**2017 Thesis Research**

**Visible Light Communication Using Reflected Light**

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**Abstract**

Visible Light Communication (VLC) is an optical wireless communication system that carries information by modulating light of LEDs recently developed for high frequency blinking. VLC can enhance security protection of transferring data and can resist to interference with radio waves. On the other hand, communication failures frequently occur even in the same room, because ~~.~~ previous researches related to the VLC mainly used line-of-sight communication.

In this study, we made an experimental device receiving reflected light and verified the reception performance of the device. Then we clarified issues to improve the communication accuracy and the communication range in the same room as follows; communication accuracy, receivable range, and transmission speed. We evaluated them on the experimental device and found the following results; 1) Under the transmission speed of 276480 [bps], the reception accuracy does not decrease with cable connection and with reflected light. 2) Reflected light could be received source at a distance of 7.2 cm from the LED.

The received signal must be amplified to improve communication accuracy and communication range. In addition to that, an element capable of high-speed operation must be used to improve transmission speed. We also have to use a light source devices achieving higher output for practical application of VLC using reflected lights with a home lighting equipment in the future.

*Keywords: Visible Light Communication(VLC), Reflected Light, Confidentiality, IoT, FPGA*