

# Automation of the OST-RJ Examination Scheduling

**Approach:** As described in our prior semester project "Automation of the OST-RJ Examination Scheduling", December 2020, exam scheduling is known to be a challenging problem to solve.

Manual scheduling of the exams is executed in an enormous Excel file and takes several weeks. The objective of the present bachelor project/thesis is to provide a fully functional version of an automated, computer-aided exam scheduling solution.

In the exam scheduler's current version, all rules defined as mandatory for a feasible solution by the customer and several rules for optimizing the resulting exam schedule from the students' point of view are implemented. The rules are defined using the constraint solver OptaPlanner, an open-source library maintained by RedHat. The lists of exams and students are uploaded as files, validated, and then imported, pre-processed, scheduled, and finally exported as files or directly accessed via an API. A web application provides functionalities such as the possibility of visualizing the resulting schedule, manually setting specific exams, defining room availabilities, and getting insights into the quality of the resulting exam schedule.

**Result:** The current solution is ready for a first pilot phase. Although some manual pre-processing of the exam schedule is still required, scheduling becomes much more comfortable, reliable, and of much higher quality. The process of examination scheduling is reduced from several weeks to an absolute minimum. Our comparison of automatically generated examination schedules with manually created ones shows at least equal if not better results.

**Conclusion:** For further improving the scheduler, the end-users have to conduct in-depth tests and document their findings. The constraint weights might need to be adjusted, and additional constraints or features in the web application to be added in order for the exam scheduler to be fully production-ready. With the continuation of the project, a fully automated scheduling process can be achieved and might even be expanded to other schools. It promises significant improvements in the quality of the schedules and the time and iterations it takes to create solid exam schedules.

## Graduate



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## Subject Area

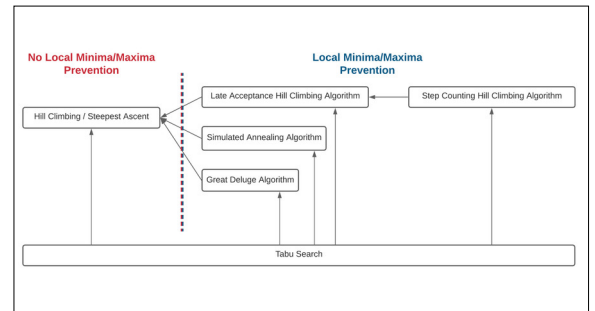
Software Engineering -  
Core Systems,  
Software, Application  
Design, Miscellaneous

## Project Partner

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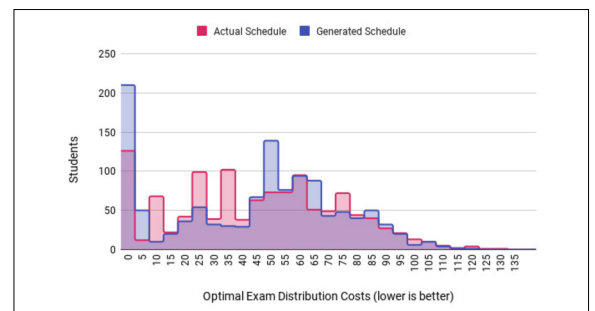
## Overview of all metaheuristic algorithms and their relations to each other.

Own presentation



## Comparison of the exam distribution for a student of a human-made exam schedule with an automatically generated one.

Own presentation



## Visualization of the exam schedule during the solving process.

Own presentation

