Approximation resistance and Uselessness

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Abstract

Let Max-3Sat be the computation problem of given a set of disjunctive clauses of size 3 in a set of Boolean variables to find an assignment that satisfies the maximal number of clauses. A random assignment satisfies a fraction 7/8 of the clauses and it is known that it is NP-hard to, even in the case of completely satisfiable formula, find an assignment that satisfies a significantly larger fraction of the clauses. We use the term "Approximation resistance" to denote this property of Max-3Sat and the purpose of the talk is to discuss this notion as well as an even stronger hardness property that we call "Uselessness".