

# New Approaches to Robust Optimization

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Many practical problems suffer from inaccurate, missing, or unreliable input data. This is a severe problem, since even small changes can make an optimal solution completely useless for practice. Robust optimization approaches try to hedge against uncertain data. The goal is to find solutions which are good for all scenarios contained in some given uncertainty set.

In this talk we will give a short overview on models for robust optimization and present some approaches which do not suffer from the conservatism of the “classical” concepts ([BTGN09]).

- We generalize the recent concept of *light robustness* originally introduced in [FM09] to general optimization problems and analyze its properties. We are able to show that we receive problems of the same type as the original problem in many cases.
- We furthermore develop a new generic approach to recovery robustness (see, e.g., [LLMS09]) which enables us to generate robust solutions whenever a solution procedure for the certain optimization problem is known. For this approach we derive two variants, *recovery to optimality* and *recovery to feasibility* (joint work together with Marc Goerigk, see [GS11, CGKS13, GS13]). We present an analysis of these approaches for different structures of the uncertainty set and experimentally evaluate their performance.

## References

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