

Computer Science/Discrete Mathematics Seminar I

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Association Schemes, Non-Commutative Polynomials and Lasserre Lower Bounds for Planted Clique

Series: Computer Science/Discrete Mathematics

Raghu Meka

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Date & Time: Mon, 05/13/2013 - 13:30 - 15:30

Location: S-101

Video Link:

<http://video.ias.edu/csdm/1213/0513-RaghuMeka>

Finding cliques in random graphs and the closely related "planted" clique variant, where a clique of size k is planted in a random $G(n, 1/2)$ graph, have been the focus of substantial study in algorithm design. Despite much effort, the best known polynomial-time algorithms only solve the problem for $k \sim \sqrt{n}$. Here we show that beating \sqrt{n} would require substantially new algorithmic ideas, by proving a lower bound for the problem in the Lasserre hierarchy, the most powerful class of semi-definite programming algorithms we know of. Our (average case) lower bound uses tools from the classical theory of association schemes and some new large deviation bounds for matrix-valued polynomials which could be of independent interest. Joint work with Avi Wigderson

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Fri, 05/03/2013 - 13:56

Tue, 05/07/2013 - 13:59

terms:

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