

Permutation Routing Via Matchings

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Abstract

In this talk we present some new complexity results on the routing time of a graph under the *routing via matching* model. This is a parallel routing model which was introduced by Alon and others. The model can be viewed as a communication scheme on a distributed network. The nodes in the network can communicate via matchings (a step), where a node exchanges data (pebbles) with its matched partner. Let G be a connected graph with vertices labeled from $\{1, \dots, n\}$ and the destination vertices of the pebbles are given by a permutation π . The problem is to find a minimum step routing scheme for the input permutation π . This is denoted as the routing time $rt(G, \pi)$ of G given π . Here we characterize the complexity of some known problems under the routing via matching model and discuss their relationship to graph connectivity and clique number. We also introduce some new problems in this domain, which may be of independent interest.

Keywords: connected graph, communication scheme, routing time, clique number, complexity.