

## ABSTRACT

This final project is conducting a study on non-orthogonal multiple access (NO-MA) with joint detection (JD) in a visible light communication system. Visible light communication (VLC) technology has various advantages such as data transfer speed, energy efficiency and excellent security as it uses light as a means of propagation.

On the transmitter side, multiple users experience multiplexing based on power domain by applying super position coding so that one subcarrier can be used by more than 1 User Equipment (UE) with Dc Biased Orthogonal Frequency Division Multiplexing (DCO-OFDM). In this final project, we use 8 and 15 Watts of power, and there are 5 UEs on the receiver side using the Line of Sight (LOS) and Non Line of Sight (NLOS) channels. We consider simulations in a 5 X 5 X 3 meter room. We also consider that the performance of the system will be evaluated using the Signal Interference to Noise Ratio (SINR) and Datarate parameters.

In this study, we found that lower energy consumption did not reduce performance. This is proven by the transmit power of 8 Watts, the SINR results increased by 45.67% from UE1 to UE2 with the highest value of 37.5121 dB and the smallest value of 5.0817 dB, while that the calculation of datarate the highest value is obtained at the transmit power of 8 Watts with a value of 62.308 Mbps and at the transmit power of 15 Watts is the highest datarate value of 57.756 Mbps.

**Keywords:** *Non-Orthogonal Multiple Access, Joint Detection, DCO-OFDM, VLC, SINR, Datarate.*