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Optimum Relay Selection for Energy-Efficient Cooperative Ad Hoc Networks

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Abstract: The Cooperative Communication (CC) is a technology that allows multiple nodes to simultaneously transmit the same data. It can save power and extend transmission coverage. However, prior research work on topology control considers CC only in the aspect of energy saving, not that of coverage extension. We identify the challenges in the development of a centralized topology control scheme, named Cooperative Bridges, which reduces transmission power of nodes as well as increases network connectivity. Prior research on topology control with CC only focuses on maintaining the network connectivity, minimizing the transmission power of each node, whereas ignores the energy efficiency of paths in constructed topologies. This may cause inefficient routes and hurt the overall network performance in cooperative ad hoc networks. In this paper, to address this problem, we studied topology control problem for energy-efficient topology control problem with cooperative communication. We proposed optimum relay nodes selection for CC network to reduce overall power consumption of network.