

# Exploiting Symmetry in Optimization

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## Abstract

Optimization problems that are highly symmetric – that is, invariant under permutations in some large group of permutation matrices – can be reduced exploiting this symmetry. This in particular applies to semidefinite programming problems that come from combinatorial problems in areas like coding theory and graph theory.

The symmetry can be exploited by reducing the feasible region to those elements that are invariant under the permutations. In case of semidefinite programming we are left with a C\*-algebra of matrices to which we may apply methods like block diagonalization or regular representation.

With these methods improved bounds are found for error-correcting codes and for the crossing number of complete bipartite graphs.

In the lecture we will explain these problems and results.

## References

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