

ABSTRACT

There are many types of wireless communication technology, one of which is visible light communication (VLC). VLC is a technology that uses light as a transmission medium from Light Emitting Diode (LED) lamps. IPS is able to determine the location of objects or small objects. While indoors, there is often a change in position of an object or objects. This presents a new technology, namely IPS which functions to move the position in the room of objects or devices that have detectors in them, such as changing the position of smartphones, devices that have sensors, and so on.

In this study, analysis has been carried out by increasing accuracy on IPS using the Triangulation method, namely Received Signal Strength (RSS) and optimized with the Spring Model, in a $5 \times 5 \times 3 \text{ m}^3$ room consisting of 4 scenarios with 3 LED transmitters. in different positions and the number of receivers is 15 PINs, with the aim of finding a suitable LED light position so as to produce accurate accuracy and have a small error value.

The results of the extensive simulation show that what can affect the accuracy in this study is the difference between the original transmitter and receiver distances and the estimated transmitter and receiver distances. When the distance between the transmitter and receiver is getting farther, the signal strength will weaken so that the received signal will not be the same as when it was sent. The simulation results show that the best scenario is in scenario 3 where the transmitter is located at coordinates (0.5; 4; 3), (2.5; 0.5; 3), (4.5; 4.5; 3) detected 15 receiver with a radius of under 1 meter and getting an accuracy of 86.84% and has increased after being optimized to 99.62%.

Keywords: IPS, VLC, RSS, Spring Model, detection, optimization.