

## ABSTRACT

Behind a lot of advantages of VLC technology there are still some weaknesses that has to be handled so the quality of VLC can be increased. One of VLC's weaknesses is the limited bandwidth modulation. It can be overcome by Non-Orthogonal Multiple Access (NOMA). NOMA uses superposition coding in transmitter and uses successive interference cancellation in receiver, so it can maximize the utilization of available bandwidth and improve spectral efficiency so that it will maximize achievable data rate. The amount of power used in this research is 7 watt and The room dimension is  $5 \times 5 \times 3 \text{ m}^3$ .

This final project will research about performance of non orthogonal multiple access in visible light communication with changes of receiver angle orientation. User will be grouped in two different channels, Line of Sight (LOS) and Non-Line of Sight (NLOS) channel. The experiment is being processed in software simulation to get the result of experiment parameter with specification of simulation focus on room dimension, specification of channel, receiver location and receiver orientation angle.

Result of analysis shows that NOMA can improve performance of VLC by increasing the value of SNR and data rate in each user. SNR has an average increase of 5.6442 dB, and data rate has an average increase of 18.0045 Mbps. The changes of orientation receiver angle from  $0^\circ$  to  $35^\circ$  also affect the achieved SNR and data rate value. The results show that the higher receiver orientation angle, the smaller the value of achievable SNR and data rate will be.

**Keywords:** VLC, NOMA, LOS, NLOS, User Grouping, Random Orientation, SNR, *Data rate*.