



MARS

Models, Algorithms, Computers and Systems



Series of Talks
WS 2023/24

Start: 3 pm

Location: Seminar Room 1, 1st floor
Jakob-Haringer-Straße 2

Contact

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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

November 28, 2023
Tuesday, 15:00-15:45
Seminar Room I, 1st floor

Matching in Evolving Graphs.

Aditi Dudeja (Salzburg)

A matching of a graph is a collection of edges that are pairwise disjoint. Traditionally, the matching problem has been studied in settings where the entire graph is a priori available to the algorithm. Several practical applications such as internet ad allocation, ride sharing, and task allocation have motivated the study of this problem in models where the graph is revealed in parts or is undergoing modifications. In this talk, we will talk about matching in such „evolving“ graph models.

Online Graphs with Bounded Recourse: In the online model, the graph, while fixed, is revealed to the algorithm adversarially, in the form of requests. The algorithm is required to respond to these requests immediately, and irrevocably. We study a variant of this model where the algorithm can revoke its decisions a bounded number of times. In this setting, we show upper and lower bounds on the recourse when the goal is to maintain an optimal matching.

Dynamic Graphs: In the dynamic graph model, the graph is undergoing modifications in the form of edge insertions and deletions. The algorithm must adapt to these changes with the goal of minimizing the work done to reoptimize the solution. We study the matching problem in partially and fully dynamic settings, and obtain efficient algorithms which maintain close to optimal solutions.

Coming...

Mean curvature flow is everywhere!

Tim Laux (Regensburg)
November 30, 2023