# ABSTRACT

Along with the rapid development of technology, the need for sophisticated communication technology users is increasing. The increasing number of wireless communication users will cause the availability of radio wave spectrum to decrease. To overcome this problem, a new wireless communication technology with visible light is currently being developed, namely *Light Fidelity* (LiFi).

This final project evaluates the coverage performance of LiFi technology by using four LED *multibeam* lamps with predetermined positions in a closed room of size $10 \times 10 \times 3$ meters. There are four scenarios in this final project research. The difference in each scenario is in the angular position of the LED *multibeam* lamp from the vertical axis. The angles used for scenarios one to four are 0°, 10°, 15°, and 30°, respectively. In addition, this simulation also carried out at different transmit power that is 5 Watt and 7 Watt. The performance of the system is analyzed using the received power, Signal to Noise Ratio (SNR), and Bit Error Rate (BER) parameters to determine the coverage area generated by each scenario.

The result of this research shows that four multibeam LED lamps with 5 W and 7 W emitting power positioned 0°, 10°, and 15° from the vertical axis produce a coverage area of 100 $m^2$. While the coverage area produced at the lamp position at an angle of 30° produces 89.76 $m^2$ with a transmit power of 5 W and 95.54 $m^2$ with a transmit power of 7 W. The placement of multibeam LED lamp positioned 10° from the vertical axis has better coverage performance. because it has the highest power received area of 64.92% of the entire room and the smallest maximum BER than other scenarios.

**Keywords:** Light Fidelity (LiFi), LED, Line of Sight, Signal to Noise Ratio (SNR), Bit Error Rate (BER).