2024 EDELMAN GALA

Recognizing Distinction in the Practice of Analytics, Operations Research, and Management Science



2024 EDELMAN GALA

FOR DISTINCTION IN PRACTICE



FRANZ EDELMAN AWARD
Achievement in Advanced Analytics, Operations Research & Management Science
Emphasizing Beneficial Impact

INFORMS EARLY CAREER PRACTITIONER AWARD
Engage & Recognize Early Career Professionals
Exemplifying Excellence and Support of the Discipline

UPS GEORGE D. SMITH PRIZE
Strengthening Ties Between Academia & Industry
Emphasizing Effective Academic Preparation

DANIEL H. WAGNER PRIZE
Excellence in Operations Research Practice
Emphasizing Innovative Methods and Clear Exposition

INFORMS PRIZE
Sustained Integration of Operations Research
Emphasizing Long-term, Multiproject Success

Orlando, Florida | April 15, 2024

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THE EDELMAN GALA

CEREMONY PROGRAM

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2024 INFORMS Early Career Practitioner Award

Shantih Spanton
2024 INFORMS Early Career
Practitioner Award Chair

2024 Edelman Finalist Project Summaries

ALDI SÜD Germany
American Airlines
McDonald's China

2024 UPS Smith Prize Presentation

Anne Robinson
2024 UPS George D. Smith Prize Chair

2023 Daniel H. Wagner Prize Presentation

James Cochran
2023 Wagner Prize Chair

2024 INFORMS Prize Presentation

Mehmet Gumus
2024 INFORMS Prize Chair

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Molslinjen
Tata Steel Limited
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2024 Franz Edelman Award Winner Announcement

Julie Swann, INFORMS President
Rajesh Tyagi, 2024 Edelman Award Chair

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Sponsorship list as of March 22, 2024.

HOST OF CEREMONY

Pooja Dewan, Formerly of BNSF Railway and Otis Elevator



A member of INFORMS since 1993, over the years, Pooja has led several initiatives that touch upon many activities conducted by INFORMS. She has served as chair of the Franz Edelman Award and Edelman Gala as well as the Innovative Applications in Analytics Award (IAAA) competition, and served as president of the Practice Section and Railway Applications Section. In addition, she served as committee chair of the Meeting of Analytics Program Directors (MAPD), in which she has been instrumental in sponsoring activities that help bridge the gap between academia and practice.

Pooja holds a master's and PhD in industrial engineering from Pennsylvania State University. She has also authored multiple research publications in various scientific journals and serves on several advisory boards.

Most recently, Pooja was the Vice President and Chief Data & Analytics Officer for Otis Elevator Company. At Otis, she was responsible for driving the analytics, data science, data architecture, and management strategy and roadmap, shaping a robust global operating model driving significant business value by innovative use of data and analytics products. She successfully transitioned the company from outdated data silos to a modern cloud data ecosystem and implemented multiple commercial artificial intelligence (AI) products. She led data science teams in developing pioneering solutions utilizing various technologies such as image analytics, large language models, machine learning, and AI. She also served as an executive sponsor for the Women in Technology Energy Resource Group at Otis and helped establish a global community that focused on enhancing the representation of women in STEM fields, demonstrating her commitment to diversity and inclusion initiatives.

Before joining Otis, Pooja held various positions at BNSF Railway, each with increasing scope and responsibility. As chief data scientist in her final role, she led the Operations Research & Advanced Analytics team to international acclaim, winning the 2018 INFORMS Prize, along with several other practice awards, including the Daniel H. Wagner Prize, IAAA, Best Railway Applications Paper Award, and was a semifinalist for the Franz Edelman Award.









ANALYTICS AND OPERATIONS RESEARCH TODAY

SMARTER DECISIONS FOR A BETTER WORLD

By Julie Swann, INFORMS President



On behalf of INFORMS, its board of directors, leadership, staff, and the volunteers whose dedication and hard work have made the 2024 INFORMS Analytics Conference and Edelman Gala a success, it is my pleasure to officially welcome you to this evening's incredible celebration. Thank you for joining us as we recognize the finalists and celebrate the winners of the most impactful INFORMS awards: the Franz Edelman Award for Achievement in Advanced Analytics, Operations Research, and Management Science; UPS George D. Smith Prize; Early Career Practitioner Award (celebrating its inaugural year!); Daniel H. Wagner Prize for Excellence in Operations Research Practice; and INFORMS Prize.

Tonight serves as a reminder of the power and impact not only of O.R. and advanced analytics, but the people who compose this community – the people whose imaginations fuel innovation and whose hard work and dedication spark the incredible discoveries and applications we'll be learning about and celebrating tonight.

This year's finalist teams represent a wide range of organizations across a broad spectrum of industry and from all across the globe. Tonight, we welcome teams from China, Germany, Denmark, India, the Netherlands, and the United States.

Tonight's awards also capture powerful accomplishments at every stage of an analytics practitioners' professional journey. From recognizing the important role of university programs in setting a standard of excellence for future analytics leaders, to the possibilities that can be achieved in the first few years working in the profession, to recognizing a career-long dedication to furthering the role and impact of analytics, and finally, leveraging advanced analytics to make a true difference in tackling our world's most complex challenges.

Regardless of career stage, there really is something here to motivate and inspire everyone at tonight's ceremony. These awards and their finalist teams prove that it's never too late … or too soon … to pursue analytics excellence.

I encourage you to take time to explore this program book, featuring this evening's awards and esteemed finalists. Again, thank you for joining us for the 2024 Edelman Gala to celebrate excellence in analytics and the incredible people who are truly making Smarter Decisions for a Better World.

SUPPLY CHAIN END-TO-END DECISION-MAKING POWERED BY OPERATIONS RESEARCH AND ANALYTICS

Reflections on Winning the 2023 Franz Edelman Award
By Mingang Fu, Jing Huang, Prakhar Mehrotra, and Srinivasan Venkatesan, Walmart Global Tech

In April 2023, at the annual INFORMS Analytics Conference in Aurora, Colorado, Walmart won the most prestigious award in the fields of operations research (O.R.) and analytics – the Franz Edelman Award. This was a momentous occasion for Walmart, and a testament to the incredible patience, hard work, and dedication of each team member involved. The journey to reach this milestone was undoubtedly challenging, but it has also been one of the most rewarding experiences.

As we reflect on this journey, there are lessons we learned along the way:

- Achieving goals takes time, effort, dedication, and a lot of discipline. Walmart applied for the 2020 Edelman Award for our work in dynamic markdowns. We were selected as finalists but did not win. This loss served as a valuable learning opportunity for the Applied AI team. We started again with renewed focus, teamwork, and an unwavering desire to win.

- The journey to the top is full of obstacles, which has the potential to impact team morale. Keeping yourself and the team motivated is essential. Your desire to win and pursuit of perfection will inspire others to do the same. More importantly, believe in your team. When someone believes in you, everything can change; fear decreases, confidence increases, and the bravery to aim higher and take a leap grows. When a team feels really supported, it has the potential to be the best it can be.

- There is power in how we tell our story and showcase ourselves to others. It's essential to be crystal clear on the takeaways and the impact you are making. A well-thought-out story is self-explanatory and sometimes obvious to the audience.

- You cannot risk leaving anything to chance or luck in your journey. You have to ensure every detail, even minor ones, are accurate and polished.

Walmart's transition into an omnichannel retailer has led to significant changes in the demand patterns faced by its brick-and-mortar stores. Additionally, the macroeconomic changes resulting from COVID-19 have further added ambiguity to consumer demand. Meanwhile, the recent advancements in warehouse automation technologies necessitated strategical transformation of Walmart's supply chain network within a short timeframe. The fast-changing demand patterns, with high ambiguity, in an accelerated transforming supply chain network, motivated us to take a holistic approach, which integrates strategic and operational decisions consisting of three components.







1. Network planning and transformation, which outlines the long-term network with step-by-step recommendations on how to achieve the end state.

2. A routing and loading system (Load Planner), which determines how to efficiently move products across the network.

3. A simulation platform, which supports strategic decision-making with executional optimization engines.

Our approach in joining O.R. on both the strategy and execution side to enable holistic end-to-end decision-making made this solution framework unique. Strategy in supply chain usually involves long-term, irreversible decisions that can become constraints for execution. It can be very expensive when these decisions are made suboptimally, limiting the room for cost improvement of execution. To overcome this challenge, we leveraged a simulation platform to support long-term strategic decisions by evaluating as many scenarios as possible.

We are proud of the breakthroughs we achieved throughout the development and implementation of our solutions in three major areas:

1. Filling the gaps between theoretical studies and real-world applications by simultaneously solving routing and loading problems using all realistic complex operational constraints.

2. Developing an exact method to solve a variable-size multiple-compartment container loading problem with complex real-life constraints, within a millisecond.

3. Accurately running hundreds of scenarios with varying inputs in reasonable time, in response to stakeholders' and management queries, thus resulting in a high adoption success rate.

Winning the Edelman Award has provided an excellent opportunity to showcase the massive scale of Walmart's supply chain, its complexities, and the enormous potential for applying O.R. and analytics to make an impact on costs, sustainability, investments, our associates, and customers. It also recognizes the collective efforts of a diverse group of Walmart associates including scientists, engineers, product managers, strategy officers, DC/store associates, and drivers. Moreover, the models and algorithms we developed have high potential for transportability beyond their original usage in the grocery outbound distribution at Walmart, demonstrating their versatility and applicability.

We are extremely honored and thankful to the judges, our coaches (Ken, Kermit, and Ulas), and the entire INFORMS community for Walmart's recognition with the 2023 Franz Edelman Award. We hope our work has proven the feasibility and value of supply chain end-to-end decision-making.

OPERATIONS RESEARCH: BILLIONS AND BILLIONS OF BENEFITS!

By Jeffrey M. Alden, Retired, General Motors

More than 419 billion U.S. dollars of impact! That's impressive! How were they estimated? How broad is the impact? Is there more? Since 1974, the Edelman finalists publish their project accomplishments in the *INFORMS Journal on Applied Analytics*. While reviewing the 307 articles, their cumulative monetary impact was estimated under the following guidelines:

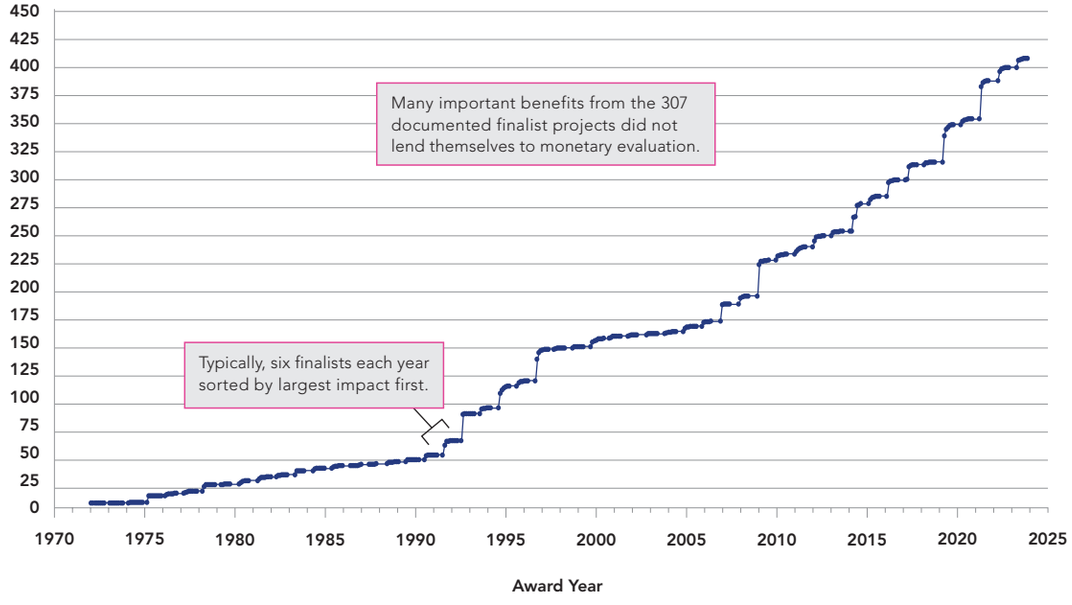
- Be objective with conservative assumptions.
- Include reported impact plus at most two more years of anticipated impact.
- Include only one year of enormous impact (10s of billions) to downplay the huge budget of some organizations.
- Ignore relative impact even though saving $10 million for a small company may be more impressive than saving $100 million for a large company.

These conservative guidelines exclude important yet difficult-to-quantify reported benefits, such as better legal dispute resolution, cancer treatments, food assistance, airline safety, epidemic disease control, on-time railways, space shuttle heat shielding, and water quality. For example, there are dozens of finalist papers with significant life and health benefits. Most are difficult to quantify, however, a CDC project on (future) U.S. epidemics expects annual savings of 6,000 lives valued at $12B,[1] one U.S. Army project estimates 4,500 avoided casualties by reducing requirements for helicopter and ground-convoy movements,[2] and a third estimated 3,000 lives saved during a recent COVID-19 crisis in Chile with better use of ICU and screening capacity.[3] Nearly all finalist papers report nonmonetary benefits and often tout them as the most important and longer lasting by establishing, for example, ongoing practices and organizational changes that improve health, safety, cooperation, decision-making, timeliness, and job satisfaction. Great! Clearly, reported monetary benefits significantly understate the full impact of Edelman finalist projects.

Another important indication of the influence of operations research (O.R.) is the impressive breadth of applications. The Edelman finalists represent 158 different application areas including aviation (safety, traffic), banking, canal operations, communications (broadband, broadcasting, radio spectrum, streaming), consumer products, crowd control, cruise lines, delivery (express, truck, food), defense (Air Force, Army), education, financial (contract bidding, credit card, fraud, investment, pension, settlement), fire protection, forestry, food assistance, healthcare (blood collection, cancer, diagnosis, disease control, elderly, hospital, medical displays, pharmaceutical, surgery), hotel management, energy production and distribution (coal, gas, electric, nuclear, oil, wind), land use, manufacturing (electronics, computers, food, paper, seeds, steel, tires, vehicles), marketing, mining, printing, sanitation, security (airport, police), senior housing, social networks, sports, tax collection, transportation (airline, highway,

Benefits of More Than $419 Billion from Edelman Finalist Projects 1972 through 2023

(Conservatively quantified benefits. Realized plus at most 2 years anticipated. In 2024 U.S. dollars.)



railway, ride share, rental, outer space, school bus), treasure hunting, U.S. census, veterinary, waste management, water (flood, flow, resources, quality), and weapons dismantlement. The list goes on and on! In fact, 791 organizations from business, government, and academia are recognized and honored as supporting or benefiting from finalist projects.[4]

Finally, this is just the "tip of the iceberg" as the Edelman Competition only captures those O.R. professionals choosing to compete! Just think, the 1,637 Edelman finalist authors represent about 13% of the current INFORMS membership.[5] Undoubtedly, a vast number of projects with significant impact did not compete due to confidentiality, lack of internal support to compete (e.g., no one thought of it, too busy, no management support, inadequate documentation), or the team was simply unaware of the competition.

The impact is immense! O.R. professionals should be proud of their profession – you can say "hundreds of billions of dollars and tens of thousands of saved lives" when asked about the value of O.R.!

[1] For CDC: 6,000 lives/year ≈ 314M U.S. population * 5% epidemic penetration * 10% die under current practices * (100% - 80% fatality reduction under improved practices) * 1 epidemic per 200 years. Value of quality year of life in U.S. as least $2M/average life ≈ $50K/year (a standard value) * 78 years life expectancy * 50% average life lived. Total expected annual impact is $12B = 6,000 * $2M. See "Advancing Public Health and Medical Preparedness with Operations Research," *Interfaces*, Vol. 43, No. 1 (note Figure 6). Numbers are values considered reasonable by the author.

[2] "Bayesian Networks for Combat Equipment Diagnostics," 2017, *Interfaces*, Vol. 47, No. 1.

[3] "Analytics Saves Lives During the COVID-19 Crisis in Chile," 2023, *INFORMS Journal on Applied Analytics*, Vol. 53, No. 1.

[4] Some organizations and contestants have competed multiple times and are counted more than once.

[5] Interesting how the average number of authors per paper has grown from 1.8 over the first 10 award years (1973–1982) to 9.9 over the last 10 award years (2014–2023).

FRANZ EDELMAN AWARD

RECOGNIZING AND REWARDING REAL ACHIEVEMENT IN O.R. AND ANALYTICS

The Franz Edelman Award Competition is administered by the Practice Section of INFORMS.

For more than 50 years, the Franz Edelman Award Competition has recognized outstanding achievements in advanced analytics, operations research (O.R.), and management science. Each year, finalist teams from leading organizations worldwide showcase projects with transformative impacts resulting from years of research and collaboration.

The award is named in honor of Franz Edelman – an early practitioner of O.R. – who is recognized for establishing one of the first O.R. business groups in North America while working with the RCA Corporation as an engineer in the 1950s. Now, more than 70 years later, we celebrate and promote the impact and importance of O.R. and analytics in nearly every aspect of the world around us.

The award selection process, beginning with a call for entries, involves rigorous review by the Franz Edelman Award Committee composed of O.R. practitioners and academics. Ultimately, six finalists are chosen after careful verification of the quality and impact of the team's work.

Finalists then prepare journal-quality papers and presentations for the INFORMS Analytics Conference, guided by experienced coaches. During the conference, judges evaluate presentations based on criteria such as application importance, technical solution novelty, and project impact. Feedback from judges helps teams refine their presentations for the final day of competition, which also includes a Q&A session with judges.

Judges assess presentations based on strict guidelines and select a winner that best exemplifies the award's standards. Finalists' achievements are highlighted in the *INFORMS Journal on Applied Analytics* and shared at the INFORMS Annual Meeting, reaching thousands of professionals, academics, and students worldwide.









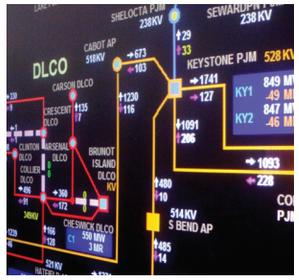




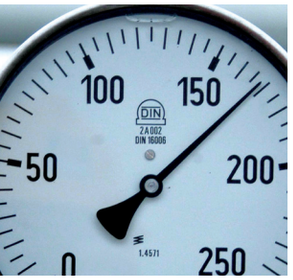










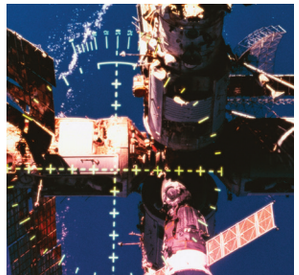












EDELMAN AWARD FIRST-PLACE RECIPIENTS

2023 **Walmart Global Tech**

2022 **Gobierno de Chile**

2021 **U.N. World Food Programme**

2020 **Intel Corporation**

2019 **Louisville Metropolitan Sewer District**

2018 **Federal Communications Commission**

2017 **Holiday Retirement**

2016 **UPS**

2015 **Syngenta**

2014 **U.S. Centers for Disease Control and Prevention**

2013 **Delta Programme Commissioner**

2012 **TNT Express**

2011 **MISO**

2010 **Indeval**

2009 **Hewlett-Packard**

2008 **Netherlands Railways**

2007 **Memorial Sloan Kettering Cancer Center**

2006 **Warner Robins Air Logistics Center**

2005 **General Motors**

2004 **Motorola, Inc.**

2003 **Canadian Pacific Railway**

2002 **Continental Airlines**

2001 **Merrill Lynch, Inc.**

2000 **Jeppesen Sanderson, Inc.**

1999 **IBM**

1998 **Bosques Arauco, S.A.**

1997 **Societé Nationale des Chemins de Fer Français and Sabre Decision Technologies**

1996 **South African National Defense Force**

1995 **Harris Corporation (Semiconductor Sector)**

1994 **Tata Iron & Steel Company, Ltd.**

1993 **AT&T**

1992 **New Haven Health Department**

1991 **American Airlines**

1990 **Health Care Financing Administration**

1989 **ABB Electric, Inc.**

1988 **City of San Francisco Police Department**

1987 **Syntex Laboratories, Inc.**

1986 **Southland Corporation (CITGO Petroleum Corporation Subsidiary)**

1985 **Weyerhaeuser Company**

1984 **Blue Bell, Inc. (dual)**

1984 **The Netherlands Rijkswaterstaat & the RAND Corporation (dual)**

1983 **Air Products and Chemicals, Inc.**

1982 **Arizona Department of Transportation**

1981 **ANR Freight System**

1980 **Kelly-Springfield Tire Company**

1979 **The Greater New York Blood Program**

1978 **Cahill May Roberts, Ltd.**

1977 **Syncrude Canada, Ltd.**

1976 **American Telephone & Telegraph**

1975 **Xerox Corporation**

1974 **Canadian National Energy Board**

1973 **The Babcock & Wilcox Company**

1972 **The Pillsbury Corporation**

THE 2024 SELECTION COMMITTEE MEMBERS AND VERIFIERS, COACHES AND JUDGES

We wish to thank the following individuals for their dedication and service as Selection Committee members and verifiers, coaches and judges for this year's Edelman Award.

The verifiers work closely with the committee members to validate the claims made by each semifinalist entry. Once named a finalist, each team is assigned multiple coaches to help them prepare for the competition. Finally, the Edelman judges are tasked with understanding each finalist presentation and project impact, to include asking pertinent questions during the competition, in order to select this year's winning team.

Selection Committee & Verifiers

- Rajesh Tyagi, *Chair, Edelman Award; GE Global Research, Retired*
- Irvin Lustig, CAP, *Vice Chair, Edelman Award; Princeton Consultants*
- Layek Abdel-Malek, *NJIT, v*
- Manish Bansal, *Virginia Tech, v*
- Carrie Beam, *University of California, Davis, v*
- Ann Bixby, *Aspen Technology*
- Luciana Buriol, *Amazon, v*
- Ulas Cakmak, *Infor*
- Manoj Chari, *Elon University, v*
- Goutam Dutta, *IIM Ahmedabad*
- Mahyar Eftekhar, *Arizona State University, v*
- Gul Ege, *SAS Institute, v*
- Zeynep Ertem, *State University of New York at Binghamton,v*
- Javier Faulin, *Public University of Navarre*
- Ken Fordyce, *Arkieva; IBM, Retired, v*
- Shailendra Jain, *Hewlett Packard Enterprise, Retired, v*
- Hansheng Jiang, *University of Toronto*
- Don Kleinmuntz, *Kleinmuntz Associates, v*
- Matthes Koch, *Desior Consulting & University of Hamburg, v*
- Sumit B. Makashir, *Amazon, v*
- Aly Megahed, *Meta*
- Polly Mitchell-Guthrie, *Kinaxis*
- Juan Morales, *Otis Elevator, v*
- Sven Müller, *Otto-von-Guericke-University Magdeburg, Germany*
- Chanel Murray, *PNC Bank, v*
- Alper Nakkas, *University of Texas at Arlington, v*
- Patricia Neri, *Underwriters Laboratories (UL) Solutions*
- Dessislava Pachamanova, *Babson College, v*
- Ioannis (Yanni) Papadakis, *Zoetis Inc., v*
- Pelin Pekgun, *Wake Forest University*
- Tulia Plumettaz, *Wayfair*
- Sanjay K Prasad, *IBM, v*
- Michael Prokle, *Fortune Brands GPG*
- Sreekanth Rajagopalan, *Dow Chemical, v*

Selection Committee & Verifiers (Continued)

- Mikael Rönnqvist, *Université Laval, Québec, v*
- Meinolf Sellmann, *InsideOpt, v*
- Inderjeet Singh, *Infor*
- Swapnil Srivastava, *Evalueserve, v*
- Zohar Strinka, CAP, *Analytics Strategies LLC, v*
- Natalia Summerville, *Memorial Sloan Kettering Cancer Center, v*
- Kermit Threatte, *Innovative Optimization*
- Joyce Weiner, *Intel, v*
- Erick Wikum, *Wikalytics*
- Peiling Wu-Smith, *General Motors, v*
- Fred Zahrn, *Disney, v*
- Xinhui Zhang, *Coupang Corp, v*

"v" Indicates verifiers

Franz Edelman Coaches

- Manish Bansal, *Virginia Tech*
- Carrie Beam, *University of California, Davis*
- Luciana Buriol, *Amazon*
- Manoj Chari, *Elon University*
- Gul Ege, *SAS*
- Shailendra Jain, *Hewlett Packard Enterprise, Retired*
- Hansheng Jiang, *University of Toronto*
- Matthes Koch, *Desior Consulting & University of Hamburg*
- Sven Müller, *Otto-von-Guericke-University Magdeburg*
- Dessislava Pachamanova, *Babson College*
- Sanjay Prasad, *IBM*
- Sreekanth Rajagopalan, *Dow Chemical*
- Mikael Rönnqvist, *Université Laval, Québec*
- Natalia Summerville, *Memorial Sloan Kettering Cancer Center*
- Kermit Threatte, *Innovative Optimization*
- Erick Wikum, *Wikalytics*
- Fred Zahrn, *Disney Decision Science Transformation*
- Xinhui Zhang, *Coupang Corp.*

Franz Edelman Judges

- Rajesh Tyagi, *Chair, Edelman Award; GE Global Research, Retired*
- Irvin Lustig, CAP, *Vice Chair, Edelman Award; Princeton Consultants*
- Ken Fordyce, *Arkieva; IBM, Retired*
- Suzan Iloglu, CAP, *Amazon Robotics*
- Aly Megahed, *Meta*
- Ioannis (Yanni) Papadakis, *Zoetis Inc.*
- Pelin Pekgun, *Wake Forest University*
- Zohar Strinka, CAP, *Analytics Strategies LLC*
- Joyce Weiner, *Intel*



Passionate about supporting causes that make our world a better place.

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THE EDELMAN LAUREATES

The individuals who author Edelman finalist papers are deemed Franz Edelman Laureates.

Authors of finalist papers to be published in *INFORMS Journal on Applied Analytics*, are recognized as Laureates and formally presented with the Franz Edelman Medal prior to the Edelman Gala.

Laureates are recognized for their significant contributions to work that was selected to represent the best applications in the world of analytical support for decision-making. Laureates are expected to serve as role models and exemplify that challenges can be met and innovative applications of analytics can help every organization.

The Laureate recognition is distinct and separate from membership in the Franz Edelman Academy.

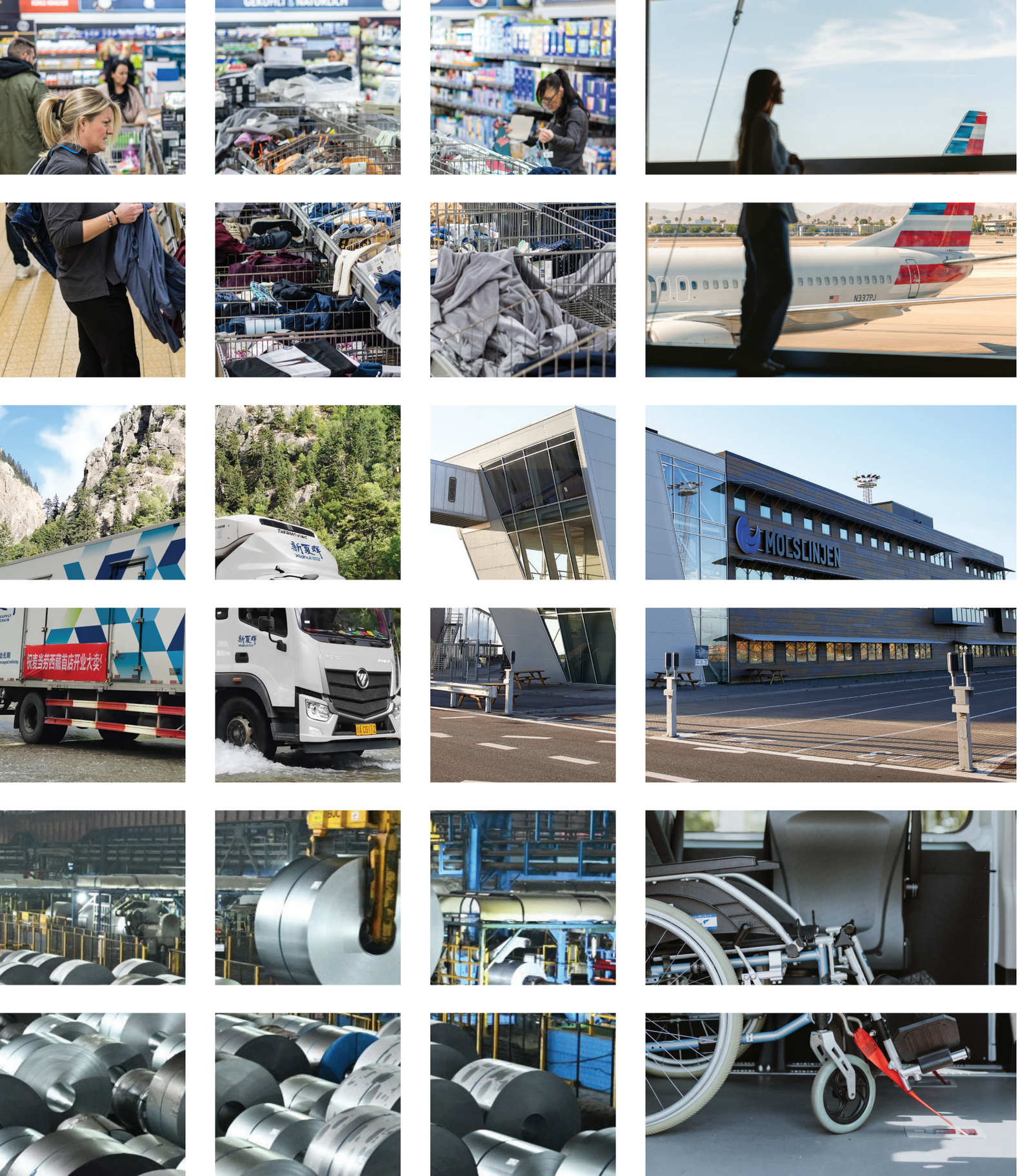
THE EDELMAN ACADEMY

Each year, participating organizations are inducted as members of the Franz Edelman Academy.

The primary client organization, or beneficiary of the finalist work, is inducted into the Edelman Academy at the Edelman Gala during the INFORMS Analytics Conference. Academy members serve as role models for other organizations.

In addition, organizations that played a major role in the work, and therefore deserve academy membership, may also be inducted. The most common example would be an organization that provided the professionals who did the majority of the analytical work.

The membership of the Franz Edelman Academy represents more than 50 years of extraordinary contributions to society through the innovative application of O.R. and advanced analytics.



THE 2024 FRANZ EDELMAN AWARD FINALISTS

Introducing the six finalists for the 2024 Franz Edelman Award.

Over the past several months, these Edelman finalist teams, with guidance from their team coaches, have demonstrated to the Edelman Selection Committee that their work is among the finest examples of operations research and analytics practice in the world. One of these organizations will be recognized as the best in class, the first-place recipient of the 2024 Franz Edelman Award for their work to help save lives, save money, and solve problems.

A shortened summary of each of the 2024 finalist team's work is described in the following pages. Papers including the full project description will be published in the January/February 2025 issue of *INFORMS Journal on Applied Analytics*. The journal, published by INFORMS, is dedicated to improving the practical application of operations research and advanced analytics in today's organizations and industries.

The 2024 Edelman Award finalists are:

- ALDI SÜD Germany
- American Airlines
- McDonald's China
- Molslinjen
- Tata Steel Limited
- Transvision



ALDI SÜD GERMANY

Data-Driven Approaches and Collaborative Intelligence for Empowering Leadership of a European Market-Leading Retailer

Simplicity, consistency, and responsibility are core values of ALDI. With a simple business model – great quality at the best price, fair and honest product offers, and efficient business processes – ALDI assumes responsibility toward their customers, business partners, employees, the community, and the environment in all they do. Their focus on the essentials and use of the discount principle has made ALDI the leading international retailer it is today. By carefully selecting their own brands to form the heart of their core product range, ALDI is able to offer a range of great quality products at the best price.

ALDI SÜD Germany started selling special buy products in the non-food sector in the late 1960s. From the early 1980s, special buys were regularly offered in the stores. The high customer demand at that time emphasized the significance of special buys, making it clear that this product category played a significant role in ALDI's business success. As a result, special buy products became an integral part of their entire product assortment. Special products were initially offered one selling day per week, increasing to two days per week in 1999. Since 2023, special buys from the non-food and food sectors are offered throughout the year, four days a week, and differ seasonally. Today, ALDI SÜD Germany offers its customers a weekly changing selection of special offers at the lowest prices and best quality.

At ALDI SÜD Germany, special buys are an important sales driver, in addition to the standard product range, with several million units sold

weekly. Yet, the limited sales space in stores, as well as the limited storage options, led to a significant relevance of optimal inventory allocation and control.

Due to market shifts and intensifying competition, ALDI SÜD Germany launched the "Data-Driven Special Buys" project and fostered a culture of employee responsibility for the key special buys product area in Germany. By combining data-driven approaches and collaborative intelligence, ALDI SÜD Germany has been addressing challenges in the market, competition, and supply chain management. The project led to substantial savings in product losses, purchasing costs, personnel expenses, and enhanced operational efficiency, all of which culminated in operational excellence and improved the customer experience.

ALDI SÜD Germany altered its approach to manage the special buys product segment by moving away from standard software solutions toward proprietary developed modules, which must align and are designed end-to-end. These modules enhance interactions between store operations, warehouses, central buying, and analytics. The core of this strategy involves advanced ensemble-based machine learning algorithms for demand prediction, inventory-related dynamic programming for decision-making, and sophisticated data analysis, complemented by a comprehensive key performance indicator system for management teams and store employees. Therefore, a higher level of involvement of store teams is crucial during processes like local markdown pricing and future product selection. By integrating local knowledge and insights from the teams, the business can effectively manage minor residual and stock uncertainties within the database and align product offerings with customer preferences.

The main goal of the "Data-Driven Special Buys" project was to develop a centralized inventory control model. Introduced between February and July 2021, the model decides on product markdowns and disposals via dynamic programming, based on price-response functions, including many influencing factors in a machine learning process. Influencing factors for each markdown include sales price, seasonal demand patterns, stock-related process costs, fill level and capacity of stores, future incoming quantities, best-before dates, and public holidays. The tool optimizes the fill level in the stores and personnel inventory based on the situation. The application reduces markdown costs and losses, optimizes the number of working hours for store teams, and enhances the attractiveness of the stores for the customers through a more visually appealing in-season range and quantity of promotional products within the sales rooms.

Based on the inventory control model, a highly advanced inventory allocation model was introduced to optimize the initial order quantity of promotional products to the warehouses. In addition, another software was introduced for product exchanges. The tool solved the problem of uneven stock redistribution after the first day of sale. The fast redistribution one day after the advertising date resulted in higher national product availability for the customers. This has had a positive effect on customer satisfaction as well as sales at the original retail price.

The mobile web application "Market-Whisper" was developed for new product suggestions and democratic participation in decision-making processes. Every employee in the company can submit new products via smartphone along with the corresponding product descriptions (e.g., price or seasonality). With this approach, ALDI SÜD Germany has managed to integrate employees into the product discovery cycle and use collaborative intelligence. The products with the highest votes are then passed on to National Buying. This process not only enables employees to participate in decision-making and product range design, but also increases commitment to the product range and the company.

ALDI SÜD Germany is committed to continue fostering a culture of innovation and engagement throughout the organization.

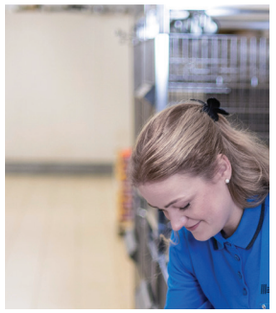
ORGANIZATION

ALDI SOUTH Group

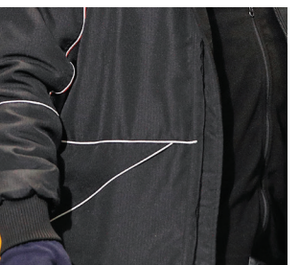
The ALDI SOUTH Group is a market-leading discount retailer founded in 1913. The company generated annual net sales of 76 billion euros worldwide in 2022 and is represented in more than 7,000 stores across 11 countries. ALDI SÜD Germany operates with approximately 2,000 stores and more than 50,000 employees, contributing to a total annual turnover of 17.9 billion euros in 2022.

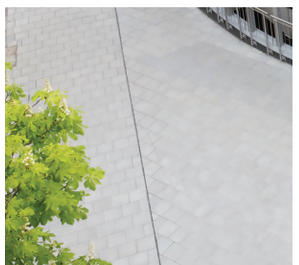






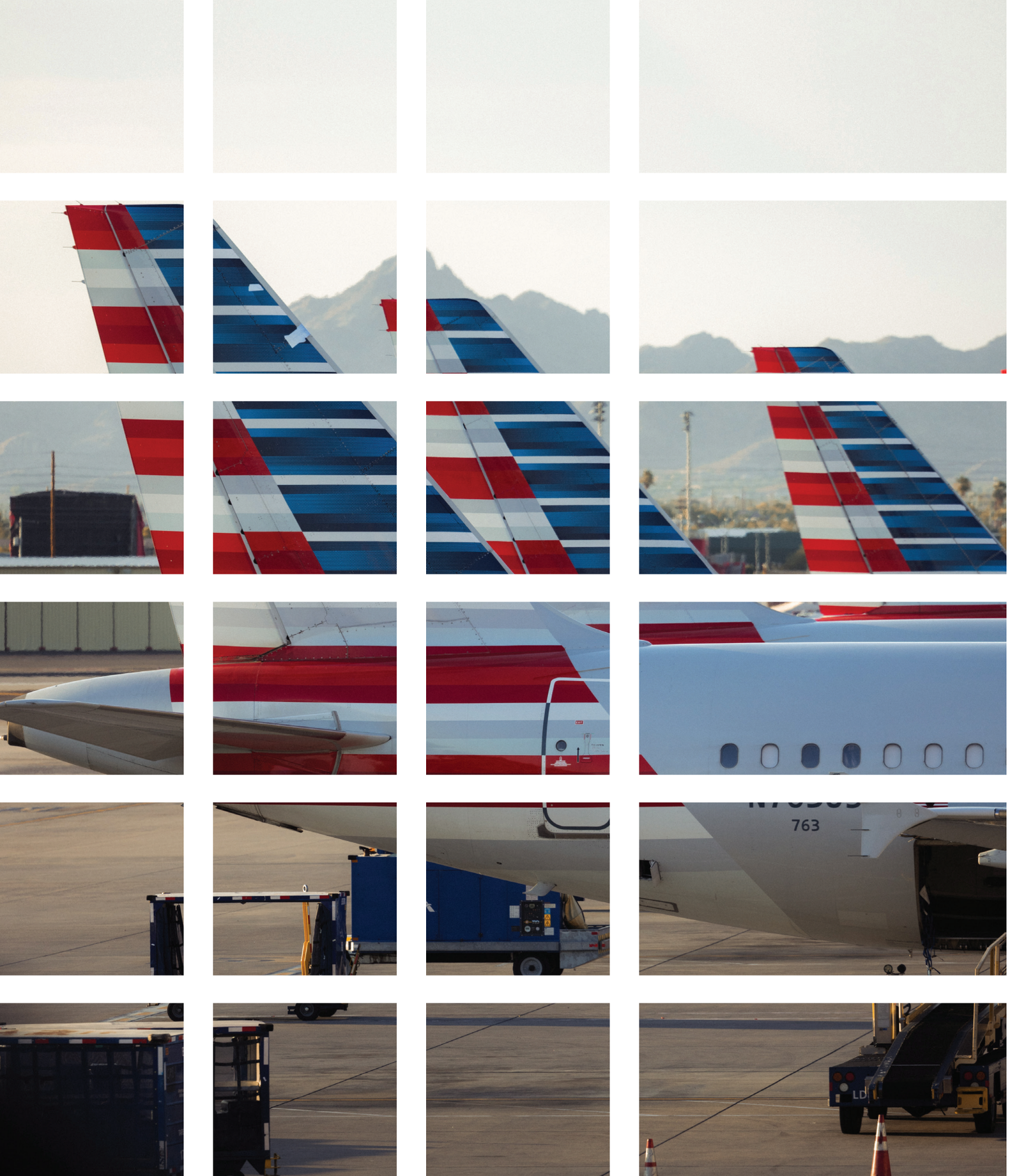












AMERICAN AIRLINES

HEAT – The Hub Efficiency Analytics Tool

The mission of American Airlines is to care for people on life's journey. Together with its American Eagle regional partners, American Airlines offer thousands of daily flights to more than 350 destinations in more than 60 countries. American has hubs in Charlotte, Chicago, Dallas-Fort Worth, Los Angeles, Miami, New York, Philadelphia, Phoenix, and Washington, D.C. Its business is to provide safe, reliable, and friendly air transportation to customers, along with numerous related services. Dedicated to ensuring every flight is special for customers is of utmost importance, with their safety, comfort, and convenience the top concerns.

American Airlines has a long history of leveraging innovative technologies to create value for customers, and invented the first automated reservation system in 1946. The concept of revenue management started at American Airlines in the early 1980s, and is now widely used across airlines, cruise lines, and hotels. Operations research (O.R.) techniques have continued to drive optimized decision-making across the enterprise, including schedule design, fleet assignment, pricing and yield management, crew pairing generation and preferential bidding, airport layout and gate assignment, and day-of operations management. Today, the O.R. and advanced analytics (OR&AA) team in the information technology organization carries on this mission of delivering for their customers through applications of O.R. and data science.

Airline operations are carefully planned and orchestrated, and a reliable operation is one

that's constantly moving. When an airline stops, it means their aircraft and crews stop – importantly, it means their customers stop, and it can become increasingly more difficult to return to normal operations.

Leveraging optimization techniques, American Airlines developed the Hub Efficiency Analytics Tool (HEAT), an industry-leading technology that helps the airline more effectively manage irregular operations during severe weather. HEAT incorporates data about weather, flight loads, customer connections, and gate availability, as well as restrictions imposed by aircraft, crew member requirements, and air traffic control. It dynamically adjusts the timing of flight departures in a coordinated fashion to ensure that customers, crew members, and aircraft keep moving when weather threatens to disrupt the flight operation. The incredible experts at the Integrated Operations Center (IOC) – the nerve center of American's operation – use HEAT to help the airline avoid the most severe weather impacts to keep operations running, while getting customers on their way faster during severe weather.

Under the hood, HEAT is a large-sized mixed-integer program model with a network-flow structure that realistically represents the state of the airline operation in real time. It models the business problem in an innovative and clever way that reoptimizes the airline schedule during irregular operations in just a few minutes.

Since its initial deployment in April 2022, HEAT has been used more than 100 times at American's largest hubs and prevented nearly 1,000 flight cancellations across its network, resulting in revenue loss avoidance in the amount of about $15 million. At Dallas-Forth Worth (DFW), which is American Airlines' largest hub, recent HEAT usage during severe weather events reduced up to 80% of the cancellations, compared with similar events in which HEAT was not used. Even more drastically, a HEAT solution that was used in June 2023 at Miami, American's third-largest hub, helped prevent all but one cancellation during a six-hour-long thunderstorm event, a 95% reduction in cancellations compared to similar events.

Overall, for high-confidence weather events, HEAT was able to reduce cancellations by 27% systemwide. These are just a subset of the benefits HEAT can offer. By optimizing crew, aircraft, and customer connectivity, it significantly speeds up the recovery from these disruptive events and enhances customer service. The HEAT tool has the visibility and support from the highest level of leadership within American Airlines. It has been prominently featured in major news outlets such as NBC, ABC, and CBS, with top executives regularly discussing the remarkable benefits the tool brings to operational reliability and customer experience.

In 2023, American Airlines delivered outstanding reliability for their customers – and HEAT was a large part of that. Last year, American experienced its best-ever annual completion factor (the number of flights completed divided by total number of flights) and led the three major U.S. network carriers in that metric. In addition, the airline had its best on-time departure and arrival performance since 2017. Innovative tools like HEAT help American Airlines deliver an operation for its customers that they can be proud of, even when Mother Nature causes disruptions.

ORGANIZATION

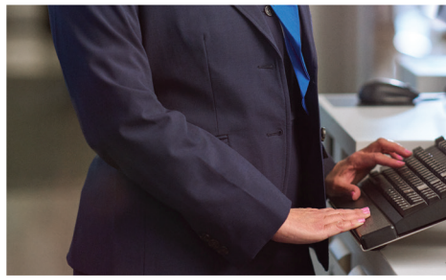
American Airlines

At American Airlines, our purpose is to care for people on life's journey. Together with our American Eagle regional partners, we offer thousands of flights each day to more than 350 destinations in more than 60 countries – that is more than half a million customers on a daily basis. American has hubs in Charlotte, Chicago, Dallas-Fort Worth, Los Angeles, Miami, New York, Philadelphia, Phoenix, and Washington, D.C.

American was founded more than 95 years ago and has a deep-rooted history leading the industry through innovation and firsts, including hiring the first Black U.S. commercial airline pilot, hiring the first female U.S. commercial airline pilot, launching the first loyalty program of any major carrier and becoming the first airline to introduce airport lounges. In 2016, American Airlines Group Inc. topped the *Fortune* list of best business turnarounds, and its stock (NASDAQ: AAL) joined the S&P 500 index.

With more than 130,000 team members around the world, American is focused on creating a world-class customer experience, building the airline to thrive forever and making culture a competitive advantage with an equal workplace for all.















McDONALD'S CHINA

Supply Chain Network Optimization Has Reduced Millions in Transportation Costs and Fostered Economic Growth for McDonald's China

Starting in 2021, McDonald's China embarked on a journey to revolutionize its supply chain, embracing operations research (O.R.), digitalization, automation, and artificial intelligence to ensure food quality and safety from farm to table.

As a globally recognized food service brand serving over 68 million people daily, McDonald's diverse menu extends far beyond its iconic hamburgers and fries. With an eye on fostering communities, McDonald's has woven itself into the fabric of Chinese urban life since its introduction in the early 1990s, boasting more than 4,000 restaurants across the country by 2021. McDonald's China aims to double its presence to 10,000 outlets by 2028, particularly targeting second- and third-tier cities to embrace new customers and opportunities.

However, this ambitious expansion presents a unique set of challenges. The geographic diversity of these cities, while enriching, poses logistical hurdles for McDonald's supply chain network. The task at hand is not merely about expanding store count, but ensuring seamless product delivery to meet the varying needs of each location.

This complex challenge calls for a scientific approach, which comprises two critical components: 1) strategically selecting and positioning distribution centers and food production facilities, and 2) formulating corresponding transportation plans to facilitate efficient delivery of food products.

McDonald's intricate supply chain spans over 3,000 distinct stock keeping units (SKUs), servicing a network of 4,500 to 10,000 restaurants through over 100 factories. Challenges arise from nonlinear transportation costs and unique service-level requirements for each product. The holistic solution involves large-scale models to minimize service distance, long-distance deliveries, overall costs, and optimize both inbound and outbound logistics. These objectives include: 1) minimizing the cumulative service distance in outbound logistics; 2) minimizing the total count of long-distance delivery (LDD) stores; 3) minimizing the overall cost, encompassing fixed costs, operational expenditures, handling expenses, and storage charges at distribution centers; and 4) minimizing the total expenditure across both inbound and outbound logistics. With the network expanding and complexity increasing, traditional solvers struggle to handle the massive scale and uncertainty introduced by growth estimates. Stochastic models become indispensable for dynamic scenario analysis, highlighting the need for efficient solutions within tight time frames.

Teams from McDonald's Supply Chain, Xiahui Logistics, and Optimization Analysis Technology collaborated to develop a unified framework using O.R. technology for McDonald's China's supply chain roadmap over the next five years. This effort integrated forecasting models to improve precision and employed sophisticated decomposition techniques to handle complex stochastic optimization models. User-friendly scenario analysis tools were introduced to address skepticism and enhance user acceptance. An intuitive interface tailored for business leaders showcases the model's value and enables iterative feedback. This interface allows easy visualization of store distribution, distribution center locations, and identification of key stores. Scenario comparisons are effortlessly generated and displayed through parameter manipulation and objective selection.

Commencing on Aug. 1, 2021, Optimization Analytics Technology, in partnership with Xiahui Logistics and McDonald's China supply chain team, undertook a collaborative effort to bring forth a transformative solution. The endeavor unfolded through a meticulously structured project comprising six pivotal phases: business requirement analysis, data collection and refinement, the design and enactment of optimization models, fine-tuning of said models, extensive scenario analysis, and the formulation of conclusive results. The true power of O.R. comes to the fore as a comprehensive sensitivity analysis is conducted for each scenario, yielding valuable business insights. This dynamic system has consistently demonstrated its prowess.

Since 2022, this project has saved McDonald's China's supply chain $63.75 million and reduced annual transportation costs by $8.9 million. This initiative will be integrated into McDonald's China's digital supply chain and data platform for continuous network optimization and inventory planning, supporting the goal of reaching 10,000 restaurants by 2028, and fostering sustainable business growth.

In summary, McDonald's China's strategic initiatives in supply chain management underscore its commitment to innovation, efficiency, and growth in the dynamic Chinese market. Through collaborative partnerships and leveraging advanced technologies, McDonald's continues to advance its supply chain to meet the evolving needs of customers and stakeholders.

ORGANIZATIONS

McDonald's

McDonald's is a world-leading food service brand with over 40,000 restaurants across the globe, serving more than 68 million people every day. McDonald's mission is to make delicious feel-good moments easy for everyone. Across the business, McDonald's strives to live up to its purpose to feed and foster communities.

The first McDonald's restaurant in the Chinese mainland opened in 1990. Today, China is the second-largest and fastest-growing market of McDonald's. McDonald's China is committed to providing great taste and great value anytime, anywhere. With multiple business platforms including restaurants, McDelivery, McCafé, Dessert Kiosk and Drive-Thru, McDonald's China proudly serves a menu with global classics and local favorites, such as Big Mac, French fries, Spicy Chicken Filet Burger, and McCrispy Chicken. With the brand manifesto of "Serving here" and its passion for food, planet, people, and community, McDonald's China drives high-speed business growth with its green growth engine by developing green restaurant, green supply chain, green packaging and green recycle. In addition, it is also committed to youth development and Ronald McDonald House Charities.

Xiahui Logistics

Xiahui Logistics is the primary logistics provider to McDonald's China and facilitates inbound transportation (from the manufacturing plant to distribution centers) and outbound transportation (from distribution centers to McDonald's restaurants). More than 2,000 Xiahui trucks are on the road for McDonald's every day, totaling 80 million kilometers traveled annually – equivalent to 2,000 times around the globe. McDonald's plan to double its restaurants in the next five years brings a significant challenge for Xiahui Logistics to support McDonald's side-by-side as they have done for the past 40 years.

Optimization Analytics Technology

Optimization Analytics Technology (OAT) is dedicated to providing advanced O.R. consulting services and optimization solutions. Established in Singapore in 2017, OAT has expanded its reach to include offices in Shanghai and a dedicated R&D center in Hefei, China. OAT takes pride in its commitment to understanding the unique business needs of each client and strives to seamlessly integrate them with O.R. principles, aiming for the successful implementation of optimization projects and showcasing the tangible benefits of their technology. Over the years, the OAT team has had the privilege of executing a diverse array of optimization projects across various industries. From supply chain network planning to replenishment optimization, route planning to advanced production scheduling and Availability-to-Promise management, OAT has been fortunate to achieve a high success rate, striving to continuously improve and adapt to meet the evolving needs of business users in Asia Pacific.





Photo credit Dinkun Chen











Photo credit _chrisUK





MOLSLINJEN

Passenger Ferry Operations in the Digital Era: Forecasting and Revenue Management at Molslinjen

The worldwide passenger ferry industry is similar in size to the airline industry, with around 5 billion passengers per year, and a market size projected to double in the coming decade. Passenger ferries are crucial elements of transportation infrastructure in countries and regions with long coastlines, islands, fjords, and large lakes. Besides their flexible operations, they are also seen as an enjoyable travel experience, as supported by numerous traveler and customer satisfaction surveys around the world.

Denmark is a relatively small country in Scandinavia with many islands – around 1,400 in total – with only 70 of them populated. Ferries strategically connect the Jutland peninsula with islands (e.g., Zealand, the island where Copenhagen is located), as well as connect the islands with each other. Another strategic connection is between Sweden and the island of Bornholm, one of the most touristic destinations in Denmark. Molslinjen operates a fleet of 21 ships (including some of the largest and fastest catamaran ferries in the world) across 10 routes, positioning Molslinjen as one of the world's largest fast ferry operators in the world. Annually, these ferries welcome approximately 15 million guests, showcasing Molslinjen's significant impact on regional connectivity. Molslinjen provides this transportation service on a commercial basis under regulatory constraints, while also aiming to reduce environmental impact.

The operation of passenger ferries is largely driven by the demand, which combines both passengers and vehicles. Many of those who use passenger

ferries will book tickets in advance, indicating the number of passengers and type of vehicle (if any). However, booked tickets can become no-shows and a significant share of passengers come without prior booking, even within the hour prior to ferry departure. Most importantly, a key challenge that differentiates passenger ferries from other transportation industries is the fact that the vehicles have to be packed in the cargo area, as rapidly as possible, prior to departure. Any delay in packing induces delays with departure, which requires additional fuel consumption to compensate for these delays. In addition, when passengers book a ticket for their ferry ride and indicate they will come with their family car, there is no way to know the size of the vehicle. In the cargo area, each and every centimeter counts – the packing process is like playing a game of Tetris, all under the pressure of time constraints.

Molslinjen partnered with Halfspace for the design, development, and deployment of a sophisticated forecasting and revenue management toolbox that integrates advanced artificial intelligence (AI) and machine learning techniques. The forecasting solution harnesses the latest advances in learning and predictive analytics to optimize the use of ferry capacities and sailing schedules. It enables Molslinjen to predict the expected number of passengers and vehicles of different types up to one year in advance, with continuous updates to target departure time. These forecasts led to significant improvements over existing benchmarks and further enhanced other decision-making processes, especially the process of packing vehicles in the cargo area, which led to substantial operational and financial impact.

In addition, dynamic pricing strategies are a cornerstone of this solution and now a core element of Molslinjen revenue management strategies. They rely on data-driven dynamic pricing approaches that account for contextual variables such as time-of-day, seasonality, and booking patterns. The aim is to decide on the number of tickets of different categories (business, standard, and reduced fare) to be offered for sale, as well as the price of reduced fare tickets within a predefined price range. The dynamic pricing approach relies on a modified expected marginal seat revenue approach with a marginal revenue transformation. This approach not only maximizes revenue but also enhances customer satisfaction by offering competitive and fair pricing.

The innovative approach that was undertaken goes beyond enhancing operational efficiency. One of the resulting achievements is the significant reduction in Molslinjen's environmental footprint. This is not only about optimizing operations – it is about setting exceptional new standards for the passenger ferry industry.

This collaboration, and the resulting forecasting and revenue management toolbox, has led to a decrease in the number of delayed departures, reduction in the average departure delay, reduction in fuel consumption, increase in available capacity for each departure, increase in effective sales capacity and overall revenue, as well as substantial time savings when it comes to staff planning and ferry packing. Altogether, the benefits have been estimated as 15-20 million DKK additional profits per year (equivalent to $2.6-$3.2 million USD), as well as a 3% reduction in fuel consumption and emissions. And, as the solutions are continuously being improved and added to additional routes, that number is only set to increase in the future.

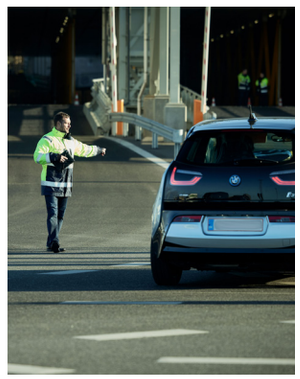
ORGANIZATIONS

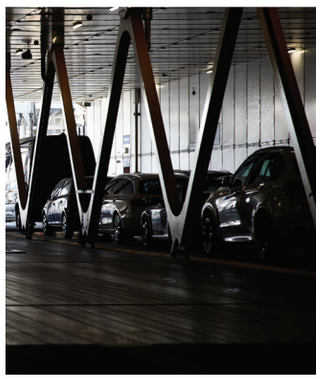
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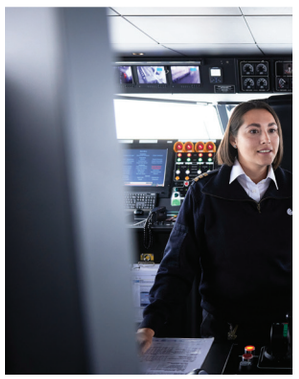
Molslinjen is one of the world's largest operators of fast-moving catamaran ferries, based in Aarhus (Denmark), serving 10 routes in Denmark, with the main route crossing Kattegat to connect Western and Eastern Denmark. Molslinjen transported nearly 15 million passengers and 4 million vehicles overall in 2023, while having the ambition to become the world's most digitalized and AI-driven ferry operator.

Halfspace

Halfspace is a leading data, analytics, and AI company based in Copenhagen, Denmark. Halfspace has a rich history of developing innovative analytics tools, starting in 2015 with a focus on live sports analysis, and since broadening to span industries such as pharma, industrial goods manufacturing, online sales, public sector, energy, and transportation. Within those sectors, Halfspace has built and successfully delivered advanced analytics systems spanning forecasting, optimization, natural language processing, generative AI, computer vision, etc.






TATA STEEL LIMITED

Optimization of Continuous Steel Annealing Operation Using Model Predictive Control at Tata Steel, India

Tata Steel is a leading global steel producer with a diverse product portfolio catering to a wide range of sectors from construction to the automotive industry. Currently, the premium automotive steel market, especially in India, is witnessing a dramatic growth both in the volume of demand and variety of steel specifications. Tata Steel holds a leadership position in Indian automotive steel market with a share of 50%. This corresponds to $1.68 billion of revenue, which is about 15% of Tata Steel's total revenue. With completion of additional annealing lines that are under commissioning, this revenue stream is estimated to grow to $2.96 billion, which is equivalent to about 23% of the organization's total revenue. For Tata Steel, the imperative is not only to retain its existing leadership position in the automotive steel market but to grow in volume and capture the emerging avenues in value added segments. The current drive of digital transformation, which has already generated savings of more than $600 million in the last five years, emphasizes the application of advanced analytics and optimization in Tata Steel's manufacturing processes and supply chain.

Cold rolled and annealed sheet products, which primarily cater to the automotive and whitegoods industries, are the most value-added steel product streams for Tata Steel. During cold rolling, the steel gets hardened due to a phenomenon called work hardening where it loses all its ductility and formability. Before we

can use the steel sheet for forming applications, we need to anneal it to regain the lost ductility. Annealing is the heating of the steel strip to a specific temperature wherein microstructural changes take place, rendering it again ductile and formable. In the modern continuous annealing process line (CAL), the steel strip passes in a continuous manner through an annealing furnace chamber with progressively increasing temperature and is gradually heated to achieve a specified target temperature.

The continuous annealing process line typically comprises various interconnected unit operations, including coil unwinding, welding, electrolytic cleaning, annealing furnace proper, optional metal coating, temper rolling, chromate coating, and winding. This interlinked configuration of multiple units with different scales of dynamics makes it vulnerable to suboptimal operation because disturbance from any of the units could adversely affect another. Such disturbances lead to unforeseen speed changes, necessitating furnace temperature manipulation to reject disturbances and maintain the target strip exit temperature. The other scenario is "grade transition," involving changes in chemistry, thickness, or width of successive strips as part of the production schedule. This implies leading and trailing strips should be correctly heated and meet their respective target annealing temperatures, which necessitates the transitioning of the furnace temperatures in an optimal manner. Both of the above problems can occur simultaneously, making the transition even more challenging. The fallout of the suboptimal management of such transitions are the under/overheating of steel strips leading to compromised temperature compliance (hence properties) and excess fuel consumption (more cost and CO2 emission). Furthermore, the tighter the control of strip temperature around the target ensures uniformity in mechanical properties throughout the strip length.

Development of Dynamic Models & Predictive Control System

Since the inception of the CAL, the previously mentioned operational challenges were being addressed manually by the operators with subjectivity and an individual's skill level often playing an important role. This left a lot of room for achieving best levels of optimality. So, to ensure optimal operation of the furnace in terms of quality, yield, and cost under the highly dynamic plant conditions, we decided to develop a real-time supervisory control solution. Subsequently, a collaboration was set up with the Automation Lab of Chemical Engineering Department at Indian Institute of Technology (IIT) Bombay, India, and a strategy based on Model Predictive Control (MPC) was envisioned.

MPC is a multivariable control scheme that simultaneously manipulates all inputs in a coordinated fashion, such that the operating constraints on controlled output and manipulated inputs (bounds, rate limits) are honored. This is achieved by using a dynamic model based on online forecasting, deployed in a moving time window. The model was built by capturing the furnace response to varying input conditions. The challenging part of model development was conducting more perturbation trials in the plant while producing premium product. To compensate for this restriction, such responses to set point changes were extracted from historic data of a variety of operating conditions as well. The controller is formulated as a quadratic programming (QP) problem that minimizes a cost function consisting of predicted controller errors and future manipulated inputs over a time window of 40 minutes. The controller is implemented in real time by solving a sequence of QP problems, one every minute.

Implementation and Operationalization

Integrating the developed optimal control layer on top of the legacy furnace control system called for meticulous engineering of the interfaces, keeping in mind various interlocks related to safety and underlying controller complexity. After integrating the solution, the transition to automatic control from the manual operation required a gradual and structured change management process. This process involved conducting multiple training and knowledge sharing sessions with frontline operators and line managers, because manual operation had been the standard practice for the previous two decades. The trials initially spanned a few hours, and the performance analysis was shared with the operating team. Based on their feedback, fine-tuning was conducted, gradually increasing the duration of uninterrupted automatic control to cover multiple shifts over days at a time. By January 2023, model-based automatic control had become the norm with an average monthly usage of 90% and manual operation was only employed during exceptional conditions.

Impact and Benefits

The share of annealed product meeting the premium quality band (+/-5 degrees Celsius of the target temperature) has significantly improved from 30% to 50%, ensuring better uniformity of properties. Additionally, an 8% reduction in product outside the widest band (+/-15 degrees Celsius) has prevented the redirection of 13,000 tons of material from one line alone, annually. Specific fuel consumption has been consistently reduced by 8% per ton of steel. Considering Tata Steel's current installations and those under commission, these figures amount to savings of $2.5 million and 10,000 tons of CO2 emission reduction annually

ORGANIZATIONS

Tata Steel

Tata Steel, with an annual crude steel capacity of 35 million tons, is one of the world's most geographically diverse steel producers and one of the few steel operations that are fully integrated – from mining to the manufacturing and marketing of finished products, including highly valued automotive steel. Focusing on innovation, technology, sustainability, and people, Tata Steel strives to be the global steel industry benchmark for value creation and corporate citizenship. The company has set a goal of achieving net zero carbon emissions by 2045.

Indian Institute of Technology (IIT) Bombay

Established in 1958, IIT Bombay has grown from strength to strength to emerge as one of the top technical universities in the world. Research and academic programs at IIT Bombay are driven by an outstanding faculty, many of whom are known for their research contributions internationally. IIT Bombay has strong collaborative research programs with leading Indian industries, multinational companies, and many national and international universities. These engagements have resulted in the development of technologies with significant societal impact.








TRANSVISION

Optimizing Mobility for Elderly and Disabled Dutch Citizens Using Taxis

Public transport by bus or train poses significant barriers for elderly and disabled people. From origin to destination, a route may contain wheelchair inaccessible areas that make their journey impossible. For people with cognitive impairments, these obstacles can be even more significant. To give these citizens the same opportunities as everyone else, the Netherlands and other countries offer government-subsidized taxi programs. For instance, in the United States, a similar service known as "paratransit" is available. Regardless of where, accessible transportation for the elderly and disabled is important for active participation in society. It is even part of the performance indicators in the United Nations (U.N.) Sustainable Development Goals as:

"The proportion of population that has convenient access to public transport, by sex, age and disability status, also distinguishing older people."

In 2020, the U.N. endorsed the World Health Organization's "Decade of Healthy Aging" plan, focusing on improving transportation for these groups.

Since 1995, Dutch municipalities have been required to provide interregional long-distance transportation for elderly and disabled citizens, in addition to local short-distance services. This new obligation presented challenges for taxi operators, because these long-distance rides, averaging 50 kilometers between pickup and drop-off, often left taxis far from their base areas. To address this, in 1998, the Dutch government started organizing interregional transportation on a national level, which is now known as Valys. Transvision secured the Valys contract in 2014, taking on the responsibility of managing over a million taxi rides annually for about 200,000 elderly and disabled citizens with about 3,000 rides on a typical day and up to 15,000 rides on Christmas Day.

Scheduling the Valys rides represents a classic operations research (O.R.) challenge known as the dial-a-ride problem. Initially, subcontractors were responsible for organizing trips originating in their area and typically ending in a different subcontractor's area. Due to the initial subcontractor's lack of operations in areas outside their own, this often led to a high number of unoccupied return taxi rides.

To achieve better service for this vulnerable group of passengers and ensure financial viability, Transvision recognized the necessity for more efficient operational planning. Leveraging their past experiences, they organized a competition to find the best solution. The partnership between Consultants in Quantitative Methods (CQM) and Geodan emerged as the clear winner, demonstrating that their O.R. approach could result in savings exceeding 100,000 kilometers per day.

Transvision then collaborated with CQM and Geodan to develop an optimization solution aimed at enhancing mobility for the Valys program. This two-stage solution efficiently combines the thousands of long-distance taxi rides, ensuring fair distribution among various subcontractors. The first stage involves a sophisticated and innovative algorithm that quickly calculates distances and travel times between all pick-up and drop-off locations, while considering expected traffic during operational execution. Remarkably, it accomplishes this within minutes, even when calculating tens of millions of potential trips.

In the second stage, the solution uses simulated annealing to optimize the combination of taxi rides using these calculated distances and times. The novel algorithm accounts for multiple factors, such as time windows, drivers' complex rest requirements, passenger pooling, seat arrangements, guide dogs, wheelchair needs, seating preferences, and more. Its goal is to achieve high quality of service, while minimizing operational costs and ensuring that the combined taxi rides are fairly distributed among the subcontractors. To manage this large and complex task, a modern parallel implementation of simulated annealing specifically tailored for this specific instance of the dial-a-ride problem was developed.

The solution was put into practice in 2020, resulting in a decisive increase in punctuality and 50% improvement in passenger satisfaction. From the beginning of the project, savings equaled 15 million driving kilometers per year, which amounts to 14,000 tons of CO2 emissions saved over six years. The resulting annual financial benefits of the solution are conservatively estimated at 20% of the government's 75-million-euro budget, gained by the (well over 20%) reduction of kilometers driven. To capitalize these savings, a novel pricing mechanism was introduced to allocate the financial savings among the government, Transvision, and subcontractors. A key feature of this mechanism was that it incentivized all parties to strive for more efficient planning. This mechanism, together with the fairness criterion to balance load among subcontractors, was crucial to get buy-in from all stakeholders in the many talks that preceded the program going live.

Once live, however, many challenges arose. At the start of 2020, just three months following the implementation of the algorithm, the COVID-19 pandemic emerged. Suddenly, regulations required the avoidance of passenger pooling and the incorporation of extra cleaning time, while still maintaining efficient taxi operations. Unlike the previous manual method, the O.R. solution proved highly adaptable in this changing landscape, simply by altering the algorithm's constraints. This flexibility was further evidenced in the post-COVID market in the Netherlands, prioritizing subcontractor satisfaction and efficiency. Additionally, the algorithm has been shown to easily scale up to 30,000 taxi rides, ready to meet future demands.

In addition to Valys, the innovative techniques developed for calculating distances, travel times calculation, and the application of simulated annealing are transferable to other dial-a-ride challenges, both within and beyond the Netherlands. Although Valys represents the largest contract in the Dutch taxi market, numerous smaller contracts exist, such as regional transportation and non-emergency medical transport (NEMT). Finally, the analytics solution has potential for international application, particularly in countries with similar taxi transport services for elderly and disabled citizens. A notable example is the United States, where cities or states are required to provide paratransit services for the elderly and disabled under the Americans with Disabilities Act (ADA). The size of these contracts in the U.S. is comparable to, or smaller than, the Valys contract in the Netherlands, indicating a broad scope for the application of this analytics solution.

ORGANIZATIONS

Transvision

Transvision is the mobility company in the Netherlands with a focus on innovative and accessible taxi transportation. They organize transport for various people and contracts. Most notably, they are responsible for the execution of the Valys contract. As a company, Transvision is convinced that everyone should be able to participate in society and support this effort by always offering efficient, trusted, and convenient transport.

CQM

CQM is an independent consultancy company with over 40 years of experience, specializing in solving complex problems using data science, statistics, and O.R. They excel in optimizing logistics, advanced planning, smart warehousing, sales and operations, inventory management, transportation planning, and forecasting. Their approach emphasizes collaboration, knowledge sharing, and transparency with a diverse range of partners.

Geodan (part of Sogelink)

Geodan, established more than 30 years ago, specializes in location intelligence, presenting information in smart maps, such as business data, traffic updates, or historical data. They focus on generating insights, improving communication, and streamlining processes through data integration.













INFORMS EARLY CAREER PRACTITIONER AWARD

INAUGURAL EARLY CAREER PRACTITIONER AWARD

The INFORMS Early Career Practitioner Award was created to engage and recognize early career professionals in the fields of operations research, management science, and advanced analytics for their exceptional contributions to business/industry, government, and consulting, and service to the profession.

INFORMS acknowledges the distinct needs of practitioners and has strategically prioritized addressing their professional growth throughout their careers. The award seeks to acknowledge individuals who have made significant contributions within the initial five years of their post-graduation employment, and currently working outside of academia.

INFORMS Early Career Practitioner Award Criteria

"Early career practitioner" refers to an INFORMS member who is no more than five years post-graduation of their highest degree, has at least two years of industry experience, and is currently working outside of academia. Full-time practitioners with adjunct academic appointments are also eligible for this award. Prize criteria includes:

- Evidence of professional accomplishments, leadership, and service to the profession, or
- Quantifiable or demonstrable impact of work to influence practice, policies, and body of knowledge within the organization or industry;
- Creativity – level of originality, novelty, or practicality of contributions;
- Demonstrable contributions to disseminating OR/MS and advanced analytics knowledge within the organization or industry; and
- Evidence of successful collaboration within multidisciplinary teams.

2024 INFORMS Early Career Practitioner Award Committee

- Shantih Spanton, *Chair, INFORMS Early Career Practitioner Award; Manhattan Associates*
- Mike Cavaretta, *Ford*
- Carol DeZwarte, *CAP*
- Bill Klimack, *BP*
- Morvarid Rahmani, *Georgia Tech*
- Ziteng Wang, *Northern Illinois University*

2024 EARLY CAREER PRACTITIONER AWARD WINNER

Growing up in Rio de Janeiro, Cristiana Lara became obsessed with challenging math problems, working on them feverishly until she could solve them. Now she sees a direct link between a love for puzzling inspired by her technically oriented parents, and her current work as a research scientist.

Cristiana received her bachelor's degree in chemical engineering from the Federal University of Rio de Janeiro. As she began her PhD program at Carnegie Mellon University's Center for Advanced Process Decision Making, she moved farther away from chemical engineering and steered more in the direction of operations research. The interface between applied math and coding allowed Cristiana the chance to see her work impact decision-making in operations, manufacturing, logistics, and a variety of business applications.

Cristiana joined Amazon in 2019 after completing her PhD. That was the same year Amazon unveiled free, one-day delivery for select Amazon Prime customers in the U.S. Thus, her start date meant Cristiana began working on a daunting mission: developing and implementing an optimization framework to support Amazon's transportation network. While the company has focused on making its delivery systems as efficient and cost-effective as possible, Amazon's growth, scale, and drive to meet customer demand put a considerable strain on its delivery network. Optimization is a constantly moving target that requires long-term strategic planning, which is where Cristiana centers her attention. Her research focuses on developing models and algorithms for solving supply chain problems.

Cristiana is making a significant impact in her time at Amazon. Her groundbreaking work on network timing has helped Amazon better formulate how to efficiently transport packages through the middle-mile network. It also resulted in her selection by the National Academy of Engineering as one of the nation's outstanding early-career engineers invited to attend the 2021 US Frontiers of Engineering Symposium.

Cristiana was an integral member of the team that developed the science behind Amazon's "Regionalization," a strategic initiative to modify the U.S. network design and execution software systems to drive down costs and improve delivery speed by dividing it into smaller regions. Most recently, she has expanded her scope to look at problems in the inventory management and assortment optimization.

Today, as a senior research scientist with Amazon, Cristiana leads a team of research scientists who develop models and algorithms for network design, line haul scheduling, and inventory placement, as well as provide analytics support and consulting for internal customers.

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CONGRATULATIONS to the 2024 Franz Edelman Award Finalists!

WAKE FOREST UNIVERSITY
CENTER for ANALYTICS IMPACT

The Wake Forest University Center for Analytics Impact (CAI) is focused on the **impact of analytics.** As the first academic center to go beyond methodology to emphasize the non-technical aspects of the effective use of analytics, the goals of the center are:

- To be the leading authority on empirical research in the success or failure of analytics and its impact on organizations and society.
- To be the premier provider for continuing education in the areas that can mitigate the difficulties posed by issues that inhibit the success of analytics.
- To host world-class seminars and conferences that will disseminate thought leadership around analytics impact.

Scan to learn more.

RESEARCH | EDUCATION | PROMOTION

UPS GEORGE D. SMITH PRIZE

UPS GEORGE D. SMITH PRIZE HISTORY

The UPS George D. Smith Prize is awarded to an academic department or program for effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics. It is accompanied by a $10,000 award. The prize committee is pleased to announce the 2024 finalists:

- Master of Science in Business Analytics
  National University of Singapore
- Darla Moore School of Business
  University of South Carolina
- Department of Management Science and Engineering
  University of Waterloo

The UPS George D. Smith Prize is an exciting award created in the spirit of strengthening ties between industry and the schools of higher education that graduate young practitioners of operations research (O.R.) and analytics. This prize has been named in honor of the late UPS chief executive officer who was a patron of operations researchers at the leading Fortune 500 corporation. George D. Smith was the second CEO of UPS, holding the position from 1962 to 1972. He joined UPS as an accountant in 1925 and at some point in his long and illustrious career held almost every functional title within the company.

While his background was steeped in finance, George Smith had a keen engineering mind. In the late 1940s, after learning about O.R., Smith realized that intuition alone would not be enough to help UPS master the many issues it faced as it grew in size from a regional to nationwide carrier. Smith recognized O.R. as an engineering approach to making decisions, and started advocating the use of O.R. concepts at UPS. Quantitative analysis became the bedrock on which the UPS engineering function was built. Because of Smith's vision, UPS now employs thousands of engineers whose focus is efficiency, sustainability, and service.

He was a strong believer in investing in our younger generation. For him, nurturing them was the key to sustained prosperity. This prize embodies Smith's beliefs: to recognize the importance of O.R. in practice, and ensure that members of our younger generation get proper exposure to its value, and in turn benefit society.

2024 UPS Smith Prize Committee

- Anne Robinson, *Chair, Smith Prize*
- Dayana Cope, *Delta*
- Fidel Rodriguez, *LinkedIn*
- Samaneh Shiri, *UPS*
- Jay Swaminathan, *University North Carolina*
- Morgan Swink, *Texas Christian University*
- Andrew Wasser, *Carnegie Mellon University*































2024 SMITH PRIZE COMPETITION

Since the earliest days of operations research (O.R.) and analytics, to support the developing technology and research, it became increasingly important to prepare young O.R. and analytics professionals to further the growing impact of these fields. The UPS George D. Smith Prize recognizes the importance of a strong partnership between industry and academia in preparing students to be effective practitioners. The diversity, quality, and innovation of this year's finalists presented the committee with an encouraging and exciting glimpse of the future of the profession.

"As we grow in size, our problems increase geometrically. Without operational research, we would be analyzing our problems intuitively only, and we would miss many opportunities to get maximum efficiency out of our operation." – George D. Smith

SMITH PRIZE PAST WINNERS

2023 Mitchell E. Daniels, Jr. School of Business
Purdue University

2022 Master of Industrial & Applied Mathematics
Eindhoven University of Technology

2021 Tippie College of Business
University of Iowa

2020 Smith School of Business
Queen's University

2019 Department of Operations, Business Analytics & Information Systems
University of Cincinnati

2018 Haslam College of Business MSBA
University of Tennessee

2017 Operations Research Program
United States Air Force Academy

2016 H. John Heinz III College of Information Systems & Public Policy
Carnegie Mellon University

2015 Sauder School of Business
University of British Columbia, Centre for Operations Excellence

2014 Leaders for Global Operations
Massachusetts Institute of Technology

2013 Department of Operations Research
Naval Postgraduate School

2012 Tauber Institute for Global Operations
University of Michigan



NUS National University of Singapore

MASTER OF SCIENCE IN BUSINESS ANALYTICS (NUS MSBA)

#1 University In Asia

QS World University Rankings 2019-2024

2024 QS Business Master's Ranking: **Business Analytics**

1st In **Asia**

Top 10 In the **World**

Introduction to NUS MSBA

The NUS Master of Science in Business Analytics (MSBA) programme is offered by the NUS Business Analytics Centre, and jointly supported in equal partnership by NUS Business School and NUS Computing.

Taught by award-winning academics from both Schools, the NUS MSBA programme is designed to facilitate experiential learning through a balance of intellectual academic rigour and hands-on applications. A standout feature of the NUS MSBA programme is that it provides students with hands-on experience in tackling real-world business analytics issues, especially through the Capstone Course: a culmination of capstone lectures, industrial analytics seminars, analytics innovation challenge, and capstone project.

The NUS MSBA boasts a strong network of industry partners that our students can interact with and learn from, to enhance their career prospects and competencies in the field. Upon completion, NUS MSBA graduates emerge well-equipped with cutting-edge skills such as artificial intelligence and machine learning, proficient in leveraging data-driven techniques and tools to address complex business challenges.

Programme Highlights

Interdisciplinary Curriculum

Access to an interdisciplinary curriculum designed by NUS Business School and NUS Computing

Strong Industrial Partnerships

Collaborate with more than 100 organisations across different industries

Diverse Community

Connect with a global network of over 900 students and alumni across 30 countries and regions

Be a Catalyst of Digital Transformation

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Visit our website **https://msba.nus.edu.sg** for the latest application period and admission criteria

NUS Business Analytics Centre
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UNIVERSITY OF SOUTH CAROLINA

Darla Moore School of Business
UNIVERSITY OF SOUTH CAROLINA

OPERATIONS AND SUPPLY CHAIN PROGRAM

No. 3
UNDERGRADUATE SUPPLY CHAIN PROGRAM *in North America*
(Gartner, 2022)

No. 6
GRADUATE SUPPLY CHAIN PROGRAM *in North America*
(Gartner, 2022)

TOP 20
UNDERGRADUATE SUPPLY CHAIN MANAGEMENT AND LOGISTICS
(U.S. News & World Report, 2024)

TOP 20
SUPPLY CHAIN MANAGEMENT MBA PROGRAM
(U.S. News & World Report, 2024)

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Collins Aerospace • Continental Tire
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Delta Airlines • Eastman Chemical
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Goldman Sachs • Honda
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Siemens Sonoco • Smith & Nephew
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UPS • UTC



STUDENTS IN OUR PROGRAM:

- Learn to apply holistic analytics to improve real-world business processes through intensive capstone consulting projects with industry partners.
- Work with Fortune 500 companies at both the undergraduate and graduate level.
- Learn from faculty experts with unique opportunities to address live operations and supply chain challenges.
- Compile comprehensive roadmaps and assist in execution and sustenance of process improvements.
- Join like-minded students who have worked on more than 350 projects idenfifying more than $330 million in client-validated recurring benefits.
- Earn project-based, industry-validated Sonoco-USC Lean Six-Sigma Green Belt Certificate before graduation.

To date, the USC Operations and Supply Chain Center has executed 350+ consulting projects with more than 40 partner firms, resulting in client-validated savings exceeding $330 million.

SONOCO-USC LEAN SIX-SIGMA GREEN BELT:

We have worked with Sonoco Products Company to jointly certify our Capstone graduates with an industry-validated LSS GB certificate with rigorous project and exam requirements. To date we have certified more than 1,600 graduates.



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The Department of Management Science and Engineering at the University of Waterloo offers unique programs centred on experiential and work-integrated learning. From undergraduate to PhD studies, the department brings together expert faculty members and talented students. Through innovative instruction and a world-leading co-op model we ensure that our learners are ready for the changing needs of industry.

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(Maclean's Student Voices Survey, 2022)

#1 university in Canada for innovation
(Maclean's 2023 university rankings)



OUR STRENGTHS:

- **Programs catered to different career stages**
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- **A unique blend of courses taught by expert faculty members**
  - Operations Management, Data Analytics, Machine Learning, Software and Information Systems, Innovation Management
- **Experiential education: Case and project-based learning in teams**
  - Case Days immerse students in authentic real-world problems presented by industry partners
  - Capstone Design projects tackle operational challenges in organizations
- **Work-integrated learning embedded in both undergraduate and graduate degrees**
  - Waterloo runs the largest co-op education program in the world
  - Excellent paid co-op placements in industry
- **Entrepreneurship and innovation emphasis**
  - Waterloo is the most entrepreneurial university in Canada
  - World-class student start-up incubator

2024 INFORMS UPS GEORGE D. SMITH PRIZE FINALIST

uwaterloo.ca/management-science-engineering/

UNIVERSITY OF WATERLOO | Department of Management Science and Engineering

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THE WAGNER PRIZE

DANIEL H. WAGNER PRIZE HISTORY

For Excellence in the Practice of Advanced Analytics & Operations Research

The Wagner Prize is awarded annually in honor of the late Dr. Daniel H. Wagner. During his years as president and principal owner of Daniel H. Wagner Associates, Dr. Wagner brought many high-quality mathematicians into the operations research community. This led to significant advances in the firm's fields of endeavor and delivery of significant applications to the Navy, Coast Guard, and other clients. Many of the applications are still in service today.

Dr. Wagner earned his PhD in mathematics from Brown University in Providence, Rhode Island, in 1951. His dissertation, "On Free Products of Groups," was published in 1957 in the journal *Transactions of the American Mathematical Society*. Dr. Wagner joined the Navy's Operations Evaluation Group at the Pentagon, working on operations research for naval warfare. He worked there until 1956, with a one-year leave of absence for postdoctoral research on free algebras at Massachusetts Institute of Technology.

Dr. Wagner then joined the Burroughs Research Center, where he directed a group of mathematicians performing analysis for the development of digital computers.

In 1957, Dr. Wagner and John D. Kettelle formed the partnership of Kettelle and Wagner, which was dissolved in 1963. That same year, he formed a new company, Daniel H. Wagner Associates, Inc. This company applied itself to cutting-edge work in the mathematics of naval tactics, especially antisubmarine warfare, detection theory, and search planning.

After retirement from the firm he founded, Dr. Wagner held various teaching and research positions with the U.S. Naval Postgraduate School and the U.S. Naval Academy.

Dr. Daniel H. Wagner was a member of INFORMS (and its predecessor ORSA) for more than 40 years. He passed away in March 1997.

2023 Wagner Prize Committee

- James Cochran, *Chair, Wagner Prize; University of Alabama*
- William J. Browning, *Applied Mathematics, Inc.*
- C. Allen Butler, *Daniel H. Wagner Associates*
- Kimia Ghobadi, *Johns Hopkins University*
- Greg Godfrey, *Metron Inc.*
- Andrea Llorenty, *BNSF Railroad*
- Ehsan Mahyari, *University of Alabama*
- Konstantina Mellou, *Microsoft*
- Vera Tilson, *University of Rochester*
- Willem van Hoeve, *Carnegie Mellon University*

2023 WAGNER PRIZE FINALISTS

The 2023 Wagner Prize competition took place during the 2023 INFORMS Annual Meeting. Four teams gave presentations to the INFORMS Practice Section judging committee seeking to demonstrate that the quality of their analysis in a real-world application qualifies them to win this award for outstanding practice of operations research and advanced analytics. The judging committee announced the winner during the Annual Meeting, and the winning team of the Daniel H. Wagner Prize will reprise their presentation during the 2024 INFORMS Analytics Conference.

Dr. Wagner strove for strong mathematics applied to practical problems, supported by clear and intelligible writing. This prize recognizes those principles by emphasizing good quality writing, strong analytical content, and verifiable practice successes within analytics and operations research.

A special issue of *INFORMS Journal on Applied Analytics* will publish the winning paper along with those of the other two finalists listed below:

Delta Coverage: The Analytics Journey to Implement a Novel Nurse Deployment Program

- Pengyi Shi, *Purdue University*
- Jonathan Helm, Mary Drewes, and Jacob Cecil, *Indiana University*

Smart Parcel Consolidation at Cainiao

- Biao Yuan, *Shanghai Jiao Tong University*
- Yujie Chen, Yuwei Chen, Haoyuan Hu, and Yinzhi Zhou, *Cainiao Network*













2023 WAGNER PRIZE WINNER

The 2023 Daniel H. Wagner Prize for Excellence in the Practice of Advanced Analytics and Operations Research first-place winners are Nicholas Mason, Rachel A. Rosenberg, Evan A. Rash, and Karl G. Kempf from Intel Corporation. The winners presented and received recognition at the 2023 INFORMS Annual Meeting in Phoenix.

The Sort-Assemble-Blend Routing Problem and its Application to Semiconductors

In recent years, the design and manufacture of semiconductor products has evolved in a new direction. Products based on "chips" have shifted from a single large die containing multiple functionalities to "multi-chips products" (MCPs) combining multiple smaller die, each with dedicated functionality, to make the final product. Advantages of this approach are improvements in 1) die yields and 2) product quality.

1. Semiconductors manufacturing is inherently stochastic. Microscopic defects occur randomly throughout the manufacturing process. If a wafer containing 50 large die has 10 defects resulting in 10 non-working die, the yield is 80%. But with the same 10 defects on a wafer containing 300 small die, the yield jumps to over 96%.
2. Manufacturing stochasticity also affects the speed, power consumption, and other performance properties of working die. With a large die, each of its multiple functionalities will have different performance with some excelling and some lagging. The same is true for small die with dedicated functionality. However, small die with functionality set A can be sorted into bins of high, medium, and low performance as can small die with functionality set B, set C, and so on. Then, a higher quality, more consistent product can be assembled from matched performance A, B, and C small die.

Functionality disaggregation also drives substantial complexity because it enables a large number of strategies to sort die into categories and assemble them with maximum compatibility as the goal. More individual components must be managed, and decisions on how to sort and assemble them must be made holistically. This creates a complex, nonlinear problem called the Sort-Assemble-Blend Routing Problem (SABR-P).

Its solution approach is formulated using genetic algorithms, Monte Carlo simulations, linear programming, and machine learning. This framework has been successfully validated and applied in practice, saving Intel Corporation more than $500 million thus far. It is the new standard for analyzing and optimizing Intel's multi-die products for the foreseeable future.

Scan QR Code for more information on 2023 winners.

INFORMS PRIZE

INFORMS PRIZE HISTORY

The INFORMS Prize has been honored during the Edelman Gala for 16 years. While the Edelman Award and the Wagner Prize recognize single projects that demonstrate outstanding accomplishments in O.R. practice, the INFORMS Prize complements them by recognizing long-term, multiproject achievements. The INFORMS Prize is awarded annually to recognize effective integration of O.R. into organizational decision-making. It is awarded to an organization that has repeatedly applied the principles of advanced analytics in beneficial and long-lasting ways.

2024 INFORMS Prize Committee

- Mehmet Gumus, *Chair, INFORMS Prize; McGill University*
- Sharon Arroyo, *Boeing*
- Karan Girotra, *Cornell Tech*
- Ahmet Kuyumcu, *Prorize*
- Nilay Noyan, *Amazon*
- Robert Rooderkerk, *Erasmus University*
- Yulia Vorotnytseva, *Saint Louis University*

INFORMS PRIZE PAST WINNERS

2023 Walmart
2022 Wayfair
2021 Amazon
2020 UPS
2019 Booz Allen Hamilton
2018 BNSF Railway
2017 The Walt Disney Company & U.S. Air Force
2016 General Motors
2015 Chevron
2014 Mayo Clinic
2013 Ford Motor Company
2012 Memorial Sloan Kettering Cancer Center
2011 Sasol
2010 Jeppesen
2009 Intel Decision Technologies Group
2008 GE Global Research Risk & Value Management Laboratory
2006 Schneider National, Inc.
2005 Air Products & Chemicals, Inc.
2004 Procter & Gamble
2003 UPS
2002 Hewlett-Packard
1999 IBM
1998 Lucent Technologies
1997 Merrill Lynch Private Client Group
1996 Pfizer Inc
1995 Bellcore
1994 AT&T and U.S. West Technologies
1993 New York City Office of Management and Budget & United Airlines
1992 San Miguel Corporation
1991 American Airlines & Federal Express

Notes: Prior to 1995, the award was called the ORSA Prize. No prize recipients were chosen in 2000, 2001, and 2007.

INFORMS PRIZE CRITERIA

The INFORMS Prize selection committee is comprised of seven members as well as the past committee chair, consisting of practitioners and academics, providing a broad representation of the operations research community.

Variety of Advanced Analytics and O.R. Applications.
Implementations in diverse applications, using a wide set of methods, led to greater opportunities to improve organizational performance.

Strategic Advantage for the Organization.
Analytics and O.R. permeate the parent organization's operations and are considered integral and a source of strategic advantage.

Substantial Impact.
Over the years the total amount of beneficial impact on the organization has been substantial. This impact was delivered through some one-time and some recurring projects; its amount could be described sometimes by numerical measures and sometimes by statements without numbers.

Model for Success.
The organization provides an excellent example of successful analytics and O.R. practice for others to follow. An important reason for success has been to contribute in a variety of basic functions; for instance, in a business organization these functions likely will include finance, marketing, production, and planning.

Top-Management Endorsements.
Strong submissions include personally written endorsements from top-level executives.

High-Quality Application.
The best applications are well written. And they are complete, with all supporting references and endorsements included.













2024 INFORMS PRIZE WINNER

Jingdong, better known as JD.com, was founded in 2004 as an e-commerce company and is rapidly transitioning into a leading supply chain-based technology and service provider. The company's expansive portfolio spans across sectors including retail, technology, logistics, health, and more, underscoring its diverse and multifaceted operations. In 2023, JD.com ranked 52nd on the Fortune Global 500 list. The company serves nearly 600 million active users, supported by an extensive infrastructure of more than 1,600 warehouses, ensuring unparalleled service and efficiency in its operations.

JD.com distinguishes itself from other e-commerce platforms by deploying its own comprehensive logistics infrastructure since 2007, ensuring reliable and prompt delivery. The company operates an omnichannel business model, offering a vast inventory of mor than 10 million self-operated SKUs across thousands of categories. Thanks to its optimized logistics network and delivery routes, efficiently managed warehouse and inventory, and quick-operating order fulfillment, JD.com has achieved exceptional proficiency in inventory turnover (approximately 30 days) and delivery timeliness (95% of self-operated orders delivered same-day or next-day).

Since 2007, JD.com has been committed to leveraging cutting-edge analytics, operations research (O.R.), and artificial intelligence (AI) algorithms to enhance its entire supply chain decision-making process, encompassing demand forecasting, inventory management, warehouse operations, and optimization of its network and fulfillment strategies. As its business scale expands, JD.com promotes O.R. capabilities throughout the organization, empowering frontline staff to leverage O.R. systems to boost efficiency, cut costs, and elevate the customer experience. The widespread application of O.R. techniques has garnered significant recognition and praise for JD.com from both the academic community and industry.

Taking inventory management as an example, JD.com approaches challenges stemming from an extensive array of product varieties, warehouse configurations, and consumer demographics, compounded by increasing customer diversity and significant demand uncertainty. In response, JD.com launched a product layout network model with an end-to-end simulation tool and decision-making module based on optimization techniques. Furthermore, JD.com developed an end-to-end inventory management model rooted in deep learning, designed to identify the optimal replenishment strategy.

Through its unwavering commitment to advancing O.R. methodologies and their effective implementation, JD.com's supply chain not only aims to lead in the industry, but also enhance the well-being of all ecosystem stakeholders and consumers. JD.com is steadfast in its dedication to leveraging the transformative potential of O.R. to foster a more efficient, responsive, and consumer-centric supply chain.

JD.COM

INFORMS

ABOUT INFORMS

The Institute for Operations Research and the Management Sciences
Smarter Decisions for a Better World

From increased efficiency in business processes that leads to billions in savings, to lifesaving advancements in medical treatments and support of at-risk populations, to revolutionized transportation and delivery systems, math and science are being leveraged to make better decisions that are truly saving lives, saving money, and solving problems. At the heart of these growing fields is INFORMS, the leading professional society for a vibrant community of more than 11,000 operations research (O.R.), analytics, and data science professionals, academics, and students – representing more than 83 countries around the world – whose impact on the economy and society has been, and continues to be, nothing short of remarkable.

INFORMS is dedicated to encouraging, facilitating, and awarding excellence in its membership. Formed in 1995 when the Operations Research Society of America (ORSA) and The Institute of Management Sciences (TIMS) merged, INFORMS strives to provide opportunities of inspiration and collaboration among its members, fostering the life-changing ideas of O.R. and analytics leaders of the future.

INFORMS hosts several meetings and events, featuring carefully cultivated content, networking, and career advancement opportunities for students, researchers, practitioners, and industry leaders. These include the Annual Meeting and Analytics Conference, held annually, and the International Conference, Healthcare Conference, and Security Conference, held every other year at locations across the globe. In addition, INFORMS hosts a number of virtual events, including the INFORMS Insights webinar series, tailored specifically for early career professionals.

The INFORMS advocacy program leverages the expertise of members to provide policymakers in Washington, D.C., with valuable insights regarding the importance of data-driven decision-making. INFORMS publishes 17 scholarly, peer-reviewed journals, more than one-third of which are featured on the Financial Times list of 50 top academic journals, highlighting the latest O.R. and analytics methods, research, and applications. In addition, continuing education and Certified Analytics Professional (CAP®) and Associate CAP (aCAP) certification programs provide opportunities for professional advancement at every career stage. With 26% of Fortune 100 companies now employing professionals who have earned the CAP, these certifications enable industry leaders to identify and employ top talent.

INFORMS provides many resources to organizations of all sizes seeking information on the benefits of analytics, connecting them with the latest research and discoveries as well as analytics and operational research professionals who have the expertise they require. In addition, within the INFORMS membership are smaller, specialized subdivisions dedicated to a common theme or technical interest, many of which directly pertain to analytics and O.R. applications for industry. INFORMS members are embracing complex problems and unlocking the valuable data needed to enhance decision-making processes and improve day-to-day operations in almost every industry sector.

INFORMS would like to congratulate and thank tonight's honorees, both for their incredible contributions today, as well as inspiring the great discoveries and advancements of tomorrow.

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ADVANCING THE PRACTICE OF O.R. & ADVANCED ANALYTICS

By Rajesh Tyagi,
President of INFORMS Section on Practice

Tonight, we gather to honor exceptional achievements in operations research (O.R.) and advanced analytics at the prestigious Edelman Gala. Organized by dedicated volunteers of the INFORMS Section on Practice, this gala showcases the pinnacle of excellence through competitions like the Edelman Award, Wagner Prize, and UPS George D. Smith Prize. Delve deeper into these competitions and meet this year's outstanding finalists within the pages of our program book.

The Practice Section ardently champions the application of O.R. and advanced analytics by curating competitions that spotlight exemplary practices within our field. Moreover, we curate practice-oriented presentations at the INFORMS Annual Meeting each fall, publish quarterly informative newsletters for Section members, and foster engagement through monthly happy hours and enlightening webinars. These endeavors underscore our commitment to demonstrating the profound impact of analytics in tackling real-world challenges.

Our Section comprises a diverse and inclusive cohort of volunteers from around the globe, encompassing a broad spectrum of industries, academia, government, and beyond. Whether you are just beginning your professional journey or are seeking to remain abreast of the latest advancements, all are encouraged to contribute to our mission of leveraging O.R. and analytics to enhance lives, optimize costs, and resolve complex issues.

We extend an open invitation to join the INFORMS Section on Practice and lend your unique perspective and expertise. The opportunities for networking and collaborative innovation to propel our profession forward are boundless and immensely gratifying.

Throughout the year, the Practice Section hosts a plethora of enriching (and enjoyable) events for its members, fostering collective learning and development irrespective of geographical boundaries. Amidst the challenges of the COVID-19 pandemic, our virtual happy hours emerged as a lifeline, fostering connectivity and camaraderie that persist to this day.

Furthermore, our Section offers a dynamic webinar series encompassing diverse topics, applications, and invaluable insights into best practices. For further details and to become part of our vibrant community, visit the Practice Section website at connect.informs.org/practice.

If you're eager to contribute as a volunteer or have suggestions for additional activities that could enrich our Section, we welcome your input. Feel free to reach out to me via email at: RajeshTyagi@yahoo.com. We eagerly anticipate your engagement and warmly welcome you to our community!











CALL FOR INFORMS AWARD SUBMISSIONS

Descriptions of INFORMS awards and prizes, and submission deadlines listed here.

Daniel H. Wagner Prize

Excellence in Operations Research Practice

The Daniel H. Wagner Prize emphasizes the quality and coherence of the analysis used in practice. This prize recognizes those principles by emphasizing good writing, strong analytical content, and verifiable practice successes.

2024 Submission Deadline: Wednesday, May 1, 2024

Franz Edelman Award

Achievement in Advanced Analytics, Operations Research, and Management Science

The purpose of the Franz Edelman Competition is to bring forward, recognize, and reward outstanding examples of impactful O.R., management science, and advanced analytics practice in the world.

2025 Submission Deadline: Tuesday, October 1, 2024

UPS George D. Smith Prize

Strengthening Ties Between Academia & Industry

The UPS George D. Smith Prize is awarded to an academic department or program for effective and innovative preparation of students to be good practitioners of operations research, management science, or analytics.

2025 Submission Deadline: Monday, November 25, 2024

INFORMS Prize

Sustained Integration of Operations Research

The INFORMS Prize is awarded for effective integration of advanced analytics and OR/MS in an organization. The award is to be given to an organization that has repeatedly applied the principles of advanced analytics and OR/MS in pioneering, varied, novel, and lasting ways.

2025 Submission Deadline: Sunday, December 15, 2024

INFORMS Early Career Practitioner Award

Engage & Recognize Early Career Professionals

The INFORMS Early Career Practitioner Award was created to engage and recognize early career professionals in the fields of operations research, management science, and advanced analytics for their exceptional contributions to business/industry, government, and consulting, and service to the profession.

2025 Submission Deadline: Sunday, December 1, 2024

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The journey to the top is full of obstacles, which has the potential to impact team morale. Keeping yourself and the team motivated is essential. Your desire to win and pursuit of perfection will inspire others to do the same.

— Mingang Fu, Jing Huang, Prakhar Mehrotra, and Srinivasan Venkatesan
2023 Franz Edelman Award Winners

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