

Report of ASEAN IVO 2017 project meeting

Smart Lighting for Internet of Things and Smart Homes

1. Objective

To review the research plan and to discuss the research plan for this fiscal year, we organized a meeting for the “Smart lighting for internet of things and smart homes” project at Danang University of Science and Technology (DUT) in May 4-5, 2018.

2. Attending Members

- Assoc. Dang The Ngoc (PTIT, Vietnam)
- Dr. Pham Quang Thai (HCMUT, Vietnam)
- Dr. Nguyen Tan Hung (DUT, Vietnam)
- Dr. Yusuf Nur Wijayanto (LIPI, Indonesia): cancelled because of getting a cold
- Prof. Ukrit Makong (Chaing Mai University, Thailand)
- Dr. Pham Tien Dat (NICT, Japan)

3. Program

On May 4, 2018, members presented research results achieved so far and discussed the issues that should be focused and further developed in this fiscal year.

- Dr. Pham Tien Dat introduced the overview of the project and research plan, and updated recent news on budget approval for this fiscal year, status of budget uses, and activities from members such as attending international conferences in USA, Japan.
- Dr. Pham Quang Thai presented the current research activities and plan for the research on OLED based VLCs and optical sensors. After the presentation, other members asked many questions and discussed on the technical issues, and discussed the next plan for this fiscal year.
- Dr. Nguyen Tan Hung presented secured real-time VLC systems and research plan in DUT, and provided demos on real-time signal generation and demodulation on FPGA kit. Several questions and discussion were made from members on the implementation of the practical system and its applications to other waveforms. We also agreed that they should cooperate with Dr. Pham Quang Thai group to have some demonstrations on the real VLC system using the developed real-time secured signal generation, encoding, and demodulation.
- Prof. Ukrit Makong presented the overview of indoor localization using visible light communication systems and current research activities at Chiang Mai university. He

also explained the research plan, including the budget use plan for this fiscal year. Dr. Pham Tien Dat commented that localization is an important application of VLC systems and can be very useful for IoT and smart-home applications, so the project should focus on this issue. We discussed and agreed to continue and further collaborate to develop and have several demos on this technique.

- Prof. Dang The Ngoc presented two different systems that were recently developed by his group at PTIT, Vietnam, including a new protocol for hybrid Wi-Fi and VLC networks for indoor communications, and a relay Li-Fi network for high-speed indoor communications. He also presented the plan for real demos and budget use plan for this fiscal year. Dr. Pham Tien Dat commented that the demos on hybrid WiFi and LiFi for indoor communications is very interesting and we should collaborate to develop the demonstration. We can conduct basic demos at PTIT, and then can extend the demos at NICT using high-speed devices such as signal generators and analyzers.
- Finally, all the members had thorough discussions on the recent development of VLC and its potential applications to practice, especially for IoT and smart-homes. We will further collaborate to develop technologies and demos. For this fiscal year, many members will present research results from the project at the international conferences, including the Optical Society of America 's Advanced Photonics Congress (USA), and The 40th PIERS in Toyama, JAPAN.

On May 5, 2018, all members visited Danang University of Science and Technology and took a Lab tour at the Department of Electrical and Engineering.

The following photo was taken at the Department of Electrical and Engineering of DUT.

