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A reinforcement learning ticket-based probing path discovery scheme for MANETs

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Abstract

In this paper, a path discovery scheme which supports QoS routing in mobile ad hoc networks (MANETs) in the presence of imprecise information is investigated. The aim is to increase the probability of success in finding feasible paths and reduce average path cost of a previously proposed ticket based probing (TBP) path discovery scheme. The proposed scheme integrates the original TBP scheme with a reinforcement learning method called the on-policy first-visit Monte Carlo (ONMC) method. We investigate the performance of the ONMC method in the presence of imprecise information. Our numerical study shows that, in respect to a flooding based algorithm, message overhead reduction can be achieved with marginal difference in the path search ability and additional computational and storage requirements. When the average message overhead of the ONMC method is reduced to the same order of magnitude of the original TBP, the ONMC method gains an improvement of 28% in success ratio and 7% reduction in the average path cost over the original TBP.

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