

Network Coordinate System using Non-negative Matrix Factorization based on KL Divergence

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Abstract—Network coordinate is used to predict the network delay between the network nodes, for the problem that the accuracy of predicting the network delay of the network coordinate system based on non-negative matrix factorization is low, proposing a new network coordinate system using non-negative matrix factorization based on KL divergence (KL-NMF). First, the advantages and disadvantages of classical algorithm for delay prediction of network coordinate system based on matrix factorization are analysed. Then, according to the characteristics of network link delay distributions, proposed a new network coordinate system based on KL-NMF algorithm and the algorithm flow. Experiment based on the four commonly used network delay matrix data set, and the results show that compared to the existing delay prediction algorithm based on NMF network coordinate system, the delay prediction algorithm based on KL-NMF network coordinate system not only reduce the error to reproduce delay matrix, but also improve the network node delay prediction accuracy.

Keyword—Network Coordinate, Non-negative Matrix Factorization, KL Divergence, Link Delay Distribution, Node Delay Prediction



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