abstract

COMPUTER SCIENCE/DISCRETE MATH II
Topic:

Speaker:

Affiliation:

Date:

Time/Room:

Does computing n copies of a function require n times the computational effort? In this work, we give the first non-trivial answer to this question for the model of randomized communication complexity.

We show that:

1. Computing n copies of a function requires sqrt{n} times the communication.
2. For average case complexity, given any distribution mu on inputs, computing n copies of the function on n independent inputs sampled according to mu requires at least sqrt{n} times the communication for computing one copy.
3. If mu is a product distribution, computing n copies on n independent inputs sampled according to mu requires n times the communication.

We also study the complexity of computing the parity of n evaluations of f, and obtain results analogous to those above.

Our results are obtained by designing compression schemes for communication protocols that can be used to compress the communication in a protocol that does not transmit a lot of information about its inputs.

This is joint work with Boaz Barak, Mark Braverman and Xi Chen.