A Variant-Hop Algorithm in Forming Bluetooth Sensor Networks

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Abstract

Blueweb is a self-organizing Bluetooth-based multihop network equipped with a scatternet formation algorithm and a hybrid routing protocol. Blueweb uses a designated root node to initiate scatternet formation and two mechanisms are introduced. One is the role exchange mechanism in which only slave nodes serve as the role of relay through the whole scatternet. The other one is the return connection mechanism in which we convert the scatternet from a tree-shaped to a web-shaped topology. In this paper, a variant-hop algorithm in forming Bluetooth sensor scatternet is proposed. Based on the design of Blueweb, this algorithm is a tier-based method to determine new roots and each new root spontaneously generates their individual web-shaped subnets. The heuristic method describes the variant-hop algorithms. With a constant k, a counter variable v, and return variable r as parameters, the variant-hop algorithm generates appropriate roots locally and evenly configures the subnet size. Computer simulation shows that this method achieves good network scalability and generates an efficient scatternet configuration for Bluetooth-based multihop sensor networks.

Keyword：Ad-hoc networks; scatternet formation; topology configuration; sensor networks