

## ANALYSIS OF COOPERATIVE TRANSMISSION USING MODIFIED ROUTING PROTOCOL IN MANET WITH CHANNEL VARIATION

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### ABSTRACT

In cooperative transmission relays can cooperate together and improve their performance and selection of protocols at the network layer that can increase the throughput, decreased the packet delay and also decrease end-to-end delay and transmission power. In this thesis, we study the joint problems of cooperative link and diversity in A Mobile Ad-Hoc Network (MANET) with variable wireless channels. In MANET the wireless nodes are in group and infrastructure less in nature. The major problems faced by wireless communication in real time environment are that of interference and un-reliable communication links. Much research work has been done to overcome this by using various techniques. Cooperative communication and transmission side diversity in the network are the two of the techniques that help in reducing interference and communication link failures. In this work, we propose a new type of protocol that proactively selects a group of forwarding nodes that work cooperatively forwarding the packet towards the destination.

We study the power allocation for decode-and-forward cooperative diversity protocol in a network. Multiple nodes are selected so as to co-ordinate their transmission to achieve transmission side diversity at the physical layer. In this network nodes are equipped with Omni-directional antenna to take the advantages of transmission side diversity to achieve energy saving under the assumption that channel gains are available at the transmitters.

The nodes are distributed uniformly, and to find the power allocation that minimizes the outage probability under a power constraint, where in the total power for all node power is less than a prescribed value during each two-stage transmission. In I stage fixed fraction of total power is allocated to the source, in II stage the remaining power is split equally among a set of selected nodes if the selected set is not empty, and otherwise is allocated to the source node.

We have also proposed a new technique to find the optimum route as a joint problem of the transmission power at the physical layer and the link selection at the network layer that incurs the minimum cost in terms of energy, no. of hops, available bandwidth and link quality (SNR), outage probability. Due to the computational and implementation complexity of the optimal solution, we derive the heuristic algorithms. We have done extensive simulation based on studies to verify the proposed techniques and with optimal schemes and heuristic methods, Analytical results show that our cooperative transmission schemes (OMCTSP) achieves average energy saving of more than 12% than direct transmission.

**KEYWORDS:** Cooperative Transmission, Manets, Variable Wireless Channel, Decode and Forward Protocol, Cooperative Diversity, Outage Probability, Throughput, OMCTSP