## ABSTRACT

Visible Light Communication (VLC) is one of the emerging wireless communication alternatives besides radio communication. By utilizing visible light as the transmission medium, VLC is considered superior to Radio Frequency (RF) because it can overcome the weaknesses or limitations of RF. One of the advantages of VLC is it is free from interference from electromagnetic waves, making it safer for humans.

In this Final Project, the writer conducts research on the influence of the number of users on uplink transmission in VLC. The difference in the number of users can affect the accuracy of data transmission in the uplink transmission system. The simulation is carried out in a room with a size of 5 m x 5 m x 3 m with a Line Of Sight (LOS) channel. The modulation technique used is DC Biased Optical-Orthogonal Frequency Division Multiple Access (DCO-OFDMA). The performance of the system will be evaluated by looking at the test parameters such as the Signal To Noise Ratio (SNR) and Bit Error Rate (BER) values obtained.

The results of this Final Project prove that the number of users can affect the SNR and BER values obtained. The results showed that the uplink transmission system in VLC with multiuser can work well in scenarios of 2 users up to 4 users. When the number of users reaches the maximum number of 4 users, the average SNR decreases by 6,449 dB, while the BER increases by $2.99\times10^{-6}$.


**Keywords:** VLC, DCO-OFDMA, *multiuser*, *Uplink*, SNR, and BER.