Project Title: Study and Evaluation of Heterogeneous Network for Smart Community and Smart City Applications

Background :

A wireless communication is the most convenient solution for data transferring that can support the mentioned requirement. However, the wireless communication has the limitation that should be considered e.g. coverage limitation in a large area and bandwidth limitation to support a lot of devices. The traditional deployment also need a wire communication for each base station that are costly to install in the area where the wire communication is not ready or in rural area.

Targets:

To create a data distribution platform on wireless mesh network using NerveNet to overcome the limitation of traditional wireless communication.

Speaker: Assoc. Prof. Kultida Rojviboonchai @Chulalongkorn University, Thailand

Project Title: Study and Evaluation of Heterogeneous Network for Smart Community and Smart City Applications

Project Members :

No.	Name	Organization
1	Dr. Yasunori Owada	NICT, Japan
2	Dr. Goshi Sato	NICT, Japan
3	Adsadawut Chanakitkarnchok	CU, Thailand
4	Kiattikun Kawila	CU, Thailand
5	Teerapat Vongsuteera	CU, Thailand
6	Dr. Kulit Na Nakorn	CU, Thailand
7	Dr. Choong Khong Neng	MIMOS, Malaysia
8	Dr. Kok Gin Xian	MIMOS, Malaysia
9	Dr. Chrishanton Vethanayagam	MIMOS, Malaysia
10	Prof. Tham Mau Luen	UTAR, Malaysia

Project Duration : From 1st June 2017 to 31th November 2019, 30 months

Project Activities:

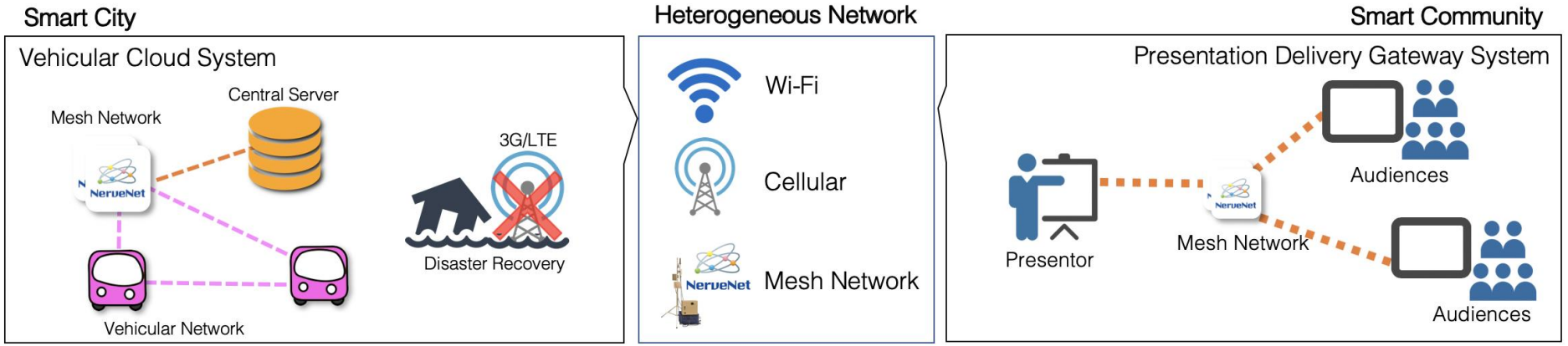
This project is divided in to two systems.

A. Vehicular cloud system on wireless mesh network

- Heterogeneous Network for Vehicular Network
- Support in Larger Scale Scenario
- Never Die Network in Disaster Recovery

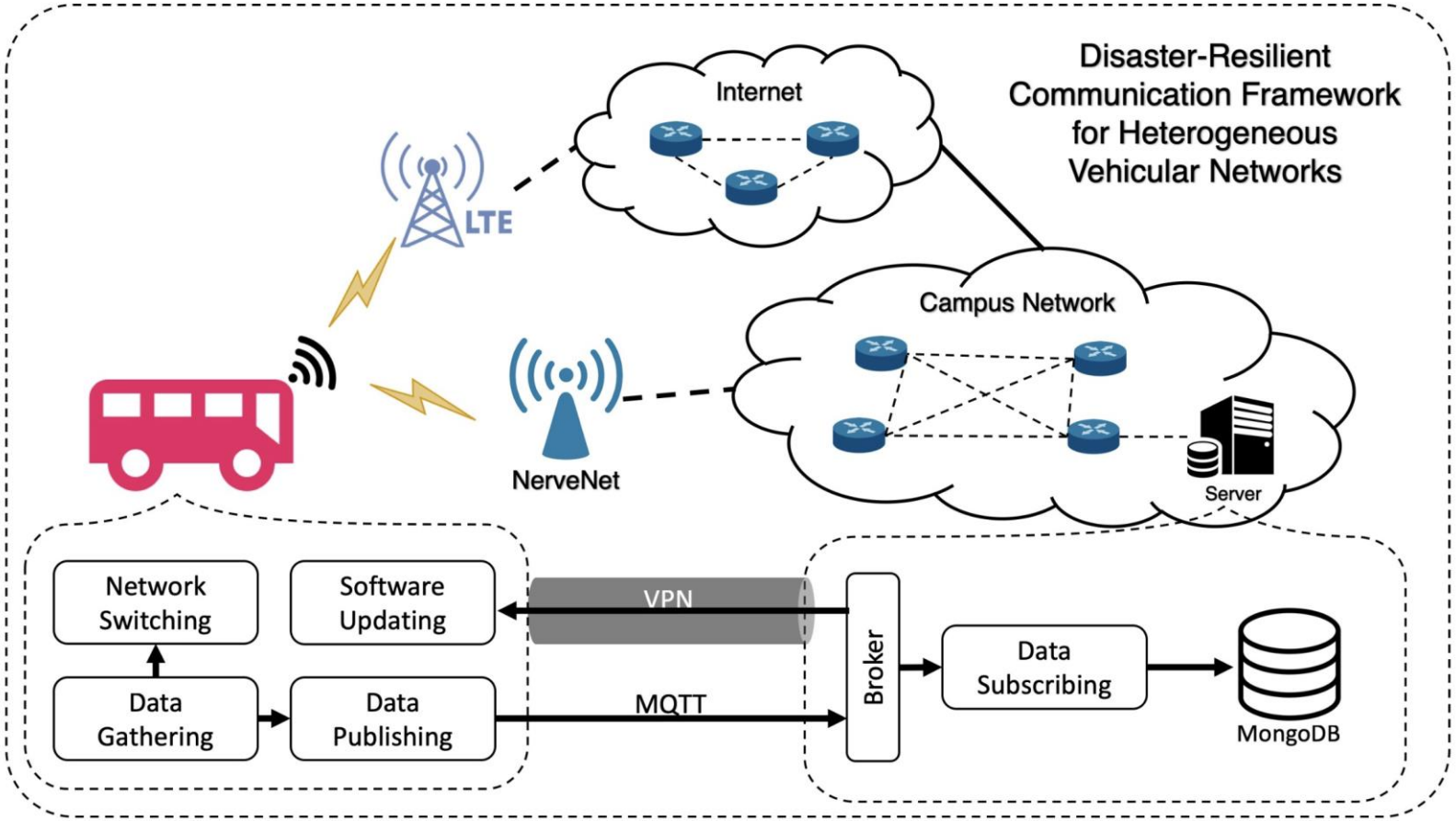
B. Presentation delivery gateway system

- Support Larger Number of Receivers
- Highly Collaborative and Interactive



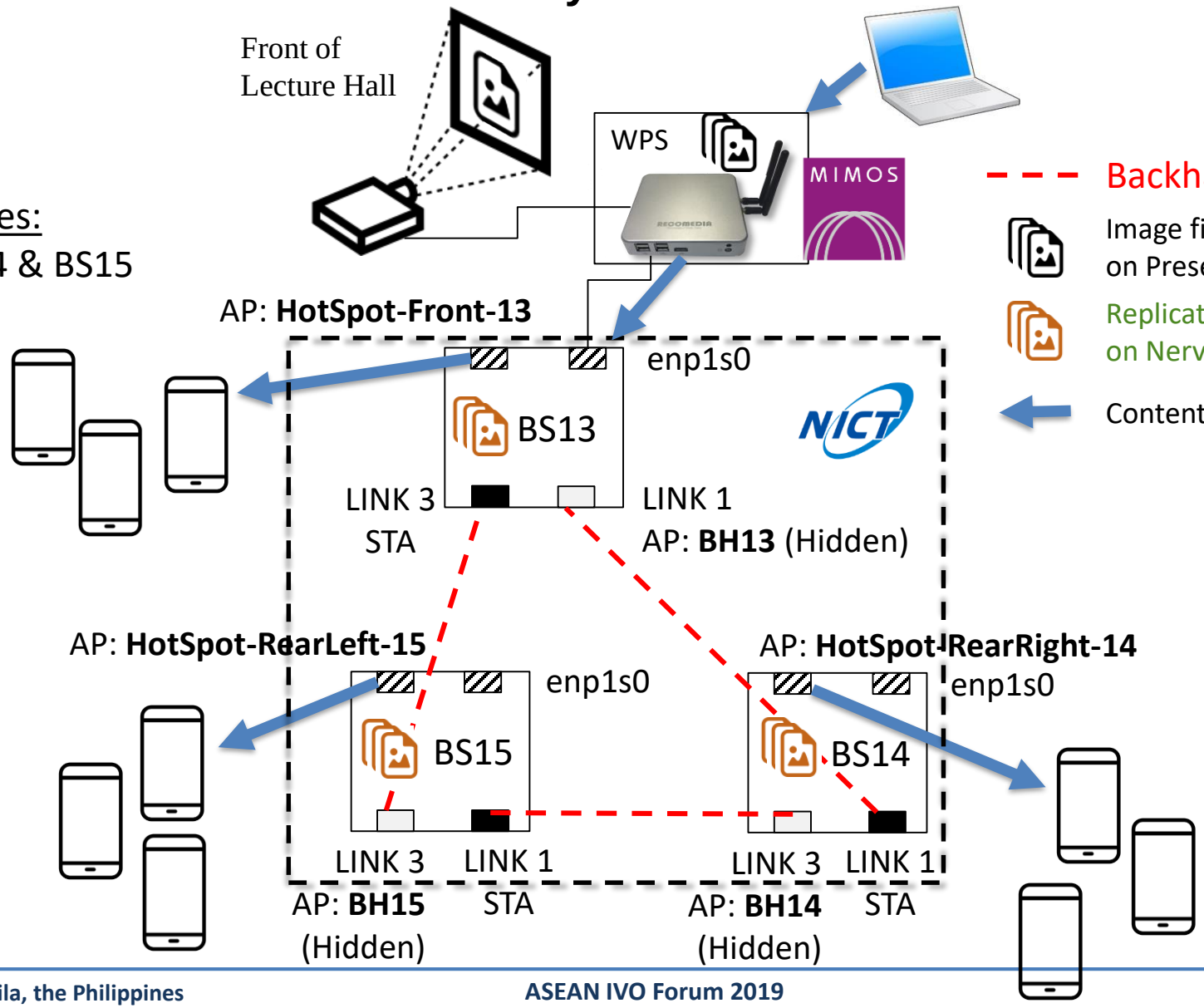
Vehicular Cloud System using wireless mesh network

Disaster-Resilient Communication Framework for Heterogeneous Vehicular Networks



R&D results:

The Wireless Presentation System



Scientific Contribution:

Presentations at International Conferences:

No:	Paper title:	Author names	Affiliation	Conference name:	The date of the conference	The venue of the conference
1	An Analysis of a Large Scale Wireless Image Distribution System Deployment	Kok Gin Xian[1], Choong Khong Neng[1], Chrishanton Verhanayagam[1], Tham Mau Luen[2]	MIMOS Berhad[1] Universiti Tunku Abdul Rahman[2]	IEEE Symposium on Computer Applications & Industrial Electronics	Apr 28, 2019	Kota Kinabalu, Malaysia
2	Disaster-Resilient Communication Framework for Heterogeneous Vehicular Networks	Adsadawut Chanakitkarnchok[3], Kiattikun Kawila[3], Goshi Sato[4], Yasunori Owada[4], Kultida Rojviboonchai[3]	Chulalongkorn University[3] National Institute of Information and Communications Technology[4]	IEEE International Symposium on Personal, Indoor and Mobile Radio Communications	Sep 11, 2019	Istanbul, Turkey

Societal Impact:

Collaboration:

The wireless mesh network can support any systems that need communication solution. The necessary content can be distributed to the desired vehicles or devices.

Eco-Friendly Solution:

Because the wireless mesh network can be installed in any small areas. It does not require the wire connection between nodes. Therefore, to increase the capacity of the network can be achieve simply and flexibly using wireless mesh network.

Social Change through Interaction:

The wireless mesh network will motivate the developer to introduce many applications to the social. The wireless communication has made it easier for people to develop any application based on IoT devices to work together to support a common cause.

Economy:

While the traditional wireless communication technology requires complex installation, the wireless mesh network can be easily setup with low cost device and low cost maintenance.

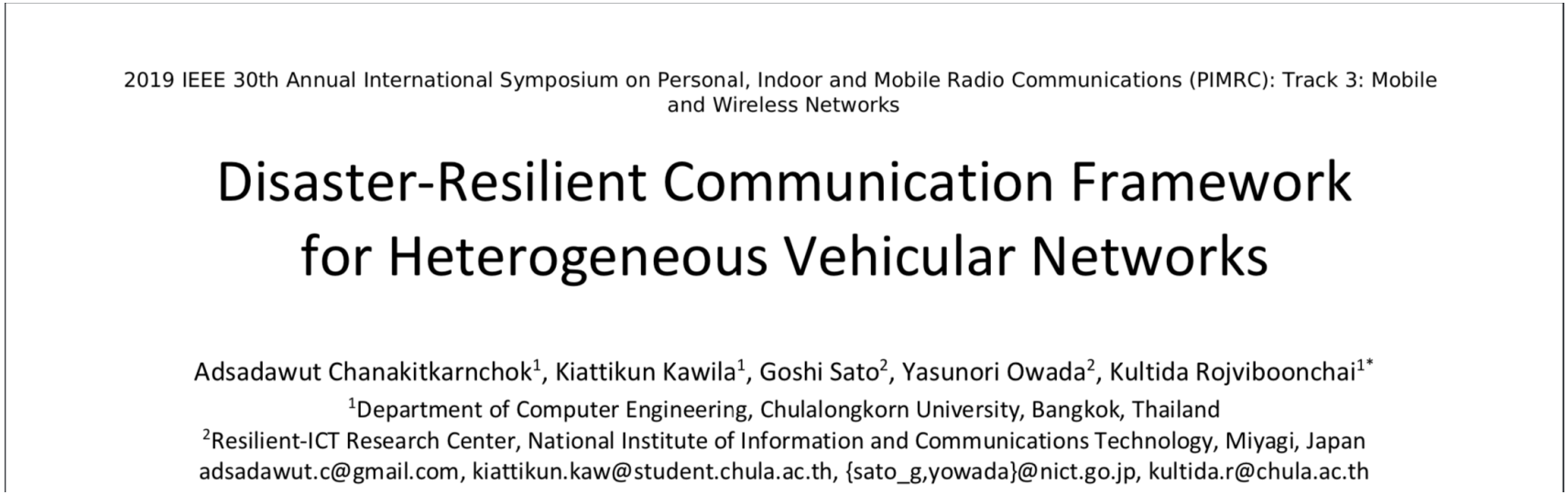
Conclusion:

Vehicular Cloud System using wireless mesh network

NerveNet Benefits

- In HetVNet situation
  - NerveNet can cooperate with traditional network
  - NerveNet can share the traffic load up to the coverage range
- In disaster situation
  - NerveNet can become a main infrastructure

Publication on Sep 11, 2019 at IEEE International Symposium on Personal, Indoor and Mobile Radio Communications in Istanbul, Turkey



2019 IEEE 30th Annual International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC): Track 3: Mobile and Wireless Networks

Disaster-Resilient Communication Framework for Heterogeneous Vehicular Networks

Adsadawut Chanakitkarnchok[1], Kiattikun Kawila[1], Goshi Sato[2], Yasunori Owada[2], Kultida Rojviboonchai[1*]

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Conclusion:

The Wireless Presentation System

NerveNet Benefits

- Can extend the coverage of a wireless presentation system
- Provide flexibility and mobility in system setup

Publication on Apr 28, 2019 at IEEE Symposium on Computer Applications & Industrial Electronics in Kota Kinabalu, Malaysia

An Analysis of a Large Scale Wireless Image Distribution System Deployment

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Future prospects:

Outlook for the future of developed technology

The data distribution platform on wireless mesh network using NerveNet can be improved in term of integrated scenarios for smart community and smart city. The vehicular cloud system in mesh topology network can be adapted to use with public transport system. This can provide the NeverDie network to the smart city. Additionally, to integrate the wireless presentation system with the vehicular cloud system, so that everyone can access the knowledge from anywhere in anytime.

Plans/Ideas on how to spread them in country/region/world

To spread our developed system to the country, we have already presented our system in the National Science and Technology Fair (NSTF) which is Thailand's largest science and technology annual festival in Year 2018 and 2019. For the region and also the world, the publication that we published in the IEEE international conference is an open-access which means that everyone can access our contribution with no cost.

Technology transfer

In this project, we provide the contact of project leader and project members for everyone who are interested in our project development.