Abstract

A relay assisted cooperative beamforming technique can efficiently improve the spectral efficiency and can reduce the interference to primary users in a cognitive underlay systems. Our objective is to reduce the total power cost of Secondary Users (SU) while limiting the interference in the direction of Primary Users (PU). Kmean algorithm which is a partition based clustering algorithm is used here as the clustering algorithm. While considering flexible cooperation as general scheme, we collectively optimize the clustering and the beamforming to lower the overall power consumption while fulfilling the secondary users quality of service and satisfying the primary users interference temperature limits. An iterative algorithm called generalized Benders decomposition method is used to find an optimal solution. The indirect transmission mode of relays is considered in this work. The relays are equipped with directional antennas which will reduce the interference to the PU and meet the power cost requirement of SU under the assumptions that the clusters are non-overlapping and fixed. Thus spectral efficiency can be increased. Through simulations, we analyzed the advantages of algorithms and showed the benefits of the relays in cognitive wireless networks.
Index Terms

Computer Science

Networks
Keywords

Green Networks  Cognitive Radio  Cooperative Beamforming  Kmean algorithm  Benders decomposition algorithm

Indirect relay mode