

## ABSTRACT

Technology is increasingly developing, both in terms of data speed, capacity, and network services provided to assist and provide human jobs. Cognitive radio network (CRN) or cognitive radio network is a solution to increase resource allocation. CRN research is based on resource allocation, optimized allocation of resources. The main problem is the problem that increases in cellular networks, using low power, minimizing maintenance, as well as small interruptions to get maximum performance by focusing on high data rate values.

Cognitive Radio Network was developed because the primary user (PU) and secondary user (SU) can communicate directly without using any other medium. This technology is very useful for the future even though it has problems in terms of interference that will occur between PU and SU because they are in the same cell. This can influence the Quality of Service (QoS) in the CRN so that it takes some resource allocations that can improve QoS performance, such as increasing the data rate, reducing interference and using power. Thus, a genetic algorithm is used for distribution in this model system.

The results of this final project using Genetic algorithm, decrease the total data rate or sumrate of 0.72% for PU and 0.57 for SU, spectral efficiency of 1.05% for PU and 1.87% for SU, energy efficiency of 0.63% for PU and 1.87% for SU. , and fairness of 2.7% for PU and 1.8% for SU.

**Keyword :** Cognitive Radio Network, Genetic Algorithm, primary user, secondary user