

## ABSTRACT

Underwater Visible light communication (UVLC) is a network communication wirelessly where information is transmitted by means of light through waves visible, in this case the light source comes from a light emitting diode (LED) as a transmitter for underwater. UVLC has several advantages over radio frequency technology such as safer communication because light propagation can't penetrate the wall so it's difficult to do hacking, relatively build cost cheap and no side effects on health.

But UVLC has several limitations, one of which is the narrow bandwidth modulation. UVLC undergoes a distribution of modulated bandwidth to allocate against each user. This bandwidth sharing has an impact on reduced system capacity.

In this study, non-orthogonal multiple access (NOMA) was applied to increase system capacity. In this final project, analyzing the performance the two best power allocation methods in water medium, including gain ratio power allocation (GRPA) and static power allocation (SPA). Apart from that done research on the effect of user fairness on sumrate on the system model NOMA-UVLC.

In the results obtained in the NOMA-UVLC system power allocation value GRPA is more stable than SPA power allocation. Then by applying residue in the successive interference cancellation (SIC) process will result in a decrease in system capacity when compared to no residue in the SIC process. In addition, with increasing sumrate on the NOMA-UVLC system has an impact on decreasing equity every user.

**Key Word** : Underwater Visible Light Communication, NOMA, GRPA, SPA, User Fairness, Sumrate, Successive Interference Cancellation.