ABSTRACT

The development of technology today increasingly feels more advanced and faster in its changes in harmony with human needs in communicating using internet network services. Increased use of internet-based devices results in the depletion of spectrum resources because in their ineffective use, a lot of spectrum is wasted. Cognitive Radio Network (CRN) is one of the solutions in implementing efficient use of spectrum effectively on devices that use spectrum resources. This research focuses on the allocation of resources in cognitive radio networks using the Ant Colont System (ACS) algorithm based on modifications to the ant matrix inspired by ant animals that live in colonies in searching for food using organic compounds called Pheromone to make decisions on the choice of the nearest trajectory. The results that will be examined show that the resource allocation algorithm that is modified in the ant matrix in this study has advantages with other algorithms with predetermined parameters. The ACS algorithm was proposed in this study to provide a solution to effectively utilize spectrum resources and minimize the increased interference in CRN by applying ACS that depends on the intensity of the pheromone in the path used by the ants to determine path selection.

The results of this final project using the Ant Colony System algorithm with modifications to the ant matrix get an average data rate of 1.4554 x 106 bps for PU and 1.6064 x 106 bps for SU, spectral efficiency 10.2041 b for PU and 15.013 b for SU, energy efficiency of 1.38 x 107 b / sWatt for PU and 1.435 x 107 for SU, and fairness of 0.73871 for PU and 0.7589 for SU.

Keywords: Cognitive Radio Network, Resource Allocation, Ant Colony System Algorithm, Ant Matrix.