Visual IoT Network for Environment Protection and Disaster Prevention [Site Visits and Project Meeting between NECTEC and National University of Laos] Report form

I. Organizer:

Name:	Dr. Phoumixay Siharath
Position:	Head of Climate Change Unit
Institution:	National University of Laos

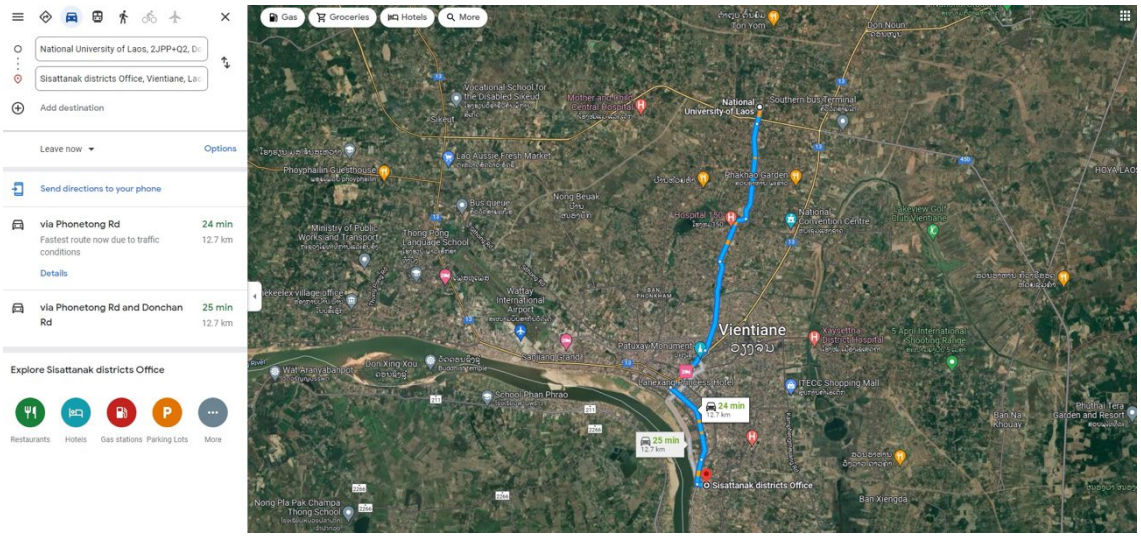
II. Objective:

1. To update and review current activities in Thailand and Lao PDR
   Roles of the Thailand team: We provide the infrastructure of the visual IoT-based monitoring system, including machine learning models for object detection to all participants.

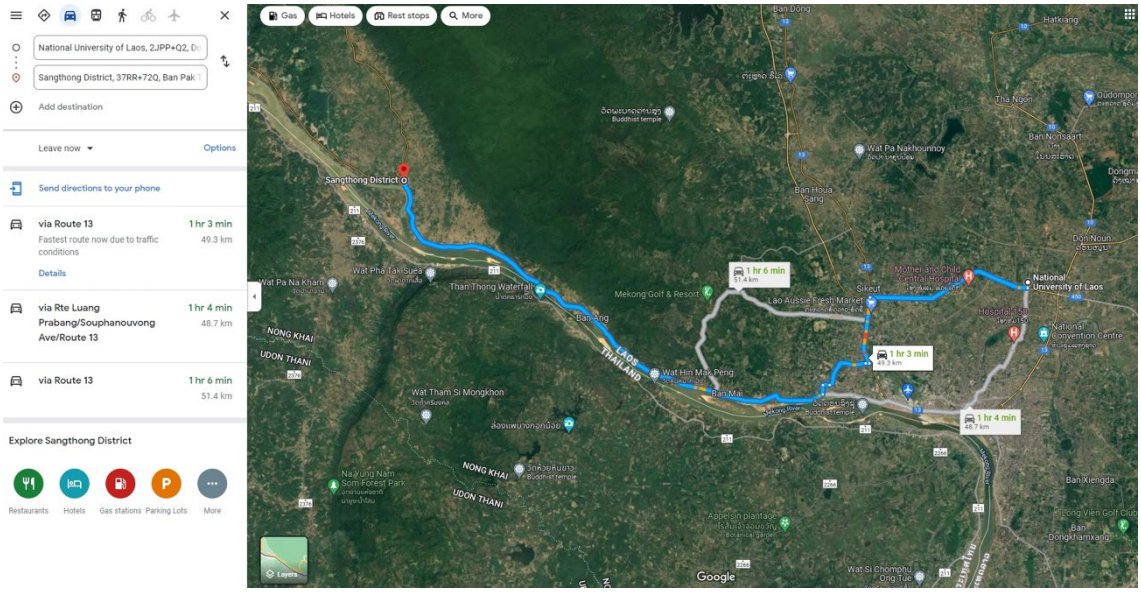
   Roles of the Laos team: NUOL team will apply the same system architecture for applications in Laos. Also, the NUOL team will contribute to constructing datasets for building machine learning models.

2. To discuss activities and experiments that will be done in Lao PDR.
   Topics to be discussed are as follows. What are application domains (e.g., forest fire, flood, landslide, or air quality)? Where will experiments be conducted? What does the NUOL team need for the experiments? How much budget does the team require? Details of the action plan.

3. To discuss and visit prospective experimental sites (e.g., along the Mekong River in Vientiane Capital, Sisattanak district, and Sangthong district) (Please see pictures 1 and 2)
4. To survey the experimental sites for future installations
   The locations are marked in the following maps. (Please see pictures 1 and 2) These areas are selected because one possible application is water level monitoring at Sisattanak for flash flood detection. The expectation for visiting the site is to explore the possibility of installing the system for such a purpose. Also, we have to talk to local authorities. Another possible application in Sangthong is forest fire detection. For the same reason, we must survey the area and talk to the local authorities.



Picture 1: Prospective experimental sites for future installations (Sisattanak)



Picture 2: Prospective experimental sites for future installations (Sangthong)

III. Program:

Date: 20 – 21 September 2022
Venue: National University of Laos and Crowne Plaza Green Hotel, Vientiane, Laos

Program Agenda:

20 Sep	09:00 – 12:00	**Venue**: Hotel's meeting room 1. Updating and reviewing current activities in Thailand and Lao PDR 2. Discussion about prospective experimental sites

		and the experiments to be conducted in Lao PDR 3. Technical discussion
	12:00 – 13:30	Working lunch
	13:30 – 16:00	**Venue**: along the Mekong River in Vientiane Capital and Sisattanak district 1. Visiting and surveying along the Mekong River in Vientiane Capital and Sisattanak district (both are potential and prospective experimental sites)
21 Sep	09:00 – 12:00	**Venue**: Sangthong district 1. Visiting and surveying Sangthong district for the prospective experimental site
	12:00 – 13:00	Working lunch
	13:00 – 17:00	**Venue**: Hotel's meeting room 1. Finalizing the project's action plan for NUOL team

IV. Participant List & Itinerary:

No.	Name	Organization	Itinerary
1	Dr. Kanokvate Tungpimolrut	NECTEC	19/9/2022 (in) 22/9/2022 (out)
2	Dr. Jessada Karnjana	NECTEC	19/9/2022 (in) 22/9/2022 (out)
3	Dr. Phoumixay Siharath	NUOL	NA
4	Dr. Khampasith Thammathevo	NUOL	NA
5	Mr. Somchay Vilaychaleun	NUOL	NA
6	Dr. Keophousone Phonhalath	NUOL	NA
7	Dr. Phetnakhone Xaixongdet	NUOL	NA
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V. Summary of the activities corresponding to the objectives

1. To update and review current activities in Thailand and Lao PDR

NECTEC team introduced the activity plan in Ching Mai and NUOL team gave some basic information about environment and disaster occurred in Lao PDR. Forest fire is also a serious problem in suburb area on Vientiane city and Luang Prabang city. Water level in Mekong River is also another environmental problem that also affect the tap water production and agriculture. Visual IoT system could be used for automatic detection of both forest fire and water level in Lao PDR.

2. To discuss activities and experiments that will be done in Lao PDR.

NECTEC and NUOL teams visited local partners to discuss about how to used the

Visual IoT system to solve their problems more effectively. For the forest fire detection application, the forest fire frequently occurs in Sangthong district (Vientiane city) and Chomphet district (Laung Prabang city). For the water level detection application along Mekong river, Kaolieo water treatment plant is located nearby Mekong river in Sisattanak district (Vientiane city). The staff read the water level from staff guage installed in Mekong river in order to adjust parameters of water treatment plant. This environmental issue affected by the level of Mekong river caused by upstream dam construction also occurred in Luang Prabang city.

3. To discuss and visit prospective experimental sites (e .g., along the Mekong River in Vientiane Capital, Sisattanak district, and Sangthong district)

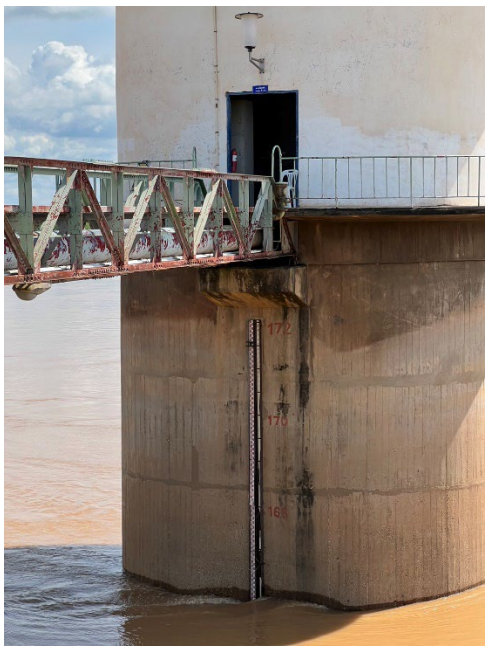
NECTEC and NUOL teams visited office of department of forestry, NUOL in Sangthong district and discuss to representatives about the requirement and possibility to install the visual IoT in this facility. There are 4 faculty members from the department of forestry stays in this office and they have to oversee more than 1,300 Hectares which covers 7 villages in this district. Foest fire patrolling is also one key task of these staffs to work with people in each village. In this area, NUOL plans to install a Visual IoT system at the view point on the hill in order to detect forest fire in targeted community. NECTEC and NUOL teams also visited Kaolieo water Treatment Plan (WTP) in Sisattanak district, Vientiane city. The Visual IoT system will be used for water level detection instead of reading by staff. It will be one parameter of water treatement process especially during dry season and rainy season. Both forest fire and water level detection are also problem in Luang Prabang city, so NUOL will discuss to their partner in Souphanouvong University.

4. To survey the experimental sites for future installations

In Sang Thong district, we plan to construct a 2 m tall aluminum pipe and install the Visual IoT system on that pipe, since this location is on the top of the hill and could see the targeted villages at downhill easily without big tree or any obatacle. NUOL team also plans to install a PM2.5 monitoring system in the same area. In Sisatanak district, since Kaolieo WTP already have installed staff guage and a 2 m tall aluminum pipe used for lighting, so the Visual IoT system could be installed on the existing aluminum pipe. NUOL taam also plans to install a water quality monitoring system. Furthermore, NUOL team will discuss to partners in Souphanouvong University about the possibility to install Visual IoT sytem for forest fire detection and water level detection.

VI. Others


Meeting at Crowne Plaza hotel

Visit Kaolieo Water Treatment Plant

Meeting with faculty member from department of forestry, NUOL in Sang Tong campus