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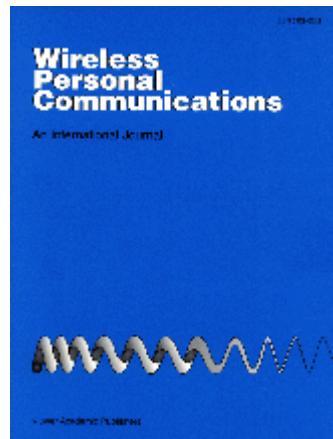
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Weighted Steiner Connected Dominating Set and its Application to Multicast Routing in Wireless MANETs

Journal

Wireless Personal Communications

Publisher

Springer Netherlands

ISSN

0929-6212 (Print) 1572-834X (Online)

DOI

10.1007/s11277-010-9936-4

Subject Collection

Engineering

SpringerLink Date

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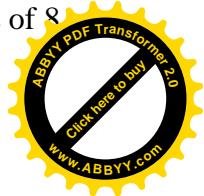
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Published online: 24 February 2010

Abstract

In this paper, we first propose three centralized learning automata-based heuristic algorithms for approximating a near optimal solution to the minimum weight Steiner connected dominating set (WSCDS) problem. Finding the Steiner connected dominating set of the network graph is a promising approach for multicast routing in wireless ad-hoc networks. Therefore, we present a distributed implementation of the last approximation algorithm proposed in this paper (Algorithm III) for multicast routing in wireless mobile ad-hoc networks. The proposed WSCDS algorithms are compared with the well-known existing algorithms and the obtained results show that Algorithm III outperforms the others both in terms of the dominating set size and running time. Our simulation experiments also show the superiority of the proposed multicast routing algorithm over the best previous methods in terms of the packet delivery ratio,



multicast route lifetime, and end-to-end delay.

Keywords Steiner connected dominating set - Multicast routing - Learning automata - Wireless mobile Ad-hoc networks

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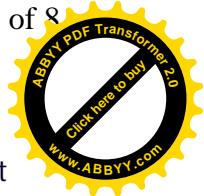
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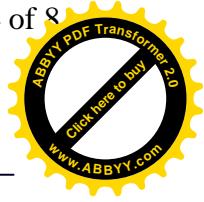
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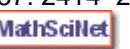
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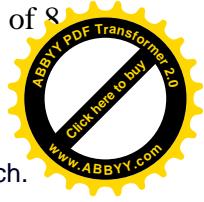
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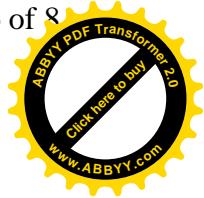
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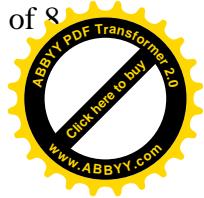
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