

# Optimization with Guaranteed Accuracy: Applications and Software

by

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The major focus in this talk is on several optimization software packages that allow to compute verified bounds, also for complex and large scale optimization problems. Various applications, reaching from linear optimization via convex optimization through to global and integer optimization, are presented.

Even for integer problems with a finite number of integral solutions roundoff errors may yield nonsensical results. Indeed, Neumaier and Shcherbina 2004 have shown that for a small innocent-looking linear integer problem many well-known state-of-the-art solvers, comprising CPLEX 8.0, did not find the optimal solution and declared the problem infeasible. Surprisingly, similar situations cannot only be constructed, but actually occur in the practice of integer programming.