

## ABSTRACT

Current technological developments, especially in the field of telecommunications, are developing very rapidly. Community needs for faster, more stable and efficient communication access are also increasingly high. This has become one of the drivers of the creation of light-based network technology, which is a visible light-based communication system or known as Visible Light Communication (VLC). In VLC system, the coverage area is influenced by several factors such as room size, room shape, number of transmitters and transmitter position. This is the problem in this research.

The main objective of this final project research is to analyze the comparison of the coverage area on the VLC system with the number of LED lights 1 and 2 in two different rooms. The research was conducted in a closed room with a Line of Sight canal in a room of size  $5 \times 5 \times 3$  meters and  $8 \times 5 \times 3$  meters and using On Off Keying-Non Return to Zero (OOK-NRZ) modulation, this Final Project examines the coverage area and the Bit Error Rate (BER) of each room with the number of 1 and 2 LED lights is in the coordinates (0, 0, 3) for 1 and 2 LED lights in both rooms and coordinates (0, -1.25, 3) and (0, 1.25, 3) for room of size  $5 \times 5 \times 3$  meters and (0, -2, 3) and (0, 2, 3) for room of size  $8 \times 5 \times 3$  meters.

This final project gets the result that is the large coverage area in each room with a different number of lights with a standard BER value of  $10^{-3}$ . In a room of size  $5 \times 5 \times 3$  meters with 1 LED light, it produces a coverage area of  $17.2 \text{ m}^2$  and 2 LED lights of  $24.36 \text{ m}^2$ . Whereas for a room of size  $8 \times 5 \times 3$  meters it produces a coverage area of  $17.56 \text{ m}^2$  and 2 LED lights of  $35.68 \text{ m}^2$ .

**Keywords: Visible Light Communication, Coverage, Light Emitting Diode, Line of Sight, Bit Error Rate, OOK-NRZ.**