BACHELOR PROJECT
SIMPLIFICATION METHODS FOR SUM-OF-SQUARES PROGRAMS

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Checking whether a real polynomial is a sum of squares has interesting applications in optimization, real algebraic geometry, group theory and other areas of mathematics. The problem cam be formulated as a semidefinite-feasibility problem, which can often be solved efficiently. Before setting up such an optimization problem, it is useful to find its easiest possible form. In the context of sums of squares of polynomials, this means to determine which monomials can occur in a sum of squares representation, and which cannot.

The goal of the project is to understand the algorithm from [1], and to extend it to more general contexts.

References

[1] P. Seiler, Q. Zheng and G. Balas: *Simplification Methods for Sum-of-Squares Programs.* `https://arxiv.org/abs/1303.0714`