

## EURO Practitioners' Forum Autumn Workshop

### Practice of OR – sharing experiences, building networks



17 November 2022, 13:00 – 17:00 CET, online

#### LIGHTNING TALKS SESSION

##### OR in Action in 5 minutes

1. SuCCESs – Modelling Pathways to a Sustainable Society  
Nadine-Cyra Freistetter
2. Planting a million trees: how UPM Uruguay schedules seedling deliveries  
Yue Zhou-Kangas
3. Vicious cycles and Systemic Risk in a Pandemic – from problem structuring to agreed action  
Colin Eden
4. Talk problems to me: Understanding user needs for OR software development  
Sander van Aken
5. Integrated production and transportation scheduling in the compound feed industry  
Jasper van Doorn
6. Blacklisting Products in e-commerce: A mathematical approach  
Ahmet Çinar

#### Details:

##### 1. SuCCESs – Modelling Pathways to a Sustainable Society, *Nadine-Cyra Freistetter*

Cutting greenhouse gas emissions and removing carbon from the atmosphere is the pressing quest of our times. We develop a new computational model called SuCCESs, that calculates scenarios of reaching sustainability goals until 2100. SuCCESs is a large-scale, open source, linear programming model that will be able to assess the consequences of climate change mitigation strategies and their mutual amplifications or trade-offs by modelling a society that cost-efficiently balances emission reductions and carbon sequestration within energy, land-use, and material production sectors. Here, we present future plans and applications, current stage and first results of the SuCCESs model.

*Nadine-Cyra Freistetter is a doctoral researcher at the Finnish Meteorological Institute. With degrees in physics and environmental management and ecotoxicology, she specializes in climate change and sustainability modelling in long-term scenarios. Her previous studies include climate change impacts on road weather, greenhouse gas emissions from forests and invasive species management.*

## 2. Planting a million trees: how UPM Uruguay schedules seedling deliveries, *Yue Zhou-Kangas*

UPM Uruguay uses Eucalyptus fibre harvested from its own 300 plantations. The harvested trees are replaced with genetically suitable seedlings raised in 14 nurseries. For the replacement, UPM plans and executes weekly deliveries for 1M seedlings on trucks traveling a combined distance of up to 18000 kilometres.

This scheduling could be modelled as a *multi-depot capacitated vehicle routing problem with time window*; but the huge scale of the challenge coupled with tight planning deadlines makes this impractical. I'll describe how we approached the problem, successfully automating the planning, providing feasible delivery schedules and significantly reducing the manual planning effort.

*Being a stationery lover, Yue cannot resist beautiful notebooks and postcards. When she received her PhD in Mathematical Information Technology, she had no vision that someday she will have a place in the paper industry. But now she works as a specialist in Advanced Analytics in UPM.*

## 3. Vicious cycles and Systemic Risk in a Pandemic – from problem structuring to agreed action, *Colin Eden*

Experts and managers in 15 different organisations, with different discipline backgrounds and roles share their knowledge about Covid risks. They share and build their causal knowledge same-time/different place using the internet and new causal mapping software Strategyfinder. One of a host of analysis techniques in the software reveals millions of interacting vicious cycles. Further analysis shows which vicious cycles and which risks need mitigating to have the biggest impact. The experts focus strategy development on these risks and agree action packages that are fully implemented.

This talk is based on work undertaken to address Covid-19 risk management strategy in Norway.

*Colin is Emeritus Professor at Strathclyde Business School. After PhD in dynamic programming he became an OR practitioner/consultant. Joining academia led to developing 'cognitive mapping' for problem structuring when working with an individual client. His current focus is on working with teams to facilitate fast solution finding to messy/complex problems.*

## 4. Talk problems to me: Understanding user needs for OR software development, *Sander van Aken*

Developing OR algorithms requires thorough problem definition. Navigating problem space is a challenging and insecure process. How do you approach this when end-users are responsible for different markets with their own constraints, which may not be spoken out loud? How do you set the course of your product in a complex and ever-changing environment? How do you make sure that what you build will be used, and hence creates value?

Learn about how user research methodologies help us in uncovering the network planning problem at FlixBus, in failing fast, and in continuously refining and iterating on our problem definition.

*Sander works as Senior Operations Researcher at FlixBus' network planning optimization team. The team develops OR algorithms, which are embedded in software products, to support network planners in their daily work. He also acted as the team's Product Owner for a while.*

## 5. Integrated production and transportation scheduling in the compound feed industry, *Jasper van Doorn*

The compound feed industry is one of many examples where the schedules for production and transportation are heavily intertwined. Based on customer requirements, the industry has been transitioning more and more from make-to-stock towards make-to-order production. The end-of-production silos have originally been designed to store large quantities of few different stock products, instead of small quantities of many different products that cannot be mixed. This means it is crucial that vehicles are available to deliver an order as soon as possible after production completed. Together with many practical complexities in the production, loading and delivery processes itself, this leads to a complex integrated optimization problem to be solved.

*Jasper van Doorn is a PhD student in the Analytics & Optimization group at the Vrije Universiteit Amsterdam. His research focuses on developing new solving methods on the cutting edge between classical operations research and artificial intelligence for complex optimization problems found in real world applications.*

## 6. Blacklisting Products in e-commerce: A mathematical approach, *Ahmet Çinar*

A decision maker is required to determine the set of products that will be put into blacklist. Due to the several different performance metrics such as unsupplied ratio, dispatch on time ratio, defective ratio and so on, she needs to find an optimal weight set corresponding to these metrics. In this talk, I will present a mathematical programming approach to blacklisting problem and discuss the difficulties of using OR in e-commerce.

*I studied operations research in Bilkent University and did a PhD in Koç University. I also have a law degree and interested in literature. While I was doing my research in operations research, I also worked in industry. I like developing mathematical models and algorithms. It makes me happy when I see my models are used in actual settings. I work in an e-commerce company named Trendyol.*



**EURO Practitioners' Forum** (formerly the EURO Working Group on Practice of OR), aims to help develop supportive networks, support and assist OR practitioners, and in particular people whose primary purpose is applying OR in a business/government/charity or similar environment. We believe that practitioners can benefit enormously from networking, sharing experiences, learning from each other, and potentially collaborating with each other; and that there is even more benefit to be gained from cementing links between these practitioners and EURO's academics.

**Become a member** and follow the Forum for information on numerous inspiring activities.