

## **ABSTRACT**

Technological developments are increasingly developing in terms of data rate. Cognitive Radio Network (CRN) are communication systems that take advantage of the spectrum gap channels network that are not currently in use. This final project focuses on resource allocation in cognitive radio network proposes an optimized resource allocation algorithm. The main problem is handling the increasing demand for wireless network services, then low power usage, and small interference so that it can be used optimally and minimizes maintenance and most important is high data rate speeds to maximizes performance.

Cognitive Radio Network was developed because it can connect directly from primary users to each other continuously with secondary users without having to use another medium. This technology is useful for the future despite having problems where interference will occur with the frequency between PU and SU in the same cell. This can affect the QoS (Quality of Service) intended in CRN communication so that it takes several resource allocation distributions that can increase data rates, reduce interference and increase data rates. The algorithm used for distribution in this model system is Hungarian or what is known as Bipartite Matching.

Hungarian algorithm in this final project can produce a solution to share resources fairly both PU and SU with an average fairness value of 0.7673. The system data rate increases by 4.37% if you do 5 increases the number of primary users and keep the number of secondary users. Hungarian algorithm has not become an option because it is less good than the minimum interference algorithm. as a result, the performance of data rate is not superior.

**Keywords:** Cognitive Radio Network, Resource Allocation, Hungarian, Primary user, Secondary user, Data rate, Spectral Efficiency.