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

Bounds of Asymptotic Performance Limits of Social-Proximity Vehicular Networks

Abstract:

In this paper, we investigate the asymptotic performance limits (throughput capacity and average packet delay) of social-proximity vehicular networks. The considered network involves N vehicles moving and communicating on a scalable grid-like street layout following the social-proximity model: Each vehicle has a restricted mobility region around a specific social spot and transmits via a unicast flow to a destination vehicle that is associated with the same social spot. Moreover, the spatial distribution of the vehicle decays following a power-law distribution from the central social spot toward the border of the mobility region. With vehicles communicating using a variant of the two-hop relay scheme, the asymptotic bounds of throughput capacity and average packet delay are derived in terms of the number of social spots, the size of the mobility region, and the decay factor of the power-law distribution. By identifying these key impact factors of performance mathematically, we find three possible regimes for the performance limits. Our results can be applied to predict the network performance of real-world scenarios and provide insight on the design and deployment of future vehicular networks.