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## Greeting from the New President

Yukari Tsuji  
President, IEICE Communications Society  
Senior Vice President, NTT Advanced Technology Corporation



I am very honored to be the President of the IEICE Communication Society (IEICE-CS) in 2022. I respect for all predecessors who have built and grown this research community, and I will strive to further improve its value in light of the changes in the surrounding environment. I look forward to working with you all for one year from here.

First of all, I would like to express my sincere gratitude to all of you for your continued understanding and cooperation with IEICE and IEICE-CS. Academic activities cannot be achieved without the support of all members and staff. I would like to thank all the members who participate in the study group and engage in academic activities such as submitting papers. And also, thank you to everyone who supports the activities. In the last two years, most of the study groups, general conferences, and international conferences have been held online under the coronavirus pandemic. So, the various committee members and staff are having a lot of trouble with the addition of new issues and operations. I am truly grateful for your efforts.

The influence of corona has been extremely large recently, but looking back on the past few decades, as a result of the whole world pursuing economic growth through innovation, advances in information and communication technology have created both positive and negative aspects. With the spread of the Internet, SNS, and smartphones, an environment has been created in which anyone can send and receive information at any time, and unintentionally, even in the case of coronavirus pandemic, remote work is possible without stopping social activities. On the other hand, it has also created negative aspects such as infodemic (spreading without confirming the facts), and the current situation is that it does not envelop people in different positions. Moreover, unfortunately, the traditional social system is not designed for sustainability, and the rising economic growth has also caused environmental problems as a result. In light of such changes, the 2021 theme of the World Economic Forum (Davos Conference) was “The Great Reset” (review of the world’s socio-economic system). At the plenary session, discussions were held on rethinking the economy centered on people’s well-being, solving social issues through innovation, and creating cultural value.

Under these circumstances, what kind of situation is IEICE and IEICE-CS? As mentioned above, until the time of writing this article, all events have been held

remotely, including the international conference ICETC, which was launched two years ago by IEICE-CS. On the other hand, the number of members of both IEICE and IEICE-CS is decreasing, and in particular, the number of corporate members and overseas members is decreasing significantly, and I feel that this is a major issue from the perspective of diversity.

Just as whole society is required to be reviewed in various ways, IEICE and IEICE-CS must also undergo flexible changes and evolution for sustainable growth.

- (1) Technology is of course important when trying to solve social issues, but it may be necessary to take a bird’s-eye view not only from technology but also from a system perspective and design thinking. In order to see things from that perspective, diversity of members belonging to the research community will be required across countries, cultures and industries. In addition, in order to make a study group or an international conference that is enjoyable for colleagues all over the world with diversity, I would like to devise various ideas such as theme setting and holding format of the event related to IEICE-CS.
- (2) I was able to reaffirm the importance of serendipity through direct dialogue while being aware of the convenience of remote holding in academic society activities due to the coronavirus pandemic. In near future, it is expected that the number of direct dialogue and remote hybrid holdings will increase. However, in that case, I think it is required to consider the balance between the convenience of participating members and the necessary expenses and increase in staff operation in terms of academic society management.

I think that future technologies need to make progress linked to the economy, society, and ethics in order to lead to the well-being of people. I hope that we can create and support a prosperous society through information and communication technology. Let’s work together and step by step so that IEICE-CS can play a part in that.

Finally, the IEICE-CS GLOBAL NEWSLETTER (GNL) will be temporarily suspended, but in the future, IEICE as a whole will consider ways to communicate information to global members. I hope we can meet again in a different way soon.

# 2021 IEICE Fellow Conferred on Nine IEICE-CS Members

Kohei Ohno  
 Director of Planning and Member Activities,  
 IEICE Communications Society



## 1. Introduction

The title of IEICE Fellow is conferred on IEICE members who are recognized as having made a significant contribution to the institute in academic, technical or related fields. In 2021, IEICE Fellow is conferred on 26 IEICE members including Nine from Communications Society (CS) who are listed in Table 1.

held in a virtual format. In the Ceremony, Prof. Toru Ishida, the president of IEICE presented the names of new fellows and their contributions.

## 3. Next Fellow Conferment Ceremony

The 2022 ceremony is going to be held in Shibaura Institute of Technology, March 2023.

## 2. The Conferment Ceremony

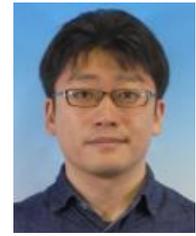
On 17<sup>th</sup> of March during IEICE General Conference 2022 online, the Fellow Conferment Ceremony was

Table 1 New IEICE Fellows from Communications Society.

Name	Contribution Contents
Kenta Umebayashi	Effective Utilization of Spectrum Resource for Wireless Communications
Yukihiko Okumura	R&D and Practical Application of 5th Generation Mobile Communications System
Haruko Kawahigashi	R&D and Enlightenment of the Electronic Warfare Technology
Shigeki Shiokawa	Development of Researchers of Communications Technology through the Society Editing Activities
Hideyuki Shimonishi	Research and Development on Software-Defined Networking and Its Implementation
Morio Toyoshima	R&D on Laser Beam Propagation through the Atmosphere and In-orbit Verifications in Satellite Laser Communications
Hajime Nakamura	Research and Development on Optimization of Transport Network Planning and Telecommunication Traffic Control
Takanori Hayashi	R&D on QoE Evaluation Methods for Video Communication Services
Kiyohito Yoshihara	Research and Development of Autonomous Network Configuration and Its Implementation



# Annual Report of Technical Committee on Information and Communication Management (ICM)



Tetsuya Uchiumi (Fujitsu), ICM Secretary  
 Hiroki Nakayama (BOSCO Technologies), ICM Secretary  
 Yoshifumi Kato (NTT), ICM Assistant

## 1. Introduction

The technical committee on Information and Communication Management (ICM) is a technical committee of the Communications Society of the IEICE [1]. This article briefly reports the last year’s activities of ICM and introduces the upcoming English session.

## 2. Activities

The ICM held two-day technical meetings five times from May 2021 to March 2022. The venues and the main topics of each meeting are shown in Table 1. In addition, three special sessions were sponsored by ICM as shown in Table 2.

Of particular note, in the English session in 2021 IEICE Society Conference at Online, the number of papers reached 11 in total. This session was hosted and presented entirely in English. The purpose of this session is to promote the globalization of the IEICE by providing the participants staying in Japan or joining from overseas with more opportunities for presentations and discussions in English.

Table 1. ICM Technical Meetings in FY 2021.

No	Date	Venue	Main Topics	Joint
1	May 13-14	Online	Service Management, Operation/Administration, Security Management, etc.	IPSI-IOT IPSIJ-CSEC
2	Jul. 15-16	Online	Management Function, Management Theory, etc.	-
3	Nov. 25-26	Reference Hakata Ekihigashi Rental Room (Fukuoka) and Online	Network Quality, Network Management and Measurement, Network Virtualization	CQ NS NV
4	Jan. 27-28	Online	Applications and Research Opportunities of Life Log, Office Information System and Business Management	LOIS
5	Mar. 3-4	Online	Element Management, Management Functionalities, Operations and Management Technologies, etc.	-

Table 2. Special Sessions by ICM in FY 2021.

Title	Date	Remarks	Theme
English Session	Sep. 16	As one of the symposium sessions in IEICE Society Conference	Network and Service Design, Control and Management
APNOMS 2021	Sep. 8-10	The premier conference in the Asia Pacific region sponsored by ICM	Networking Data and Intelligent Management in the Post-COVID19 Era
ICM Workshop	Mar. 3	In conjunction with ICM Technical Committee Meeting	Evolution of Information and Communication Management Accelerating Toward the 6G Era in 2030

Furthermore, ICM Workshop 2022 was held as the part of online conference. In the panel session, four invited speakers presented and discussed the theme, to the obvious interest of the approximately 30 attendees. After the session, a banquet was held virtually to promote social intercourse. On another day, the ICM annual award ceremony was held to celebrate winners in 2021.

## 3. Awards and Upcoming Event

The winners are shown in Table 3. The English Session Encouragement Award is given to the authors of the best papers of the English session every year (Fig. 1). ICM committee is now calling for submission for the upcoming English session. The deadline is early in July.

## 4. Reference

[1] ICM, <https://www.ieice.org/~icm/eng/>

Table 3. Winners of ICM Awards in 2021.

Award	Winners	Title
Research Award	Natsuki Fukazawa, Naoki Yoshida, Shingo Ata, Ikuo Oka	Utility of Training Data in Sequential Accumulation Learning-Based Anomaly Detection
	Masaru Sakai, Kensuke Takahashi, Satoshi Kondoh	Study of Constructing a Petri net Model using Distributed Trace Data of Microservices.
	Reiko Kondo, Takashi Shiraishi, Hitoshi Ueno	The Techniques for managing configuration differences in container-based systems
English Session Encouragement Award	Hong Duc Nguyen, Shunsuke Aoki, Yuuki Nishiyama, Kaoru Sezaki	An Online Task Offloading Strategy in Vehicular Edge Computing

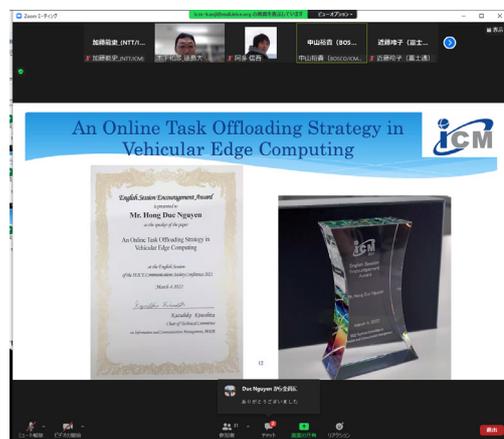


Fig. 1. ICM Annual Award (English Session Encouragement award)

# Report on NS English Session at 2022 IEICE General Conference – BS-3: Enabling Technologies for Network Systems and Services during the 5G/Beyond 5G Era



Zhi Liu\*, Masahiro Yoshida\*\*, Kotaro Mihara\*\*\*, Takashi Ikebe\*\*\*, Tetsuya Oishi\*\*\*, and Akihiro Nakao\*\*\*\*

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## 1. Introduction

This article introduces an English Session at the 2022 IEICE General Conference, one of activities of IEICE Technical Committee on Network Systems (NS) [1] regarding promotion of IEICE globalization. Since 2005, in every year's general conference, the technical committee on NS have been continuously organizing the English session in order to offer a good opportunity to make presentations and discussions with overseas researchers, including overseas students. In 2022, in spite of the spread of COVID-19, the 2022 IEICE General Conference [2] was successfully held as an online conference on March 15<sup>th</sup>-18<sup>th</sup>, and we have organized the full English symposium session entitled "Enabling Technologies for Network Systems and Services during the 5G/Beyond 5G Era" in the conference.

## 2. NS English Session

In every NS English Session, we raise a special theme regarding the hot topics of recent Information and Communication Technology (ICT) fields and invite to submit high quality papers. Table 1 shows the recent themes in the English Session. As shown in the table, in 2022, especially interested in the enabling technologies for network systems and services during the 5G/Beyond 5G era. Target topics include, but are not limited to: AI technologies for network and services, mobile and wireless communications, ubiquitous system and communications for applications with/post COVID-19, network security, and network applications. We believe that these are promising technologies to boost the innovation and realizations of future network systems, and we offer a good opportunity to present, share and discuss the state-of-the-art research efforts in English.

Table 1. Recent main themes of NS English sessions.

Year	Theme
2020	In-Network Intelligence for Design, Management, and Control of Future Networks and Services
2021	AI Technologies and Their Applications for Future Network Systems and Services
2022	Enabling Technologies for Network Systems and Services during the 5G/Beyond 5G Era"

As mentioned in the previous section, we have continuously organized the English Sessions since 2005. Figure 1 shows transitions of number of submissions to the English Sessions. As shown in the figure, more than 40 papers were constantly submitted in most of the years. In 2020, 2021 and 2022, because of the spread of COVID-19, the paper submissions became decreased unfortunately. In 2022, we have nine paper submissions, and all submitted papers are presented online by Zoom [3]. The topics of papers are widely variety, such as deep learning, federated learning, intra-data center networks, ICN, 5G applications and so on. Without exception, all submitted papers are high quality and well investigated. Thanks to the all speakers and attendees, the English Session has been very active and succeeded. Among the all submitted papers, three papers are selected as especially excellent papers and will be received NS English Session Award.

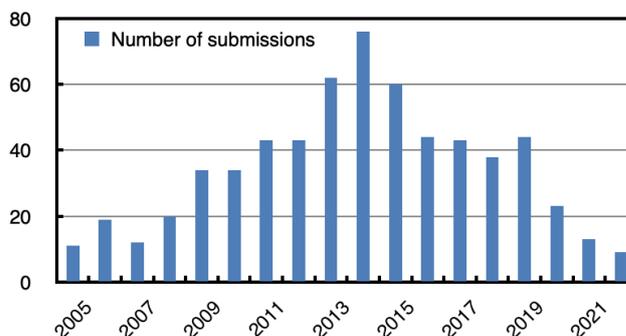


Fig. 1. Transitions of number of paper submissions to NS English Session.

## 3. Conclusion

In this article, we introduced the activities of NS English Session in the IEICE General Conference, including the latest 2022 NS English Session. Unfortunately, the conference was held online because of the spread of COVID-19, however we continuously contribute to offer a good opportunity to make presentations and discussions in English in the conference.

Although the number of paper submissions become decreased, the technical committee on NS continues to

encourage submissions from Japanese and overseas students as their first steps to international conferences. And we will keep offering an active place for research presentations and discussions to overseas researchers.

**Acknowledgement**

Technical committee on NS would like to give special thanks to Prof. Yoshiaki Tanaka, Waseda University, for enormous efforts and continuous supports to arrange the English Sessions.

**4. References**

- [1] IEICE Technical Committee on Network Systems website [online]: <http://www.ieice.org/~ns/eng/>.
- [2] IEICE General Conference [online]: <https://www.ieice-taikai.jp/2022general/en/index.html>.
- [3] Zoom [online]: <http://zoom.us/>.

## Report on 38<sup>th</sup> IN/NS Research Workshop

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### 1. Introduction

The 38<sup>th</sup> IN/NS Research Workshop took place online on March 10<sup>th</sup>, 2022. Here, all invited speakers, panelists, and audiences participated online. The workshop was sponsored by the technical committee on Network Systems (NS) and Information Networks (IN) of the IEICE Communications Society. The overall theme was “Current Status and Challenges of Cyber Security in the Post-Corona Era.” The workshop’s aim was to discuss the technical direction and research topics for cybersecurity. A record showing of 65 participants testified to the success of the workshop. The workshop featured one invited talk session (four speakers) and one panel session.

### 2. Invited Speakers

The general chair of the workshop, Prof. Kenji Ishida (Hiroshima City University), invited four distinguished leaders in evolution of information networks (Fig. 1). These speakers addressed the topics related to cybersecurity. Figures 2 to 5 show photographs of the speakers.



Fig. 1 Moderator: Prof. Ishida

Dr. Daisuke Inoue (NICT) presented the latest frontiers of cybersecurity.



Fig. 2 Invited speaker: Dr. Inoue

President Satoru Koyama (N.F. Laboratories Inc. / NTT Communications) presented cybersecurity measures in NTT Communications.



Fig. 3 Invited speaker: Pres. Koyama

Prof. Tatsuya Mori (Waseda University) presented research trends concerning cybersecurity and AI.



Fig. 4 Invited speaker: Prof. Mori

Prof. Tsutomu Matsumoto (Yokohama National University) presented research trends concerning physical security and cybersecurity.



Fig. 5 Invited speaker: Prof. Matsumoto

### **3. Panel Session**

After the invited talks, the panel session was held. The session was moderated by the general chair, Prof. Ishida. All of the above invited speakers were invited as panelists. In this session, the trends, the future visions, problems of utility, policy for cybersecurity and future technologies in the post-corona era were discussed.

### **4. Conclusion**

This year's workshop invited key persons to speak on the evolution of cybersecurity for the post-corona era. We believe that the presentations given by the invited speakers and the subsequent panel discussion provided intellectual stimulation to the audience and fruitful insight into future research and development.

The technical committee on NS and IN plans to hold next year's workshop in March 2023. Finally, we would like to express our gratitude to the workshop committee members, particularly to Shigefumi Naito (NEC Corp.), Kouki Inoue (Fujitsu Limited), Akira Murakami (TOSHIBA Corp.), Yuta Muto (Hitachi, Ltd.), and Keiichi Iwata (Mitsubishi Electric Corp.) who made this workshop possible.

# Annual Report of Technical Committee on Network Systems

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Chair Prof. Nakao

## 1. Introduction

This report covers the annual activities of the IEICE Technical Committee on Network Systems (NS). It describes activities at the monthly technical meetings, recent research topics of the committee, and the research awards for 2021.

## 2. Technical Meetings

During the period between April 2021 and March 2022 there are 10 NS technical meetings, 1 workshop [1], and additionally, 3 technical meetings of Network Software (NWS) sub-committee (as shown in Table 1). Several meetings are co-located with the OCS (Optical Communication Systems), PN (Photonic Network), SeMI (Sensor Network and Mobile Intelligence), RCS (Radio Communication Systems), SR (Smart Radio), RCC (Reliable Communication and Control), IN (Information Networks), CS (Communication Systems), NV (Network Virtualization), ICM (Information and Communication Management), and CQ (Communication Quality) technical committees. All

technical meetings in 2021 were held Online or Hybrid due to COVID-19.

Recently presented papers mainly focus on technologies that support new generation networks, wireless and mobile networks, IoT, applications, security issues, network virtualization, SDN/NFV, cloud computing, Mobile Edge Computing (MEC), ICN/CCN, blockchain, and Quality of Service/Experience (QoS/QoE). In addition, the number of presented papers related to AI and machine learning is increasing rapidly in recent years.

At each technical meeting, we host lectures by invited speakers who are experts in their research fields. During this fiscal year, we have invited lectures on network virtualization and softwarization, applications of AI and machine learning, network design, IoT, and other topics. In fiscal 2021, we had 174 presentations from academia and 59 from industry in the NS technical meetings.

Since June 2003, we have been encouraging research of young researchers who have presented papers at NS technical meetings by inviting them to give follow-up

Table 1: Technical meeting schedule for fiscal 2021. (Gray cells indicate technical meetings of NWS sub-committee)

Date	Location	Theme	Co-location with
April 15–16	Online	Traffic, Network Evaluation, Resource Control and Management, Network Reliability and Resilience, Network Intelligence and AI, etc.	
May 13–14	Online	High Level Protocol, Networking Technologies, IP Network Application Technologies, Network System Related Technologies, Security, Blockchain etc.	
June 5	Online	Network Software in the After-Corona Era	
June 24–25	Online	Core/Metro System, Photonic Network System, Optical Network Design, Traffic Engineering, Signaling, GMPLS, etc	OCS, PN
July 14–16	Online	AI/ML-based Network, M2M (Machine-to-Machine), D2D (Device-to-Device), IoT (Internet of Things), etc.	SeMI, RCS, SR, RCC
September 9–10	Online	SIP, IMS, Cloud/Data Center Network, SDN/NFV, IPv6, Machine Learning, etc.	CS, IN, NV
October 6–8	Online	Network Architecture (Overlay, P2P, Ubiquitous Network, Active Network, NGN, New Generation Network), Grid, etc	
October 22–23	Online	Network Software for Robotics	
November 25–26	Hakata/ Online	Network Quality, Network Measurement and Management, Network Virtualization, Security, Network Intelligence, etc.	CQ, ICM, NV
December 16–17	Nara/ Online	Multi-hop/Relay/Cooperation, Sensor/Mesh, Ad-hoc Network, D2D/M2M, Wireless Network Coding, VoIP, IoT, Edge etc.	RCS
January 27–28	Online	Network Software, Network Application, SOA/SDP, NGN/IMS/API, Distributed Control/Dynamic Routing, etc.	
		Network Software for the After/With Corona	
March 10–11	Online	General, IN/NS Workshop (March 4)	IN

talks several months later. We call these the “encouragement talk.” We invited six young researchers to give such talks in the past year. We will continue this activity.

### 3. Research Awards 2021

The Technical Committee selected the recipients of Network System Research Award from among 160 regular papers that had been presented at monthly NS technical meetings from January to December in 2021. The award is given to each of the authors of the three or four best papers of each year. The abstracts of the four papers that won the award in 2021 are as follows.

#### **Takamitsu Iwai et al. “Bandwidth Allocation Method Preserving Slice Quality Fairness in a Wireless Environment,” [2]**

Network slicing, which allocates appropriate resources according to the application, has been proposed to improve the user experience and diversify network services. Various application traffic coexists in the same network in the current wireless networks, where we can not satisfy each application requirement. Hence, 5G wireless communications are expected to have various types of links (e.g., eMBB, mMTC, URLLC) and provide application-specific network slicing for high-bandwidth and latency-sensitive applications such as autonomous vehicles.

However, in a wireless environment with fluctuating link capacity, we need to adjust each slice's bandwidth dynamically while maintaining the user experience when we can not satisfy the requirements specified by each application due to insufficient link capacity. In addition, network operators need to assign the bandwidth based on an explicit metric since we need to allocate bandwidth for the clients who do not use slicing. We propose a novel control method that sets a utility function, called slice quality, for each slice and adjusts each slice's bandwidth depending on the link capacity to keep these qualities fair. We set different utility functions for the normal slice, a typical slice that requires a fixed bandwidth, and the residual slice, a best-effort slice that manages the non-slicing users' bandwidth. We update the allocated bandwidth so that each slice's quality is fair based on the link capacity at each point in time. We show a median improvement of 65% in the slice quality's fairness than a simple bandwidth allocation policy while keeping the quality degradation of normal slices below 10%.

We believe this research can contribute to more precise and diverse network slicing for mobile applications. The 5G wireless communications bandwidth fluctuates significantly under high-speed mobility. Our method will provide dynamic network slicing for such an extreme communication environment.

#### **Shunya Kida et al. “Distributed Deployment of Aerial Base Stations with RF Energy Harvesting” [3]**

An unmanned aerial vehicle (UAV)-mounted aerial base station (ABS) can be considered a promising technology to enhance the capacity and coverage in future mobile communication networks. Owing to its flexible mobility, ABSs can adaptively respond to a sudden traffic increase such as in open-air concerts. In addition, ABSs can assist the existing terrestrial networks when they fail due to disasters. Although ABSs have high flexibility, determining their optimal placement that maximizes the overall communication quality of ground users is a challenging problem because of complicated air-to-ground channel characteristics and inter-cell interference among ABSs. Moreover, ABSs are faced with the problem that their available power resources are limited. This study considers an ABS network in which ABSs perform radio frequency (RF) energy harvesting from terrestrial base stations and proposes a distributed ABS deployment method for maximizing the performance of RF energy harvesting and downlink transmission to users simultaneously. We assume that ABSs perform the RF energy harvesting and downlink transmission to a user in successive time slots and if both have sufficient quality, the user is covered by an ABS. By considering the number of covered users as the performance metric, we formulate an ABS deployment problem and present a distributed algorithm to solve it. In our method, each ABS updates the position by using only its local information and exchanging information with neighboring ABSs. Such a distributed method has an advantage over centralized ones proposed in many existing studies because distributed methods can respond to user dynamics rapidly by local information exchange/computations, whereas centralized methods have large overhead of information gathering from the whole network with relatively large communication delay. We evaluate the proposed method by simulation and the results demonstrate that our method improves both the energy harvesting and communication quality of users.

#### **Shino Shiraki et al. “Indoor Localization for Pedestrians Using Contact Information Between Smartphones,” [4]**

Indoor localization using wireless communication technology is an important research topic in the field of wireless sensor networks, and a method based on estimated distances among multiple known-location anchor nodes and a pedestrian smartphone is particularly well known. In this method, distance between each anchor node and the smartphone is estimated directly from the received signal strength of wireless signal emitted by the anchor node. However, a problem with this method is that the received signal strength varies greatly depending on the wireless propagation environment.

Recently, primarily in response to the COVID-19 pandemic, digital contact tracing applications for smartphones have entered widespread use. This has caused us to conjecture that smartphone contact

information could also be used for indoor localization. With that point in mind, this study proposes two indoor localization algorithms (multilateration and cooperative) that utilize contact information obtained from smartphone Bluetooth Low Energy (BLE) beacons. In our methods, each node (smartphones and anchor nodes) establishes proximity relationships among other nodes in the vicinity based on the received signal strength of the BLE signal emitted by those nodes, and each node periodically sends the identifiers for those nodes to the server. Next, the server estimates distances between nodes based on their proximity relationships. An advantage of our proposed method is that it is less dependent on changes in the radio propagation environment because it estimates distances from node proximity relationships. Finally, the pedestrian smartphone locations are estimated using the proposed algorithms.

Cooperative localization can be seen as an extended version of multilateration, and our simulation results show that it improves localization accuracy compared to multilateration. More specifically, the average localization error is about 2 m when using cooperative localization. Additionally, in terms of localization error, the standard deviation for the cooperative localization is smaller than that for the existing centroid method, thus indicating that stable localization is possible using our proposed method.

**Takumi Shiohara et al. “Maximum Delay Analysis of Fixed Backoff in IEEE 802.11 Considering Significant Interference for In-Vehicle Wireless Communication,” [5]**

Mission-critical periodic communication using CSMA/CA are under active research. One of them is in-vehicle wireless communication using IEEE 802.11 ad/ac/ax. In in-vehicle communication, each in-vehicle sensor terminal transmits small-sized data (tens to hundreds of bytes) in a cycle of several milliseconds to tens of milliseconds. Therefore, all terminals need to successfully transmit data within this cycle. In other words, there is a requirement that the total delay, such as backoff delay and retransmission time due to the contention window (CW), must be kept within the allowable value determined by the above cycle. In this study, we define the maximum value of this delay as the maximum delay, and analyze its characteristics.

We propose a delay distribution analysis method for the IEEE 802.11(CSMA/CA) fixed CW, which has already been proposed for efficiently accommodating many terminals for mission-critical periodic communication with interference. We also show that the delay distribution derived from the analytical model is an upper bound on the delay distribution of the fixed CW method. In the proposed analysis method, we focus on the fact that the transition of the number of terminals and the upper bound of the collision frequency distribution can be approximated by a binominal distribution. The proposed method consists of the following two steps. The first step is to derive

the distribution of the total number of slots required for all terminals in the target network in the system to leave from a two-dimensional Markov model that focuses on the number of terminals. In the second step, we derive the delay distribution by transforming the obtained total number of slots distribution into real time, focusing on the upper bound of the distribution of the number of events that can occur in a slot time. By the proposed method, we can obtain the communication delay characteristics by theoretical analysis even in the communication model which is very different from the conventional one, where terminals exit from contention one by one due to successful communication.

#### 4. Future Plans

The Technical Committee will have 10 NS technical meetings in this fiscal year. In case it is difficult to host on site meetings due to concerns on COVID-19, we will hold online meetings.

(For more information, please see our home page.

URL: <https://www.ieice.org/cs/ns/eng/index.html>)

#### 5. Reference

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# Report on the IEICE Welcome Party

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## 1. About the Welcome Party

The Welcome Party is one of major activities of the IEICE Communication Society (IEICE-CS) held at every IEICE General Conference. The objective of having this party is to provide young engineers especially students with a good opportunity to meet and talk friendly with experienced researchers and engineers in various organizations.

It had been held at the IEICE Society Conferences in September from 2008 to 2011. However, considering school year in Japan (starting in April), in 2013, we moved it at General Conferences in March so that it can help students to think about their possible engineering carrier just before starting their new school year. However, the event could not be carried out in 2020 since the General Conference 2020 had been canceled due to the global pandemic of COVID-19. In 2021, the welcome party was held in the virtual format because the General Conference 2021 was also held online.

## 2. The Welcome Party in 2022

The Welcome Party was held online on 15<sup>th</sup> March 2022, the first day of IEICE General Conference 2022. In this year, this event was held jointly by Communication Society (CS), Engineering Sciences Society / NOLTA Society (ESS/NLS), Electronics Society (ES) and Information and Systems Society (ISS).

Table 1 shows the whole contents of the party. It began with the opening remarks from Prof. Hisaya Hadama, the CS president for 2021. It was followed by the chat session where participants randomly sent to the breakout rooms to enjoy conversation with others in the room gathered by chance.

In the presentation from companies, nine companies being active in the communication field, NEC, NTT Lab., Oki, NTT docomo, Hitachi, Fujitsu, Mitsubishi Electric, Murata Manufacturing, presented their business and R&D activities. It was followed by the session in which students can frankly talk with employees of the companies in the designated breakout rooms so that students could have an image of working in the telecommunication industry.

Finally, we conclude the party with the closing remarks from Prof. Yukari Tsuji, the next CS president.

As a result, we had 85 participants including 35 students. Form the survey, some comments from the attendees are introduced as follows:

- It was my first time participating in the welcome party. The atmosphere was casual, and I was able to listen to interesting talks.
- I was able to talk with people I wouldn't usually meet.
- Time for the conversations was not long enough though.

90% of the participants had been satisfied. We believe this experimental event was very successful.

## 3. Conclusion and Acknowledgements

The CS Welcome Party was successfully held with over 80 participants. The next Welcome Party will be held in March 2023 at the IEICE General Conference at Shibaura Institute of Technology in Saitama, Japan if the conference would hopefully be held in the conventional face-to-face style. We expect many people to participate in next Welcome Party. We would like to thank all participants, especially from companies, national institutes, Societies, Technical Committees, and Membership and Service Committee.



Fig. 1 Group Photo

Table 1 Contents of the Welcome Party.

Session	(min.)
Opening Remarks from the CS president	10
Chat I	20
Presentation from Companies (NEC, NTT, Oki, NTT docomo, Hitachi, Fujitsu, Mitsubishi Electric, Murata)	20
Talk with the Companies	30
Chat II	10
Closing remarks from the next CS president	10

# Report on 22<sup>nd</sup> Asia-Pacific Network Operations and Management Symposium (APNOMS 2021)

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\* Secretary of APNOMS 2021 and NTT west.

\*\* Vice Chair of APNOMS 2021 and Tokushima Univ.



## 1. Overview

The 22<sup>nd</sup> Asia-Pacific Network Operations and Management Symposium (APNOMS 2021) was held from September 8<sup>th</sup> to 10<sup>th</sup> as a completely online event, under the influence of COVID-19. It is organized by Technical Committee on Information and Communication Management, the Institute of Electronics, Information and Communication Engineers (IEICE ICM) and the committee on Korean Network Operations and Management, the Korean Information and Communications Society (KICS KNOM), and is technically co-sponsored by the IEEE Communications Society.

APNOMS 2021, with its theme being “Networking Data and Intelligent Management in the Post-COVID 19 Era,” consists of 3 keynote speeches, a distinguished expert panel, a special session, 4 tutorial sessions, 10 technical sessions, 3 poster sessions, and 2 innovation sessions. Over 110 people participated in the conference.

## 2. Highlights

Three executives delivered keynote speeches from each perspective. Ms Hey-Chyi Young from Telecommunication Lab, Chunghwa Telecom Co. Ltd gave a speech on “The Opportunities and Challenges in the 5G Era,” Dr. Sungwon Lee from Kyung Hee University introduced “The Opensource Movement in the 5G MEC,” and Mr. Masanori Miyazawa from KDDI gave a speech on “The Challenge for Automated Operation Toward Future 5G and Cloud-Native Environment.”

In the distinguished expert panel session, Dr. Magnus Ewerbring from Ericsson, Mr. Shinji Yamashita from Fujitsu, Dr. De-Nian Yang from Sinica, Prof. Ping-Yu Hsu from National Central University and Dr. Sangjae Seo from KISTI discussed “Technologies for Post-Covid19 era in the data and network management aspect: Sharing experiences and challenges in various academia, industries and governments” with chair and audiences.

The special session covered the topics of “Cloud Native in Telecom Network Infrastructure” and “Artificial Intelligence/Machine Learning for Network Management.” A total of 95 papers, including 18 papers from Japan, were submitted to APNOMS 2021, among which 38 papers (9 from Japan) were accepted to be among which 40 papers (10 from Japan) were accepted

to be presented in the technical sessions. Besides, 45 papers (8 from Japan) were accepted to be presented in poster sessions. All presentations were pre-recorded and followed by live Q&A sessions. These papers are to be included in IEICE Proceedings Series, KICS Proceedings Series, and IEEE Xplore.

The technical program committee and organizing committee selected the top four papers and the top four students with the highest overall scores from technical sessions as “Best Paper Award” and “Best Student Paper Award,” respectively. One of the awardees of “Best Paper Award” is “Robotic Assistance Operation for Effective On-Site Network Maintenance Works” presented by Mr. Takayuki Warabino from KDDI Research, Inc. And one of the awardees of “Best Student Paper Award” is “Evaluation of Resource Sharing Framework for Heterogeneous Network Services” presented by Mr. Haruo Oishi from Waseda University.

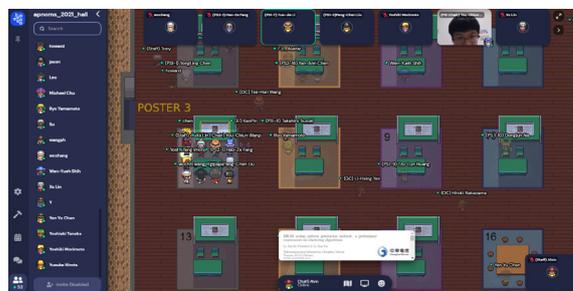


Fig. 1 Poster session held by Gather.Town



Fig. 2 Group photo of APNOMS2021 organizing committee members and staff (online)

### **3. Summary**

APNOMS 2021 was closed with great success against the pandemic of COVID-19. On behalf of all organizing committee members, we would like to express our appreciation to all parties involved in this conference.

The next APNOMS will be held in Takamatsu, Japan in 2022.

## From Editor's Desk

### ● GLOBAL NEWSLETTER suspends publication

IEICE-CS GLOBAL NEWSLETTER will suspended publication after this issue, but in the future, IEICE as a whole will consider ways to communicate information to global members. Editors hope we can meet again in a different way soon. We would like to express our sincere gratitude to everyone for their great support and cooperation to date.

### ● IEICE Society Conference 2022

IEICE General Conference 2022 will be held online, from 6<sup>th</sup> to 9<sup>th</sup> of September 2022. Complete English sessions are also scheduled in the conference. Please check out the latest conference information on the IEICE web site:

<https://www.ieice-taikai.jp/2022society/en/index.html>

### ● Thank you for GNL

I'm Nazuki HONDA, Director, International Publication, IEICE Communications Society and started editing IEICE-CS GLOBAL NEWSLETTER (GNL) at 2019. GNL was established in 2002 and has delivered various kinds of information to overseas/foreign members in IEICE-CS as a global activity. I have thoroughly enjoyed in this three years with GNL and am especially grateful to have met each of articles and reports. Thank you for all of you.

It was great experience to serve as an editor staff of this magazine for two years. I am deeply grateful to authors who made great contributions, my colleagues who always helped me, and all readers. —*Kaoru Yokoo*

Thank for reading GNL. We are cindering other ways to deliver information for Communications Society members. I am looking forward to new phases. —*Kohei Ohno*

IEICE-CS GLOBAL NEWSLETTER Editorial Staff

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# **IEICE Communications Society**



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