Seminar on Combinatorial Computing
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Room 6417, Graduate Center
365 Fifth Avenue, New York

Informational complexity and lower bounds in communication complexity

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Abstract

We introduce the notion of "informational complexity" of communication protocols, which measures the amount of information about the players' inputs revealed by the messages they send. This is in contrast to the usual measure of communication complexity which simply measures the number of bits sent.

In various settings, informational complexity can be shown to satisfy a "decomposition theorem" which enables us to prove lower bounds on the usual communication complexity of protocols. We shall present several recent results that use this paradigm, including

- a lower bound on direct sum problems in Yao's simultaneous message model - a lower bound for set disjointness in the multi-party model - a space lower bound for approximating frequency moments in data streams

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