ABSTRACT

This final project analyzes radio resource allocation (RB) using a genetic algorithm in D2D communication. D2D communication as a technology component for LTE-A enables direct wireless links between cellular users without routing data signals via the eNB or the core networks. D2D communication can minimize the impact on quality of service due to the large number of devices connected to the core network. Genetic Algorithm works with three operators in allocating RB, including proportional selection, crossover, and mutation. This process is repeated many times (reps) to produce several generations so that the best allocation can be obtained. In the simulation process, the results of the Genetic Algorithm will then be compared with the Greedy Algorithm and the Random Allocation Algorithm. Genetic algorithms have a flexible number of D2D and cellular communications in a number of RB, minimum SINR also considered for mobile communication in ensuring the quality of its services.

The results obtained from this Final Project is where the Greedy Algorithm provides a solution to the highest average energy efficiency, the lowest total average sistem power usage, and the lowest sistem interference of 17,038 Mbps/W, 2,1793 W, dan -59,3391 dBm *compared to the comparison algorithm. The highest sum-rate and spectral efficiency are obtained using Genetic Algorithm with values that are 45,424 Mbps and 22,7120 b. The increase in resource blocks from four to ten causes a decrease in spectral efficiency. The sistem efficiency of Genetic Algorithms can be increased if the repetition of the algorithm is also increased.*

Keywords: *Device-to-Device (D2D) Communication, Genetic Algorithm, Spectral Efficiency, Energy Efficiency, Interference Mitigation.*