Abstract

Cooperative communication has characteristics of offering spatial diversity by employing relays to improve communication efficiency significantly in wireless networks. One of the important design issues in cooperative communication is to optimize the power allocated to source and relay. The problem of allocating optimal power significantly affects the performance of the network as more power radiated by the nodes not only limit battery life but also results in increased interference in the network. On the other hand, insufficient radiated power gives rise to probability of error at the receiver. Time varying nature of the channel and mobility of nodes additionally complicate the issue of power allocation further. In this paper, Amplify & Forward (AF) and Decode & Forward (DF) cooperative systems are considered and power allocation problem with an objective of maximizing the capacity of a given link is presented. Power is allocated to source and relay depending on the channel gain between source-relay and relay-destination within the constraint of maximum total power. Capacity of the Source-Relay-Destination (S-R-D) link with equal power allocation and channel gain dependent power allocation have been evaluated and compared. Results show that the significant improvement in capacity of the S-R-D link can be achieved with channel gain dependent power allocation compared to equal power allocation.
References


Index Terms

Computer Science

Networks
Keywords
Cooperative communication; outage probability; Amplify & forward; Decode & forward; capacity; power allocation