

ABSTRACT

Device-to-Device (D2D) underlying communication system can be used to reduce the workload of eNodeB and increase system data rate. This communication system consists of two users, namely Cellular User Equipment (CUE) and D2D pair, where resource block used by D2D pair and CUE are the same. However, using resource block at the same time may result in interference. Therefore, we need an efficient resource block allocation scheme for the D2D pair to reduce the impact of interference.

In this work, a resource allocation scheme is performed at single cell with the uplink communication direction. Resource allocation process uses joint greedy and greedy algorithm with power allocation using State Action Reward State Action (SARSA) algorithm. Then performed a performance comparison using joint greedy and greedy algorithms without power allocation.

Based on the simulation conducted, resource allocation process using joint greedy and greedy algorithms with power allocation using SARSA algorithm provides excellent performance in terms of sumrate with average value $3,878 \times 10^8$ bps, energy efficiency with average value $1,373 \times 10^7$ bps/watt, spectral efficiency with average value 43,086 bps/Hz, D2D fairness index with average value 0,99525, and eNodeB fairness index with average value of 0,696.

Keywords: Device-to-Device, Resource Block, SARSA, Joint Greedy, Greedy