Energy consumption of Geographic Routing Mechanisms in Wireless Sensor Networks - a Survey

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Abstract

Geographic routing algorithms have received an increasing interest as a routing solution for WSN over the past years. These algorithms refer to nodes by their location, rather than their address and use this coordinates to route greedily when possible toward the destination. These tasks are executed for a better scalability, successful data transmission and lower energy consumption. Most geographic routing mechanisms tend to have a limitation regarding routing toward dead ends and obstacles. Some algorithms were developed for packet radio and wired networks as a greedy strategy, based on the relative direction of the source and destination. Instead of selection the next hop by the minimum criteria, two hops information and heuristic model are used to avoid congested areas and void regions. To increase the delivery rate, multipath strategy algorithms were introduced to broadcast a message through different nodes that are within a cone or a rectangle determined by the source and destination nodes. On the other hand, other techniques tend to not rely on location information but define a scalable coordinate based routing algorithm that involve assigning virtual coordination to each node. These techniques are powerful and reliable but indeed they fail to have good packet delivery, guaranty transmission to all target nodes and working on large void areas. These mechanisms do not focus on energy consumption and network life time. Hence the need of a new approach that concerns energy efficiency, greatly shorten the average data transmission and prolong the network lifespan. In our paper, a survey of existing geographic routing mechanisms and a new routing solution in wireless sensor network environment will be presented.

Keywords: geographic routing, virtual coordinates, wireless sensor network, energy efficiency.

MSC: 90B18, 68M10, 68M12

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