

ABSTRACT

In today's era and many applications that can create dense wireless traffic (*Wireless Traffic*) are popping up. *Device to Device(D2D) Underlaying* is one solution to this problem, namely D2D uses the same frequency spectrum as (*Cellular User Equipment*) CUE. However, the use of *resource* together causes interference, so an efficient allocation of *resource* is needed.

In the final project, we will try the mode selection scheme to overcome interference and increase throughput, the 3 mode that will be used are cellular, dedicated and reuse, and the allocation process uses the greedy algorithm.

The simulation results the selection 3 mode produces the best performance with the value of sumrate of 2.521×10^8 bps in the first scenario and the value of sumrate in the second scenario of 2.546×10^8 , the value of the spectral efficiency of 28.0127 bps/Hz in the first scenario and the value of the spectral efficiency in the second scenario is 28.302, the power efficiency is 1.709×10^4 bps/watt in the first scenario and the value of the power efficiency in the second scenario is 1.414×10^4 , and fairness CUE is 0.896 in scenario one and the fairness value of CUE in scenario two is 0.4. However, the D2D fairness in the first and second scenarios of selection 2 mode is higher than that of selection 3 with a value of 0.712 compared to 0.512 in the first scenario, for the second scenario 0.674 compared to 0.437.

Keywords: *mode selection, Device to Device, Underlay, Greedy, mode celluler, mode dedicated, mode reuse.*