ABSTRACT

The increasing need for speed data access, makes Visible Light Communication (VLC) an efficient alternative for wireless transmission media. VLC has the advantages of easy installation process, spectrum that has not been limited by regulations, can be applied anywhere, and a high level of security because light cannot penetrate the walls of the room. However, based on its performance, VLC has problems with unfair datarate received by the user.

In overcoming these problems, this study will use the waterfilling algorithm. The waterfilling algorithm is able to provide fairness of datarate by each EU. This study uses 3 scenarios with the first scenario is a VLC system without an algorithm, the second scenario uses the waterfilling basic algorithm and the third uses a modification of the waterfilling algorithm with variations in the minimum and maximum allocation power. The results of simulation from all three scenarios will be analyzed for the value of SNR, datarate, fairness index and energy efficiency.

The result of this research is that the VLC system uses the waterfilling basic algorithm to have a fairness value of 1. However in the waterfilling modified algoritm with minimum power is 75 mW and maximum power is 1800 mW to have optimum ratio of energy efficiency on this research with ratio is 9%.

Keyword : *VLC, Resource Allocation, Waterfilling, Fairness.*