



Mathematisches Kolloquium

Some connections between proof complexity and graph theory

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The satisfiability problem SAT, deciding if a propositional formula has some assignment that makes it true, is a central problem in computer science, both from the theoretical and practical points of view.

On the one hand, this problem is NP-complete, and therefore very hard from an algorithmic point of view. On the other hand, modern programs can solve instance formulas with literally hundreds of thousands of Boolean variables.

The field of proof complexity tries to understand this tension from a theoretical point of view, studying upper and lower bounds for concrete proof systems like Resolution or Cutting Planes on families of combinatorial formulas.

In this talk I will review some recent results in the field of proof complexity presenting some connections to the areas of graph theory and combinatorics.