Ph: 9585554590, 9585554599
Email: support@salemsmartreach.com
URL: www.salemsmartreach.com

Capacity of Large Wireless Networks with Generally Distributed Nodes

Abstract:

This paper investigates the capacity of a random network in which the nodes have a general spatial distribution. Our model assumes n nodes in a unit square, with a pair of nodes directly connected if and only if their Euclidean distance is smaller than or equal to a threshold, known as the transmission range. Each link has an identical capacity of W bits/s. The transmission range is the same for all nodes and can be any value so long as the resulting network is connected. A capacity upper bound is obtained for the above network, which is valid for both finite n and asymptotically infinite n. We further investigate the capacity upper bound and lower bound for the above network as $n \to \infty$ and show that both bounds can be expressed as a product of four factors, which represents respectively the impact of node distribution, link capacity, number of source destination pairs and the transmission range. The bounds are tight in that the upper bound and lower bound differ by a constant multiplicative factor only. For the special case of networks with nodes distributed uniformly or following a homogeneous Poisson distribution, the bounds are of the same order as known results in the literature.