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MARS

Models, Algorithms, Computers and Systems

Series of Talks
SS 2024

Start: 3 pm

Location: Lecture room 414, 1st floor
Hellbrunner Straße 34

A cooperation with SMC

Department of Mathematics
Department of Computer Science

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Science

MARS – Models, Algorithms, Computers, and Systems

Modern high tech research in science and technology requires to a great extent an interdisciplinary approach. This applies particularly to wide areas of the methodological sciences mathematics and computer science, where generally one or more aspects of a chain of consecutive closely interlocked fields of research are considered. These start with a mathematical model, continue with algorithmic problems and finally cover aspects of the implementation on computers or high performance computing environments and therefore also issues on the efficiency of computer systems.

MARS is a doctoral programme at the Doctorate School PLUS (DSP Programme), which is organized by the departments of mathematics and computer sciences of the Paris Lodron University Salzburg. Its objective is to educate doctoral students in the research fields models, algorithms, computers, and systems and also to achieve new insights and research findings especially with regard to the inter-dependency of these fields of research. The focus will be on important topics relevant for the Salzburg research site. MARS fields of research form particularly from a methodological point a cohesive and closely linked line of research and cover a wide spectrum of scientific interests.

Joint activities constitute the structured doctoral program in MARS. These include seminars with external guest speakers, one day workshops with external guests and multi day retreats away from the university, as well as summer schools on the topics of MARS.

Program

June 27, 2024
Thursday, 15:00-15:45
Lecture room 414, 1st floor

Mixed Integer Optimization Problems on Networks with PDE Constraints
Alexander Martin (TU Nürnberg)

Motivated by challenging questions in the transformation and control of our energy system we study mixed integer optimization problems on networks with PDE constraints. Control decisions are typically modeled by integer optimization methods, while the physical behavior of water, gas and hydrogen is represented in a continuous nonlinear way, e.g. by partial differential equations (PDEs).

The topic of this talk is to discuss mathematical approaches and insights for the efficient coupling of integer and continuous nonlinear optimization in this context. We will also demonstrate the numerical success using examples from gas network optimization within the framework of the SFB/TRR154.

Coming...

MARS Series of Talks WS 2024/25