1. Abstract

The block sensitivity of a Boolean function is known to be polynomial related to a number of other complexity measures of a Boolean function, including deterministic decision-tree complexity, degree as a polynomial and certificate complexity. However, a long-standing open question is whether block sensitivity is also polynomial related to sensitivity of a Boolean function, and a positive answer to this question is known as the Sensitivity Conjecture. In fact, a stronger version of the Sensitivity Conjecture suggests that block sensitivity is bounded by the square of sensitivity times a constant. We will first analyze the polynomial relationship between block sensitivity and complexity measures, and introduce the Sensitivity Conjecture. Then, we will restrict our view to graph properties, and present a uniform hypergraph property that shows a quadratic gap between block sensitivity and sensitivity, which matches the previously known largest gap for general Boolean functions.