Computational Real Algebraic Geometry in Practice *

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─── **Abstract** ───

Real algebraic geometry deals with the solution set of (possibly quantified) systems of polynomial equations and/or inequalities over the real numbers, which arise frequently in science and engineering. Main concern in real algebraic geometry is to determine the properties of the solution sets such as non-emptiness, dimension and quantifier free description as a semi-algebraic set. Such tasks are carried out by symbolic and algebraic algorithms: *cylindrical algebraic decomposition (CAD)* or *quantifier elimination (QE)*. Various algorithms and deep complexity results about CAD and QE have been studied during the last several decades (see [1]). Moreover, practically efficient software systems of QE have been developed and also are applied to many nontrivial application problems (see [2, 3, 4, 5]). In this talk we explain several algorithms of CAD and QE together with their engineering applications.

─── **References** ───

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