

ABSTRACT

The increasing number of cellular users significantly give an impact to the increasing number of communication density traffic in cellular network, thus the addition of network capacity is necessary. One of the 5G technology features called device to device (D2D) communication is being developed. D2D communication is a feature that is able to serve peer to peer communication so that D2D partners can communicate directly without having to pass through the Base Transceiver Station (BTS) by reusing resources from the cellular user.

D2D communication causes interference with the implementation of D2D communication can cause interference to conventional cell phone communications. So as to reduce the interference that occurs when allocating resource allocation resource is required appropriately. On this final task will be done simulation of resource allocation using heuristic algorithms and greedy algorithm, *minimum interference* algorithm with random allocation algorithm as the comparison.

The algorithm is tested on two scenarios, namely variations in the number of D2D pairs and variations in the distance of the cell radius by finding the value of the sumrate, spectral efficiency, energy efficiency and fairness. The heuristic allocation algorithm in this final project provides a solution to divide the resources equally to the D2D pair with an average fairness value of 0.68045 on the effect of changes in the amount of D2D while the change in cell radius has an average of 0.691667. The heuristic allocation algorithm cannot yet be the best choice for increasing the performance of the system sumrate because there are still other algorithms such as the greedy algorithm.

Keywords: resource allocation, device to device, heuristic, greedy, *minimum interference*, random allocation.