

ABSTRACT

A Slotted ALOHA (SA) based approach identified as an alternative which is the direction to go for an indoor Internet of Things (IoT) Optical Wireless Communication (OWC) scenario may contain a large number of IoT devices competing to send short packets through a number of ceiling-mounted OWCs. Sky Access Points (APs). Many access control schemes for Slotted Aloha (SA) have been researched since their development. Among them is Dynamic Frame Length ALOHA (DFLA) with a technique of adjusting the frame length and the probability of accessing each channel. DFLA is not suitable for distributed environments. Therefore, an efficient alternative coding scheme is needed to reduce the packet loss ratio at high traffic loads.

By proposing a very simple way, namely CRDSA based on Slotted ALOHA (SA) frames. Contention Resolution Diversity Slotted ALOHA (CRDSA) is one of the channel coding techniques to reduce the occurrence of packet collisions sent and received in the same frame and slot in Multiple Access Channels (MAC). In addition, Non-Orthogonal Multiple Access (NOMA) is applied to the Visible Light Communication (VLC) system using superposition coding on the transmitter side and at the receiver is implemented Successive Interference Cancellation (SIC) with variations in the number of iterations in the decoding section.

Based on the simulation results that have been carried out, it is found that the highest Offered Traffic (G) value for the highest throughput performance using CRDSA with an increase in throughput value of $\pm 27\%$ from 0.5004 to 0.5249 and the value of Packet Loss Ratio (PLR) decreased $\pm 27\%$ in the performance value. using 100 Slot Node with a chance of collision between packets (collision) of 26.19%.

Keywords: VLC, CRDSA, Throughput, PLR, Degree Distributions