# Algebraic Predicates for Empirical Data

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It is widely assumed that the assignment of truth values to non-trivial algebraic predicates containing numerical data is possible only if the data are exact and if exact computation is employed. But in many *application areas* the answers to questions like "Are all zeros of that (model) polynomial in the left half-plane?" are of principal importance.

We develop a framework in which algebraic predicates with *empirical data* are assigned a positive real number in place of a truth value. This *validity value* permits an interpretation which is more informative that the classical "yes – no" answer. It depends *continuously* on the data and can thus be computed approximately by floating-point arithmetic. A number of non-trivial examples support the usefulness of our approach.