

## **ABSTRACT**

The development of wireless communication media has made Radio Frequency (RF) communication media no longer efficient, especially in developing 5G networks. So that there is Visible Light Communication (VLC) technology using a visible light source that can be a source of lighting as well as a communication medium that can be used on 5G networks with a higher frequency spectrum and bandwidth than RF.

This final project focuses on the value of throughput and Packet Loss Rate (PLR) based on the value of offered load when it reaches threshold using Frameless CSA. In addition, this study uses the Frequency Domain-Extended (FDE) method to increase the frequency or degree which will be used during the decode process. This final project uses FDE value  $K=1,2,3$ , with channel model Line of Sight (LOS) and Non-Line of Sight (NLOS). The value of  $K$  is the number of additional frequency or degree values during the decoding process later.

Based on the simulation results and research analysis, it shows that using the FDE method on the LOS channel can increase throughput by 64% and reduce PLR by 33%. While on the NLOS channel, it increases throughput to 61% and decreases PLR by 40%. Thus, the FDE method on the frameless CSA can reduce the possibility of packet collisions.

**Key Word** : Visible Light Communication, Frameless CSA, Frequency Domain-Extended, LOS, NLOS, Throughput, PLR