ABSTRACT

Nowadays, technology is growing especially in telecommunication. This telecommunications development is marked by the increasing use of smartphones to communicate. The more increasing need to communicate, then the data traffic will be higher which causes data rates and power efficiency problems. While communicating with Celular Users (CU), the devices have to send signals through Base Stations (BSs) or evolved Node B (eNB) on Long Term Evolution (LTE) communications that requires a lot of power. Device to device (D2D) is a communications technology which connects each device directly without sending the signal to eNB.

To overcoming the interference problem, resource allocation needs to be done, so that resources can be used simultaneously while maintaining Quality of Service (QoS) D2D communication is carried out. Resource allocation is carried out on an underlaying communication network. Resource allocation system to downlink direction. The algorithm proposed in this final project is Bipartite Matching, where the algorithm aims to make comparison of performace measurement sum-rate (amount of data rate), average of data rate, fairness, energy efficiency and spectral efficiency then compared with Greedy and Random Allocation algorithm in one cell by adding as many D2D pairs as possible.

This final project has given prove with the simulation results that the Bipartite Matching algorithm with Hungarian maximization method gets a system sum-rate that is more superior than two comparison algorithms. In the results of simulations performed in this final project, the proposed algorithm is a solution in a state of high user density in a communication system.

Keywords : *Device-to-device, Underlaying, Downlink, Resource Allocation, Bipartite Matching, Greedy, Random Allocation*