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CONTENTION-AWARE QOS ROUTING ALGORITHM BASED ON MULTI-RATE SERVICE OF IEEE 802.11 OVER MOBILE AD HOC NETWORKS

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Abstract. *This paper presents a contention-aware QoS routing algorithm based on the multi-rate service of IEEE 802.11, which is implemented to minimize the total sum of consumed timeslots while providing the required timeslots at nodes over routes and their contention neighbors over mobile ad hoc networks. The experimental results are provided to show the superior performance of the proposed algorithm. Particularly, the proposed algorithm shows better performance when traffic load is relatively heavy.*
Keywords: QoS routing, Contention neighbors, Multi-rate service, Mobile ad hoc networks

1. **Introduction.** Mobile ad hoc networking technology has gained a large amount of interest and demand. It makes fast and temporary connections among mobile nodes possible without the help of infrastructure. Recently, it has become more feasible thanks to the rapid development of digital communication and wireless network. However, there are still many problems that prevent it being successfully deployed in the field. For instance, the network topology must be dynamically maintained because the links may be unstable due to the random movement of mobile nodes, and the limitation of resources such as battery power, radio propagation range and bandwidth. It is especially challenging to support multimedia services over mobile ad hoc networks since stringent QoS (quality of service) is required.

Generally, ad hoc routing protocols are categorized into three groups: table-driven protocols, on-demand protocols and hybrid methods [1]. Table driven protocols are essentially proactive because they maintain routing tables by exchanging up-to-date routing information. Hence the delay is negligible in determining a route since the route is already known when data packets are forwarded, but a lot of network resources are used to maintain the routing information. DSDV (destination sequenced distance vector) [2], OLSR (optimized link state routing) [3], CGSR (cluster-head gateway switch routing) [4] and WRP (wireless routing protocol) [5] are such examples. On the other hand, on-demand protocols are fundamentally reactive because they invoke a route determining process only when a route is needed. Thus, the delay may be increased a little until a