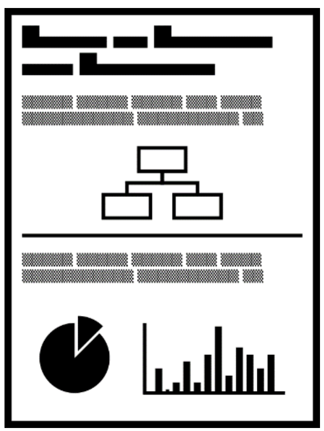
Student Lightning Talks

Chiao-Ning Chuang
on behalf of the PRAGMA Students Steering Committee

The 36th PRAGMA Students Session, Jeju, South Korea

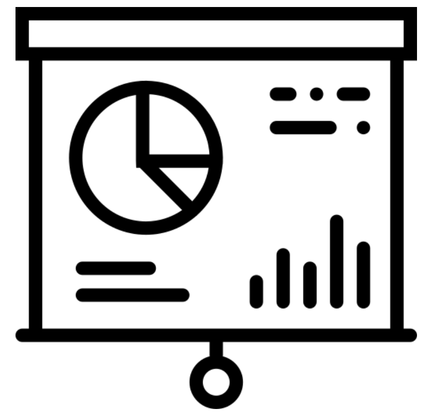
Apr. 25th 2019

Student Activity Overview @ PRAGMA36



Poster
(44 Posters)

Lightning Talks
(32 Presenters)



Presentation
(9 Presenters)

Sessions

- Student Presentation Session
  - 09:00~12:00, 24th Apr. 2019
- Lightning Talks Session
  - 16:00~16:45, 25th Apr. 2019
- Poster Session
  - 16:45~18:00, 25th Apr. 2019
- Award Session
  - 17:00~17:20, 26th Apr. 2019

Poster Voting

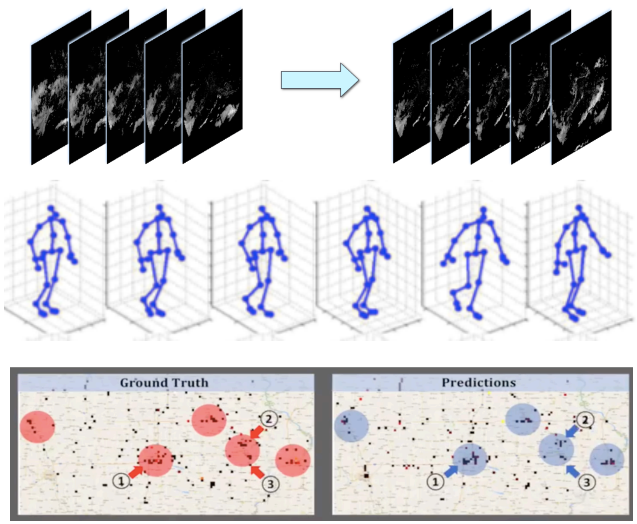
- There will be 3 awards for best 3 posters
- Please vote for your favorite poster
  - Paste a sticker on the poster

Lightning Talks

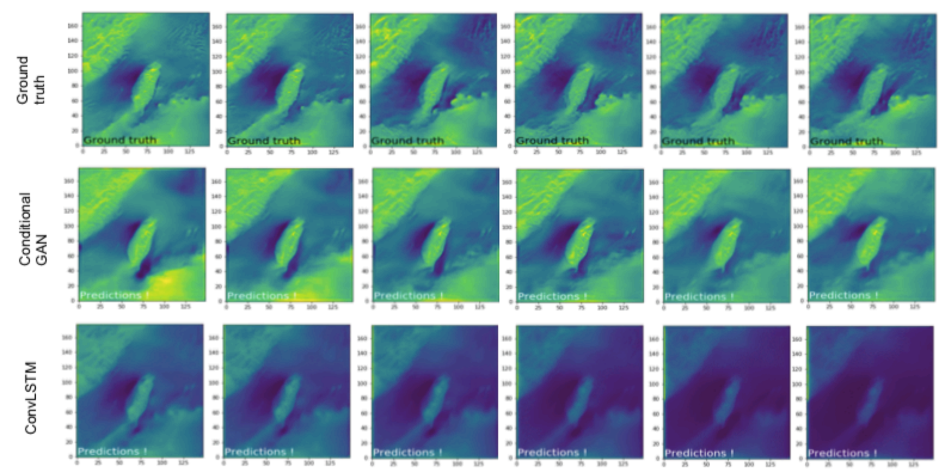
Wind Forecast Using Extension of Conditional Generative Adversarial Networks with Geospatial-temporal data

Chiao-Ning Chuang; Horng-Shing Lu; Wen-Yi Chang; Whey-Fone Tsai

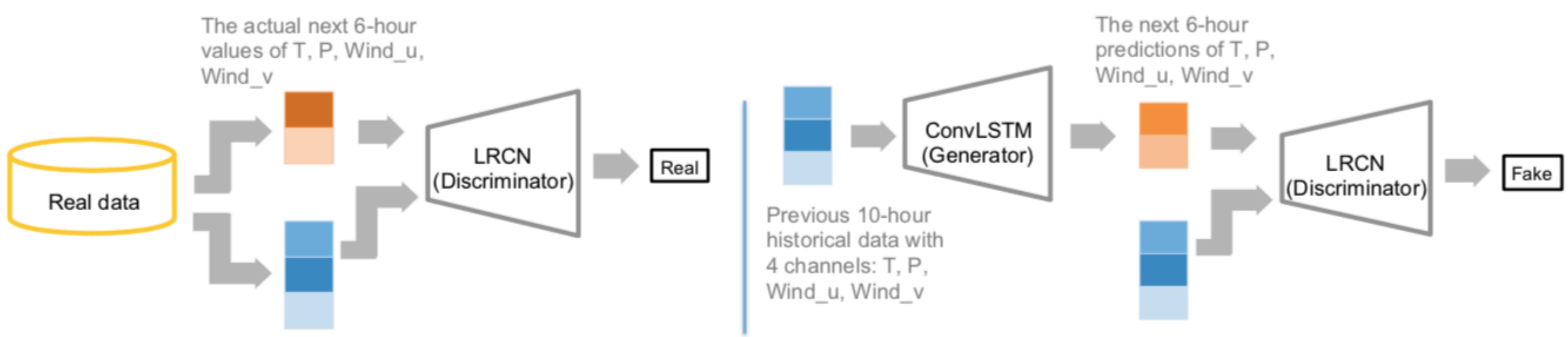
Common real-world spatial-temporal forecasting problems:



The results from top to bottom: ground truth frames; prediction by cGAN; prediction by ConvLSTM.



Our Conditional GAN model structure with ConvLSTM as the generator and LRCN as the discriminator



Wind Forecast using Conditional Generative Adversarial Networks with Geospatial data

Chiao-Ning Chuang, Wen-Yi Chang
and Whey-Fone Tsai

Prediction For Dengue Fever Using Hybrid Machine Learning

Henny Febriana Harumy, Chan Huah Yong and G.C Sodhy

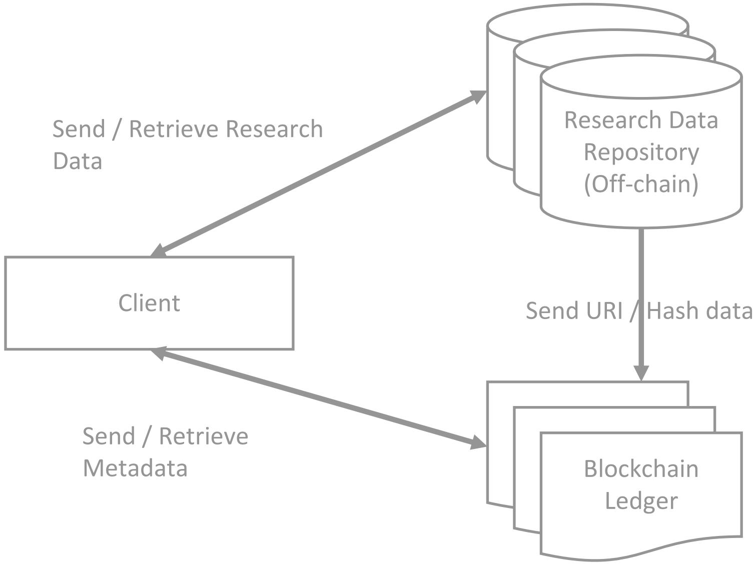
A study on the Blockchain-powered Research Data Repository with FAIR Principles

Yeongheon Song[*†], Minho Lee[*†]

[*] Research Data Sharing Center, Div. of National Science and Technology Data, Korea Institute of Science and Technology Information (KISTI)

[†] Dept. of Data and HPC Science, University of Science and Technology (UST)

- How we can ensure *integrity* of research project and *reproducibility* of research data?
- We propose a conceptual model for research data repository based on Hyperledger Fabric, a *permissioned* Blockchain solution.
- *Accessibility*
  - It can ensure that *metadata* is accessible in the repository, *despite the data is corrupted*.
  - The RESTful API involves user authentication procedures and it can be used to selectively provide information and to prevent unwanted information from being leaked.
- *Reusability*
  - Blockchain-based research can be used to track *data manipulation* and enable stakeholders to verify it.
  - If there is any data loss or corruption, researchers can figure out when it occurs.
  - The system also can provide data uploaders with trust, since each download is recorded in a Block with a timestamp.



<Figure 1> Basic Architecture of Proposed Solution

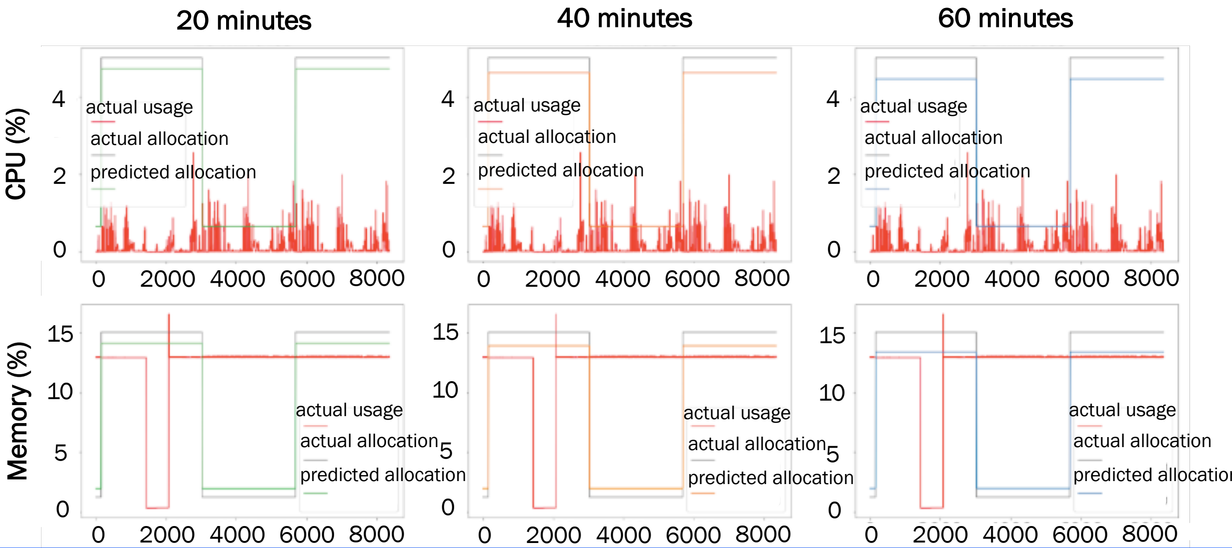
Towards Optimal Resource Utilization in Data Centers using Long Short-Term Memory

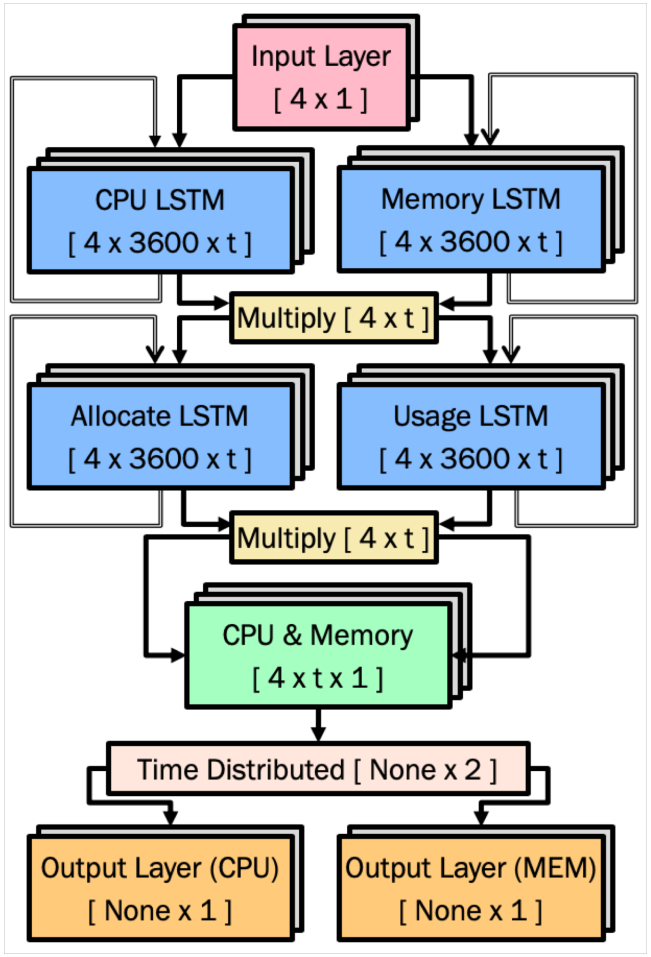
Kundjanasith Thonglek, Kohei Ichikawa, Keichi Takahashi, Chawanat Nakasan, Hajimu Iida

Laboratory for Software Design & Analysis

established in 2005

- **Goal**: Improve resource utilization in data centers
- **Methodology**:
  - Analyze Google's cluster usage dataset using PCA and select the important features
  - Design and implement DNN model based on LSTM to predict optimal resource allocation
- **Evaluation**:
  - Simulated resource usage and allocated resource
  - Improved resource utilization rate for 17.98%





DNN model based on LSTM to predict optimal resource allocation

Graduate School of Information Science, Nara Institute of Science and Technology

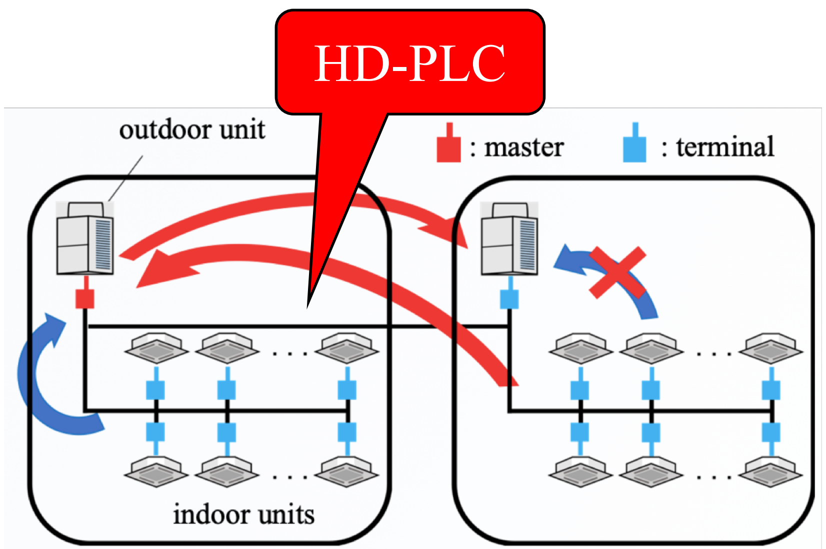
Performance Evaluation of IoT Protocols on HD-PLC

Miyagoshi Kazuki[1], Shimojo Shinji[2]
Graduate School of Information Science and Technology[1], Osaka University, Japan
Cybermedia Center[2], Osaka University, Japan

High Definition Power Line Communication (HD-PLC) : a technology that carries out high-speed communication using some existing lines like power lines.
Congestion frequently occurs in HD-PLC communication.
→ Improvement using the retransmission of
MQTT(Message Queuing Telemetry Transport)
or CoAP(Constrained Application Protocol).

Problem

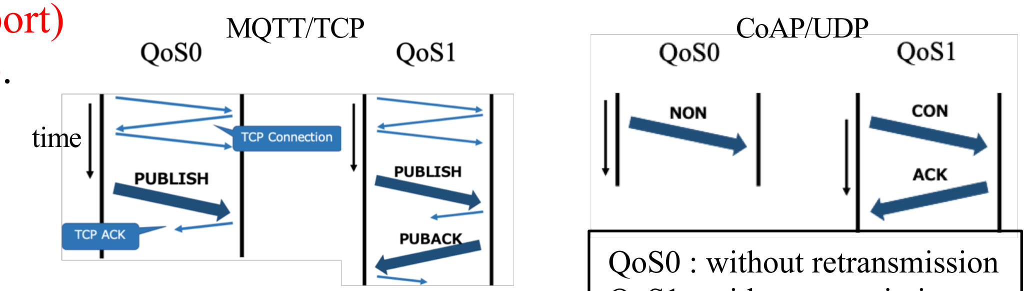
It is unclear how IoT protocol performs on HD-PLC



Direct communication with the master

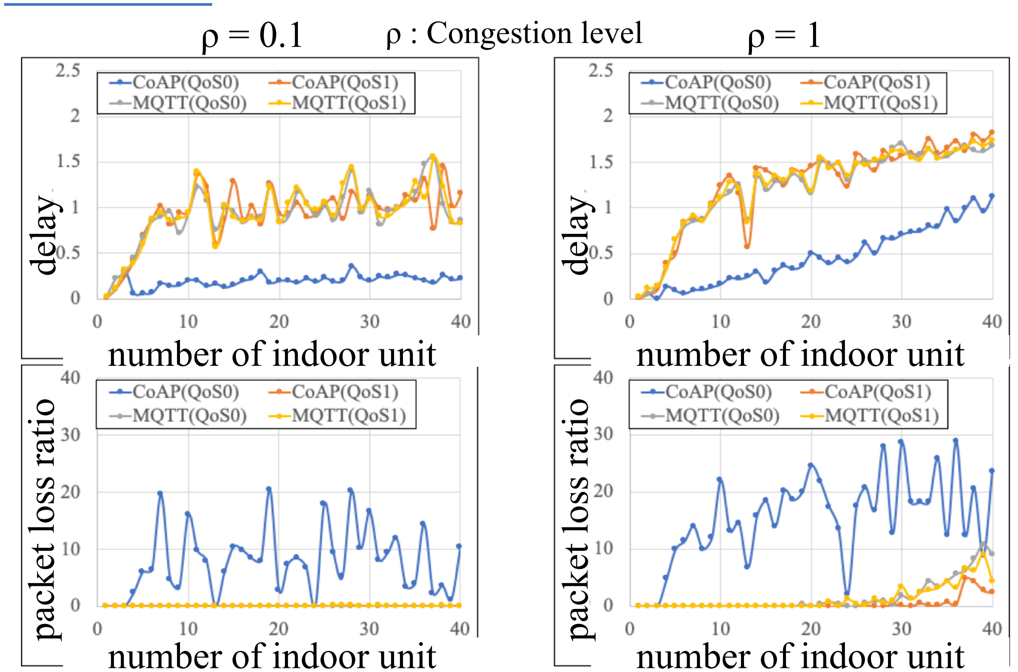
Communication via master

Approach



QoS0 : without retransmission
QoS1 : with retransmission

Evaluation



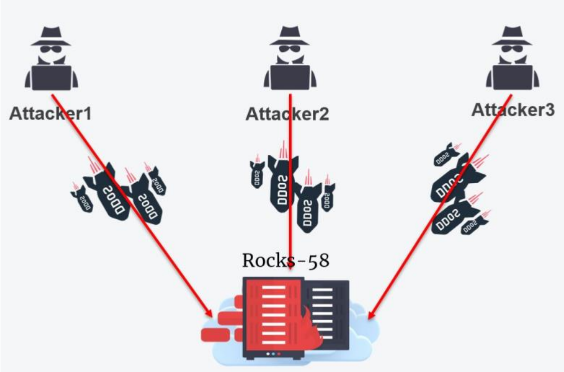
PRAGMA 36
April, 24-26 2019
Jeju, Korea

Security Test of Indonesian E-Health Community Cloud Model Test Bed on PRAGMA Cloud

Arie Surachman, Sri Chusri Haryanti, Ummi Azizah Rachmawati Sri Puji U.A., Rosini

Faculty of Information Technology, YARSI Univeristy, Indonesia

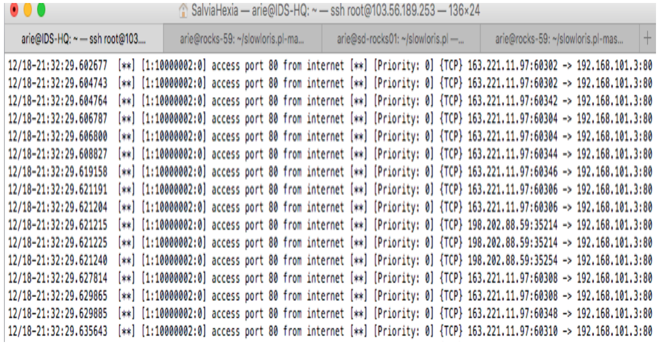
UNIVERSITAS YARSI



Scenario 1 DDoS Attack

Problem ?!

- How the topology works ?
- How Snort & netfilter IPtables do they works ?
- How the Results ?



```
SalviaHexia — arie@IDS-HQ: ~ — ssh root@103.56.189.253 — 136×24
arie@IDS-HQ: ~ — ssh root@103....   arie@rocks-59: ~/slowloris.pl-ma...   arie@sd-rocks01: ~/slowloris.pl —...   arie@rocks-59: ~/slowloris.pl-mas...
12/18-21:32:29.602677  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60302 -> 192.168.101.3:80
12/18-21:32:29.604743  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60302 -> 192.168.101.3:80
12/18-21:32:29.604764  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60342 -> 192.168.101.3:80
12/18-21:32:29.606787  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60304 -> 192.168.101.3:80
12/18-21:32:29.606800  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60304 -> 192.168.101.3:80
12/18-21:32:29.608827  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60344 -> 192.168.101.3:80
12/18-21:32:29.619158  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60346 -> 192.168.101.3:80
12/18-21:32:29.621191  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60306 -> 192.168.101.3:80
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12/18-21:32:29.621215  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:35214 -> 192.168.101.3:80
12/18-21:32:29.621225  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:35214 -> 192.168.101.3:80
12/18-21:32:29.621240  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:35254 -> 192.168.101.3:80
12/18-21:32:29.627814  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60308 -> 192.168.101.3:80
12/18-21:32:29.629865  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60308 -> 192.168.101.3:80
12/18-21:32:29.629885  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60348 -> 192.168.101.3:80
12/18-21:32:29.635643  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 163.221.11.97:60310 -> 192.168.101.3:80
```
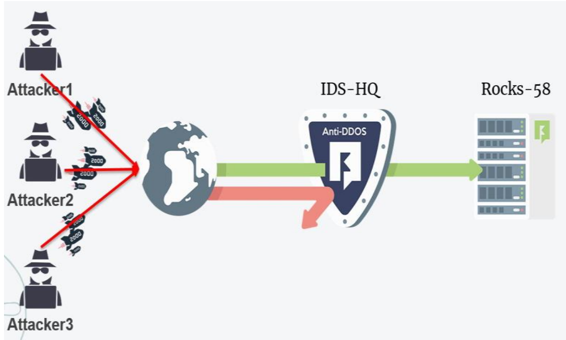
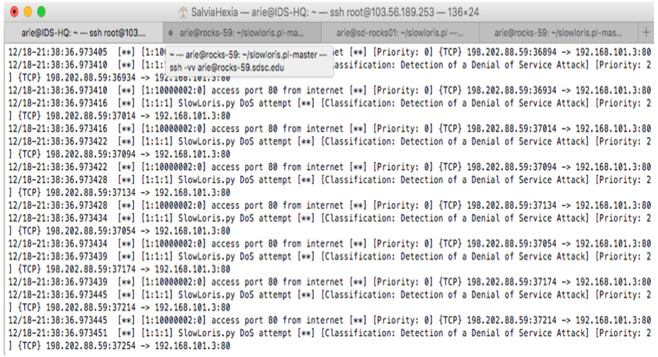



Scenario 2 DDoS Attack

Snort is very crucial for the cloud server



```
SalviaHexia — arie@IDS-HQ: ~ — ssh root@103.56.189.253 — 136×24
arie@IDS-HQ: ~ — ssh root@103....   arie@rocks-59: ~/slowloris.pl-ma...   arie@sd-rocks01: ~/slowloris.pl —...   arie@rocks-59: ~/slowloris.pl-mas...
12/18-21:38:36.973405  [**] [1:10 ~ — arie@rocks-59: ~/slowloris.pl-master — et [**] [Priority: 0] {TCP} 198.202.88.59:36894 -> 192.168.101.3:80
12/18-21:38:36.973410  [**] [1:1: ssh -vv arie@rocks-59.sdsc.edu assification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:36934 -> 192.
12/18-21:38:36.973410  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:36934 -> 192.168.101.3:80
12/18-21:38:36.973416  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37014 -> 192.168.101.3:80
12/18-21:38:36.973416  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37014 -> 192.168.101.3:80
12/18-21:38:36.973422  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37094 -> 192.168.101.3:80
12/18-21:38:36.973422  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37094 -> 192.168.101.3:80
12/18-21:38:36.973428  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37134 -> 192.168.101.3:80
12/18-21:38:36.973428  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37134 -> 192.168.101.3:80
12/18-21:38:36.973434  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37054 -> 192.168.101.3:80
12/18-21:38:36.973434  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37054 -> 192.168.101.3:80
12/18-21:38:36.973439  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37174 -> 192.168.101.3:80
12/18-21:38:36.973439  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37174 -> 192.168.101.3:80
12/18-21:38:36.973445  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37214 -> 192.168.101.3:80
12/18-21:38:36.973445  [**] [1:10000002:0] access port 80 from internet [**] [Priority: 0] {TCP} 198.202.88.59:37214 -> 192.168.101.3:80
12/18-21:38:36.973451  [**] [1:1:1] SlowLoris.py DoS attempt [**] [Classification: Detection of a Denial of Service Attack] [Priority: 2
] {TCP} 198.202.88.59:37254 -> 192.168.101.3:80
```

DIRECTORY OF JURISPRUDENCE (LAW INFORMATION RETRIEVAL SYSTEM)

Fathe Hibatulwafi and Wardiyono

Improving Application Migration in Dynamically Changing Network Using Load Balanced and Adaptive Parallel TCP

Wongsatorn Thongthaworn and
Prapaporn Rattanathamrong

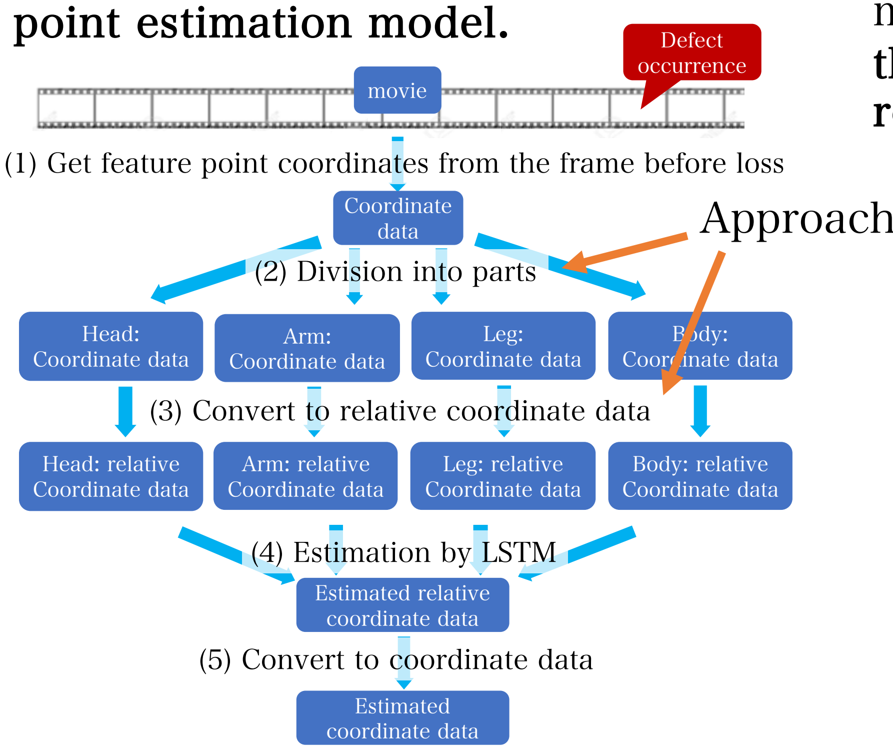
The Estimation of Missing Body Feature Points in Moving Images Using LSTM

Satoshi Yamanaka, Chonho Lee, Susumu Date, Shinji Shimojo

- **OpenPose** is OSS, able to extract body feature points in an image or moving images.
- There are cases where **the feature point extraction fails** because the body in moving images is shielded by objects or due to the image blurring.

Approach & Solution

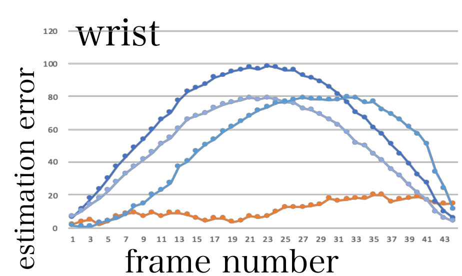
We propose **a LSTM-based feature point estimation model.**

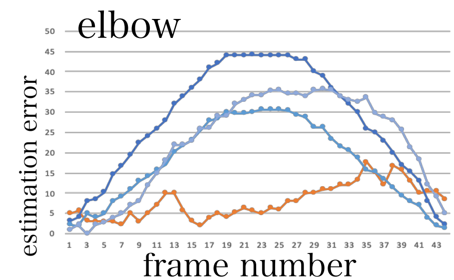


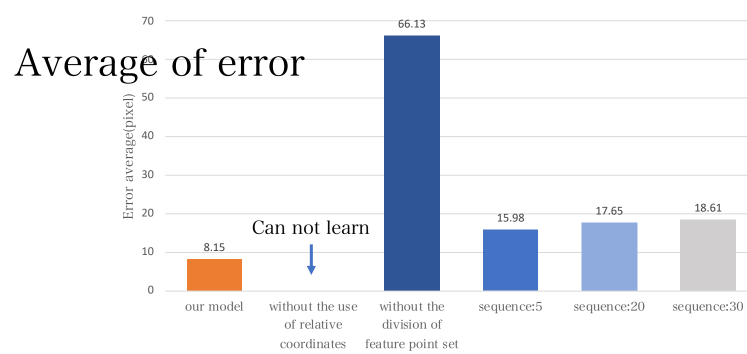
Evaluation

We evaluate the proposed model by estimating missing feature points in a walking video.

the proposed solution has a strong impact to reduce the estimation error.





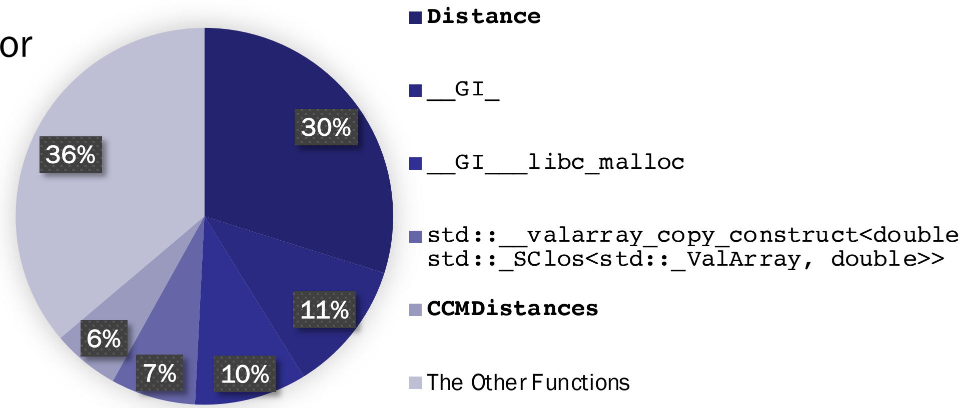


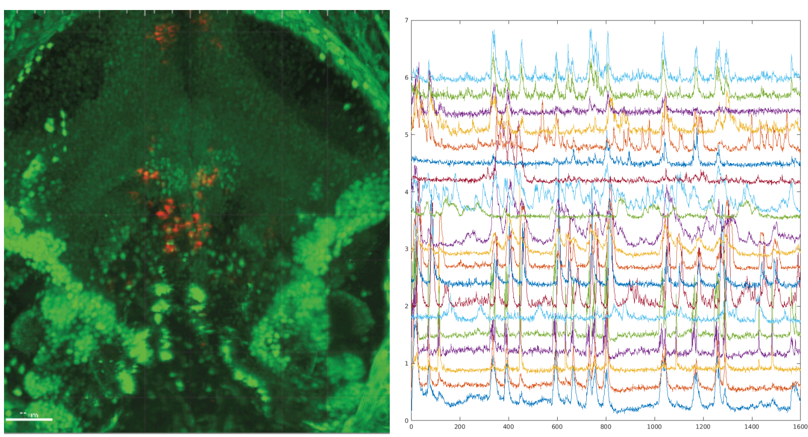
Calculation of Complete Zebrafish Brain Neural Activities on ABCI

Wassapon Watanakeesuntorn, Kohei Ichikawa, Keichi Takahashi, Jason Haga, Gerald Pao

- "Zebrafish Neural Activity Maps for Novel Neuromorphic Deep Learning Architectures" from UCSD
  - Collects and analyzes Zebrafish neural activity for use with Convergent Cross Mapping (CCM) from Empirical Dynamical Modeling (EDM)
  - Find the relationships within the neural activity network of the fish brain
  - Uses EDM library for CCM calculation on ABCI
- CUDA enabling and optimizing EDM library for ABCI

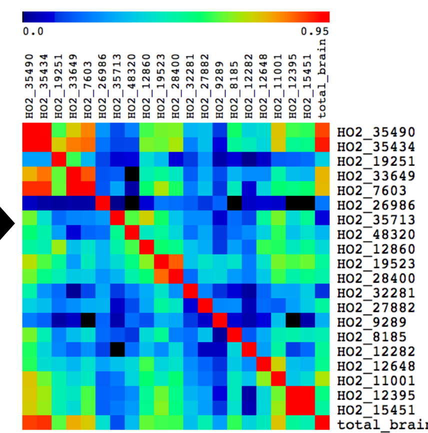
Breakdown of CPU Time (cppEDM)





Zebrafish Neural Activity
(Data size up to Petabytes)

Calculate CCM on ABCI



Causal Relationships
Determined by CCM

SLIDING WINDOWS AS DATA AUGMENTATION ON HISTOPATHOLOGY IMAGES FOR CNN TRAINISLIDING WINDOWS AS DATA AUGMENTATION ON HISTOPATHOLOGY IMAGES FOR CNN TRAINING

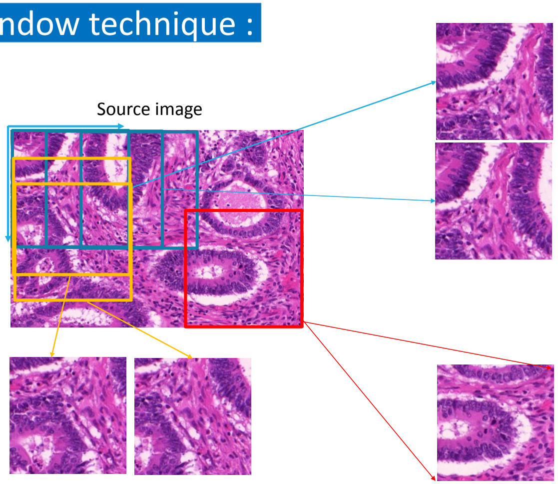
Toto Haryanto[a], Aniati Murni[a], Kusmardi Kusmardi[b], Heru Suhartanto[a]
email : toto.haryanto@ui.ac.id, aniati@cs.ui.ac.id, kusmardi.ms@ui.ac.id, heru@cs.ui.ac.id

[a]Faculty of Computer Science, Universitas Indonesia, Depok, 16424, West Java, Indonesia, [b]Faculty of Medicine, Universitas Indonesia, Depok, 16424, West Java, Indonesia.

Motivation

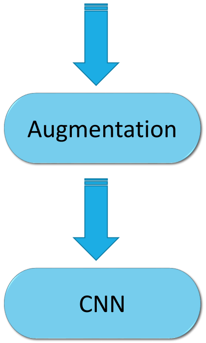
- ❖ (CNN) requires large amounts of data for the learning process. On the other hand,
- ❖ The availability of medical data is one of the issues especially for the training process using CNN.
- ❖ This study will apply sliding windows to obtain data sub-samples on histopathological images.
- ❖ A total of 83 original data with dimensions of 775x522 were used in this study.

Sliding window technique :

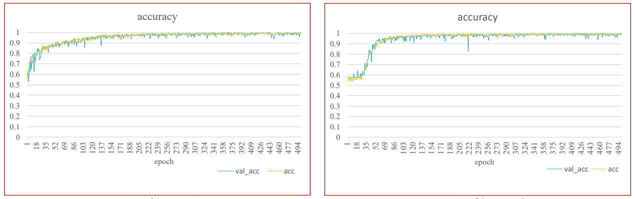


Result : 224 x 2224

- ❖ 3898 training images
- ❖ 1702 validation images

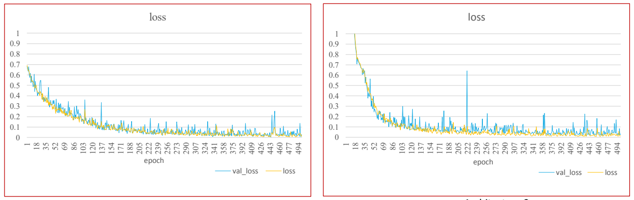


.:: Graphics of accuracy ::.



Architecture 1 Architecture 2

.:: Graphics of loss ::.



Architecture 1 Architecture 2

Conclusion

- ❖ Sliding windows can be implemented to produce histopathology dataset required for CNN

Geographical Information Extraction from Social Media for Automated Urban Event Mapping

Manassanan Boonnavasin and
Prapaporn Rattanatamrong

PACIFIC RIM APPLICATIONS AND GRID MIDDLEWARE ASSEMBLY
PRAGMA

The Study of Applying Edge Computing to Music Recognition

Suchanat Mangkhangjaroen and
Prapaporn Rattanatamrong

PACIFIC RIM APPLICATIONS AND GRID MIDDLEWARE ASSEMBLY
PRAGMA

E-RPID: Enhanced Robust Persistent Identification of Data

Yu Luo, Beth Plale and Rob Quick

PACIFIC RIM APPLICATIONS AND GRID MIDDLEWARE ASSEMBLY

PRAGMA

PID based routing in Named Data Networking

Jeremy Musser, Yu Luo, Martin Swany and Beth Plale

IoT Based : Agricultural Care System for Farmer

-

Arduino electric
faucet

UNIVERSITAS YARSI

Submission 28: Integration of non-compartmental analysis and biological equivalence test using EDISON Science Apps

Table 1. An example of the concentration-time data used for EDISON Apps.

SUBJ	GRP	PRD	TRT	nTIME	TIME	CONC
1	RT	1	R	0	0	0
1	RT	1	R	0.25	0.26	511.3
1	RT	1	R	0.5	0.46	678.79
1	RT	1	R	...	...	...
1	RT	2	T	0	0	0
1	RT	2	T	0.25	0.25	487.62
1	RT	2	T	0.5	0.48	769.6
...	...	...	...	...	...	...
5	TR	1	T	0	0	0
5	TR	1	T	0.25	0.23	382.79
5	TR	1	T	0.5	0.45	477.03
5	TR	1	T	...	...	...
5	TR	2	R	0	0	0
5	TR	2	R	0.25	0.28	596.98
5	TR	2	R	0.5	0.47	832.76
5	TR	2	R	...	...	...
...	...	...	...	...	...	...

Table 2. The raw pharmacokinetic data calculated by NonCompartEdison App

SUBJ	GRP	PRD	TRT	AUClast	Cmax	Tmax
1	RT	1	R	5018.927	1043.13	1.04
1	RT	2	T	6737.507	894.21	1.03
2	TR	1	T	4373.97	447.26	1.01
2	TR	2	R	6164.276	783.92	1.98
4	TR	1	T	5592.993	824.42	1.97
4	TR	2	R	5958.16	646.31	0.97
5	TR	1	T	3902.59	803.7	0.8
5	TR	2	R	4620.156	955.3	0.74

Table 3. Comparison of 90% confidence interval for the ratio of the geometric means

(A)

Analysis	Lower Limit	Point Estimate	Upper Limit
EDISON Science App	0.88944	0.95408	1.02341
SAS: PROC GLM	0.88944	0.95408	1.02341
SAS: PROC MIXED	0.88944	0.95408	1.02341

(B)

Analysis	Lower Limit	Point Estimate	Upper Limit
EDISON Science App	0.90136	0.97984	1.06515
SAS: PROC GLM	0.90136	0.97984	1.06515
SAS: PROC MIXED	0.90136	0.97984	1.06515

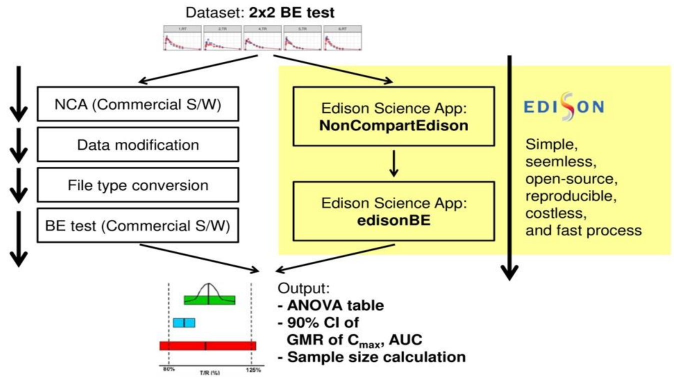


Figure 1. Comparison between a traditional analysis process (left boxes) and the proposed process (right boxes) using EDISON Science Apps.

The use of various media in health literacy for health information dissemination to the Indonesian society: A quantitative research study

Rosini Rosini, Wardiyono, Syauqi Arahman, Santria Darlis, Sindy Safitri and Yulinda

PACIFIC RIM APPLICATIONS AND GRID MIDDLEWARE ASSEMBLY
PRAGMA

Wsn System For Monitoring And Automatication Urban Farming Based On Android

Mochamad Radika and Ahmad Sabiq

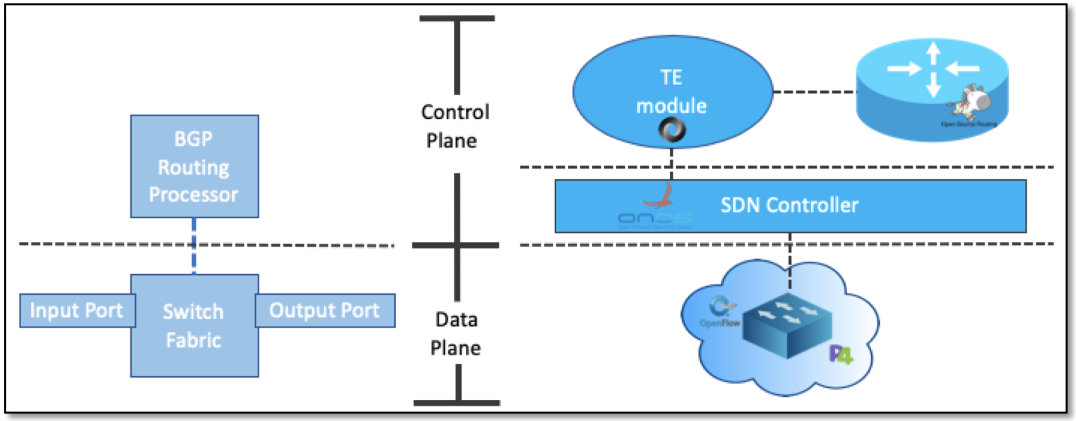
Architecture of Traffic Engineering module for reconfigurable data-plane routers

Sebastian Aguirre

Objective

Route inter-domain traffic considering application layer information and BGP routing policies, by introducing SDN elements into the routing model of Transit Networks.

- Architecture Overview
- Traffic Engineering module
  - Organization
- Work in Progress



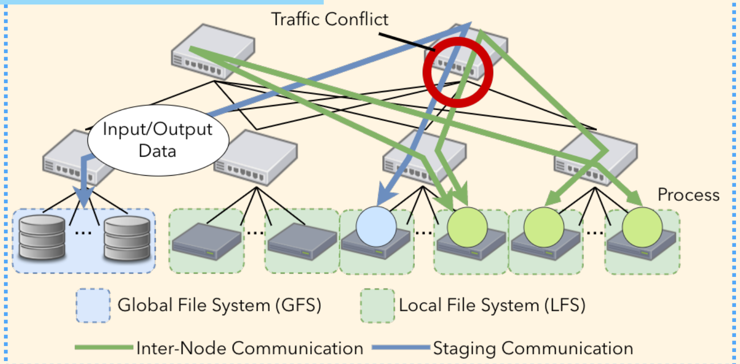
Evaluation of SDN-based Conflict Avoidance between Inter-Node Communication and Staging Communication based on Packet Monitoring

Arata Endo, Chunghan Lee, Susumu Date, Yasuhiro Watashiba, Yoshiyuki Kido, Shinji Shimojo

Background: Accelerating the staging execution is important for the throughput of high-performance computing systems.

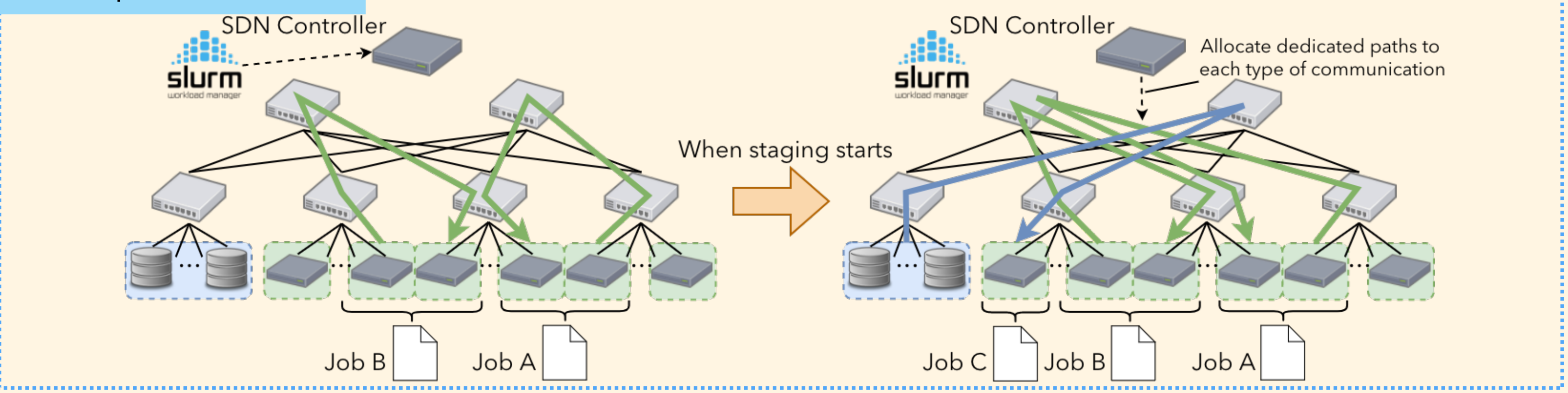
Research Focus: The traffic conflict between inter-node communication and staging may decrease the communication performance.

The Traffic Conflict



Goal: To investigate how the traffic conflict affects the communication performance and alleviate the effect by using the programmability of SDN.

Our Proposed Method



Evaluation: We are building an experiment environment and plan to conduct a packet monitoring experiment.

Administrative Interface

PRAGMA Cloud Scheduler

Hyojeong Kang (Chungnam Nat'l Univ.)

INTRODUCTION & OBJECTIVES

Improve the following issues related to site and resource management in the cloud scheduler
First, resource administrators should be able to modify the resource attributes for their resources
Second, resource administrators should be able to add a new resource as well

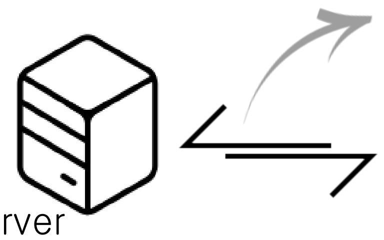
RESULTS & CONCLUSIONS

Language & Program : HTML, JAVA SCRIPT, SASS, REACT, PYTHON, MYSQL

1. Worked on the Create Resource Form to modify a resource and maintain each resource.
2. Users are classified into three categories. The user has limited access to each area. The subdivisions are admin, resource-admin and user. The focus is on resource-admin.
3. Resource-admin has more access to resources than users, but is more restrictive than admin. To satisfy this condition, the resource-admin can not modify or delete the resource except the resource created by the resource-admin
4. Additionally, in order to restrict the creation of resources, ordinary users can't access the resource creation form

PRAGMA Cloud Testbed: Data Storage Monitoring and Visualization

Hajeong Cho (Chungnam National University)



TCP log data created in real-time

too many!

to process, visualize, and monitor ...etc

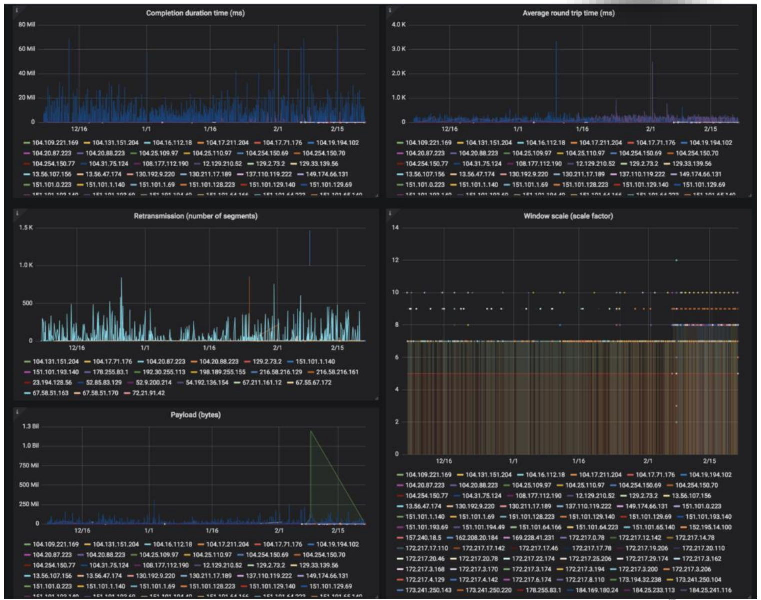
"EFFICIENCY" required

What's the goal in this project?

- Reduce the process time including preprocessing and data insertion
- Visualize a data-source in a better way

Conclusions

- This program inserts data into the influx DB at multiple points.
- This program exports data without converting the types unlike before.
- Dashboard visualized shows the network status information group by IP address.



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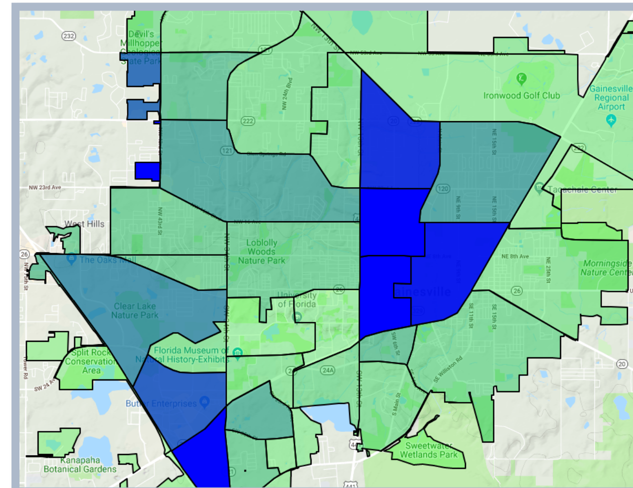
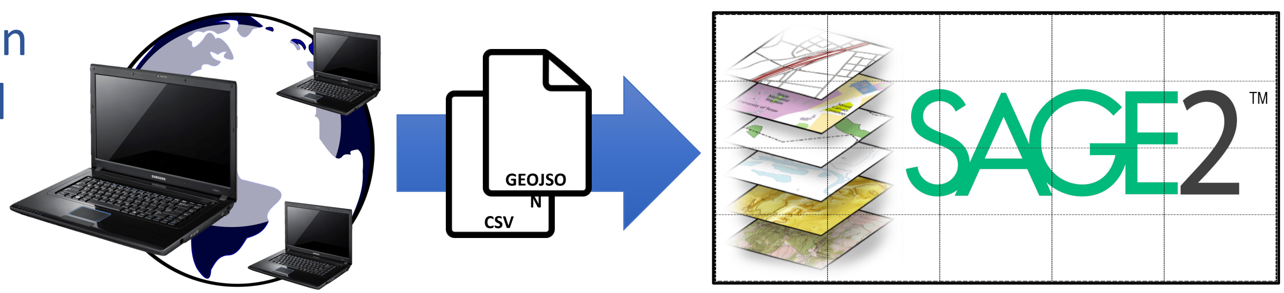
ADVANCED COMPUTING & INFORMATION SYSTEMS

Visualizer for Data-centric Modeling of Gainesville Businesses

Michael Elliott, Parth Patel, José A. B. Fortes



- **What is it?**
  - A decision support system that operates on datasets of geographic data
  - Built on the SAGE2 platform
- **What does it do?**
  - Layers geographic information on a map
  - Visualizes relationships across data
  - Multiple users can upload their own data to a shared display wall



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We are from YARSI University with poster ID 50

3D-Model Reconstruction Using Photogrammetry Technique

Muhamad Nuh, Muhammad Reza Aditya, Novian Gilang Bujana, Nova Eka Diana, Nurmaya and Ummi Azizah Rachmawati

PACIFIC RIM APPLICATIONS AND GRID MIDDLEWARE ASSEMBLY
PRAGMA

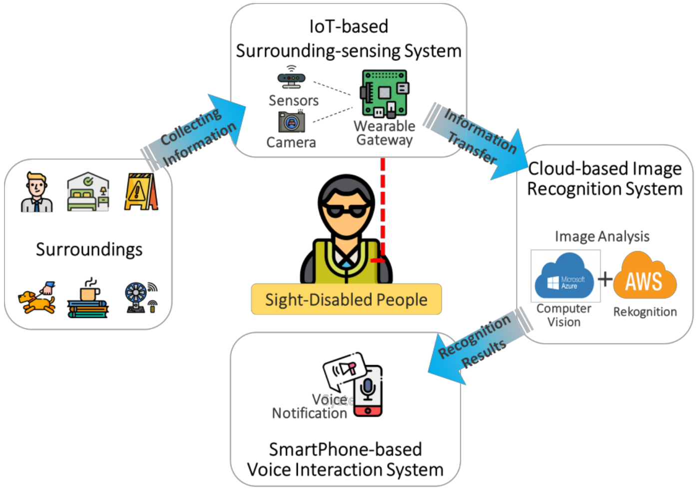

UNIVERSITAS
YARSI
PRAGMA
Hallo my name is Muhammad Reza Aditya, i am from Universitas YARSI INDONESIA


Good day PRAGMA

Show Me the World (SMW) :
An Intelligent Cloud of Things System for Sight-Disabled People

Eunsol Lee, Zheng Lan, Li Taijin, HanKyul Kim, Karpjoo Jeong
Konkuk University Smart Infrastructure Lab

- For their living and safety, sight-disabled people also need to know or understand their surroundings in the world.
- We develop an intelligent cloud of things system to provide information about their surroundings.
- SMW uses IoT sensing devices to obtain information about the user's surroundings. SMW also employs a wearable gateway to manage those devices.
- SMW supports cloud-based image analysis tools to recognize other people approaching the user and to detect the existence of objects and spaces.

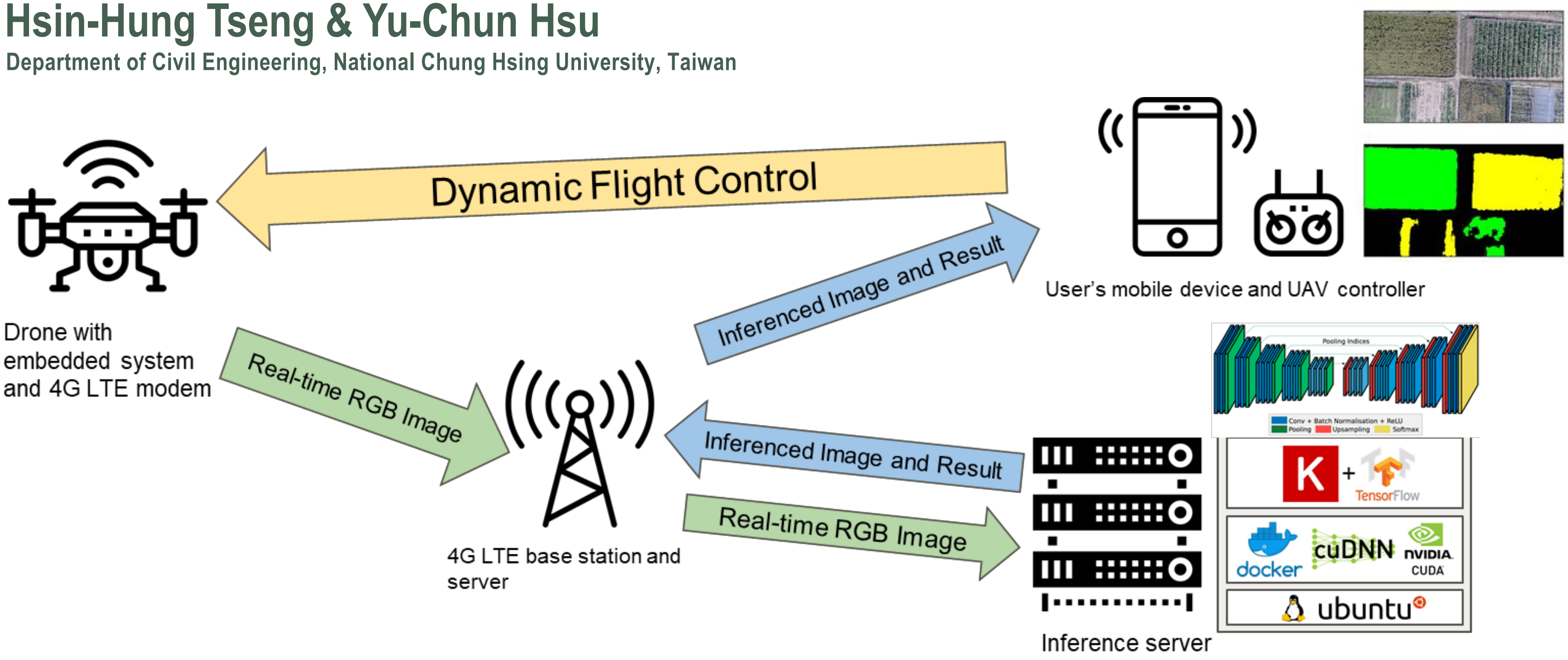


< System Structure >

Enabling Smart Agriculture Applications with Edge Computing and Deep Learning

Hsin-Hung Tseng & Yu-Chun Hsu

Department of Civil Engineering, National Chung Hsing University, Taiwan



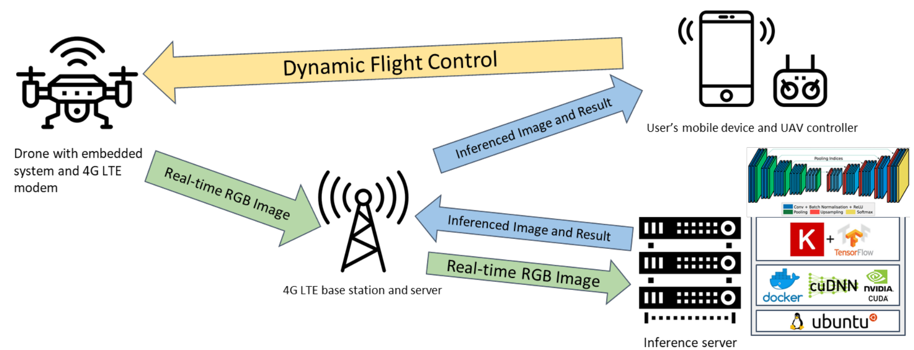
New data access model addressing trust among stakeholders

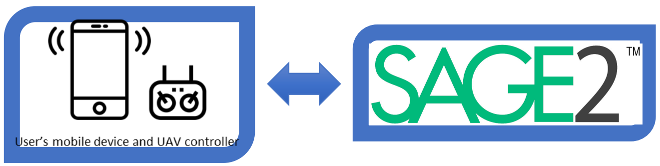
Courtney Hill and Tho Nguyen

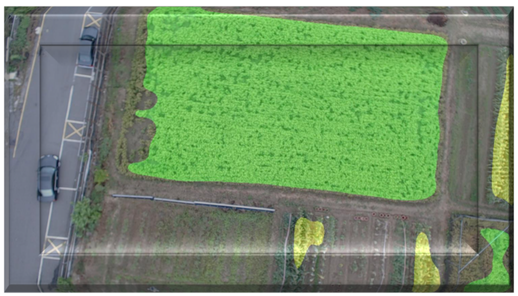
SAGE2 Component for AUAV Applications for Smart Agriculture

Michael Elliott[1], Parth Patel[1], Ming-Der Yang[2], Hui Ping Tsai[2], Cloud Tseng[2], Yu-Chun Hsu[2], and Christopher Stewart[3], José A. B. Fortes[1]
1 University of Florida, USA; 2 National Chung Hsing University, Taiwan; 3 Ohio State University, USA

- Extends the "AUAV Applications for Smart Agriculture" project by the IDCSA lab at NCHU
- Replaces the mobile device component with a remotely-accessible alternative built on SAGE2
- The application visualizes raw and inferenced image streams sent from an aerial drone.
- The application also includes a GUI for plotting a flight path and displays logistics and controls for the drone itself.
- Use Case:
    - An operator could use the SAGE2 application to monitor multiple smart agricultural UAVs.







ADVANCED COMPUTING & INFORMATION SYSTEMS

UNIVERSITY of FLORIDA

Thanks to

- All of the PRAGMA Student members
  - Who join the student workshop and gave presentation of their own work

- All of the PRAGMA Senior members
  - Who cares students, support students' research and be a good model for students