



GOR-AG: Praxis der
Mathematischen
Optimierung
Dr. Jens Schulz

Mail: schulz-gor@gmx.net

We invite you to the 111th meeting of the GOR working group "Practice of Mathematical Optimization". This meeting is planned to be held in person with the topic

Optimization in the era of Generative AI

The workshop is hosted and co-organized by Flix SE, known for brands like FlixBus and FlixTrain.

It will take place on **Thursday and Friday, November 26 & 27**, at Flix SE headquarters in **Munich, Germany**.

Participation in the workshop is free for all GOR members, speakers, and hosts. Otherwise, the participation charge is 50€ for bachelor's and master's students, and 100€ for everyone else. The working language will be English. Food and drinks during the event are sponsored by Flix SE. We strongly advise you to book your stay and travel, acknowledging that the on-site event may be canceled on short notice. In this case, the organizers will waive the registration fee but will not refund any other costs.

We are looking for speakers from academia and practice who share their experience!

Registration for speakers and participants is open until beginning of November:
<https://redseat.de/pmo111/>

The latest information on the meeting is available on the homepage of the GOR
(<http://www.gor-ev.de/arbeitsgruppen/praxis-der-mathematischen-optimierung/real-world-optimization>).

Yours sincerely,

Jens Schulz, Julia Kallrath, Josef Kallrath

(GOR AG)

Berit Johannes, Sander Van Aken

(Flix SE)

Vorstand

Prof. Dr. Jutta Geldermann (Vorsitz)
Prof. Dr. Stefan Ruzika (Arbeitsgruppen)
Prof. Dr. Dominik Möst (Tagungen)
Hanno Schülldorf (Finanzen)

Kontakt

geschaeftsstelle@gor-ev.de
www.gor-ev.de
Tel.: +49 (0) 241 80 23830
Fax: +49 (0) 241 6 80 23830

Bankverbindung

Konto: 1 465 160
BLZ: 430 500 01 Sparkasse Bochum
IBAN: DE82430500010001465160
BIC: WELADED1BOC

Optimization in the era of Generative AI

Specific aims

In this workshop, we want to discuss how Generative AI, or broadly Agentic AI, is reshaping Operations Research. We focus on combining OR and LLMs to create more impact with OR and to democratize it. We are interested in how this combination changes the OR pipeline end-to-end, from model development and testing through to decision-support tools and end-user assistants. We also aim to explore the new workflows, roles, and user experiences that this enables.

We welcome speakers and attendees to present and discuss cutting-edge research and practical applications at the intersection of GenAI and mathematical optimization. The presentations will cover topics ranging from problem formulation and structuring, AI-assisted model development, scenario generation and robustness analysis, conversational decision support, interactive what-if analysis, explainability of optimization recommendations and decision trade-offs, trust and reliability, and lessons learned from deploying GenAI-enabled workflows in practice.

Given how fast this space is moving, we also explicitly invite participants to bring topics from their own experiences - early-stage ideas, lessons from ongoing experiments, or open questions are equally welcome.

We want to foster collaboration and knowledge sharing among industry experts, researchers, and academics. We provide a platform for networking and exchanging ideas with fellow professionals and industry practitioners. Practical, computational, and architectural contributions from academia and industry are welcome for submission.

The core of this 1.5-day workshop will feature an engaging schedule of talks, while, as usual, we will reserve plenty of time for informal exchange and networking.

Format of presentations:

- **Talks of 35 + 10 min** duration – expert talks
- **Lightning talks of 5 (maybe 10) min** – present your company's perspective, demonstrate your favorite GitHub projects,... on Thursday.

If you would like to contribute a talk, please feel free to contact the organizers.

Jens Schulz ([schulz-gor 'at' gmx.net](mailto:schulz-gor@gmxdotnet))

About Flix SE

Flix intends to transform the collective transport sector by offering sustainable and affordable long-distance bus- and train travel solutions in more than 40 countries across four continents through its brands FlixBus, FlixTrain, Kamil Koç, and Greyhound. With its asset-light business model and innovative technology platform, Flix, launched in 2013, swiftly established a market-leading position for long-distance bus travel in Europe, North America and Türkiye and is rapidly expanding further into South America and Asia-Pacific region.

While Flix manages the commercial side of the business such as network planning, pricing, operations control, marketing and sales, quality management and continuous product development with a data-driven approach, trusted Flix partners conduct the daily operations.

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The venue & accommodation

Venue

Flix SE headquarter
Friedenheimer Brücke 16
80639 München

Accommodation

You are free to choose any hotel, there are plenty of alternatives along the S Bahn between Hirschgarten and Hauptbahnhof. Here are two hotels near the Flix SE headquarter that we are planning to use:

Holiday Inn Express München City West Friedenheimer Brücke 15, 80639 Munich, Germany [View on Google Maps](#)

Ibis München City Arnulfpark Arnulfstraße 2, 80335 Munich, Germany [View on Google Maps](#)

Pre-conference get-together

For arrivals on Wednesday, we organize a spot in a restaurant. Please, let us know upon registration whether you would like to participate. You can change your choice later.

Conference dinner

We will hold a conference dinner on Thursday evening. Details will be revealed later. It is included in the participation fee.

Excursion

We are still elaborating the options for an excursion.

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Talks

In alphabetical order of author's last name

- **From Prose to Solver: Turning Natural-Language Descriptions into Validated, Solver-Routable Optimization Tasks**
Andreas Götz
- **Can you beat the Algorithm? Using GenAI to create an OR Games Factory**
Jens-Peter Joost (JPJ Solutions)
- **Sixt Agentic AI Application**
Eunji Lee (SiXt SE)
- **Making LLM-assisted optimisation modelling verifiable**
Justus Killian Wolff ([Bool.io](https://bool.io))
- **Combining LLMs with optimization models to enable configurability and explainability**
Network Planning Optimization (Flix SE)

Lightning talks

In alphabetical order of author's last name

- **AI in IVU.opt: From Decoding Legacy Systems to Developing New Features**
Stephan Schwartz (IVU)
- **Tba**
Konrad Steiner (Kearney / Optano)

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Abstracts

From Prose to Solver: Turning Natural-Language Descriptions into Validated, Solver-Routable Optimization Tasks

Andreas Götz (OptWare)

Validation, solver routing, and orchestration as foundations for agentic optimization workflows — with lessons from the OptWare Hub

Andreas Götz is Head of Product Engineering at OptWare.

Can you beat the Algorithm? Using GenAI to create an OR Games Factory **Jens-Peter Joost (JPJ Solutions)**

From a certain perspective, operations research problems can be viewed as games: within a clearly defined setting and under limited resources, the goal is to achieve the highest possible Score. s computer games have grown in popularity over the past decades, gamified learning may offer an opportunity to raise awareness of operations research and make its concepts more accessible.

This talk presents how generative AI was used to create an Operations Research Games Arcade consisting of seven games. In each game, players compete against an optimization algorithm and attempt to find an optimal or near-optimal solution to a classical OR problem embedded in a fantasy setting. In “Dungeon Hoard”, players fight monsters and pack valuable loot while solving a two-dimensional knapsack problem. In “Cart & Run”, they flee from a minotaur, all while tackling a prize-collecting vehicle routing problem.

Which AI tools were used? What worked well? Where do current generative AI capabilities still fall short? The talk shares lessons learned from this experimental project and discusses how they can be transferred to the use of agentic coding tools in real-world operations research applications.

Jens-Peter Joost is an independent Operations Research consultant and optimization specialist developing decision-support and optimization solutions, particularly in routing, logistics, and supply chain planning. Through his consultancy JPJ Solutions, he combines mathematical optimization, modern software engineering, and GenAI to turn complex OR methods into practical applications, interactive tools, and educational games

Sixt Agentic AI Application **Eunji Lee (SiXt SE)**

Large-scale operational planning in asset-intensive industries relies on mathematical optimization, but model outputs are routinely adjusted by domain experts whose contextual judgment isn't captured in the model's objective function - and those adjustments rarely feed back into future planning cycles. We present an approach to making this human-in-the-loop process more structured: a multi-agent AI system that augments the optimizer with analytical layers, with the goal of making model outputs interrogable and expert interventions explainable. We share the architecture of a production system at SIXT, the design discipline required to earn trust from experienced domain experts - specifically the challenge of keeping AI recommendations traceable and the conversational interface that lets users explore trade-offs rather than accept outputs passively - and early signals on whether the system changes expert behavior over time. The talk concludes with open questions around closing the loop between human insight and model inputs, and the

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broader challenge of building AI systems that improve through use rather than despite it.

Eunji Lee is Executive Product Analyst in Operations Research at SiXt SE and holds a Ph.D. in Logistics & Supply Chain Management from Technical University of Munich, Germany (2024). From 2024 to 2026, Eunji was Assistant Professor in Supply Chain Management at University of Mannheim – Business School - Faculty of Operations Management.

Making LLM-assisted optimisation modelling verifiable

Justus Killian Wolff ([Bool.io](https://bool.io))

Generative AI is quickly changing how optimisation models are created. Large language models (LLMs) can explain standard formulations, generate solver code, and translate natural-language requirements into structured models. This lowers the cost of getting to a first model, but it also raises a harder practical question: how do we know that the generated model is the right model?

A useful optimisation model is not finished when it solves. It still has to be explained, checked against the real problem, corrected when assumptions are wrong, and adapted when requirements change. For users outside dedicated OR teams, generated Python, JuMP, or Pyomo code often remains hard to inspect or own.

This talk looks at a shift in the modelling workflow: if LLMs can produce a first formulation quickly, the bottleneck moves from writing constraints to making modelling decisions explicit, reviewable, and explainable. Many practical models reuse the same patterns again and again: exactly-one choices, at-most-one assignments, if-then dependencies, capacity limits, allocation rules. Keeping these patterns visible as named modelling concepts before compiling them into algebraic formulations makes the model easier to discuss and gives the LLM a more structured target. To make this concrete, the talk draws on the development of bools and uses a realistic planning example to illustrate the workflow, from plain-language problem description to readable model and solved instance. This serves as a basis for discussing lessons from using LLMs for optimisation modelling in practice: prompting, modelling abstractions, sandboxing, and user review.

We also discuss where this approach is particularly useful today: in model review and recurring planning problems, especially in companies that have not used optimisation before, where standard modelling patterns are often sufficient and the hard part is making the model understandable, trustworthy, and easy to adapt. More broadly, we ask how OR expertise changes when LLMs can draft models: from writing every constraint by hand toward designing the workflows, abstractions, and verification mechanisms that make optimisation usable beyond specialist teams.

Justus Kilian Wolff is the founder of bools. He holds a B.Sc. in Industrial Engineering from Karlsruhe Institute of Technology (KIT) and an M.Sc. in Operational Research from the University of Edinburgh. Before founding bools, he built fraud detection systems at audit.neo. With bools, he works to lower the barrier to using mathematical optimisation in practice by making models easier to create, verify, and adapt.

AI in IVU.opt: From Decoding Legacy Systems to Developing New Features

Stephan Schwartz

We use AI agents in IVU's optimization team to simplify everyday development tasks, understand complex (legacy) code more quickly, and selectively extend our optimization model. What works well so far—and what does not (yet)?

Stephan Schwartz is Senior Optimization Developer since 2023 at IVU, a planning service provider for railway and bus planning. He finished his PhD in 2018 at Zuse Institute Berlin in the group of Ralf Borndörfer.

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