

Student Awards

Wassapon Watanakeesuntorn, Kundjanasith Thonglek

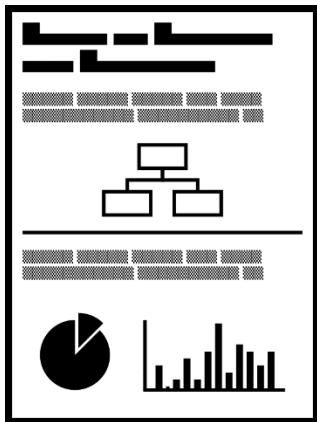
on behalf of the PRAGMA Students Committee

The 36th PRAGMA Students Session, Jeju, South Korea

Apr. 26th 2019



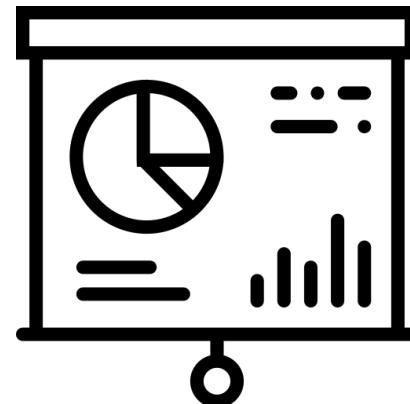
Student Activity Overview @ PRAGMA36



Poster
(44 Posters)



Lightning Talks
(32 Presenters)



Presentation
(9 Presenters)

Student Presentation Session



Best Student Presentation



Honorable Mention

IoT-based Agricultural Care System
for Farmers

Novian Gilang Bujana



3rd Place

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

Kundjanasith Thonglek



2nd Place

Enabling Smart Agriculture Applications with Edge Computing and Deep Learning

Hsin-Hung Tseng



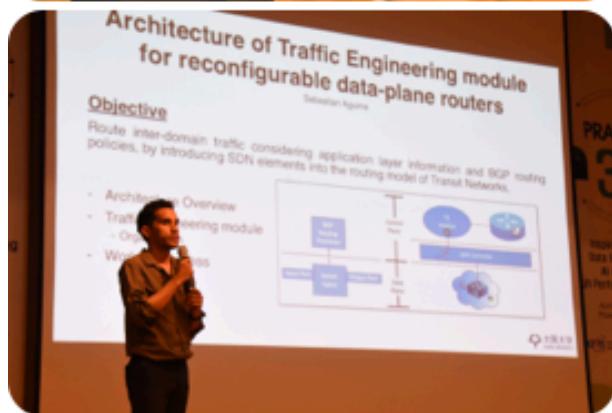
1st Place

Architecture of Traffic Engineering Module for Reconfigurable Data- Plane Routers

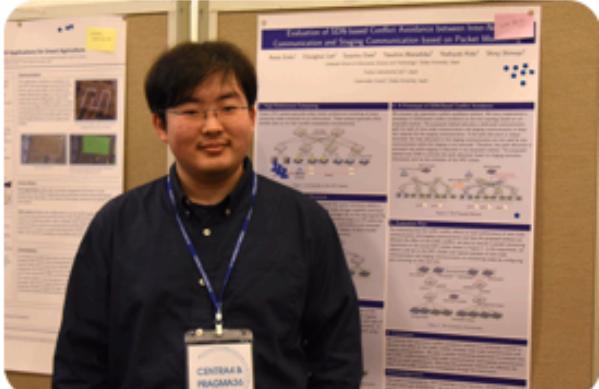
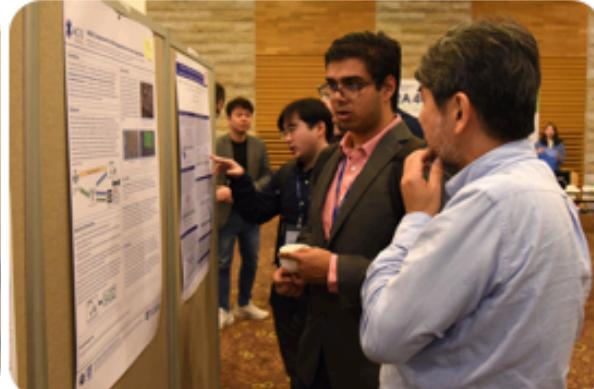
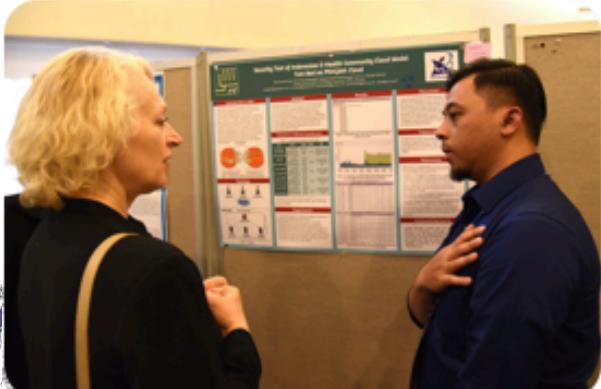
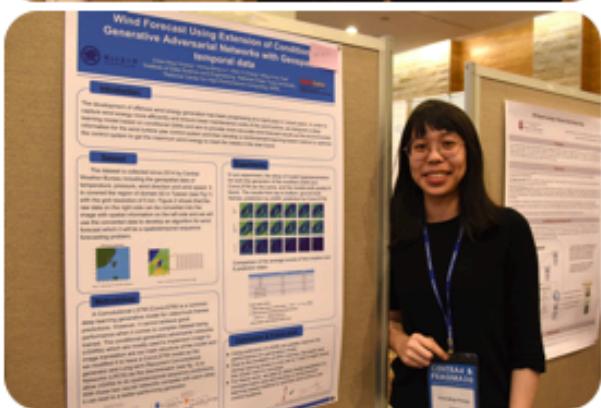
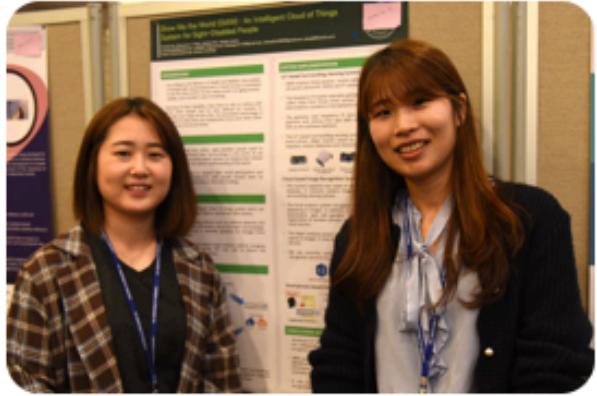
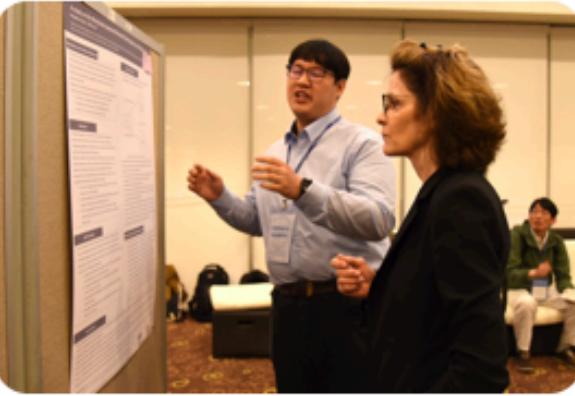
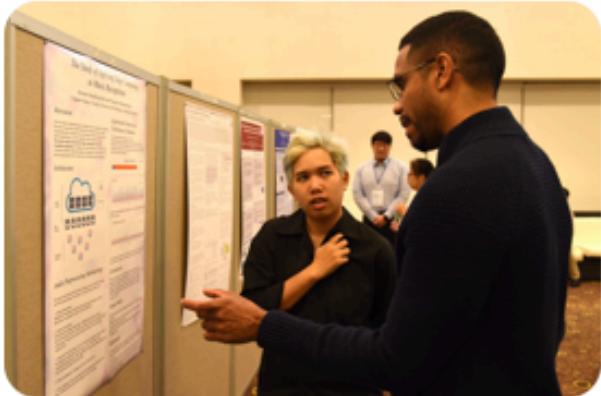
Juan Sebastian Aguirre



Lightning Talks Session



Poster Session



Best Poster



3rd Place

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)

Introduction and Problem Statement

- The need for preserving research data has been exponentially increased due to rapid increase in a computation capacity and open science policy.
- Open science itself is not a new concept, but ensuring the reproducibility of scientific data and improving availability is got more importance in the concept of open data.
- Transparency of scientific research also need to be ensured by registering all of research procedures because of the problem of research integrity.
 - Intentional or accidental corruption of research data
 - P-hacking: Removal of outliers / Clustering groups after experiments, Set hypothesis after result analysis

Blockchain

- As its name suggests, the data structure of Blockchain composed of a previous hash of the block and transaction data. Because hashes are calculated sequentially, if transaction data is compromised, the entire hash value after that block must be recalculated.
- Blockchain solutions are formed in type of public, private and consortium.
- Scientific blockchain solutions usually consist of public blockchain. (i.e., To promote the sharing of research data and exchange it with tokens)
- However, the use of public Blockchain and cryptocurrency could increase uncertainty and degrade the stability of the system.
 - The price of cryptocurrency is highly variable and the value of the token can be easily changed.
 - Consensus algorithms such as PoW(Proof of Work) requires a large number of calculation and profligate resources.
 - From the perspective of data privacy, smart contract in public network may leak researcher's personal information or unverified research data.

FAIR Principles

- As the volume of research data grows exponentially, data provider must ensure integrity and quality and promote the usability of research data.
- The FAIR guiding principles were established to remove the barriers to discovery and reuse and improve utilization of research data. FAIR principles consist of the following components.
 - Findable:** (Meta)data are assigned with a UID (Unique Identifier) and registered in a searchable resource.
 - Accessible:** (Meta)data are retrievable using a standardized communication protocol.
 - Interoperable:** (Meta)data use formal vocabularies which meet FAIR Principles.
 - Reusable:** (Meta)data are richly described with accurate and relevant attributes.

Conclusions

- We purposed a research data repository model based on a permissioned Blockchain platform, which helps scientists deal with research misconduct because it is transparent in transactions.
- However, There can be a single point of failure if the storage for research data is configured as only a single node. Therefore, Multi-node based models such as HDPS and Swarm or Blockchain-based storage models such as Ethereum Swarm are needed.
- Smart Contract and MSP in the Blockchain ledger also can be used to set data permissions for repository users. This allows data to be shared among researchers and it can be given to external reviewers for peer review purposes.
- This is a initial proof-of-concept model and we expect future studies would provide a detailed implementation of research data provenance and sustainability for long-term preservation through data quality control, peer management, and storage security systems.

Acknowledgments: This work formed part of research project carried out at the Korea Institute of Science and Technology Information (KISTI). [N-13-001-004-002 Construction of Research Data Open Platform and Its Utilization Support]

PRAGMA (Practical Application and Grid Middleware Assembly) 36 Workshop, Jeju, South Korea, April 24-27, 2019

KISTI
Korea Institute of Science and Technology Information
과학기술정보통신부
KISTI
Korea Institute of Science and Technology Information
과학기술정보통신부

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

Yeongheon Song
Minho Lee

2nd Place

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
eunsolLee04@gmail.com, lan820911@gmail.com, teetaegeum123@gmail.com, alwayskim9305@gmail.com, jeongk@konkuk.ac.kr
Smart Infrastructure Lab, Konkuk University

BACKGROUND

- According to the Ministry of Health and Welfare, the number of people with visual impairment in South Korea is estimated to be 252,794 in 2018. As the nation enters an aging society rapidly, such number is also increasing.
- Because of their disability, they have to rely on various aids from other people, but it's very difficult for humans to provide such help all the time. So automated technology is required to help them live independent lives even when other people are not around them.

OBJECTIVE

- For their living and safety, sight-disabled people need to know or understand their surroundings in the world. So we develop a surrounding-aware system to extend their limited vision ability for the better understanding of the world.
- This system aims to expand their social participation and strengthen communication with people around them by providing information about their surroundings.

APPROACH

- We propose an intelligent cloud of things system which can recognize surrounding objects, spaces and their events.
- SMW uses IoT sensing devices such as a motion detector and a camera to obtain information about the user's surroundings. SMW also employs a wearable gateway to manage those sensing 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 DESIGN

The diagram illustrates the SMW System Structure. It shows three main components: 1. IoT-based Surrounding-sensing System (containing a Wearable Camera and a Wearable Gateway), which feeds into the Cloud-based Image Recognition System. 2. Cloud-based Image Recognition System (containing Image Analysis, Computer Vision, and AWS Rekognition), which provides a Notification to the Sight-disabled Person. 3. Smartphone-based Voice Interaction System (containing a Request/Response interface and Application Interface), which also provides a Notification to the Sight-disabled Person. A central figure of a sight-disabled person receives notifications from both systems.

CONCLUSION AND FUTURE WORK

- Advanced ICT technologies can help sight-disabled people to live independent and safe living. Those technologies can recognize persons and identify objects in surroundings.
- SMW uses advanced IoT, cloud and AI technologies for object identification and facial recognition. It provides such information for sight-disabled people through the smartphone-based voice interaction system.
- In the future, SMW will be extended to support text recognition for the enhanced understanding of the world.

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

Eunsol Lee
Lan Zheng
Taijin Li
Hangeul Kim
Karpjoo Jeong

1st Place



The poster is titled "IoT Based : Agricultural Care System for Farmers". It features logos for Universitas Yarsi and Institut Agama Islam Negeri (IAIN) Syekh Nurjati Cirebon. The title is at the top left, with a pink sticky note reading "Poster file 24" to its right. Below the title is a decorative graphic of blue dots and green leaves.

BACKGROUND: Indonesia is an agricultural country where the majority of the population works as farmers. In 2010 until 2017 the number of farmers in Indonesia has decreased by 1.1% annually. The decreasing number of farmers has an impact on rice imports which are getting higher, and the price of rice has increased every year. In 2018 the increase in rice prices on the market was around 3%.

RESEARCH PURPOSES: Developing this system to help farmers monitor agriculture, care for agriculture, implement and develop agriculture by utilizing an Android smartphone.

WORK PROCESS: A flowchart showing the research process: START, Identify the research object, Identification of problems, Determine the research purposes, Study of literature, Data collection, Implementing of the system in accordance with the research purposes, Testing, Software development, Hardware design, and END. A decision diamond asks if the system is successful; if NO, it loops back to the start. If YES, it moves to the next step.

METHODOLOGY: A flowchart showing the methodology steps: START, Identify the research object, Identification of problems, Determine the research purposes, Study of literature, Data collection, Implementing of the system in accordance with the research purposes, Testing, Software development, Hardware design, and END. A decision diamond asks if the system is successful; if NO, it loops back to the start. If YES, it moves to the next step.

DEVELOPMENT AND PROGRESS: This section is under development. It mentions progress achieved, such as an electric faucet control feature used to water plants in the form of water or pesticides using an android smartphone, and the ability to know soil moisture integrated with an android smartphone. Future plans include developing temperature features in the agricultural area and plant reports every hour sent to the app.

INTERFACE: Displays several screenshots of the mobile application interface, including screens for soil moisture monitoring, crop management, and weather information.

PUBLICATIONS AND AWARDS: Shows a small logo for PRAGA and a circular seal for "PAPUA INNOVATION AWARDS".

IoT-based Agricultural Care for Farmers

Novian Gilang Bujana
Mochamad Radika, Jagat Prayogo
Eresha Tirtan, Chairul Anwar
Siti Sarah, Nurul Amalia
Inda Dwi Lestantri, Ahmad Sabiq

Thank You

See you at PRAGMA37

