GOR Gesellschaft für Operations Research e.V.

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GOR-Arbeitsgruppe: Praxis der Mathematischen Optimierung
Dr. Jens Schulz
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Herewith, we invite you to the 101st meeting of the GOR working group “Real World Mathematical Optimization” in the Physikzentrum Bad Honnef (Hauptstr. 5, 53604 Bad Honnef, http://www.pbh.de). This meeting is hold as a symposium with the topic

Mathematical Optimization meets Machine Learning and Artificial Intelligence

The workshop takes place on November 22 & 23, 2018 on Thursday and Friday.

The working language will be preferably English, since some speakers or participants are expected from abroad.

Note that the participation in a GOR-AG-Workshop for non-members is subject to a registration fee, unless you are a speaker or a host. Except for students, the Physics Center collects an infrastructure fee of 40 Euro/person.

Please register yourself online using https://www.redseat.de/pmo101/ as soon as possible, but ideally not later than October 26th, 2018. The latest information on the meeting is available on the homepage of the GOR (http://www.gor-ev.de/arbeitsgruppen/praxis-der-mathematischen-optimierung).

Yours sincerely,

Jens Schulz, Julia Kallrath, Josef Kallrath
(GOR AG)

Vorstand:
Prof. Dr. Alf Kimms (Vorsitz)
Dr. Ulrich Dorndorf (Finanzen)
Prof. Dr. Alf Kimms (Tagungen)
Prof. Dr. Anita Schöbel (Arbeitsgruppen)

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Mathematical Optimization meets Machine Learning and Artificial Intelligence

This symposium focusses on successful applications that combine techniques from Mathematical Optimization with those from Machine Learning and Artificial Intelligence. In machine learning, the target is to make computer systems learn from historical data and relationships. Based on this, reliable decisions are generated and hidden insights can be uncovered, also known as *predictive analytics*. Most prominent examples as of today are pricing mechanisms and online advertisement. In Mathematical Optimization, the target is to find the best values for a set of variables that are subject to constraints which limit the potential solution space. Various applications from engineering and economics exist that can only be successfully handled by the use of mathematical optimization techniques. The term Artificial Intelligence is commonly used when a machine agent (like in computer games) acts like a human, i.e., it makes decisions, learns or solves complex problems. Examples are strategic games (chess and Go) or autonomous cars.
Definitely, there is a huge overlap among the applications and also among the methods applied in the three fields. While these have evolved partially separately, their interplay in algorithms and decision making processes becomes more and more important as the data availability, computing power and memory availability have increased tremendously.

Aim of the workshop
This two-day event attempts to give an overview of the current state-of-the-art of the interplay of techniques from Mathematical Optimization, Machine Learning and Artificial Intelligence in theory and practice. Because of the many applications fields we expect a broad spectrum of talks and fruitful discussions that penetrate the use of these methods in real world applications and stimulate further research directions.

Please contact one of the organizers if you are interested in presenting at this workshop.

In talks, either 15+5 min, 25+5 min or 40+5 min by choice, experts from practice, research institutions or software companies, will present selected problems and the corresponding solutions.
Experts from universities, research institutions, industry and software companies are welcome to present selected problems and available solutions.

Please contact:

Jens Schulz (schulz-gor ‘at’ gmx.net), Julia Kallrath (julia.kallrath ‘at’ h-da.de) or Josef Kallrath (josef.kallrath ‘at’ web.de) if you are interested in presenting.

Presentations from the following speakers have been confirmed:

Dr. Torben Barth (Fraport AG, Frankfurt)
Applied analytics at Frankfurt Airport

Dr. Oliver Bastert (FICO, München)
Optimal Machine Learning

Raoul Heese (Fraunhofer ITWM, Kaiserslautern)
Machine learning-driven screening of operation windows in chemical plants

Prof. Dr. Stefan Helber (University of Hannover, Hannover)
Modeling and predicting the throughput of stochastic flow lines with limited local buffer capacity via artificial neural networks

Sebastian Hilgert (DB Analytics, Deutsche Bahn, Frankfurt)
Dispatching in railway operation using simulation and machine learning

Renke Kuhlmann (University of Bremen, Bremen)
Learning to Steer Nonlinear Interior-Point Methods

Dr. Marius Lindauer (University Freiburg)
Machine Learning for Automated Algorithm Design

Prof. Dr. Ulf Lorenz (University of Siegen, Siegen)
Tree Search and Learning - Algorithms and Heuristics in the PSPACE-hard World

Prof. Dr. Marco Lübbecke (RWTH Aachen, Aachen)
AI + ML + Opt = ?

Christian Mandl (TU München, München) & Dr. Ferdinand Kiermaier (BASF SE, LU)
Combining Mathematical Optimization and Machine Learning for Optimized Energy Procurement at BASF SE

Jonas Ostmeyer (PSI FLS Fuzzy Logik & Neuro Systeme GmbH)
Deep Qualicision: Optimization driven labeling of process data – position paper

Ulrich Reincke (SAS, Heidelberg)
Autotuning im Machine Learning im Viya- Release von SAS

Dr. Hergen Schultze (BASF SE, Ludwigshafen)
Optimization Challenges in AI Systems for Materials Research

Prof. Dr. Kevin Tierney (Bielefeld University, Bielefeld)
Deep Learning Tree Search for the Container Pre-Marshalling Problem

The Venue

All talks and meals, including the conference dinner on Thursday take place at the physics center in Bad Honnef.

Physikzentrum Bad Honnef, Hauptstr 5, 53604 Bad Honnef
(http://www.dpg-physik.de/dpg/pbh/)

The Hotel

The MAXX Hotel (Steigenberger) has been booked for all participants who have selected staying for one or two days between 21st and 24th (21st-23rd; 22nd-23rd; 22nd-24th). It is conveniently in walking distance of about 500m.

Maxx Hotel Bad Honnef, Hauptstrasse 22, 53604 Bad Honnef
(www.bad-honnef.maxxhotel.com)

Price: 99€/night (single room) and 120€/night (2 people in double room) incl. breakfast.