



## Relay Positioning for Reducing Energy Consumption in Cooperative Networks and Performance Evaluation of Interference Alignment and Receiver Diversity in Cooperative Networks

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### Abstract

The number of Access Points (AP) in a network is much smaller than the network users. Hence, some users may be far from AP's requiring more power to transmit data. Cooperative communication has been proposed, which uses the broadcast nature of the wireless medium to exploit the spatial diversity in wireless networks. One issue is to find a near optimal position for the limited number of available relays. Initially, we use a greedy algorithm to determine the position of the relays, then, we use our improved iterative algorithm to place the relays. Using simulations, we compare both the algorithms in terms of average energy consumption, average number of hops and average r-cover. The simulation results provide us an insight into positioning of the relays in a cooperative wireless network.

Receiver Diversity (RD) and Interference Alignment (IA) can effectively improve the capacity of a wireless network. The objective is to provide an analysis for the comparison of IA and different RD strategies such as Maximal Ratio Combining (MRC), Equal Gain Combining (EGC) and Selective Combining (SC) in cooperative relay networks. We find that there is no case of dominance for the two techniques.

### Bio

Vignesh Sivakumar is currently pursuing his Master's degree in the Department of Electrical and Computer Engineering, Auburn University, Auburn, AL, under the guidance of his advisor, Dr. Prathima Agrawal. He received his Bachelor's degree in Electronics and Communication Engineering from Anna University, Chennai, India in 2008. His research interest includes Wireless Network Protocols, MIMO, Receiver Diversity and Energy Management in Cooperative Networks.

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