A study on the intrusion detection system based Event Driven with Local VLC

Hyung-O Kim[1], Yunsik Lim[2], Yeongsik Yoo[3], Jongsung Lee[4], Hyeungkeun Yu[5], Kwangseok Ko[1], Jaesang Cha[1*],

[1] Dept. of Electronic & IT Media Eng. & NID Fusion Tech., Seoul National Univ. of Science and Tech., Seoul, Korea
[2] Dept of Broadcasting Production., Yeoju Institute of Technology, Yeoju, Korea
[3] Dept. of Electronic Engineering, Yeoju Institute of Technology, Yeoju, Korea
[4] Dept. of Electronic Engineering, Bucheon Univ., Bucheon, Korea
[5] Dept. of Strategy and Info., AnySmart Co., Seoul, Korea
* corresponding author: chajs@seoultech.ac.kr

Abstract. Recently, BEMS(Building Energy Management System) are emerging in the field of energy savings. In addition, The dissemination of LED lights is spreading. We proposed an Intruder Detection System using an image processing technique with indoor security CCTV. And then We implemented the visible light communication between indoor LED lights. it is enable to communicate between itself without other network infra. The proposed technigues are indeed proof its possibility to practical use.

Keywords: Event Driven, VLC(Visible Light Communication), LED BEMS(Building Energy Management System), Surveillance

1 Introduction

Interest in energy saving has increased in recent years due to environmental concerns about global warming and air pollution. There are growing needs of developing a information technology for energy efficiently management and energy saving.

Therefore, the overseas including the developed countries are researched the IT technology that reduces the energy consumption in the building sector for efficient operation [1]. The BEMS is analyzed energy consumption by optimally control such as air conditioning system, lighting fixture and fire prevention equipment in the building[2]. Also it is technology to maximize energy savings by effectively controlled. Recently It has been developed a variety of techniques through LED control by the development of LED lighting technology [3][4].

This paper is organized as follows. We analyze the abnormal behavior detection of event-driven method in Chapter 2. And then we look at the features and configuration of indoor lighting systems in Chapter 3. Then we analyze of results through the experiment of the proposed algorithm in Chapter 4. Finally, we make the conclusion of this paper.

2 Event-driven method abnormal behavior detection

An abnormal behavior detection system based on image processing has purpose that need to be applied to multiple objects a variety of detection rules at the same time. The event-driven method's S/W architecture in system that assumed the environment of multiple events occurring is very useful in terms of real-time implementation.

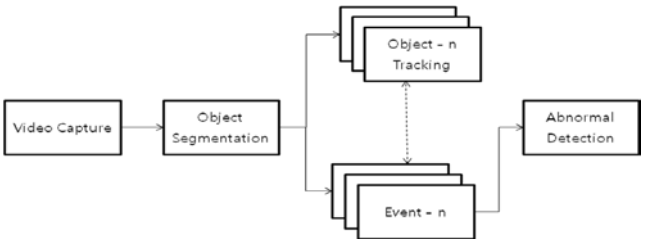

Fig. 1. The block diagram of An abnormal behavior detection based on image processing

3. Visible light communication based on LED lighting

The visible light communication based on LED is the convergence technology which is able to lighting functions and communication at the same time. The visible light communication performs modulation and demodulation by a cycle of about 30 nanometers because a person's vision to recognize to be constantly light on when that is more than 100 times per second the flashing lights.

In this paper, the receiver is amplified the micro-current to emit light and to be excellent the response using transmitter of LED 3x3 array, high reaction rate of PIN Photodiode and two OP-amp. Therefore we are implemented the receiver that can adjust the amount of light and distance using input signal voltage that is generated.

4 Experiments and discussion

The experimental structure verifies to link the possibility of abnormal behavior detection system based on image processing and LED visible light communication. It detects signal of abnormal behavior to input in real-time detection image from IP camera for usual indoor image monitoring through the background of the modeling and the violation detection processing of event-driven method. Therefore the signal that detected abnormal behavior is transmitted to the LED visible light communication receiver through the LED light transmitter.

Fig. 4. abnormal behavior detection based image processing

Fig.4 shows the process the captured image from the camera was displayed on the screen of the extracted object tracking process.

5 Conclusion

In this paper, we was analyzed the abnormal Behavior detection system of event-driven method. And then we was implemented the lighting control system for BEMS using LED visible light communication. Also we clearly proposed the configuration and the characteristics of the system through the schematic. We proposed the abnormal behavior alert system. There are real-time monitoring systems, the dynamic object image tracking, clustering of many object and detection human movement base on the designed structure through visible light communication in building. It has demonstrated the possibility of implementing related Software development.

Developed system in this paper is able to be applied to a variety of security solutions as well as the building's indoor monitoring system. It can maximize the effectiveness of the prevention from various accidents. Therefore, it is considered to be able to minimize losses by preparing a fast response when abnormal situation occurs.

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