

Speaker: Michael Dobbins (Binghamton)

Title: The Real RAM Analogue to the Cook--Levin Theorem

Combinatorics Seminar, Tuesday, February 11, 2020

In "A Framework for robust realistic geometric computations" by Erickson, van der Hoog, and Miltzow, the authors introduce a real analog of NP defined as those decision problems where every positive instance has a witness consisting of both bits and real numbers that can be verified in polynomial time in the real RAM model of computation. They show that such a problem can be reduced in polynomial time on a Turing machine to deciding whether a multivariate polynomial formula has a real solution. This is analogous to the Cook–Levin Theorem, which shows that every problem in NP can be reduced in polynomial time to deciding whether a Boolean formula has a satisfying assignment.

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