algeria, Bahrain, Benin, Botswana, Canada, Chile, Egypt, France, Italy, Kenya, Mali, Mauritania, Qatar, Tanzania, Tunisia, the United Kingdom, and the USA.

The conference aimed to promote research and knowledge sharing in crucial healthcare application areas, including hospital service performance, healthcare establishment accreditation, logistics, resource management, planning, combinatorial optimization, patient admission and care processes, expense management, IoT, information systems, decision support, risk management, and data analytics. The diverse content highlighted the *African Working Group in Healthcare Systems'* dedication to advancing healthcare optimization through research and international collaboration.

Members of the organizing committee (left to right): *Zeineb Ben Houria, Hejer Khlif, Asma Ouled Bedhief, Safa Chabbouh, Safa Bhar Layeb, Sondes Hammami, Amina Antit, Imen Mejri, Amira Brahmi.*

Attracting a substantial number of submissions, the conference underwent a rigorous selection process led by the scientific committee, resulting in the acceptance of 40 manuscripts. These papers, carefully chosen through peer review by both national and international experts, formed the cornerstone of an extensive conference program. Notably, contributions hailed from diverse locales, spanning Algeria, Bahrain, Canada, France, Hungary,

Iraq, Tunisia, the United Kingdom, and the USA. The proceedings of the *International Conference Healthcare Systems Day 2024* are accessible on the *HAL* science platform (https://hal.science/hal-04571919) and are also indexed by Google Scholar and other recognized databases.

The *"Healthcare Systems Day 2024"* Group Picture.

The conference kicked off with an opening panel featuring a brief introduction to the *African Federation of Operations Research Societies* (*AFROS*) and thanking the sponsors of the event. Insights into the group's mission, highlighted past events, and shared participation statistics from across the globe were provided. There were three parallel sessions featuring a diverse mix of oral presentations and posters, covering advanced topics within healthcare applications. Additionally, attendees had the opportunity to listen to five plenary sessions presented by healthcare executives and university researchers, enhancing the conference program with valuable insights and expertise. The event fostered a friendly atmosphere, with numerous scientific discussions taking place during coffee breaks and the conference lunch, potentially leading to several new research collaborations. The closing ceremony was truly memorable, thanks to the invaluable contributions of everyone involved in ensuring the success of *Healthcare Systems Day 2024*.

Keynote Speakers delivering their in-person presentations (left to right): *Prof. Chokri Hammouda, Prof. Najla Aissaoui,* and *Prof. Mohamed Boussarsar*.

ICAM 2024 AT THE VIDYASAGAR UNIVERSITY, INDIA: APPLIED MATHEMATICS MEETS OPERATIONAL RESEARCH

Sankar Kumar Roy <roysank@mail.vidyasagar.ac.in>,
Gerhard-Wilhelm Weber <gerhard.weber@put.poznan.pl>

The *International Conference on Applied Mathematics* (*ICAM 2024*) took place at *Vidyasagar University*, India, on June 27 and 28, 2024. This biennial conference, initiated by the *Department of Applied Mathematics* at *Vidyasagar University*, Midnapore, West Bengal, India, serves as a prominent platform for experts in Applied Mathematics and *OR*. *ICAM 2024* attracted over 178 participants from various countries, with nearly 60% being PhD students and young researchers.

The conference covered a wide range of topics, including Operations Research, Computer Science, Fuzzy Mathematics, Optimization, Mathematical Programming, Graph Theory, Numerical Analysis, Soft Computing, Dynamical Meteorology, and Computational Fluid Dynamics. The program featured 160 presentations in parallel sessions, four Keynote talks, and eleven invited lectures, providing ample opportunities for knowledge exchange and collaboration among researchers and practitioners in these fields.

Welcome Speech by Program Chair, *Prof Dr. Sankar Kumar Roy.*

The conference began with a welcome reception on Thursday morning, where the pleasant weather and lush greenery of Vidyasagar University created a perfect ambiance for reconnecting with colleagues and meeting new participants. On

Thursday, following a warm welcome address by *Prof. Susanta Kumar Chakraborty* (Chief Patron & Vice-Chancellor), *Prof. Madhumangal Pal* (Head & Chairman), and *Prof. Sankar Kumar Roy* (Program Chair) from the International Program Committee, the scientific program was inaugurated by *Keynote Speaker Prof. Sankar Kumar Pal* from ISI, Kolkata, with his enlightening talk on "*Granular Video Mining and Deep Learning: Why and How?*". Another *Keynote Speaker*, *Prof. Nelson Maculan*, later shared his insights on "*Optimization Models for the Euclidean Steiner Tree Problem in n-Dimensions*".

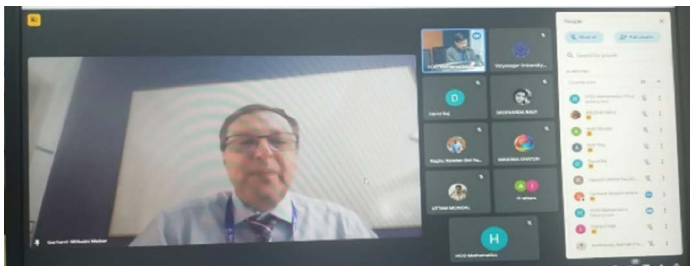
The day continued with invited lecture sessions and a networking lunch, followed by five parallel sessions where young and enthusiastic researchers presented their innovative works to the international community.

Friday brought another exciting day for the participants, beginning with *Prof. Oscar Castillo*'s keynote speech on "*Optimization of Type-2 Fuzzy Systems and Future Trends for Theory and Applications*". The day also featured invited lecture sessions, parallel presentations and the ceremony for the certificates. The conference breakfast and lunch at the university were social highlights, with attendees enjoying delicious seasonal menus in the serene and picturesque campus setting.

The conference concluded on Friday with a compelling *Keynote Speech* by the academic *Prof. Gerhard-Wilhelm Weber*, who is respected in India, on "*Optimization Management of Defined Contribution Pension Funds under the Effect of Inflation, Mortality, and Uncertainty*", wrapping up a highly successful event.

Hosting the Applied Mathematics community at Vidyasagar University was a great honor for our team, and we extend our heartfelt thanks to everyone who contributed to the success of the conference. We eagerly look forward to reconvening at *ICAM 2026* at Vidyasagar University!

Inaugural Ceremony of *ICAM 2024*.



Keynote Speech by *Prof. G.-W. Weber*.

INTERNATIONAL CONFERENCE ON APPLIED MATHEMATICS (ICAM 2024) CELEBRATED IN HO CHI MINH CITY, VIETNAM

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From July 11-13, 2024, Ton Duc Thang University (TDTU) held the International Conference on Applied Mathematics (ICAM 2024) in Ho Chi Minh City, Vietnam.

The Organising and Scientific Committees included *Vo Hoang Duy* (Vice President, TDTU), *Phan Quoc Khanh* (Scientific Chair), *Chu Duc Khanh* (TDTU), *Ewa Bednarczuk* (Polish Acad. Sci.), *Nguyen Huu Can* (TDTU), *Gyu Whan Chang* (Incheon National University, Korea), *Alexander Kruger* (TDTU), *Le Ba Khiet* (TDTU), *Mohsen Razzaghi* (Mississippi State University, USA), *Wen Song* (Harbin Normal University, China), *Phan Thanh Toan* (TDTU), *Nguyen Dong Yen* (Vietnam Acad. Sci.).

Participants of *ICAM-2024*, July 11-13, 2024, Ton Duc Thang University.

Dr. Tran Trong Dao, President of TDTU.

The conference participants presented and discussed the latest research in Optimization, Operations Research, Variational Analysis, and other topics in Applied Mathematics along with their applications. These are among the fastest growing areas of mathematics in Vietnam. The conference was jointly organized by many strong groups in the country and brought together more than 100 researchers from across Vietnam as well as Australia, Chile, China, India, Japan, Korea, Pakistan, Poland, Saudi Arabia, South Africa, Taiwan, Thailand, the United Kingdom, the United States.

"*This event is a scientific forum organized specifically for experts in various fields of applied mathematics. This special occasion offers an opportunity to meet in person, exchange ideas, and disseminate scientific achievements to promote academic development in applied mathematics, particularly Algebra, Optimization, Numerical Analysis, Applied Analysis, and Statistics. I am very pleased to see the conference attracting many speakers and participants from many countries around the world,*" said *Dr. Tran Trong Dao*, President of TDTU, during the opening ceremony.

For more details about the conference, visit https://icam2024.tdtu.edu.vn/.

APPLIED MATHEMATICS AND ENGINEERING WITH AN *OR* PERSPECTIVE AT ICAME 2024 IN THE BEAUTIFUL AEGEAN REGION OF TURKIYE

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The *Third International Conference on Applied Mathematics in Engineering* (*ICAME'24*) (https://icame.balikesir.edu.tr/), successfully held in the beautiful part of Balikesir and the touristic and historical coast of Aegan Sea, in Ayvalik, Balikesir, Turkiye, on June 26-28, 2024, was a great success like its previous versions. This biennial conference was organized in a hybrid format and brought together leading researchers and academics in Applied Mathematics and Engineering to discuss current and interdisciplinary topics in Optimization, Control, Fractional Calculus, Artificial Intelligence and their applications in Engineering and Operational Research.

Conference poster, *ICAME'24*, Balikesir, Turkiye.

ICAME'24 has a rich scientific program with pleanary lectures, invited and mini-symposium talks and also with contributed talks by including the following details: Four plenary lectures by *Dumitru Baleanu* from Lebanese American University (Lebanon), *Abdon Atangana* from University of the Free State (South Africa), *Ender Ozcan* from University of Nottingham (UK), and *Gerhard-Wilhelm Weber* from Poznan University of Technology (Poland), four invited talks by *Mukund N. Janardhanan* from University of Warwick (United Kingdom), *Eray Cakici* from IBM Data Science & AI Elite Team (Germany), *Jordan Hristov* from University of Chemical Technology and Metallurgy (Bulgaria), and *Hossein Jafari* from University of South Africa, and a total of 214 presentations (in six parallel sessions) have been successfully presented by 188 authors from 26 countries, i.e., Turkiye, Germany, United Kingdom, USA, Bulgaria, Morocco, Belgium, Poland, Hungary, Portugal, Romania, Malaysia, Indonesia, India, Ireland, South Africa, Algeria, Qatar, Oman, Lebanon, Iraq, Iran, Nigeria, Singapore, United Arab Emirate and Palestine.

Group picture of *ICAME'24*, VE Hotels Ayvalik (Vilayetler Evi), Sarimsakli, Balikesir, Turkiye.

Beyond the scientific success of the conference, *ICAME'24* had a well-organized social program in a touristic part of Balikesir, in Ayvalik. Besides Ayvalik's rich historical heritage, its wealth of artistic landmarks and culinary delights were highlighted through organized tours and cultural activities. These experiences enriched the conference and provided participants with a vibrant cultural tapestry to explore. In addition, the conference included a gala dinner in the bay of Ayvalik, where attendees had the opportunity to network while enjoying the beautiful views of the Aegean Sea. Additionally, participants of the *ICAME'24* were informed about upcoming *OR* events: *EURO 2025* (https://euro2025leeds.uk/), and *IFORS 2026* (https://www.ifors2026.at/home/).

OPTIMIZATION AND OR IN MOROCCO, CELEBRATED AT ICOP 24 IN THE HISTORICAL CITY OF FEZ

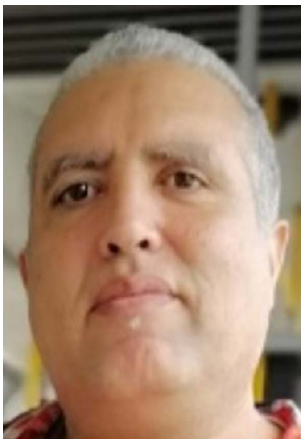
Nazih Abderrazzak Gadhi <abderrazzak.gadhinazih@usmba.ac.ma>

ICOP 24, an *International Conference on Optimization*, was held at the faculty of *Sciences Dhar El Mahraz, Sidi Mohamed Ben Abdellah University* of Fez (Morocco), from May 16 to 18, 2024. It was jointly organized by the *Laboratory of Mathematical Analysis and Applications* (*LAMA*), the *Faculty of Sciences Dhar El Mahraz* (*FSDM*), and *Sidi Mohamed Ben Abdellah University* (*USMBA*). On behalf of the Program Committee, *Prof. Nazih Abderrazzak Gadhi*, the chairman of the conference, discussed the conference content, welcomed all the participants, and expressed gratitude to the keynote speakers for accepting the invitation. A photo of all the participants at this event was taken right after the opening ceremony.

Participants of *ICOP 24*.

During the conference, attendees presented their most recent research and explored future directions and collaborative opportunities in optimization and operational research. The event included 11 plenary talks and 9 parallel sessions with productive discussions. Both academics and students took the opportunity to discuss and connect with our esteemed guests. *Prof. Nazih Abderrazzak Gadhi* (https://orcid.org/0000-0001-6752-2709) took advantage of this occasion, with all these eminent researchers gathered, to honor his mentor, *Prof. Hassan Riahi*.

COP 24's *Keynote Speakers* included *Dr. Alireza Kabgani* (University of Antwerp, Belgium): "*High-order Moreau envelope in the nonsmooth and nonconvex setting*"; *Prof. El Mostafa Kalmoun* from (Al Akhawayn University, Morocco): "*A theoretical analysis of bilevel optimization formulations for optical flow*"; *Prof. Alexander Y. Kruger* (Ton Duc Thang University, Vietnam): "*Fuzzy multiplier rules: decoupling approach revisited*"; *Prof. Luz de Teresa* (Universidad Nacional Autónoma de México, Mexico): "*On Stackelberg hierarchic control for parabolic equations*"; *Prof. Juan Enrique Martinez Legaz* (Universitat Autònoma de Barcelona, Spain): "*Closed convex sets that are both Motzkin decomposable and generalized Minkowski sets*"; *Prof. Fabio Raciti* (University of Catania, Italy): "*Variational inequality approach to network games: theory, algorithms and extensions*"; *Prof. Hassan Riahi* (Cadi Ayyad University, Morocco): "*Combining Strong Convergence, Values Fast Convergence and Vanishing of Gradients for a Proximal Point Algorithm Using Tikhonov Regularization in a Hilbert Space*"; *Prof. Vladimir Shikhman* (TU Chemnitz, Germany): "*Scalarization via utility functions in multi-objective optimization*"; *Prof. Michel Théra* (University of Limoges, France): "*Linear regularity and strong CHIP of closed sets in Asplund spaces, old and new results*"; *Dr. Alain Zemkoho* (University of Southampton, United Kingdom): "*The bilevel optimization renaissance through machine learning: lessons and challenges*"; and *Prof. Enrique Zuazua* (Friedrich-Alexander-Universität, Erlangen-Nürnberg, Germany): "*Optimal placement of sensors and actuators*".



For more details about the conference, visit https://icop24.sciencesconf.org/.

4th ICPR AEM 2024: MOVING TO NEW PRODUCTION AND MANAGEMENT PARADIGMS, CELEBRATED IN POZNAN, POLAND

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International Conference on Production Research (*ICPR*) has a history of over 50 years of biennial conferences organized and supported by *International Foundation for Production Research* (*IFPR*). The *ICPR* events are complemented with regional conferences in the regions of IFPR activity. The *4th Regional Conference for Africa, Europe, and Middle East* (*ICPR AEM 2024*) was held at the *Poznan University of Technology* (*PUT*), *Faculty of Engineering Management* (*FEM*) in Poznan, Poland from June 28 to July 3, 2024 (https://aeme-cpr.put.poznan.pl). The Conference addressed contemporary challenges in production management, offered numerous solutions to organizational problems and initiated numerous discussions on new production research and management paradigms.

The conference started on Friday with a *Doctoral Workshop* which included inspiring instructions on designing and implementing research methods and structuring doctoral thesis by *PhD Isabella Jesemann*, professional networking by *Prof. Anthony Chiu*, and on academic career planning by *Prof. Mihai Dragomir*. The workshop resulted in posters presenting research concepts prepared by groups of workshop participants. The posters were presented during poster session, and their publication potential was discussed with experts.

The *ICPR AEM* was also the opportunity to discuss current issues during *Regional IFPR meeting*, held at the *Faculty of Engineering Management* on Sunday. The fruitful meeting concluded with appointing the location and organizers of the *ICPR AEM in 2026* - Newcastle University Business School.

Official opening of the conference was scheduled for Monday morning and followed by inspiring keynotes by *Prof. Gerhard-Wilhelm Weber*, *Prof. Daniela Popescu*, and *Prof. Anthony Chiu*. The day continued with parallel sessions, dedicated to green and circular manufacturing, maturity and resilience and digitization of manufacturing processes. The participants had the chance to

Keynote by *Prof. Daniela Popescu*.

talk during networking lunch and regional evening, presenting the folklore of *Wielkopolska* region.

The second day of the *ICPR AEM* brought even more inspiring presentations and discussions, after which participants had the opportunity to walk through the historical center of Poznan. The evening was concluded with a conference gala dinner held in the hall of *FEM* facility and honored by the exclusive performance of *PUT* choir *Volantes Soni*, making the evening unforgettable. Even though the conference was officially closed, on Wednesday participants could have fun during the tour on historic tram.

Hosting the *IFPR* community in Poznan was a great honor for our team, and we thank everyone who contributed to the conference's success. We look forward to meeting again at *ICPR AEM 2026* in Newcastle!

The *Conference Dinner*.

LEARNING AND INTELLIGENT OPTIMIZATION CONFERENCE LION 18, CELEBRATED IN ISCHIA ISLAND, NAPOLI, ITALY

Paola Festa <paola.festa@unina.it>

This international meeting continued the successful series of *LION* events (the most recent editions were *LION 14* in Athens, *LION 16* in Milos Island, and *LION 17* in Nice). As any *LION* conference, the main purpose of this edition was to bring together experts from these areas to discuss new ideas and methods, challenges and opportunities in various application areas, general trends and specific developments. In particular, *LION 18* was focused on exploring intersections and uncharted territories between Artificial Intelligence, Machine Learning and Operational Research, as proven by a variety of contributions received and by the *Invited Talks* given by the following five leading researchers:

- *Mauricio G. C. Resende*, University of Washington, Seattle, on June 9th: "*Random-Key Optimizers (RKO): Problem Independent Combinatorial Optimization*";
- *Frank Hutter*, University of Freiburg, Germany, on June 10th: "*AI that builds and improves AI: Meta-Learning the next generation of Learning Methods*";
- *Ruth Misener*, Imperial College London, UK, on June 11th: "*Optimal Decision-Making Problems with Trained Surrogate Models Embedded*";
- *Matthias Poloczek*, Amazon, USA, on June 12th: "*Bayesian Optimization: A Reliable Tool for Black-Box Problems and Beyond (with a Deep Dive into High Dimensions)*";
- *Kevin Tierney*, Bielefeld University, Germany, on June 13th: "*Deep Reinforcement Learning for Vehicle Routing Problems*".

The conference took place in *Ischia Island* (Napoli, Italy) from June 9th to 13th, 2024.

Ischia is one of the wonderful islands in the Gulf of Naples, having volcanic origin and known and appreciated all around the world for its diversified landscape, natural beauty, and thermal water. Its wonderful thermal hot springs have been used for wellness and therapeutic treatments since the VIIth century BC on Ischia, there are many nice beaches that invite the visitor to take a swim.

Ischia Island: location of *LION 18* conference.

LION 18 Technical Program Committee involved many people, including *Carlos Ansòtegui*, *Francesco Archetti*, *Hendrik Baier*, *Roberto Battiti*, *Christian Blum*, *Mauro Brunato*, *Antonio Candelieri*, *Konstantinos Chatzilygeroudis*, *Clarisse Dhaenens*, *Luca Di Gaspero*, *Theresa Elbracht*, *Giovanni Fasano*, *Daniele Ferone*, *Paola Festa*, *Francesca Guerriero*, *Laetitia Jourdan*, *Dario Landa-Silva*, *Vittorio Maniezzo*, *Silvano Martello*, *Yannis Marinakis*, *Oleg Prokopyev*, *Massimo Roma*, *Andrea Schaerf*, *Meinolf Sellmann*, *Marc Sevaux*, *Thomas Stützle*, *Tatiana Tchemisova*, *Kevin Tierney*, *Gerardo Toraldo*, *Dachuan Xu*, *Qingfu Zhang*, *Anatoly Zhigljavsky*, *Antanas Zilinskas*.

LION 18 Local Organizing Committee members were *Maurizio Bruglieri*, *Ciriaco D'Ambrosio*, *Daniele Ferone*, *Paola Festa* (Chair), *Giusy Macrina*, *Tommaso Pastore*, and *Ornella Pisacane*.

The author of this report, ***Prof. Paola Festa*** (paola.festa@unina.it) from University of Napoli "Federico II", Italy, served as the *Conference Chair of LION 18*.

160th ANNIVERSARY OF PROF. DR. HERMANN MINKOWSKI CELEBRATED AT INTERNATIONAL CONFERENCE IN KAUNAS, LITHUANIA

Audrius Kabašinskas <audrius.kabasinskas@ktu.lt>

The International Scientific Conference dedicated to the 160th Anniversary of Birth of Prof. Dr. Hermann Minkowski took place at *Kaunas University of Technology* (Lithuania) during 20-22 June, 2024. The event was held in the university's Great Aula, the same location where the University of Lithuania was ceremoniously opened on February 16, 1922, marking the establishment of Kaunas University of Technology.

Minkowski Conference: Group photo with speakers and organisers. First on the right seat is the great-grandson of *H. Minkowski*, *Prof. P. Rudenber*. Then, sitting from right to left, the members of the scientific program committee: *M. Ragulskis*, *N. Schappacher*, *J. Brüdern*, *B. Narkevičienė* and *M. Wardetzky*.

The conference, organized by mathematicians from *Kaunas University of Technology* and *Georg-August Göttingen University*, honored *Hermann Minkowski*, the renowned mathematician who proposed the concept of the unity of space and time and established its geometric structure. *Minkowski*, whose contributions are foundational to the theory of relativity, spent his early childhood in Aleksot, a suburb of modern Kaunas, and attended the Kaunas Governorate Gymnasium (now Maironis Gymnasium). Later, when the family moved to Königsberg, he studied at the universities of Königsberg and Berlin. After graduation, *H. Minkovski* taught at the universities of Königsberg, Bonn, Zurich, Berlin and Göttingen. *Minkowski* passed away at the age of 44 on January 12, 1909, from complications of a ruptured appendix. Despite his untimely death, his scientific legacy continues to influence fields such as relativity, gravity, astrophysics, cosmology, and electrodynamics. *Minkowski*'s pioneering work on four-dimensional space-time and Gaussian curvature laid the mathematical foundation for *Einstein's* second theory of relativity, significantly impacting modern technologies such as GPS and space travel by ensuring accurate navigation and efficient transportation systems. His methods are also crucial in *OR*, optimizing traffic flow, transportation planning, and resource extraction processes, enhancing operational efficiency across industries. Thus, *Minkowski*'s contributions continue to shape and improve our world, demonstrating their enduring relevance in contemporary science and industry.

Esteemed plenary speakers included *Habil. Dr. Tilman Sauer* from Mainz University, *Dr. Joachim Schwermer* from the University of Vienna, *Dr. Martin Henk* from the Technical University of Berlin, and *Dr. Stefan Halverscheid* and *Dr. Thorsten Hohage* from Georg-August Göttingen University. The plenary session concluded with a talk by *Prof. Dr. Paul Rudenber*, *H. Minkowski*'s great-great-grandson, from Southern Maine Community College, USA. *Prof. Rudenber* humorously inquired about the "Minkowski sausage", referring to an early fractal structure first described by his great-great-grandfather.

The conference also celebrated FMNS's recent achievement of obtaining the right to provide PhD studies in Mathematics in Kaunas, in collaboration with Göttingen and Charles Universities. In this occasion, *Dr. Jörg Brüdern*, a professor at Göttingen University and chair of the PhD program, and *Dr. Miloš Kopa*, a professor at Charles University and the keynote speaker at *EURO 2024*, were honored with silver ambassador badges by Rector *Eugenijus Valatka* and Dean *Bronė Narkevičienė* from the Faculty of Mathematics and Natural Sciences.

The three days conference concluded with an excursion "*Along the Paths of H. Minkovski*" on June 22, the original date of birth of *Herman Minkowski*. The *Minkowski Conference* attracted 90 participants from 11 countries, featuring 5 plenary talks and 50 scientific presentations.

Looking for reason to visit Kaunas? The best opportunity is 29 June - 3 July 2026, during 23rd *ECMI Conference on Industrial and Applied Mathematics*.

MACHINE LEARNING, OPTIMIZATION, AND APPLICATIONS CONFERENCE CELEBRATING OR IN KIGALI, RWANDA

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The German Research Chair, *Prof. Dr. rer. nat. habil. Abebe Geletu* of *AIMS Rwanda* and *Prof. Dr.-Ing. habil. Pu Li* of the Process Optimization Group of Technology University of Ilmenau led the organizing committee of the *African International Conference on Machine Learning, Optimization, and Applications* (*MLOA*). The conference had 85 attendees including scientists, industry experts, and ministry representatives. The *MLOA* conference, held from July 24 to 26, 2023, showcased how machine learning, optimization, and operations research methods can drive technological advancements, better resource utilization, and advances in a various human endeavors.

Organizers, International and Local Committee Members, and Participants of *MLOA 2023*.

On *24 July*, the AIMS global network president, *Prof. Dr. Sam Yala* offered opening remarks. This was followed by speeches from honourable guests including Rwanda's Minister of Information and Communication Technology (ICT), *Paula Ingabire* who underlined Rwanda's innovation and pioneering role in the technology sector on the African continent and highlighted the idea of pan-Africanism. The conference's mission was to unite top global and African minds to create innovative solutions for developmental and sustainability challenges of Africa. World-leading researchers, PhDs, and practitioners presented their scientific innovations and research experiences.

25 July was dedicated to the submitted research papers of the participating scientists. Majority of the presentations were delivered in-person. Among other things, the presenters addressed how machine learning, optimization, and operational research methods can be applied to improve the African farming sector, water resources management, health care, renewable energy generation, storage and distribution, etc. The conference provided an international platform for discussions, collaboration between scientists, exchange of knowledge on current trends, and future prospects on advanced applications of machine learning, optimization, and operations research methods; especially, to address development challenges and sustainability problems of African countries.

On *July 26*, international guests toured Kigali and visited *Kigali Genocide Memorial*, *Nyandungu Eco-Park*, the *AIMS Rwanda Center*, and *AIMS Research & Innovation Center* (*RIC*) for a social event to network and engage in less formal discussions. During this visit, *AIMS Research and Innovations Center* PhD students presented short talks on their research work.

The conference featured the following distinguished speakers: *Prof. Boris Mordukhovich* from Wayne State University, USA, discussed "*Advances in Optimization*". *Prof. Avi Ostfeld* from Technion - Israel Institute of Technology, Israel, focused on "*Optimization Methods in Water Distribution Network Systems*". *Prof. Patrick Mäder* from Technische Universität Ilmenau, Germany, spoke on "*Machine Learning and its Applications*". *Prof. Lorenz T.* (*Larry*) *Biegler* from Carnegie Mellon University, USA, highlighted "*Optimization and Engineering Applications*". The *MLOA* conference fostered connections within the diverse scientific community. The presentations covered advanced research and brought together participants from various academic backgrounds under machine learning, optimization and applications.

Conference Homepage: https://www.aims-tuilm-syosu.com/event/conference2023/.

Distinguished speakers at *MLOA* (top-down, left-right): *Prof. Mordukhovich*, *Prof. Ostfeld*, *Prof Mäder*, and *Prof. Biegler*.

OPTIMIZATION AND OR IN SICILY, ITALY: INTERNATIONAL WORKSHOP ON "ADVANCES IN NONLINEAR ANALYSIS AND OPTIMIZATION"

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From May 23-29, 2024, the *International Workshop on "Advances in Nonlinear Analysis and Optimization"* (*NAO*) was held at the *International School of Mathematics «Guido Stampacchia»* of the *Ettore Majorana Foundation and Centre for Scientific Culture* in Erice, Sicily (Italy).

Opening Ceremony of *NAO* (left to right): *Professors A. Barbagallo, G. Moscariello, M. Théra, H. Frankowska* and *L. Mallozzi*.

The directors of the workshop were *Annamaria Barbagallo* (University of Naples Federico II), *Hélène Frankowska* (CNRS and Sorbonne Université), *Lina Mallozzi* (University of Naples Federico II) and *Gioconda Moscariello* (University of Naples Federico II).

The aim of the workshop in Erice, Sicily, was to review and discuss recent developments of the theory of Nonlinear Analysis and Optimization and to provide an environment to fruitful interactions in these closely related fields of research and their applications. Nonlinear Analysis has wide and significant applications in many areas of mathematics, including functional analysis, variational analysis, nonlinear optimization, convex analysis, nonlinear ordinary and partial differential equations, dynamical system theory, mathematical economics, game theory, signal processing, control theory, and so forth. Optimization is a rich and thriving mathematical discipline. Properties of minimizers and maximisers of functions rely intimately on a wealth of techniques from mathematical analysis, including tools from calculus and its generalizations, topological notions, and more geometric ideas. The theory underlying current computational optimization techniques develops ever more sophisticated duality-based algorithms, interior point methods, and control-theoretic applications are typical examples. Many of our daily-life problems can be written in the form of an optimization problem. Hence, solution methods are needed to solve such problems. Due to the complexity of the problems, it is not always easy to find the exact solution. However, approximate solutions can be found. The theory of best approximation is applicable in a variety of problems arising in nonlinear functional analysis and optimization.

Participants at *NAO 2024*.

The workshop participants presented and discussed the latest research in Optimization, Operational Research and Nonlinear Analysis along with their applications. These are important directions in Applied Mathematics and are among the fastest growing areas of mathematics in Italy. The workshop brought together about 40 researchers from across Italy as well as the US, Vietnam, France, Austria and Australia.

The workshop created opportunities for young researchers to communicate and learn directly from experts in the field. It was sponsored by the *University of Naples Federico II*, the *National Institute for High Mathematics "Francesco Saveri"* (*GNAMPA*), the *Italian Association of Operations Research* and the *Association for Mathematics Applied to Social and Economic Sciences*.

For more details about the workshop, visit https://sites.google.com/view/nao2024/.

OPTIMIZATION AND OR MEET IN ANTWERP: WORKSHOP OF NONSMOOTH OPTIMIZATION AND APPLICATIONS (NOPTA 2024)

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The *Mathematical Optimization Team* and *Applied Mathematics Group* of the *Department of Mathematics* at the *University of Antwerp* were pleased to host the *SOCN Spring* Course "*Variational Analysis in Optimization and Control*" led by *Prof. Boris Mordukhovich* and the "*Workshop on Nonsmooth Optimization and Applications*" (*NOPTA 2024* - https://www.genconv.org/nopta-2024-workshop/), from 8 to 12 May 2024. Both events, together with a special issue of the *Journal of Global Optimization* were dedicated to the *75th birthday* of our colleague *Prof. Boris Mordukhovich*. All the necessary information can be found on the website of *NOPTA 2024* (i.e., https://sites.google.com/view/wnopta/home).

NOPTA 2024 participants in *HORTA*, Antwerp, Belgium.

The primary objective of this workshop was to bring together researchers, academics, practitioners, and industry experts in the field of nonsmooth optimization to foster collaboration and knowledge exchange. The workshop aims to create a platform for sharing cutting-edge research, innovative methodologies, and practical applications related to nonsmooth optimization techniques. The scope of the workshop included (but was not be restricted to) the following topics: (i) nonsmooth convex optimization; (ii) nonsmooth nonconvex optimization; (iii) nonsmooth and variational analysis; (iv) complexity and efficiency of nonsmooth optimization algorithms; (v) large- to huge-scale structured optimization; (vi) nonsmooth optimization in machine learning; (vii)novel applications of nonsmooth optimization.

While the *SOCN* course had 120 registrations, the *NOPTA 2024* received 103 registered participants. We were privileged to have 15 *keynote presentations* on a wide array of topics: (1) *Boris Mordukhovich*: *"Fundamental convergence analysis of sharpness-aware minimization"*; (2) *Yurii Nesterov*: *"Optimization, the philosophical background of artificial intelligence"*; (3) *Coralia Cartis*: *"Optimization of functions with low effective dimensionality"*; (4) *Radu Ioan Boţ*: *"Fast continuous time methods for monotone equations"*; (5) *Marc Teboulle*: *"Lagrangian methods for nonsmooth optimization"*; (6) *Claudia Sagastizábal*: *"Exploiting VU-structure in l1-regularized minimization"*; (7) *Michel Thera*: *"Linear regularity and strong CHIP of closed sets in Asplund spaces, old and new results"*; (8) *Amir Beck*: *"New results on the multi-dimensional linear discriminant analysis problem"*; (9) *Russell Luke*: *"Convergence theory for randomized nonconvex optimization algorithms"*; (10) *François Glineur*: *"Performance estimation of optimization methods: a guided tour"*; (11) *Mikhail Solodov*: *"Descent sequences in weakly convex optimization"*; (12) *Jérôme Bolte*: *"Nonsmooth differentiation of equations and algorithms"*; (13) *Panagiotis Patrinos*: *"Forward backward envelopes under the lens of generalized convexity: Unifying framework and algorithms"*; (14) *Nicolas Gillis*: *"Inertial and extrapolated block majorization minimization with application to NMF"*; (15) *Peter Richtarik*: *"On the resolution of a stubborn problem in federated learning and how it relates to nonsmooth optimization"*. We also invited 20 semi-plenary presentations and received 44 posters presented in five days of the workshop. We are grateful to the *Applied Mathematics Group* and the *University of Antwerp* for financial and administrative support, as well as the *FWO*, *ERC* (*ACCOPT* project), and *Atlas Copco* for additional financial support.

75th Birthday of *Prof. Boris Mordukhovich* (left) and *NOPTA 2024 Conference Dinner* in *HORTA* (right).

PHD SCHOOL ON ROBUST OPTIMIZATION SUCCESSFULLY HELD IN MONTPELLIER, FRANCE

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The *Laboratoire d'Informatique, de Robotique et de Microélectronique de Montpellier* was pleased to host the *School on Robust Optimization* from June 3 to June 5 of 2024 (https://roschool24.sciencesconf.org). This school was organized in the same spirit as the one that took place in Avignon in 2022. It covered the basics of static robust optimization, adjustable robust optimization, and combinatorial robust optimization. The classes were given by three experts on the topic, namely *Ayse Nur Arslan*, *Boris Detienne*, and *Marc Goerigk*, and were organized into lectures, exercises, and lab sessions. There were 39 students attending the school, coming from Europe and beyond. The novelty of this year was to welcome all participants with a wine-and-cheese tasting on the first day of the school.

We are grateful to *GDR-RO* for financial support, as well as the *LIRMM* for administrative support.

CORVINUS UNIVERSITY OF BUDAPEST HOSTED THE 10th VOCAL CONFERENCE

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The 10th VOCAL Optimization Conference took place at Corvinus University of Budapest, Hungary, from 5-7 June 2024. The event was supported by the *Corvinus University of Budapest* (*BCE*), the *Hungarian Operational Research Society* (*MOT*), the *Association of European Operational Research Societies* (*EURO*) and the Continuous Optimization Working Group of *EURO* (*EUROpt WG*). A total of 93 participants from 13 different countries (Austria, Belgium, Czech Republic, Croatia, France, Germany, Hungary, Italy, Romania, Serbia, Switzerland, United States and United Kingdom) took part in the event.

The conference featured four keynote plenary speakers on a variety of topics. *Daniel Kuhn* (College of Management of Technology, Swiss Federal Institute of Technology Lausanne) gave a presentation on "*Distributionally Robust Linear Quadratic Control*". *Máté Matolcsi* (Budapest University of Technology and Economics, Rényi Institute) gave a talk on "*Linear Programming Bounds for Problems in Discrete Geometry*", while *François Glineur* (Center for Operations Research and Econometrics, Catholic University of Louvain) spoke on estimating the efficiency of optimization methods. The *EURO*-supported plenary speaker, *Merve Bodur* (Operational Research, School of Mathematics, The University of Edinburgh), discussed theoretical and practical issues of decision making under uncertainty in her presentation "*Decision Rules for Sequential Decision-making Under Uncertainty*".

Giancarlo Bigi, chair of the PC, *Merve Bodur*, *EURO Plenary Speaker*, *Sarah Fores*, *EURO* representative, *Tibor Illés*, chair of the ISC (from left to right).

The conference featured 27 sessions with a total of 79 half-hour presentations on various topics in operations research, such as approximation algorithms, interior point algorithms, decision theory, game theory, combinatorial optimization and stochastic programming. *Corvinus University of Budapest* was represented at the conference with a total of 18 participants. The event was organized by the *Corvinus Centre for Operations Research*, *Corvinus Institute of Advanced Studies* and several members of the *Department of Operations Research and Actuarial Sciences* (*Tibor Illés*,

Prof. Aurél Galántai, the winner of the *2024 Egerváry Award* (left), *Miklós Pintér* (right), member of the *MOT* board; in the foreground: *Zsolt Darvay*.

Marianna Eisenberg-Nagy, *Csaba Kolos Ágoston*, *Petra Renáta Rigó* and *Anita Varga*). The opening speech of the international conference was given by *Zoltán O. Szántó*, dean of *Corvinus Institute of Advanced Studies*, academic vice-rector of Corvinus University. In his speech, he highlighted the achievements of Corvinus University in operational research and the past, present and future of the field at our university.

Keeping with the tradition of the conference, one of our sponsors, *MOT*, presented the Jenó Egerváry Award at the conference dinner. The winner of the 2024 Egerváry Award was *Professor Aurél Galántai*, whose work was praised by our colleague *Miklós Pintér*, a member of the *MOT* board.

The conference provided an excellent opportunity for networking between researchers in the field of operational research. It was a great opportunity for participants to exchange ideas, discuss new research and explore opportunities for collaboration. After the plenary presentations and the parallel sessions, several informal discussions and debates took place, which also contributed to a friendly and productive atmosphere. During the coffee breaks, the atmosphere was warm and inviting, with attendees sharing ideas and forming connections in a relaxed setting. The beauty of Budapest, with its majestic Danube River and historic landmarks, provided a stunning backdrop for the conference. Participants had the chance to enjoy the city's rich culture and scenic views, further enhancing the overall experience of the event.

Book Review

THE SUSTAINABILITY OF OPERATIONS - PAST, PRESENT, FUTURE

By Joris Van De Klundert

Now Publishers Inc., Hanover, The United States
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OR AND OM PRACTICES - A SUSTAINABILITY APPROACH

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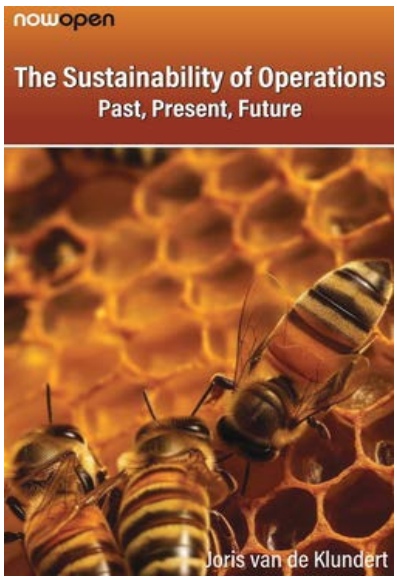
This book by *Joris Van De Klundert* on the interface between sustainability and operations considers operations from a global sustainability point of view. It offers an extensive and historical insight into the relationship between operations and sustainability that has not yet appeared in the operations management literature. Specifically, it reveals how operations are impacting planetary boundaries and social inclusion. In addition, it clarifies how operations came to be as they are currently, based on rigorous definitions of relevant concepts. It is a meticulous attempt by the author to depict how operations have influenced human beings and vice versa. Various episodes in the development of traditional (production, logistics, distribution) as well as non-human operations ranging from cotton supply chain to the impact of the development of the script to the current dynamic advancements in the fields of information & communication technology have been skillfully brought together by the author to build a coherent story. It also adeptly explores the pathways towards a sustainable future.

This book presents a much broader scope of operations which encompasses all operations of humankind as required to address the sustainability of humankind and planet earth in three interrelated core domains: economic development, social inclusion, and environmental protection. Its primary focus is to highlight the pressing need for revolutionizing operations given the challenges presented by present day unsustainable operations; in light of 4IR, technological advancements, the Paris Agreement, and SDG 12. The key research aims of this book are to: *i)* analyze the history of the operations of humankind and its impact on sustainability. This analysis can provide insight into the logic and value of existing operating models and the enablers and barriers of the transformation in operations that is required to return to a safe and just operating space, *ii)* take inventory of the present urgent sustainability challenges as caused by operations and of the ongoing technological innovations of the 4IR, and to establish the relationship between them, and *iii)* explore how to redesign and manage human operations to form sustainable future ways of working and living for humankind, in particular by leveraging the technologies of the 4IR. Thus, while not primarily based on operations management, this study explicitly relates to existing operations management practices and literature. Further, in line with its research aims, it also covers operations management perspectives at the end of each chapter (except Chapters 1 and 11) which mostly consider how operations can help mitigate sustainability challenges.



OR and *OM Practices* -
A sustainability approach

The author has graciously cited various scholarly research contributions in the "References" section at the end of the book to provide to its readers an in-depth review of the literature related to its contents. This book is intended to cater to diverse and interdisciplinary audience including practitioners, scientists, and students of operations management and operations research. It may also serve as a valuable resource for policy makers, business strategists, technology managers, and others devoting themselves to creating a sustainable future, as it may build the necessary understanding of the present operations that cause transgressions of the safe and just

operating space, and of the transition towards sustainable operations. It has been designed to enable the operations community to understand current problems, to find directions towards sustainable operations, and to contribute to the necessary transition

A brief overview of the highlights of the chapters in this book follows:

***Chapter 1* – Introduction** presents the reader with a background and rationale for the sustainability of operations. It discusses the relevance of past, present and future of operations management to humankind and vice versa. It elucidates the crucial role of operations management and its association to sustainability given the impact of 4IR, SDG12, and technological advancements in the present times. It presents the readers with the research aims with which this book has been written.

***Chapter 2* – Sustainability and Operations** provides a formal description of the definition and scope of operations. It goes on to explain various other important definitions and concepts including sustainable ecosystems, an ecosystems-based definition of operations, and ecosystems dynamics and ecosystems engineering. Next, it throws light on the sustainability challenges of the operations of humankind, which are expressed in terms of economic development, social inclusion, and environmental protection. It concludes with presenting sustainability challenges from various operations management perspectives viz. the empirical organizational, the primary process, the value chain, the human society, and the planetary.

***Chapter 3* – The Origin of Operations** begins with a discussion on the origin of operations as defined by the emergence of life, of a community of members of living species, in the ecosystem of planet earth 4 billion years ago. This is followed by a discussion about the industrious bees and the industrious beavers to illustrate the complexity and advanced organizational behavior that nonhuman operations involve as well as to depict how they form a natural anchor for sustainable operations through their eusocial ways of living and working.

***Chapter 4* – The Operations that Shaped Humankind** describes various operations management practices like stone tool manufacturing, making fire and hunting & gathering that shaped humankind. The next section on sustainability of gathering and hunting operations discusses these operations in terms of their impact on economic development, social inclusion, and environmental protection. It shows that while in comparison to the effective ecosystem engineering beavers, hunting and gathering humans stood out for their impact on ecosystems, the resulting (near) extinctions of other species and subsequent ecosystem impacts have been often unintentional consequences of human operations rather than consciously planned ecosystem engineering operations. It closes with operations management perspectives for more effective ecosystem engineering, specialization, and division of labor.

***Chapter 5* – Food Production in Sedentary Niches** discusses the evolution of operations of humankind beginning with a discussion on the development and spread of agricultural operations in the section 'First Farmers'. This is followed by a discussion on various other operational advances and innovations which include - the invention of the wheel, the use of metals, mining and melting, urbanization and civilization, and the development of transport, trade & supply chains. Further, it discusses how the advancements in these agricultural operations impacted sustainability of the agricultural revolution in the context of economic development, social inclusion, and environmental protection. It ends with the operations management perspectives of ownership, capital, civilization, and warfare as well as the foundations of operations management.

***Chapter 6* – The Production of Visible Language** covers further advancements in the production of visible language until the first industrial revolution of the 18th century which include development of the script, writing operations and resources, & paper and printing. It is followed by a discussion on sustainability of the script and book printing in the context of economic development, social inclusion, and environmental protection. It concludes with the operations management perspectives on xylopgraphy and printing.

***Chapter 7* – The Global Cotton Supply Chain** examines how the shift from printing to newer supply lines triggered the industrial revolution followed by a discussion on industrial revolution centered around and brought about by cotton manufacturing. It goes on describe the developments and advancements of cotton and coal manufacturing operations and the powerful impact they made on global supply chains worldwide. Sustainability of the first industrial revolution is next covered in the context of economic development, social inclusion, and environmental protection. The chapter concludes with operations management perspectives on operations management for mass production and

standardization through interchangeable parts.

***Chapter 8* – Engines and Electricity** starts with an explanation of some of the many operations of invention which shaped the 19th century industrial revolution. These include Edison's invention factory, electricity and the electric engine, the car manufacturing assembly line, and applications of oil and gas. Next, the sustainability of the second industrial revolution in terms of economic development, social inclusion, and environmental protection is covered. The chapter closes with a discussion on the birth of operations management as a discipline and the continuous flow clockwork.

***Chapter 9* – Communication, Calculation, and All Other Service Operations** covers the advent of the third industrial revolution marked by the advances and ubiquity in information and communication technologies including telegraph, telephone, mobile, computer, internet, 2G, 3G, 4G and 5G, WiFi and Bluetooth, etc. The next section describes the services revolution by first defining services followed by an explanation of formalization and servitization followed by shedding light on whether there has been a threshold development resulting in revolutionary new service operations, or whether the old services have automated and scaled up old. Sustainability of the 3rd industrial revolution in terms of economic development, social inclusion and environmental protection is covered next. The chapter concludes with operations management perspectives on the role of information and communication technology in operations management, lean operations and the elimination of waste, services operations management and operations management for information and communications products and services.

***Chapter 10* – A Revolutionary Transgression of Planetary Boundaries** begins with a discussion on evolution and revolutions toward contemporary operations, followed by a deliberation on transgression of planetary boundaries in the context of environmental protection, social inclusion, and economic development. The next section introduces and defines the 4th industrial revolution. Subsequently, operations management reflections depicting current operations management practices in terms of economic development, social inclusion and environmental protection given 4IR have been described.

***Chapter 11* – Operations for a Sustainable Future addresses** how to redesign and manage human operations to form sustainable future ways of working and living for humankind, by leveraging the technologies of the 4IR. It begins with a synthesis of the five pathways towards a sustainable future focused on operations and technological advancement. The next section elucidates some of the many important interactions between operations and technology that play a pivotal role for a sustainable future. These include energy and greenhouse gas emissions, agriculture, land use and biochemical flows, industry and novel entities, and services operations management. The chapter concludes by presenting operations management reflections for sustainable operations management which describe how operations management can make essential, meaningful contributions to resolving the sustainability challenges.

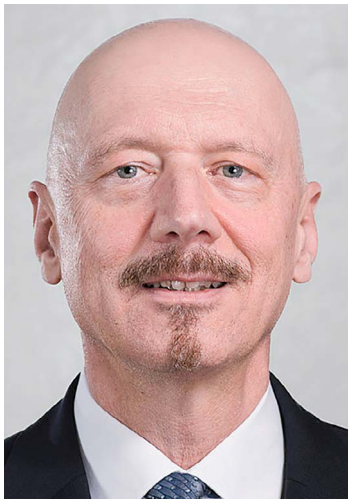
It may be particularly worth noting that the book intends to be inclusive and explicitly covers social sustainability. Hence there is ample opportunity for

Book author: *Professor Joris Van De Klundert*

operations research to contribute to sustainability by optimizing equity and social inclusion in global value chains (as outlined in the final chapters). Also, during the current times, when attention is shifting to optimization problems in the production of carbon neutral renewable energy, this book emphasizes that there are many opportunities for operational researchers to contribute to a sustainable future for planet earth and its inhabitants (even in the most remote areas of planet earth).

While this book vividly describes *OR* and *OM practices in the past, present and future from the perspective of sustainability*, many further scientific, practical, and real-world applications may be further explored.

Richard Hartl | 2015 - 2023



This is an update on the treasurer's report on 2023. In the June 2024 issue of IFORS-News, I reported the unaudited results, based on the payments made and received in 2023. This led to a loss of $US 38,660 in the unaudited results. Meanwhile the auditor has delivered the audited result. As expected, due to accruing, the income of the 2023 Triannual conference (as well as the expenses related to it) count for 2023, even if received only beginning of 2024. As a consequence, the 2023 numbers now show a profit of $US 31,637. Our thanks go to the organizers of IFORS 2023 in Santiago/Chile for organizing a conference that was both scientifically and financially very successful.

Let me end this report with a personal statement. I had the honor and pleasure of serving as the IFORS treasurer for 9 years (2015 to 2023). While adding to my workload, this was a very rewarding experience. I had the privilege of working together with 4 IFORS presidents (Nelson Maculan, Mike Trick, Grazia Speranza, Janny Leung), three secretaries (Mary Magrogan, Christy Blevins, Gavin Blackett) and numerous AC members from all over the world. All these were amazing and dedicated people and – contrary to some of the meetings at university level – there were never fights or unpleasant arguments. Always the team as a whole (AC) pulled together to achieve the best possible solution with the aim to foster Operations Research in the world.

During these 9 years, IFORS faced some challenges. First, one of our "cash cows", the IAOR was discontinued by the publisher and we lost a significant source of income. To make up for that in the long run, we started a new journal, Sustainability Analytics and Modeling (SAM). We also had to endure the period of Covid-19 and our IFORS 2020 conference had to be deferred to 2021 and in the end had to be turned into an online conference. A third major challenge was the organizational registration in Switzerland. Even though we had started this tedious registration process already at the beginning of my term, it is still not completely finished. While finally being registered, we are still struggling with obtaining the NPO status. Finally, the IFORS secretariat, which had been with our US member society INFORMS for many years, had to be moved to our new secretariat with our UK member society ORS. The danger of losing our organizational memory was successfully averted through a series of very efficient handover meetings.

Financially, the situation of IFORS has not changed substantially in these 9 years of my term as treasurer. End of 2014, IFORS had assets of $US 1.53 million (which was the highest amount ever due to the very successful IFORS 2014 conference in Barcelona) and end of 2023 we had accumulated funds of $US 1.42 million.

Beginning of 2024, my successor Marco Laumanns (who previously had been treasurer of the Swiss OR society for many years) took over. I wish him and IFORS all the best and I am sure that IFORS will continue to contribute significantly to making the world a better one.

Appreciation:

On behalf of IFORS, I would like to express our deep appreciation for the stellar service of Prof. Dr. Richard Hartl as IFORS Treasurer for nine years. Throughout his term as Treasurer where IFORS faced many challenges, Richard helped us negotiated those changes and IFORS came out the better for it. We thank Richard for his dedication, professionalism and good humour --- also his travel stories! We wish Richard more travel adventures, but know he will not be far from the IFORS family!

Janny M.Y. Leung
IFORS President

Obituary

Helle Welling | 1932 - 2024

GRAHAM RAND

The IFORS Statutes used to state: 'The duties of the Secretary are to act as administrative servant of the Federation'. Helle Welling, IFORS secretary for 21 years, who has died at the age of 92, was a marvellous servant to the International Federation of Operational Research Societies (IFORS). In her case, perhaps 'mother' would be a better word than 'servant', because she said that 'to function as the IFORS secretary is in many ways like running a big family. To be in charge of the organisation of a General Meeting, a President's dinner, and to cooperate with various organizing committees of a Triennial Conference is like organising a big party at home'. She went on to comment that 'to me it was like having pen friends all over the world. I sat in the middle trying to meet demands from the member societies and from the IFORS officers, answering questions, organising, planning meetings, and solving problems. And - as in a real family - when you give, you receive. I will never cease to marvel how much you receive in return for trying to be there for the member societies and the IFORS' officers'. For many operational researchers in the final quarter of the last century, Helle was simply Mrs. IFORS: she was the embodiment of IFORS, serving as IFORS Secretary from 1976 until 1997, and playing a valuable role at the Triennial Conference in Beijing in August 1999.

Helle had first become involved in IFORS in 1970, when working for the then IFORS President- Elect, Arne Jensen, Professor of Mathematical Statistics and OR at the Technical University of Denmark. He assumed that Helle would know what IFORS was all about, but eventually he realised that this was not the case, and suggested that she went to London to visit the IFORS' secretary, Margaret Kinnaird. Helle commented that 'after half a day spent with Margaret, things started falling into place'.

In 1972 Helle went with Arne Jensen to the IFORS Conference in Dublin. She recalled how she sat listening to the General Meeting of the Board of Representatives, with English being spoken in about 30 different accents. Helle asked Margaret how on earth she was able to minute all these statements/outbursts/questions. Margaret's answer was: 'I write what they think they said'. Helle said 'later on, when I myself became in charge of the minutes of the General Meeting, I always had Margaret's words in the back of my mind'.

In 1973 Arne Jensen, Roger Collcutt from the UK, then the IFORS Treasurer, Margaret and Helle went to Japan to look at conference facilities for the 1975 Conference. They were entertained in the most magnificent way. Apparently, Margaret and Helle became so absorbed in the Japanese way of entertaining that one night when they returned to the hotel, their heads filled with the day's discussions, they decided to have their own private tea ceremony. Helle recalled that 'there we were at 12 o'clock at night all dressed up in our version of the Japanese kimonos, trying to copy the Japanese way of relaxing. I am not sure we met all the requirements for a Japanese tea ceremony, but I do recall that we put the work behind us and had a good night's sleep, although disturbed by a minor earthquake'. Helle much appreciated the enrichment of her life through her service to IFORS.

Helle played a key role in the conferences held in Toronto (1978), Hamburg (1981), Washington DC (1984), Buenos Aires (1987), Athens (1990), Lisbon (1993) and Vancouver (1996). She worked with IFORS' Presidents Takehiko (Bill) Matsuda (Japan,1974-76), David Hertz (USA, 1977-79), Roger Collcutt (UK, 1980-82), Heiner Müller-Merbach (Germany, 1983-85), Jacques Lesourne (France,1986-88), William P. Pierskalla (USA, 1989-91), Brian Haley (UK, 1992-94) and Peter Bell (Canada,1995-97). With these Presidents and their Administrative Committees, she served OR Societies and operational researchers all over the world.

In 1976, the IFORS Bulletin, a non-scientific publication carrying information on IFORS and OR activities worldwide, was initiated by Heiner Müller-Merbach, who was then a Vice-President. The Bulletin was distributed to all member societies and to individuals interested in OR. Helle took over the editorship in 1979, a role she carried out for two decades, and developed it into a useful means of

transmitting information on what was happening in the OR world, in particular to smaller societies. But its main role, in a pre-internet age, was to establish a link among the various member societies. In the Bulletin, IFORS member societies and individual OR people could publish anything concerning the OR world. Such information reached other OR Societies, and a great number of lone OR workers throughout the world. Helle became an IFORS Fellow in 2022. In her nomination documents, one former president said that 'she published a regular newsletter with all information related to IFORS, which was distributed to all Societies. In a time when all communications were by mail, she kept all our societies in touch'. Andres Weintraub (President 1998-2000)

Another said that 'of all of the great persons that I have been privileged to know in my years with and for IFORS I have known none with the dedication and capabilities she has demonstrated in care and work for our Societies'. Bill Pierskalla (President 1989-91)

Helle attended a gathering at the EURO conference, held in Copenhagen in July, and met some of those who hold her in a great deal of respect and affection, including IFORS President, Janny Leung, and three former presidents. With the news of her death a month later, we realise how fortunate we were to have that opportunity.

IFORS NEWS

Editor in Chief: Antonio Mauttone

universität wien

Decision Support for a Sustainable World

The 24th Conference of the International Federation of Operational Research Societies

12–17 July2026, Vienna, Austria