Combinatorics
Seminar

Fooling bounded depth circuits

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Abstract: We will present a very nice breakthrough result of Mark Braverman which establishes that polynomially sized bounded depth circuits are "fooled" by t-independent distributions (for polylogarithmic t). In simpler words, for any circuit C of size m in this class, given any distribution D of n-bit strings (elements in $\{0,1\}^n$) such that the bits are t-wise independent ($t = \text{polylog}(m)$), the distribution of $C(D)$ is practically identical to that of $C(U)$, where U is the uniform distribution.

This result was recently applied by E. Chattopadhyay and D. Zuckerman (2016) to essentially derandomize the binomial random graph $G(n, 1/2)$. As a corollary they now hold the record for the best bounds on Ramsey graphs explicitly constructed by an algorithm.

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