## ABSTRACT

Visible Light Communication (VLC) system will act as an alternative to radio communication in the process of transmitting data between users faster. However, the main drawbacks of VLC systems are the narrow modulation bandwidth of the light source, limited communication range, and the effect of light or other lighting, which can prevent it from achieving good data rates. Therefore, the Non-Orthogonal Multiple Access (NOMA) system in VLC is proposed to be a solution to optimize performance on the VLC system, which uses Superposition Coding on the transmitter side and Successive Interface Cancelation (SIC) on the receiver.

This Final Project will conduct a simulation design to determine the performance of the NOMA system on VLC with variations in transmission LEDs and power allocation with the Static Power Allocation (SPA) algorithm in a 9 x 9 x 3m dimension room that is partially penetrated by sunlight which can cause interference.

Simulation results prove that NOMA is able to improve the performance of the VLC system in each receiver. SINR increased by an average of 26.6351 dB for 1 LED and 28.0405 dB for 2 LEDs, the data rate increased by an average of 88.66761 Mbps for 1 LED and 93.09015 Mbps for 2 LEDs. Variations in the number of LEDs and the presence of solar interference affect the performance of NOMA-VLC, where the performance of NOMA-VLC with 2 LEDs produces an average SINR value of 1.4054 dB greater than 1 LED. The average value of the data rate in the simulation of 2 LEDs also has a value of 4.41405 Mbps greater than that of 1 LED. Sunlight interference results in decreased performance of affected users. For BER value, every user in NOMA with VLC has a value of 0.



Keywords : NOMA, Superposition Coding, Successive Interface Cancelation, LED, VLC, SPA, OOK-NRZ, BER.