SMT Solving for Real Algebra

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Satisfiability checking is a relatively young research area, aiming at the development of algorithms and tools for checking the satisfiability of existentially quantified logical formulas. For propositional logic, in the late '90s impressive progress was made towards practically applicable solutions, resulting in powerful SAT solvers. Driven by this success, a new line of research started to enrich propositional SAT solving with solver modules for different theories. Nowadays, sophisticated SAT-modulo-theories (SMT) solvers are available also for algebraic problems, partly based on decision procedures rooted in symbolic computation.

In this talk we give a brief introduction to SMT solving, discuss relations to symbolic computation, and illustrate the potentials and obstacles for embedding symbolic computation techniques in SMT solvers on the example of the cylindrical algebraic decomposition.