OeGOR Summer-Workshop
for PhD-candidates and Post-Docs

The Austrian Society for Operations Research (OeGOR) organizes a workshop for PhD-candidates and Post-Docs.

Invited Speakers:

Mirjam Dür (University of Augsburg):
Conic optimization: an application-oriented survey

Xavier Gandibleux (Nantes Université):
An introduction to Julia and JuMP for Operations Research

Date: 31.07.2023 – 04.08.2023

Place: University for Continuing Education (Donau Uni) Krems

Participation in the workshop is free of charge, if your institution or supervisor are members of OeGOR. However, lunch will be organized centrally, thus requiring a meal contribution of ca. € 50.-. All other food, travel and hotel arrangements must be organized and covered by the participants.

Registration: send an e-mail **until May 31, 2023** to raimund.kovacevic@donau-uni.ac.at

Each invited speaker will give a two-day program. The participants are also invited to give a presentation of their work. Take the chance to create a bond with fellow students and with OeGOR!

31.7.-1.8. Mirjam Dür: Conic optimization: an application-oriented survey

A conic optimization problem is a problem involving a constraint that the optimization variable be in some closed convex cone. Linear optimization is a prominent example, where the nonnegativity constraint can be interpreted as requiring that the variable should be in the cone of nonnegative vectors. Other examples are second order cone problems (SOCP) where the variable is constrained to be in the second order cone, and semidefinite programming (SDP) where the matrix variable is required to be in the cone of positive semidefinite matrices. More general cones appear in special applications.

In this course, we will highlight the enormous modeling power of conic optimization and review recent progress made in this field. While the past decades have seen research mainly in linear conic optimization, interest has now shifted to nonlinear and mixed-integer conic optimization. We will discuss algorithmic progress made in this direction as well as new fields of application. Special emphasis will be given to applications of conic optimization appearing in Operations Research.

2.8.: Short presentations by the participants

3.8.-4.8. Xavier Gandibleux: An introduction to Julia and JuMP for Operations Research

Julia is a high-level, high-performance programming language for numerical and scientific computing. Started in 2009 at the Massachusetts Institute of Technology, the first public version has been released in 2012. The language became stable in 2018 when the version 1.0 has been released.

The Julia syntax will appear familiar to users of Matlab, Fortran, Python, C/C++. Into the long list of scientific tools written in Julia, JuMP is an algebraic modeling language for mathematical optimization. Since 2018, JuMP comes with MathOptInterface, an abstract data structure for representing instances of mathematical optimization problems. It allows to call many MIP solvers (among others HiGHS, GLPK, CPLEX, or again GUROBI).

This course presents the environment for developing in Julia, a starter kit of Julia instructions and data structures to know for coding an algorithm, the package JuMP for modeling and solving optimisation problems, and a selection of useful packages for operations research. The practical aspects of lectures cover the installation of a working environment, the coding of optimisation algorithms, the modelisation and resolution of optimisation problems with JuMP.

The participants are invited to attend to the course with their own laptop, having the super-user access on the computer for installing the required resources, and with a wifi internet access (Eduroam or 4G/5G).