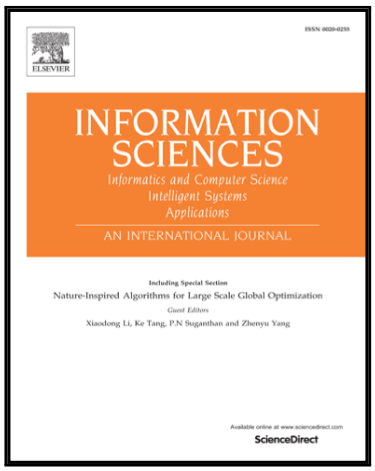

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Trustworthiness-Hypercube-based Reliable Communication in Mobile Social Networks

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Abstract: In mobile social networks (MSNs), the routing packet is forwarded from any user of in a group to any user of the other group until it reaches the destination group - the group where the destination is located. However, it is inevitable that malicious groups could compromise the quality and reliability of data. To alleviate such effect, analyzing the trustworthiness of a group has a positive influence on the confidence with which a group conducts transactions with that group. In our previous work, the feature-based first-priority relation graph (FPRG) of MSNs is proposed, in which two vertices (groups) are connected iff they have a first-priority relationship. In this paper, the trustworthiness computation of a group is firstly presented in the algorithm TC (Trustworthiness Computing) based on the FPRG. The trustworthiness of a group is evaluated based on the trustworthiness of neighbors and the number of malicious users in the group. We then establish the Trustworthiness-Hypercube-based Reliable Communication (THRC) algorithm in MSNs. The algorithm THRC can provide an effective and reliable data delivery routing. Finally, we also give two scenario simulations to elaborate the processes of the trustworthiness computation and reliable communication.

Keywords: Mobile social networks, Trustworthiness, First-priority relation graph, Social feature, Reliable communication.

1 Introduction

The mobile social network (MSN) paradigm is proposed as a mean of ferrying data through mobile devices using human social contacts [34] (see Fig. 1). MSNs are considered as a case of socially-aware Delay/Disruption Tolerant Networks (DTNs) [17] that are characterized by intermittent connectivity and limited network capacity. MSNs take advantage of social contacts to opportunistically create data paths over time [34]. As storage capacities of mobile devices increase, and support for short-range data transfer protocols (e.g., WiFi and Bluetooth) becomes more prevalent, we can use these devices to forward data along an efficient and reliable path in a store-carry-forward fashion.

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