A Mobile Ad hoc Network Q-Routing Algorithm: Self-Aware Approach

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Abstract

This paper proposes a new adaptive Mobile Ad hoc Networks (MANET) routing algorithm to find and maintain paths which provide Quality of Service (QoS) for network traffic using a low-complexity bio-inspired learning paradigm. MANETS are highly dynamic, and thus providing QoS routing is considered a challenging, complex domain. Classical routing approaches cannot achieve high performance. Thus, it is necessary for nodes to be self-aware i.e. able to discover neighbours, links, and paths when needed. This proposal combines the self-aware capabilities in CPN with a Q-learning inspired path selection mechanism. The research defines a Q-routing reward function as a combination of high stability and low delay path criteria to discover long-lived routes without disrupting the overall delay. The algorithm uses Acknowledgment-based feedback to update link quality values in order to make routing decisions which adapt on line to network changes allowing nodes to learn efficient routing policies. Simulation Results show how the reward function handles the network changing topology to select paths that improve QoS delivered.
References


Index Terms
Computer Science Wireless

Keywords
Cognitive Packet Network (CPN), Q-Routing, Self-Aware Networks (SAN).