

ABSTRACT

Along with the development of technology, the human need for accessing information with high data rate is increasing. Visible Light Communication (VLC) uses light as a signal information carrier so it can transmit information quickly. VLC can be implemented to support 5G technologies such as massive Machine Type Communication or Internet of Things.

In 5G technology there is a term called massive connectivity which can accommodate a very large number of user. If a user simultaneously sending a packet, it can cause the packets to collided. Multiple access technique method uses both the physical layer and the network layer to manage when the user using the same access point (AP). ALOHA is a multiple access scheme in the form of random access which allows user to send data without waiting a feedback from receiver.

This final project contains a research on multiple access techniques by applying random access on the VLC communication system. This research focuses on the throughput and packet loss rate values. The simulation is carried out in a closed room with the Line of Sight channel model with a room size of 6 x 6 x 3 meters. There are 60 to 100 users that can be a devices, IoT sensors or machines which is simulated with a random position.

Based on the results of this research, it can be concluded that Frameless ALOHA has the ability to increase the length of framelength by increasing its timeslots as to increase the probability of a successful packet being sent. Therefore, it can increase *throughput* from 0.188 until 0.235 with 1.25x increases and lower PLR value up to 37% with value 0.037 for IRSA and 0.014 for *frameless* ALOHA 2.6x *timeslots* IRSA when number of users reach 100.

Key Words : VLC, Random Access, Frameless ALOHA, Throughput, PLR