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Baltimore, Nov. 7 2000

Communication in Parallel Systems

Fall 2000

Assignment 7

Problem 12 (4 points)**:**
Show that Batcher's sorting network can be used to route arbitrary permutations in the hypercube and the deBruijn graph deterministically in $O((\log n)^2)$ time steps.

Problem 13 (4 points)**:**
Extend the strategy in the previous problem to obtain a strategy that can route arbitrary h-relations (every node is the source and destination of exactly h packets) in the hypercube in $O(h(\log n)^2)$ time. Furthermore, think about a strategy that allows to route arbitrary partial permutations in the hypercube in $O((\log n)^2)$ time.