

**Report for ISRS2024**  
The 29<sup>th</sup> International Symposium on Remote Sensing  
at  
**National Chung Hsing University,**  
**Taichung, Taiwan**

**24-26 April 2024**

**Edited**  
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Supported by

One Health One World (OHOW),  
Institute of Industrial Science, The University of Tokyo, Japan  
SpringGX and JAXA



# Report for ISRS2024

## Schedule

Table 1. The schedule of the ISRS2024 conference.

Date	Activities	Venue
2024/4/23 (Tuesday)	Move from Japan (Narita) to Taichung	
2024/4/24 (Wednesday)	ISRS2024 (Day 1)	National Chung Hsing University
2024/4/25 (Thursday)	ISRS2024 (Day 2)	National Chung Hsing University
2024/4/26 (Friday)	ISRS2024 (Day 3)	National Chung Hsing University
2024/4/27 (Saturday)	Move from Taichung to Taipei. Visit Taipei 101 and the wind-damper system. Flight from Taipei to Japan.	

## Participants

Table 2. The list of participants from Takeuchi lab.

Name	Grade/ Position	Affiliation	Role
Wataru Takeuchi	Professor	Takeuchi lab, IIS	Committee member of the conference, and Presenter
Eiko Yoshimoto	Staff	Takeuchi lab, IIS	Booth manager
Khin Myat Kyaw	Assistant professor	Takeuchi lab, IIS	Presenter
Xuan Truong Trinh	Project Researcher	Takeuchi lab, IIS	Presenter
Yu Yang	D3	Takeuchi lab, IIS	Author of the manuscript
Shoki Shimada	D3	Takeuchi lab, IIS	Presenter
Chihiro Naito	D2	Takeuchi lab, RCAST	Presenter

## 1. ISRS2024 (4/24, 4/25, and 4/26)

- Overview

There are 106 oral presentations (including 56 student competitions), and 45 poster presentations focusing on the various remote sensing applications. Each oral presentation is composed of 12 minutes speaking, and 3 minutes Q&A.

On the first day, there were three keynote speeches about (1) “Overview of Earth Remote Sensing Development of Taiwan Space Agency”, (2) “From YOLOv4 to YOLOv7”, and (3) “Past, Present and future of Geostationary Ocean Color Imager” from distinguished researchers in the Taiwanese remote sensing community.

A Young-scholar night event was held on the second day where the communications amongst students from various universities and countries were facilitated through collaborative works to answer questions about the topics in Taiwan.

On the third day, the closing ceremony and awards for student competitions were held. Naito-san (D2), and Shimada-san (D3) received “Excellent student paper award”, and “Outstanding student paper award”, respectively. Through the conference program, “One-Health-One-World (OHOW)” booth was prepared to showcase the research activities, and many people were interested in.

- Observation, Discussion, Comments

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Topic	Name	Observation Discussion/Comments
Presentation sessions	Shimada	<p>The presentation topics were quite diverse focusing on the remote sensing data cal/val, new-method development, and machine learning applications. The range of target variables to be analyzed was also large. Presentation slides were all well prepared. I couldn't get questions from the audience, but the chairperson asked me questions "Why are the target sites so scattered?", and "What is the effect of atmospheric correction parameters acquired by AERONET?". I think that those are very important questions in terms of the applicability and reliability of my research about the hyper-spectral based solar PV classifications. My response to the first question was that "Currently non-c-Si PVs are in limited use, so we needed to look for a large area in Japan". The second question was answered as "It is very much possible that the distance between the AERONET site and the HISUI image locations affects the atmospheric correction, so it should be improved by using other satellite based atmosphere measurement outputs".</p>
Young scholar night	Shimada	<p>The young-scholar night was a very enjoyable event, where we interacted with the students from Taiwanese universities. They helped us answer questions about the quiz having topics in Taiwanese society. We also talked about the current research topics.</p>
My presentation - Q&A	Truong	<p>Conference Poster Presentation: Queries and Suggestions for Future Work Poster Queries and Future Work Suggestions</p> <p>The poster presentation prompted several questions aimed at clarifying the presented content along with valuable suggestions for future work, detailed below:</p> <ol style="list-style-type: none"> <li>1. Rose Angeli Macagga, National Central University (Philippines) <ul style="list-style-type: none"> <li>● Suggestion: It is proposed that the tube be utilized as a chamber to incorporate different types of sensors.</li> </ul> </li> <li>2. Dimas from National Central University (Indonesia, Robotics) <ul style="list-style-type: none"> <li>● Suggestion: Consider simplifying the connectivity from a 4G module to a 3G module to conserve energy.</li> </ul> </li> <li>3. Bilguunmaa Myagmardulam, Assistant Professor, Toyama University <ul style="list-style-type: none"> <li>● Query: What type of sensor is currently used, and what prompted the choice? Is there potential for further development with different sensors?</li> <li>● Response: The project has explored various sensors, including laser, ultrasound, and radar. Previously, the device used ultrasound sensors, but issues with noise led to a switch to laser sensors, which</li> </ul> </li> </ol>

Topic	Name	Observation Discussion/Comments
		improved accuracy. Plans for integrating radar sensors in the next version are underway.
Notable Conference Presentations: Insights from Various Studies	Truong	<p>The following presentations highlighted at the conference exemplify significant advancements and critical insights across diverse environmental and technological domains:</p> <p>Pham Chi Cuong and Tang-Huang Lin</p> <p>Title: "Spatiotemporal Change Analysis of Urban Land Use and Sprawl Using Remote Sensing and CA-ANN: A Case Study in Ho Chi Minh City, Vietnam"</p> <p>Note: Currently focused on urban heat islands, though interested in ocean studies.</p> <p>Tran Thi Linh Chi and Tang-Huang Lin</p> <p>Title: "Associations between Aerosol's Deposition and Chlorophyll-A Distribution in the South China Sea Based on Multi-Sensor Satellite Observations"</p> <p>Focus: Impact of aerosols on Chlorophyll A distribution.</p> <p>Aji Kusumaning Asri, Chih-Da Wu, and Others</p> <p>Title: "Advanced Ensemble Learning Model to Accurately Estimate Benzene Concentration in Vulnerable Residential Area"</p> <p>Methodology: Utilized ground-based sensors and GIS to extrapolate benzene concentrations, with discussions around incorporating atmospheric models similar to those used by Trang.</p> <p>Shunsuke Ura and Yuji Sakuno</p> <p>Title: "Marine Plastic Detection Trial Using Near-Infrared Multispectral Camera and Thermal Infrared Camera"</p> <p>Challenge: Detecting marine plastics is complex due to similar spectral responses with other floating objects.</p> <p>Jhieh-Syuan Jhuang and Jen-Jer Jaw</p> <p>Title: "Toward a Future Design of Point Cloud Processing Platform"</p>

Topic	Name	Observation Discussion/Comments
		<p>Proposal: Automate segments of the workflow, like segmentation, using advanced AI tools like YOLO to enhance efficiency and accuracy.</p> <p>Thi-Kieu-Diem Nguyen and Po-Chun Hsu</p> <p>Title: "Influence of Marine Heatwaves on Typhoon Intensity in the East China Sea"</p> <p>Finding: Increased typhoon intensity linked to marine heatwaves.</p> <p>Sohee Park and Duk-jin Kim</p> <p>Title: "Evaluation of the Land Motion and Characteristics Analysis of Reclaimed Areas along the West Coast of Korea Using Time-Series InSAR"</p> <p>Issue: Continuous subsidence in reclaimed areas, posing potential environmental challenges.</p>
Keynote speech	Truong	<p>Conference Presentation Overview: YOLO Real-Time Object Detection</p> <p>Presenter: Mark Liao</p> <p>Key Highlights:</p> <p>Introduction to YOLO: YOLO (You Only Look Once) is renowned for its real-time object detection capabilities.</p> <p>Latest Update: YOLOv9 has been released, positioning it as the most advanced and effective tool globally for object detection tasks.</p> <p>Applications:</p> <p>Real-Time Traffic Control: YOLO's capabilities are leveraged to manage traffic dynamically, improving flow and reducing congestion.</p> <p>Real-Time Blindspot Monitoring: The system enhances vehicle safety by monitoring blind spots using real-time object detection.</p> <p>Potential for Mobile Applications: Given its lightweight architecture, YOLO is suitable for mobile devices, opening up possibilities for new applications like Ganoderma detection.</p>

Topic	Name	Observation Discussion/Comments
		<p>Technical Discussion with Mark Liao:</p> <p>Object Class Definition: Successful deployment of YOLO for specific tasks like Ganoderma detection requires defining a distinct object class, which includes parameters such as size, scale, shape, features, and neighboring context.</p> <p>Human Observation Factors: Adaptation to human-like observation nuances such as rotation, scale, and generalization is crucial for improving detection reliability.</p> <p>Enhancements and Advanced Techniques:</p> <p>SIFT (Scale Invariant Feature Transform) and SURF (Speeded-Up Robust Features): These techniques contribute to the robustness and accuracy of feature detection across various scales.</p> <p>Learning Models: Exploration of one-shot and few-shot learning models to train the system efficiently with minimal data inputs.</p> <p>This presentation underscores the ongoing advancements in YOLO technology and its expanding scope in real-time object detection across different platforms and applications.</p>
Communications with other professors	Truong	<p>Greeted Professor Fuan Tsai, Professor Jen Jer Jaw, Professor Wang Chi Kuei and updated my current situation.</p> <p>Professor Jaw has many students with good presentations, and he emphasized on providing good education. Professor Wang encourages my progress with research work.</p>
Keynote speech	Naito	<p>In the Keynote speeches, I learned several satellites and facts as the following.</p> <ul style="list-style-type: none"> <li>● Taiwan Space Agency (TASA) has launched and operated the FORMOSAT series (current version 5) satellite which provides 2 m-resolution panchromatic and 4 m-resolution multispectral images.</li> <li>● GPS-RO or GNSS-RO refers to radio occultation which involves the refraction of satellite signals through the atmosphere. The magnitude of refraction depends on the atmospheric substance content.</li> <li>● GeoKOMPSAT is a project that develops the geostationary satellite system monitoring atmospheric parameters and the ocean environment. Geostationary Ocean Color Imager (GOCI) is a sensor onboard COMS or GeoKOMPSAT,</li> </ul>

Topic	Name	Observation Discussion/Comments
		<p>which monitors ocean color derived from chlorophyll concentration and other marine surface conditions.</p> <ul style="list-style-type: none"> <li>• Yolo v4 and v7 developed by Prof. Liao provides solutions to the smart city traffic problems by detecting and counting fast-moving objects in traffic.</li> </ul>
Presentation session	Naito	<ul style="list-style-type: none"> <li>• In my presentation, I received a question about validation of satellite data and the analysis result. To this question, I explained that I plan to use ground-measuring data as comparison. To accomplish it, I will need to collect such ground-measured data, and also determine the appropriate validation metrics, especially for the vulnerability assessment result.</li> <li>• For other presentations related to my research, topics on soil moisture data comparison and MODIS NPP recalculation were interesting. As for soil moisture, Ms. Higuchi from the National Institute of Technology Matsue college compared AMSR2 and SMAP soil moisture products with in-situ data in Mongolia. The interesting findings for me was that ascending data correlated with NDVI, while descending data did not correlate with NDVI with the larger influence of vegetation in AMSR than SMAP. (I would like to communicate with him later to exchange our knowledge).</li> <li>• With regard to NPP, I learned “the CASA model” which calculates NPP based on light use efficiency. The presenter attempted to refine the MODIS NPP with the CASA model. Although the presenter did not show the result of comparison with the existing MODIS NPP, it was informative for me to know a new idea.</li> <li>• Addition to these researches, point cloud processing was also informative. One presenter showed a method for segmentation of objects with smoothness and weighting point clouds by distances among objects. Another presenter attempted to extract the round shape of a building by deriving features from a feature algorithm, and applied these features to PCA.</li> </ul>



Figure 1. At the conference site of ISRS2024.



Figure 1-b. Opening ceremony with lab Alumni, Dr. Jeark Principe from The University of the Philippines.



Figure 2. OHOW booth at ISRS2024.





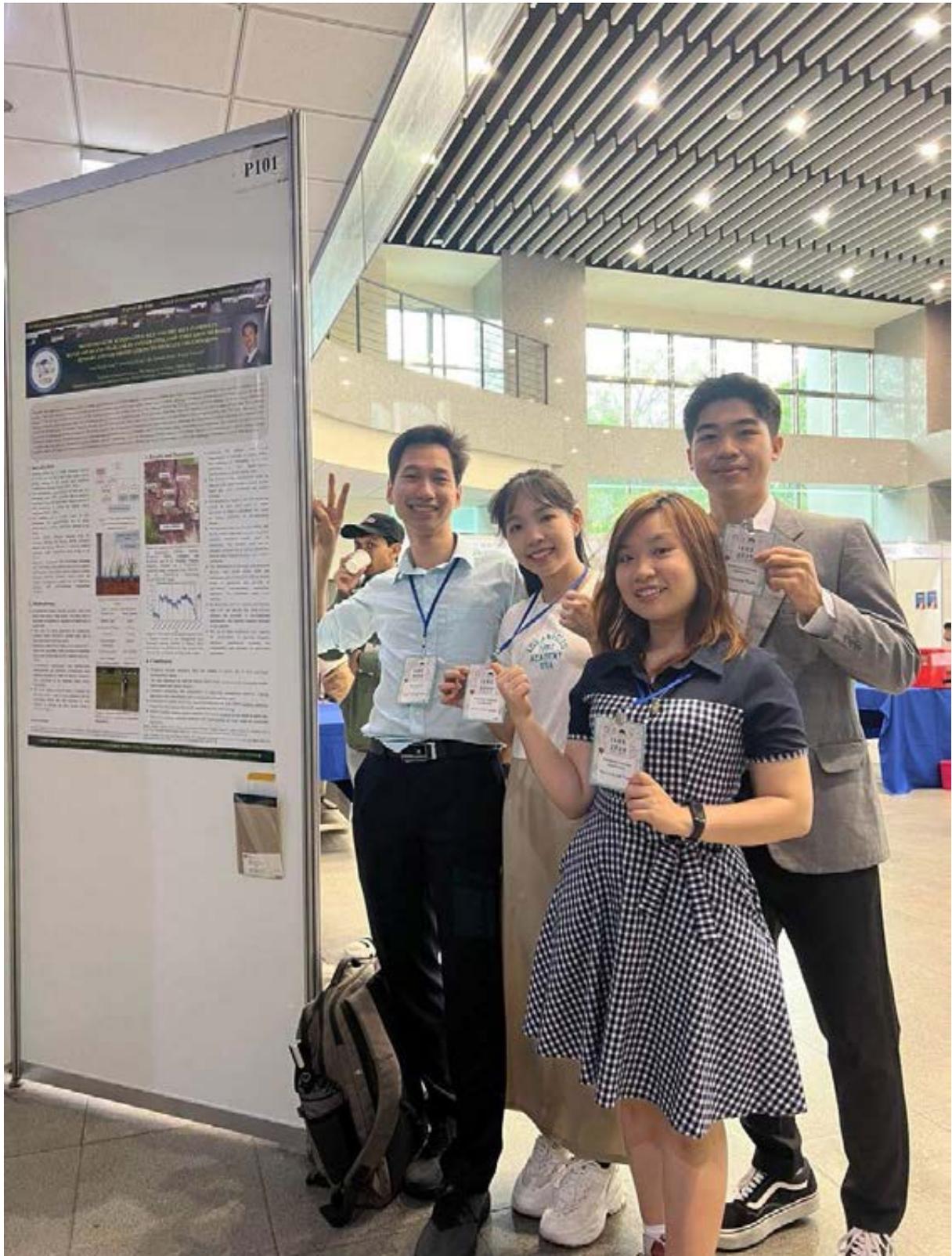


Figure 3. Giving a presentation at the ISRS2024 oral session.



Figure 4. After the closing ceremony of ISRS2024.

## 2. Taipei visit (4/27)

- Overview

On the way back from Taichung to Japan, we took this opportunity to experience the civil engineering infrastructures in Taiwan. There is a high-speed railway (HSR) connecting Taiwan from north to south. In addition, a significant metro network is in Taipei city. “Taipei 101” is one of the tallest buildings in the world, and there are two things which would be valuable experiences. One is the elevator which is also one of the fastest in the world. In addition, there is a “wind-damper” on top of the building. It is the only such infrastructure open to the public.

- Observation, Discussion, Comments

Topic	Name	Observation Discussion/Comments
Taiwan HSR	Shimada	The ride on HSR was convenient as there were very limited vibrations. It took less than an hour from Taichung to Taipei. Train system was well organized, and it was easy to purchase tickets for foreigners like us, and the train came just on time showcasing the capability of the railway management.
Taipei metro	Shimada	It was surprising to see that the Taiwanese Metro system was an extensive train network, which may have improved the city transport rather than relying on personal cars compared to other big cities in Asia. It connects many parts of Taipei, and the trains came on time. There is also a metro connecting Taipei station and Taoyuan airport.
Taipei 101	Shimada	Taipei 101 stood out from the surrounding buildings. The elevator taking us from the ground to several hundreds meters high only took less than a minute with the speed of 60 km/h at maximum. The engineering knowledge behind the wind-dumper at the top-floors was very impressive. We learned how it worked in case of a large earthquake, or strong wind events.
Taichung Traffic	Truong	<p>Traffic Observations in Taichung City</p> <p>General Traffic Composition: In Taichung City, the traffic primarily comprises a mix of cars and motorbikes. Walking is generally less preferred, potentially due to the heavy presence of motorized vehicles or the layout of the city's infrastructure.</p> <p>Adaptations in Traffic Rules for Mixed Vehicle Environments:</p> <p>Intersection Design: Motorbike Waiting Areas: To leverage the agility of motorbikes, waiting areas at intersections are specifically allocated in front of cars. This arrangement facilitates quicker starts for motorbikes when signals change, enhancing flow efficiency.</p> <p>Turning Rules: Two-Stage Turns for Motorbikes: When turning left, motorbikes are often required to execute a two-stage turn rather than turning directly. This rule mandates that motorbikes first move to a designated midpoint on the road before completing the left turn. This method not only enhances safety by reducing conflicts between motorbikes and other vehicles but may also help in alleviating traffic congestion.</p> <p>These observations indicate tailored strategies to manage the unique mix of traffic in Taichung, aiming to enhance safety and optimize traffic flow. There are potentials to apply this to traffic in</p>

Topic	Name	Observation Discussion/Comments
		bike-heavy countries such as Vietnam.
Taichung walkability	Truong	<p>In Taichung City, parking lots for motorbikes are designated on pavements, confined to squares that occupy at most 50% of the pavement area. This arrangement aims to provide reasonable space for pedestrian movement. Hanoi has implemented a similar strategy; however, there have been issues with insufficient space remaining for pedestrians to walk comfortably. You can read more about the specific strategies in Hanoi on the VTC News website <a href="https://vtcnews.vn/ke-vach-via-he-phan-rong-de-do-xe-phan-cho-nguoi-di-bo-toan-goc-cay-bot-dien-ar759978.html">https://vtcnews.vn/ke-vach-via-he-phan-rong-de-do-xe-phan-cho-nguoi-di-bo-toan-goc-cay-bot-dien-ar759978.html</a> .</p>
Cities	Naito	<ul style="list-style-type: none"> <li>● I learned about the mechanism of Taipei tuned mass damper, which is a technique used in skyscrapers around the world. It was impressive to note that Japanese company, Kumagaigumi, was involved as one of the constructors. Similar to Taipei 101, I observed many Japanese contributions in Taipei and Taichung, such as HSR and the National Taichung Theater.</li> <li>● It was also a pleasure for me to see trees placed on balconies in many mansions and apartments. Taiwan has legislation to promote greenspaces and protect trees, which may be a result of or have contribute to residents' interest in greenspaces.</li> </ul>



Figure 5. Taipei 101 tower seen from the ground.



Figure 6. The view from the observation floor of Taipei 101.

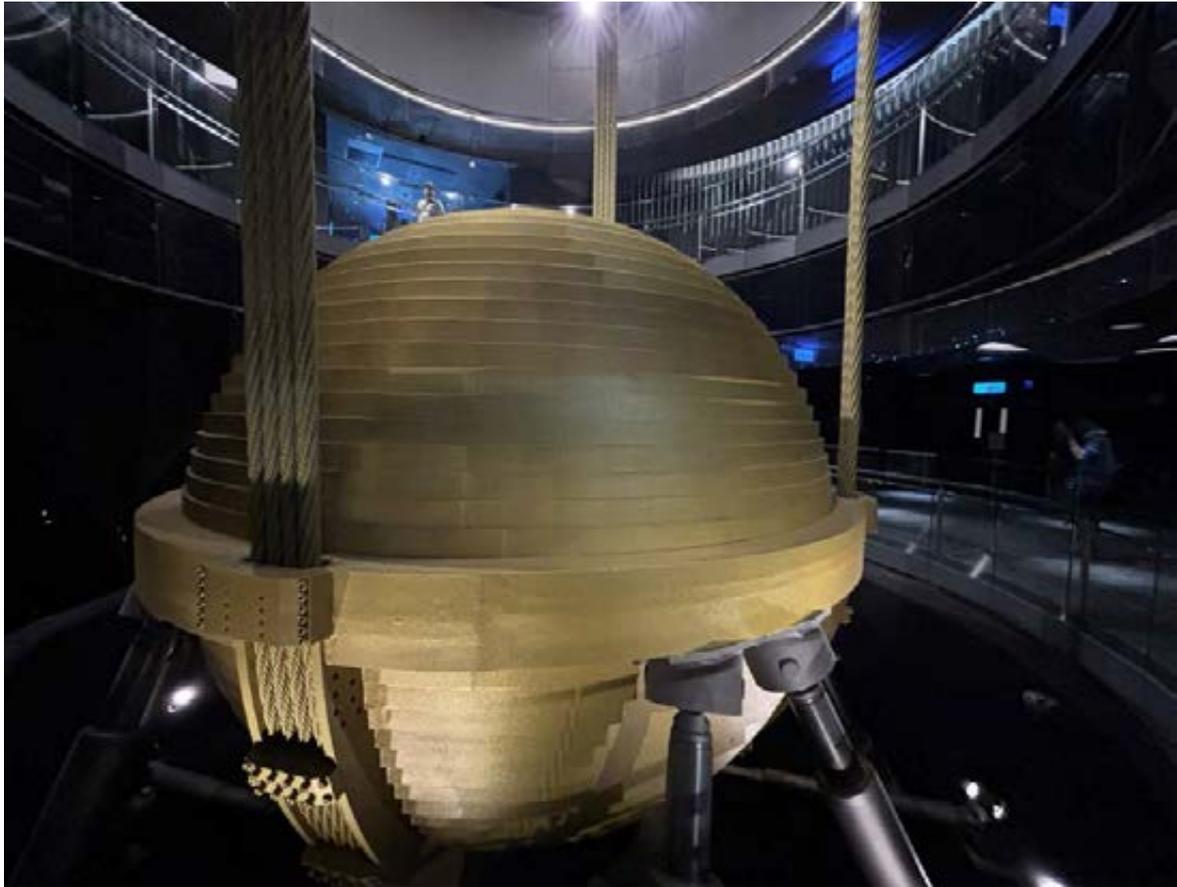


Figure 7. The wind-damper of Taipei 101.



Figure 8: An intersection in Taichung city

23<sup>rd</sup> -27<sup>th</sup> April 2024 ISRS2024 at Taichung, Taiwan  
Attendances: Prof. Takeuchi, Dr. Khin, Dr. Truong, Shimada, Naito, Yoshimoto

23<sup>rd</sup> April (Tue) NRT\_BR183\_13:25\_TPE\_16:05

Ubus:1623: Taoyuan Airport(桃園空港) →Taichung station (Minzu RD) (台中駅) 320 元 (2 hs~2 hs & half)



24<sup>th</sup> April (Wed.) left the hotel at 11:00 by taxi to the venue.



We were prepared for the booth.



We had lunch at the University cafeteria.



13:00- started the conference at the library building, International Conference Hall



Keynote speaker Prof. Jong-Shinn Wu



Keynote speaker Prof. Hong-Yuan Mark Lio

Keynote speaker Prof. Joo Hyung Ryu

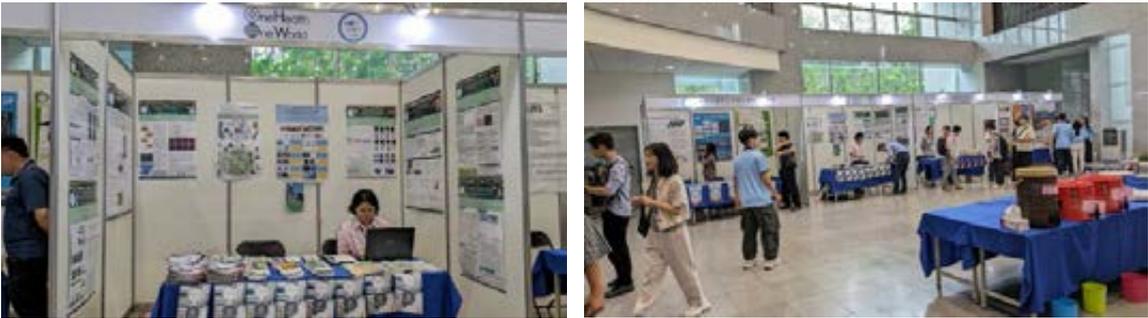


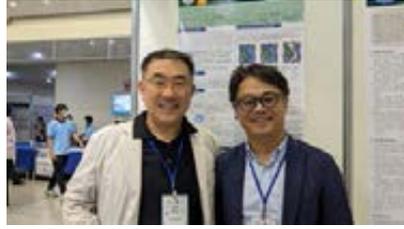
break time!

Banquet 18:00-20:00 @13F Ballroom, The Splendor Hotel-Taichung



25<sup>th</sup> Day 2 Sessions @College of Engineering B1 (B13,17,29), 1F, 2F(R226) 9:00-16:45





Session room (day2 and day3)

26<sup>th</sup> Day 3 closing ceremony @B17 11:45-13:00



Ms. Chihiro Naito won an Excellent Student Paper Award

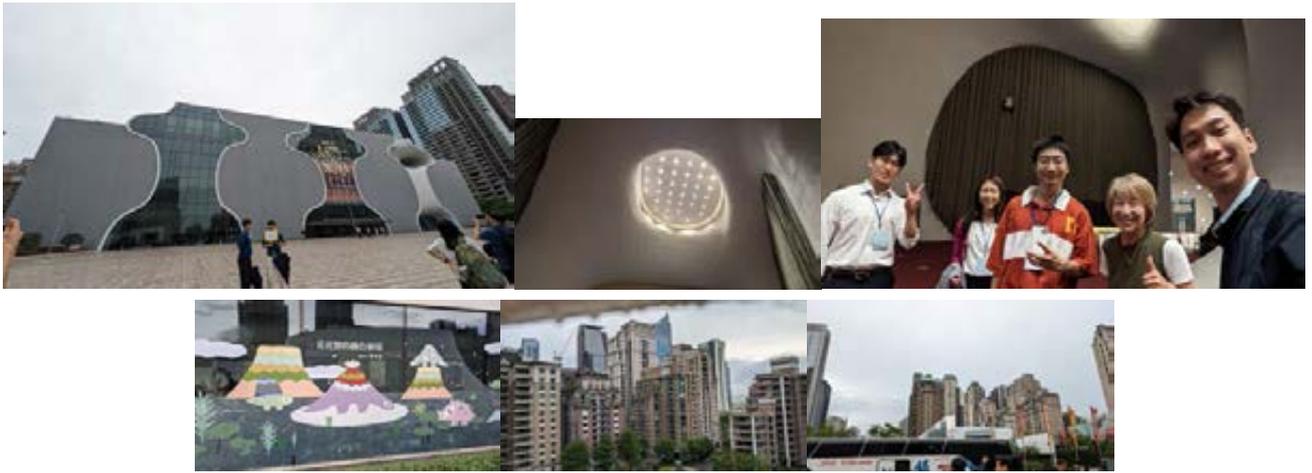


Mr. Shoki Shimada won the Outstanding Award.



Announced ISRS2025

26<sup>th</sup> Optional culture tour 13:30~16:30 visited National Taichung Theater



Taichung city, eat, building and so on took a walk every morning and night.





Taichung Station



## Memorandum

1. I had to ensure the booth sign had my full name. Be sure to order The University of Tokyo, Japan.
2. I thought of writing the schedule on the back of the name card.
3. Pamphlets placed at booths should be easy to hand out.
4. It might be good to have a poster QR or booklet.
5. It is better to consider the display in advance.
6. If possible, it would be good to have OHOW goods.

