

Prahladh Harsha, TIFR, Mumbai

Communication complexity: A treasure house of lower bounds

Consider the following intriguing problem in the Mughal court: Akbar, known for his political sagacity, and Birbal, skilled in administrative affairs, want to come to a common understanding on matters of state. Being men of few words, they want to achieve this with the minimal conversation.

This problem of minimizing the exchange between tacit speakers was abstracted in the computer science literature more than 3 decades ago [Yao1979] and has been extremely useful in modelling a wide variety of situations: auctions, time-space tradeoffs in computations, circuit lower bounds, streaming, linear programming etc. In many of these situations, communication complexity offers tight and optimal lower bounds.

In this talk, I'll survey some of the recent successes in communication complexity and also outline some of the lower bound techniques used to prove these optimal bounds. This talk is inspired by a recent joint work with Rahul Jain in which we study the communication complexity of the tribes function.