Keynote Sessions

Keynote Session 1 (11/25 AM1) Chair: Akihiro Nakao (The University of Tokyo)

KS1	Data Center De-centralization and Edge Cloud Convergence with IOWN APN	Masahisa Kawashima (IOWN Technology Director, IOWN Development Office, NTT, Technology WG Chair, IOWN Global Forum)
	Abstract: This presentation introduces a global collaboration effort by IOWN Global Forum, which aims to develop next generation compute and network infrastructures, leveraging the evolution of optical communication technologies. It also explains how the infrastructures help societies achieve both carbon neutrality and growth with AI.	Biography: Masahisa Kawashima is currently leading NTT's R&D of Innovative Optical and Wireless Network (IOWN) as the IOWN Technology Director. He is also serving as the Chair of the Technology Working Group at IOWN Global Forum. He has been working as a bridge between technologies and businesses since he joined NTT in 1994. His expertise includes high-speed networking, SDN, cloud/edge computing, AI, and data management. Nowadays, he is exploring innovative ways of making products/services cloud-native levering the evolution of optical communication and optoelectronics integration technologies.

Keynote Session 2 (11/25 AM2) Chair: Akihiro Nakao (The University of Tokyo)

KS2	Vision and Activities towards 6G	Satoshi Suyama (NTT DoCoMo)
	Abstract: For upcoming 2030 society, activities on research and development for 6G are ongoing in the world. In 6G, many use cases and requirements are under discussions, and new technical features will also be discussed. In this presentation, we show our company NTT DOCOMO's latest vision and activities towards 6G.	Biography: Satoshi Suyama received the B.S. degree, the M.S. degree, and the Dr. Eng. degree from Tokyo Institute of Technology, Tokyo, Japan, in 1999, 2001, and 2010, respectively. From 2001 to 2013, he was Assistant Professor in the Department of Communications and Integrated Systems at the Tokyo Institute of Technology. He has been engaged in research on mobile communications systems and digital signal processing for wireless communications. Since April 2013, he has joined NTTDOCOMO, INC. and has been involved in research and development of 5G and 6G. He is currently Senior Manager of 6G-Tech Department in NTT DOCOMO and Deputy Leader of 6G Radio Technology Project in XGMF, Japan.

Keynote Session 3 (11/26 AM1) Chair: Shoji Kasahara (Nara Institute of Science and Technology)

KS3	Quantum Internet	Winston K.G. Seah (Victoria University of Wellington, New Zealand)
	Abstract: The Internet has become the backbone of our society, transforming from a mere carrier of information to becoming the source of information, applications, and services. Quantum computing, which has been receiving significant limelight recently, promises capabilities that can solve computationally complex problems previously unachievable by classical computers. While data transfer between quantum computers can be achieved using quantum communications, quantum networking is critical to maximize the capabilities of quantum computing, similar to how the Internet transformed society and the way we used computers. Unlike classical computers that encode information using distinct "0" and "1" values, called bits, the quantum equivalent, qubit (or quantum bit), can be a superposition of "0" and "1", with a unique property that it cannot be copied or done without being detected, making it highly suitable for security applications, e.g. quantum key distribution, secure access to remote quantum computers, etc. Conversely, inability to copy qubits also makes it impossible to use existing communication techniques, like repetition or signal amplification, making it a monumental challenge to transmit over long distances, motivating the development of new technologies, like quantum repeaters. The quantum internet is governed by the laws of physics and possesses no analogy in the classical networks. This talk will discuss the ongoing research on quantum communications and networking, touching on how designing quantum internet protocols requires a major paradigm shift and imposes new challenges to network design.	Biography: Winston K.G. Seah specializes in algorithm and protocol design for networks in challenged conditions and extreme environments, such as, embedded systems with severe resource constraints, highly mobile networks, electromagnetic nanoscale networks and underwater networks. With the Internet of Things as the overarching application domain, his latest research includes algorithms and protocols for quantum internet, massive machine-type communications and ultra-reliable low-latency communications, as well as, novel approaches for network anomaly detection using artificial intelligence and machine learning techniques. Winston received the Dr.Eng. degree from Kyoto University, Kyoto, Japan, in 1997, and ME and BSc degrees from the National University of Singapore in 1993 and 1987 respectively. In 2009, he joined Victoria University of Wellington, New Zealand, as Professor of Network Engineering. Prior to this, he has worked for more than 16 years in mission-oriented industrial research, taking ideas from theory to prototypes, most recently, as a Senior Scientist (Networking Protocols) in the Institute for Infocomm Research (I2R), Singapore. Winston strongly believes that research goes far beyond publishing papers and strives to solve challenging real-world problems using unconventional and innovative approaches.

Keynote Session 4 (11/26 AM2) Chair: Shoji Kasahara (Nara Institute of Science and Technology)

KS4	An IX-Anchored Internet	Richard T. B. Ma (Department of Computer Science, National University of Singapore)
	Abstract: Given the best-effort service abstraction designed by the Internet's network layer, today's TCP/IP-based Internet still cannot guarantee end-to-end quality-of-service (QoS). One of the missing pieces from prior efforts is the design of economic/business models that incentivize the participation of autonomous systems (ASes). In this talk, we propose a new approach that tries to leverage the Internet exchanges (IXs) to build inter-domain collaborations among ASes so as to fulfill QoS guarantees.	Biography: Richard T. B. Ma received the B.Sc. degree (Hons.) in computer science and the M.Phil. degree in computer science and engineering from The Chinese University of Hong Kong, in July 2002 and July 2004, respectively, and the Ph.D. degree in electrical engineering from Columbia University in May 2010. During his Ph.D. study, he worked as a Research Intern at IBM Thomas J. Watson Research Center, Yorktown Heights, NY, USA, and Telefonica Research, Barcelona, Spain. From 2010 to 2014, he worked as a Research Scientist at the Advanced Digital Science Center (ADSC), University of Illinois at Urbana–Champaign, Champaign, IL, USA. He is currently an Associate Professor with the School of Computing, National University of Singapore. His current research interests include distributed systems and network economics. He was a recipient of the Best Paper Award Runners-up from the ACM Mobihoc 2020 and a co-recipient of the Best Paper Award from the IEEE IC2E 2013, the IEEE ICNP 2014, and the IEEE Workshop on Smart Data Pricing 2015. He is a Senior Member of the ACM.

Keynote Session 5 (11/27 AM1) Chair: Toru Takahashi (Mitsubishi Electric Corporation)

KS5	Challenges in Developing Beyond 5G Network Systems	Hiroaki Harai (Director General of Network Research Institute, National Institute of Information and Communications Technology)
	Abstract: The speaker presents R&D challenges in developing the Beyond 5G Network Systems for the innovative networks. The R&D target is fundamental and system technology for optical and wireless communications and for networking enabling to fulfill essential functions of the broadband, resilient, ultra-reliable, and ultra-low latency communications desired in the Beyond 5G era.	Biography: Hiroaki Harai is currently a Director General of Network Research Institute at the National Institute of Information and Communications Technology, Tokyo, where he is managing R&D on computing and AI-enabled networking, next-generation wireless, photonic networks, optical and radio convergence, space communications, and resilient ICT as key technologies of innovative networks. Prior to present position. He received the M.E. degree and the Ph.D. degree in information and computer science from Osaka University, Japan, in 1995 and 1998, respectively. After he joined NICT, he has conducted R&D on network architecture, optical networks, and mobile networks. Since April 2018 to March 2021, he managed research and development testbed construction and stable operation of networks and clouds such as JGN and StarBED, and he designed Beyond 5G Mobile and NFV Testbed that is currently in operation. From April 2021, he is in present position. He was a recipient of the Outstanding Young Researcher at the 3rd IEEE ComSoc Asia–Pacific Young Researcher Award in 2007 (optical network topic), the Best Paper Award in ITU Kaleidoscope Academic Conference 2014 (mobile sensor network topic) and Excellent Paper Award in IEICE Communications Society in 2020 (networking topic).

Keynote Session 6 (11/27 AM2) Chair: Toru Takahashi (Mitsubishi Electric Corporation)

KS6	Distributed learning for wireless resource allocation in mMTC networks	Ji Yusheng (National Institute of Informatics)
	Abstract: In large scale distributed systems such as massive Machine-Type Communication networks, distributed control mechanism could be more efficient than a centralized one. In order to have a large amount of devices to act autonomously and cooperatively for achieving better system performance, we consider distributed learning techniques for wireless resource allocation and access control.	Biography: Yusheng Ji received the B.E., M.E., and Ph.D. degrees in Electrical Engineering from the University of Tokyo. She joined the National Center for Science Information Systems (NACSIS), Tokyo, Japan in 1990. She is currently a Professor and Director of Information Systems Architecture Science Research Division, National Institute of Informatics (NII), Tokyo, Japan, and a Professor at the Graduate University for Advanced Studies (SOKENDAI), Japan. Her research interests include network resource management and mobile computing. She is a member of IEICE, IPSJ, ACM, and a Fellow of IEEE. She has published 600 international conference and journal papers, and received many best paper awards, including IEEE Communications Society Outstanding Paper Award, etc. She has served as a TPC Co-chair, General Co-chair, or Symposium Co-chair of major conferences, including IEEE INFOCOM, ICC, GLOBECOM, VTC, etc. She is an IEEE VTS Distinguished Lecturer.

Invite Special Sessions

Invite Special Session 1 (11/25 PM2) Chair: Makoto Taromaru (Fukuoka University)

IS1-01	Receive Beamforming Designed for Massive Multi-user MIMO Detection via Gaussian Belief Propagation	Takanobu Doi (NEC Corporation), Jun Shikida (NEC Corporation), Daichi Shirase (NEC Corporation), Kazushi Muraoka (NEC Corporation), Naoto Ishii (NEC Corporation), Takumi Takahashi Osaka University, and Shinsuke IBI (Doshisha University)
	Abstract: We present two full-digital receive beamforming (BF) methods for Gaussian Belief Propagation (GaBP) in base stations (BSs) employing massive multi-input multi-output (MIMO) for the open radio access network (O-RAN). GaBP is an efficient multi-user detection method in massive MIMO systems, known for its low computational complexity and high accuracy. In the context of beyond fifth-generation (beyond 5G) mobile communication systems, which are expected to increase uplink capacity, it is crucial to minimize BS costs by limiting the bandwidth of fronthaul (FH) links. A well-known strategy for this is dimensionality reduction of the received signal using receive BF at the radio unit. This paper clarifies the design criteria for BF weights considering the subsequent GaBP signal detection, proposing singular-value-decomposition-based BF and QR-decomposition-based BF with discrete-Fourier-transformation-based spreading. These methods achieve dimensionality reduction without compromising desired signal power by utilizing channel null spaces. Moreover, they reduce correlations between received signals in the BF domain, thus enhancing GaBP robustness against spatial correlation among fading coefficients. In addition, we have proposed trainable GaBP (T-GaBP) whose internal parameters are trained using deep unfolding techniques based on deep learning methods, in order to improve robustness against the spatial correlation and convergence performance. Simulation results, considering realistic BS and user equipment setups, demonstrate that the proposed BF methods significantly improve detection capability of T-GaBP while substantially decreasing computational costs.	
IS1-02	Experimental demonstration and performance evaluation of chaos-based radio encryption modulation scheme	Kenya Tomita (Nagoya Institute of Technology), Mamoru Okumura (Nagoya Institute of Technology), Takeshi Nagata (Nagoya Institute of Technology), and Eiji Okamoto (Nagoya Institute of Technology)
	Abstract: With the spread of 5th generation mobile communications system (5G) and their use cases, it is becoming more important to ensure the security of wireless communications. We have proposed a chaos-based radio-encrypted modulation scheme that combines physical layer security and channel coding effects to satisfy this requirement. We have also confirmed the channel coding effect, evaluated its security, applied it to multi-level modulation and multi-user access schemes. However, those studies have been done only by computer simulations. Therefore, we constructed a transmission system using the Universal Software Radio Peripheral, a type of software radio, and its control software LabVIEW, and evaluated the effectiveness of channel coding and security. Currently, we are considering the implementation of this system in devices with simpler configurations such as Internet of Things terminals. In this presentation, we will introduce those studies.	
IS1-03	Design and Implementation of Low Latency IP Video Transmission System for Racing Drones	Fumiaki Mizuno (Keio University Graduate School of Media and Governance), Takeshi Matsuya (Keio University Graduate School of Media and Governance), Jin Mitsugi (Keio University Faculty of Environment and Information Studies), Osamu Nakamura (Keio University Faculty of Environment and Information Studies)
	Abstract: This session introduces a low-latency IP video transmission system proposed by the authors and its practical applications. Recently, race drones, which pilots navigate while watching the camera feed to compete on lap times, have gained popularity. The prevalent method for race drones has been low-latency analog video transmission. However, traditional digital IP video transmission, though it offers higher image quality, has not been used in race drones due to increased latency from frame buffering and encoding processes. Additionally, conventional drone video transmission systems could not transmit video Non-Line-of-Sight. To address these issues, instead of encoding on a frame basis as in conventional methods, this approach pipelines the processes of camera capture, image correction, encoding, and IP transmission on an 8-line basis, implementing a low-latency HD video transmission system on an FPGA without using frame buffering. The total latency of the proposed method is 30.9 ms, which reduces the latency by approximately 100 ms compared to traditional digital video transmission for drones, achieving a delay closer to the 27.6 ms of analog transmission.	

Invite Special Session 2 (11/26 PM1) Chair: Kouichirou Amemiya (NTT)

IS2-01	Development of a High Throughput Communication Server with Moving Target Defense	Yuto TANABE (Net One Systems Co., Ltd.), Kaori MAEDA (Hiroshima City University), Yasuhiro OHISHI (Internet Initiative Japan Inc.), Reiji AIBARA (Hiroshima University), Chisa TAKANO (Graduate School of Information Sciences, Hiroshima City University)
	Abstract: Attacks on servers on the Internet and reconnaissance activities for them are increasing. MTD (Moving Target Defense) is a defense technology that solves the issue by dynamically changing identifiers such as server IP addresses to increase the difficulty of attacks and reduce the probability of being attacked. Various overheads occur in the implementation of MTD, which has a large effect on communication performance such as throughput. In our speech, we talk the proposal of new MTD method and the implementation of a MTD server using this method for high throughput. The server can dynamically change the IP address and the communication route, which is called as IP address hopping and route hopping, respectively. In the proposed method, the IP mobility mechanism is used for IP address translation in IP address hopping and route switching in route hopping, and DPDK (Data Plane Development Kit) is used to achieve high throughput. Furthermore, encryption by IPsec is also implemented as an additional measure against man-in-the-middle attacks. We show the throughput measurement of the server using the proposed method and its usefulness compared with the other methods.	
IS2-02	Building a High-speed Information-Centric Networking Router on a Commercial Off-the-Shelf Computer	Junji Takemasa (Osaka University), Yuki Koizumi (Osaka University), Toru Hasegawa (Osaka University)
	Abstract: A software router, which is built on a commodity computer, has been a well-studied research topic for a few decades, and is becoming feasible with the recent advances in networking technologies such as DPDK and eBPF. However, the emergence of information-centric networking (ICN), a novel Internet architecture, raises a couple of performance issues, as the router must support name-based forwarding and per-packet caching at line speed. This talk presents how to build high-speed, i.e., 100 Gbps-class, ICN software routers. The talk first presents a microarchitectural analysis at the level of CPU pipelines and instructions to identify performance bottlenecks on the commodity computer. The microarchitectural analysis highlights two issues: memory access latency to large forwarding tables and cache computations for unpopular packets. The talk then presents solutions to these two issues: a prefetching technique of forwarding tables for the former and a cache admission technique of unpopular packets for the latter. Finally, the talk summarizes the lessons learned.	
IS2-03	Information-Centric Networking Making Innovative Technology into Reality	Kazuhisa Matsuzono (NICT), Yusaku Hayamizu (NICT), Hitoshi Asaeda (NICT)
	Abstract: Information-Centric Networking (ICN) is an innovative technology that provides low-loss, low-latency, high-throughput, and high-reliability communications for diversified and advanced services and applications. In this talk, we present ICN functionalities as well as recent research findings. To facilitate the development of functional code and encourage application deployment, we introduce an open-source software platform called Cefore that facilitates CCNx-based communications whose message types are defined by the Internet Research Task Force. Cefore consists of networking components such as packet forwarding and in-network caching daemons, and it provides APIs and a Python wrapper program that enables users to easily develop CCNx-based ICN applications running on Cefore. We then introduce the current activity at the Moonshot project that aims to create a cybernetic avatar infrastructure for diversity and inclusion and how we can apply ICN applications. We also consider promising research directions for further innovation.	

Invite Special Session 3 (11/26 PM2) Chair: Takumi Oishi (Hitachi, Ltd.)

IS3-01	Invisible Sensing - High-Throughput Walk-Through Security Screening System Featuring Motion-Robust Radar Imaging and ML	Masayuki Ariyoshi (NEC Corporation), Kazumine Ogura (NEC Corporation), Tatsuya Sumiya (formerly with NEC Corporation), Nagma S Kahn (NEC Corporation), Shingo Yamanouchi (NEC Corporation), Toshiyuki Nomura (NEC Corporation)
	Abstract: Radar-based sensing and concealed weapon detection technologies have been attracting attention as a measure to enhance security screening in public facilities and various venues. For these applications, the security check must be performed without impeding the flow of people, with minimum human effort, and in a non-contact manner. We developed technologies for a high-throughput walk-through security screening called Invisible Sensing (IVS) and implemented them in a prototype system. The IVS system consists of dual planar radar panels facing each other and carries out an inspection based on a multi-region screening approach as a person walks between the panels. Our imaging technology constructs a high-quality radar image that compensates for motion blur caused by a person's walk. Our detection technology takes multi-view projected images across the multiple regions as input to enable real-time whole-body screening. The IVS system runs its functions by pipeline processing to achieve real-time screening operation. This talk presents our IVS system along with these key technologies and demonstrates its empirical performance.	
IS3-02	Analog-Circuit Domain Cancellation with Optimal Feedback Path Selection on Full-Duplex Relay Systems	Hayato Fukuzono (NTT), Keita Kuriyama (NTT), Masafumi Yoshioka (NTT-AT), Toshifumi Miyagi (NTT), Takeshi Onizawa (Tokyo University of Science)
	Abstract: This work proposes a scheme that reduces residual self-interference significantly in the analog-circuit domain on wireless full-duplex relay systems. Full-duplex relay systems utilize the same time and frequency resources for transmission and reception at the relay node to improve spectral efficiency. Our proposed scheme measures multiple responses of the feedback path by changing the direction of the main beam of the transmitter at the relay, and then selecting the optimal direction that minimizes the residual self-interference. Analytical residual self-interference is derived as the criterion to select the optimal direction. In addition, this work considers the target of residual self-interference power before the analog-to-digital converter (ADC) dependent on the dynamic range in the analog-circuit domain. Analytical probability that the residual interference exceeds the target is derived to help in determining the number of measured responses of the feedback path. Computer simulations validate the analytical results, and show that in particular, the proposed scheme with ten candidates improves the residual self-interference by approximately 6 dB at the probability of 0.01 that the residual self-interference exceeds target power compared with a conventional scheme with the feedback path modeled as Rayleigh fading.	
IS3-03	Unified 6G Waveform Design with 5G NR Backward Compatibility	Juan LIU (DOCOMO Beijing Labs), Xiaolin HOU (DOCOMO Beijing Labs), Wenjia LIU (DOCOMO Beijing Labs), Lan CHEN (DOCOMO Beijing Labs), Yoshihisa KISHIYAMA (NTT DOCOMO), Takahiro ASAI (NTT DOCOMO)
	Abstract: 5G has achieved large-scale commercialization across the world and the global 6G research and development is accelerating. To support more new use cases, 6G should satisfy extreme performance requirements beyond 5G, including extreme high data rate and extreme coverage extension, etc., which motivates the utilization of high-frequency bands such as millimeter wave (mmW) and sub-terahertz (sub-THz) as well as non-terrestrial network (NTN), respectively. However, the nonlinearity of power amplifiers (PA) is a critical challenge for both high-frequency bands and NTN. Therefore, high power efficiency (PE) waveform design has become an important 6G research topic. Meanwhile, high spectral efficiency (SE) and low out-of-band emission (OOBE) are still important key performance indicators (KPIs) for 6G waveform design. Furthermore, from the standardization point of view, it is also desirable for 6G waveform to maintain the backward compatibility with 5G NR. In this presentation, we will explore various 6G candidate waveforms and introduce our 6G unified waveform design, which is based on the Discrete-time Fourier Transform spreading Orthogonal Frequency Division Multiplexing (DFT-s-OFDM) waveform utilized in both 4G LTE and 5G NR. It can realize flexible waveform shaping (i.e., compression and expansion) by applying simple signal processing techniques before and after the DFT module, which improves the SE, PE, and OOBE performance of waveform. The simulation results have verified the effectiveness of our proposed 6G unified waveform design with NR backward compatibility. Especially, for two example 6G usage scenarios, our proposal can improve the NTN UL throughput and the mmW coverage, respectively.	

Invite Special Session 4 (11/27 PM1) Chair: Hiraku Okada (Nagoya Univ.)

IS4-01	Model-Based Tuning of Machine Learning-Aided GNSS Positioning	Shinsuke Ibi (Doshisha University), Takumi Takahashi (Osaka University), Hisato Iwai (Doshisha University)
	Abstract: In global navigation satellite system (GNSS), including the global positioning system (GPS) and quasi-zenith satellite system (QZSS), the receiver position is estimated by solving nonlinear simultaneous equations using the iterative method. However, disturbances induced by the ionosphere and troposphere, as well as multipath effects in urban areas and between tall buildings, deteriorate positioning accuracy. To suppress the harmful influence of the disturbance, differential positioning, such as real-time kinematic (RTK) positioning, which improves the positioning accuracy with the assistance of the correction data yielded from the base station, is effective. In this talk, we apply a deep unfolding (DU) technique, which is a type of machine learning technique that can construct flexible derivation algorithms by training the dataset to the GNSS iterative estimation algorithm. After learning the DU network based on the observation data at the base station, the rover receives the correction data obtained from the DU network. The correction data helps in improving the rover positioning performance.	

IS4-02	Toward Predictive Modeling of Solar Power Generation for Multiple Power Plants	Kundjanasith Thonglek (Osaka University), Kohei Ichikawa (Nara Institute of Science and Technology), Keichi Takahashi (Tohoku University), Chawanat Nakasan (Kasetsart University), Kazufumi Yuasa (NTT FACILITIES, INC.), Tadatoshi Babasaki (NTT FACILITIES, INC.), Hajimu Iida (Nara Institute of Science and Technology)
	Abstract: Solar power is the most widely used renewable energy source, which reduces pollution consequences from using conventional fossil fuels. However, supplying stable power from solar power generation remains challenging because it is difficult to forecast power generation. Accurate prediction of solar power generation would allow effective control of the amount of electricity stored in batteries, leading in a stable supply of electricity. Although the number of power plants is increasing, building a solar power prediction model for a newly constructed power plant usually requires collecting a new training dataset for the new power plant, which takes time to collect a sufficient amount of data. This paper aims to develop a highly accurate solar power prediction model for multiple power plants available for both new and existing power plants. The proposed method trains the model on existing multiple power plants to generate a general prediction model, and then uses it for a new power plant while waiting for the data to be collected. In addition, the proposed method tunes the general prediction model on the newly collected dataset and improves the accuracy for the new power plant. We evaluated the proposed method on 55 power plants in Japan with the dataset collected for two and a half years. As a result, the pre-trained models of our proposed method significantly reduces the average RMSE of the baseline method by 73.19%. This indicates that the model can generalize over multiple power plants, and training using datasets from other power plants is effective in reducing the RMSE. Fine-tuning the pre-trained model further reduces the RMSE by 8.12%.	
IS4-03	Dynamic Projection Mapping Technologies Pioneered by High-speed Vision	Leo Miyashita (Tokyo University of Science), Tomohiro Sueishi (Tokyo University of Science), Satoshi Tabata (Tokyo University of Science), Tomohiko Hayakawa (Tokyo University of Science), Masatoshi Ishikawa (Tokyo University of Science), Tokyo University of Science (Tokyo University of Science)
	Abstract: Dynamic projection mapping (DPM), in which appropriate images are precisely projected onto dynamically moving and deforming objects in real time, is the technique that is attracting extensive research and new applications. In this talk, we point out that DPM requires critically different high-speed performance compared to ordinary projection mapping, and introduce high-speed vision technologies as a means to achieve such responsiveness. The high-speed vision technologies include high-frame-rate and low-latency devices such as vision chips, high-speed projectors, and high-speed image processing algorithms. In addition to the technologies, we present some state-of-the-art DPM applications that are evolving toward unconstrained, multimodal representation based on these high-speed vision technologies.	

Invite Sessions

Invite Session 1 (11/25 PM1) Chair: Taku Yamazaki (Shibaura Institute of Technology)		
I1-01	Wireless LAN Technologies based on Mathematical Model of Physical Phenomena	Hiroyasu Obata (Hiroshima City University)
	Abstract: Wireless LAN has become one of important infrastructures in the current access network. However, by a significantly increasing number of communication devices connecting to wireless LANs, various issues such as throughput performance degradation and deployment of AP in appropriate place have emerged. Wireless LAN communication is particularly susceptible to the increase in the number of terminals and changes in the usage environment. While responses such as expanding the bandwidth are being implemented, a fundamental solution remains challenging. To address challenging issues in networks, various studies have proposed network control inspired by phenomena observed in nature. In our research, we aim to achieve more efficient wireless LAN communication by applying mathematical models that describe physical phenomena observed in nature. This presentation will show the wireless LAN access control using a synchronization phenomena model of coupled oscillators and its application technologies as part of the results.	
I1-02	A Study on the Design and Analysis of Cache Networks: Socially-aware ICN and Similarity Caching	Ryo Nakamura (Fukuoka University)
	Abstract: In this talk, I'd like to present research topics on the design and analysis of cache networks. As a preliminary, I'll briefly review the architecture of Information-Centric Networking (ICN), which is a sort of cache network, and discuss ways to analyze the benefits of ICN from the perspective of content caching. Then, I'd like to introduce my recent research topics: socially-aware ICN and similarity caching. Specifically, I will provide an overview of our socially-aware ICN, which takes into account features observed in social media, and the relationship between these social features, e.g., the presence of influencers, and content caching. Moreover, I will present an analysis of similarity caching in a general cache network.	
I1-03	In-Network Video Processing Technology for Real-Time Live Video Distribution	Hiroyuki Kitada (NTT)
	Abstract: The IP-based transmission of video has been advancing, leading to its increasing adoption for video data transmission between devices in video production. On the other hand, HTTP streaming of compressed video is currently the mainstream for video distribution to end users. Therefore, data format conversion processing is required between video production and distribution systems, resulting in delays in processing and buffering. The authors have studied the application of video transmission technology to video distribution and have proposed an in-network video processing technology. This paper describes the in-network video processing technology's design, implementation, and evaluation.	
I1-04	MAN Model Design Based on Regional Railways Information for Beyond 5G Research	Takuji Tachibana (University of Fukui)
	Abstract: To accelerate research on Beyond 5G technologies, we proposed an algorithm that designs mesh-type metropolitan area network (MAN) models based on a priori regional railway information in 2022, because ground-truth communication network information is unavailable. In addition to the design algorithm, we proposed a method that assigns population information to each node by highlighting the number of passengers alighting/boarding at each station and the population densities in day and night. We also proposed a compression algorithm for the large original MAN model in order to design a small MAN model. According to these proposed algorithms, we designed Tokyo TMN23 model and Tokyo TMN12 models for Tokyo 23 wards. Since 2022, we have provided Tokyo TMN23 model with 23 nodes and Tokyo TMN12 models with 12 nodes as open data. After the release of the models, these models are already used in various research fields by researchers around the world. This presentation explains the MAN model design algorithms and introduces the Tokyo MAN models. Then, the validity of the proposed algorithms is shown through comparisons with other models. This presentation also introduced new MAN models that are designed with person trip survey data in addition to regional railway information.	
Invite Session 2 (11/26 PM1) Chair: Daisuke Umehara (Kyoto Institute of Technology)		
I2-01	Target Estimation Using a Terahertz TDS Synthetic Aperture Array	Keizo Cho (Chiba Institute of Technology)
	Abstract: Terahertz waves have a shorter wavelength than microwave and millimeter waves, so they are effective for imaging on the order of millimeters and estimating the position and thickness of targets. In conventional imaging using terahertz waves, high-resolution images are obtained by focusing the transmitted wave with a lens and irradiating it onto the target for observation. However there is the problem that it takes time to scan the target to obtain images of the surface and thickness direction. To overcome the problem, the authors are investigating the use of a synthetic aperture array in terahertz time domain spectroscopy (TDS) and the application of high-resolution estimation technology to the received signal to speed up measurements and improve resolution. This presentation will introduce examples of non-destructive measurement of the internal structure of dielectric substrates using terahertz TDS, and the results of position estimation of thin wire targets with a spacing of 2 mm or less using synthetic aperture arrays, MUSIC, and compressed sensing.	
I2-02	Low Latency Cellular Network Based Vehicle-to-Vehicle Communication towards Autonomous Driving Era	Manabu Mikami (SoftBank Corp.)
	Abstract: Japan recently suffers from a serious social problem that is becoming difficult to maintain regional transportation services such as route buses and district railways nationwide, due to the progress of labor shortage and regional depopulation caused by declining birthrate and aging population. Autonomous driving technologies are essential to realizing sustainable regional transportation services, and require to reduce further communication latency in cellular mobile networks that support the technologies. In order to contribute to solving the social problem, we are working on technology research and developments of low latency vehicular communications towards application to platooning for automated buses. This lecture will describe the major technical issues in communication quality when using cellular network based vehicle-to-vehicle communication, i.e., V2N2V, for the platooning application. It will also present a low-latency in-vehicle UE-to-UE communication technique to resolve their issues, including the field evaluation results.	
I2-03	Packet-Index Level Modulation and Its Implementation	Mai Ohta (Fukuoka University)
	Abstract: In the IoT, packet-level index modulation has been proposed as a method to increase the number of transmitted bits while satisfying the duty cycle; in PLIM, symbols are assigned to indexes of frequency and time slots during packet transmission, thereby increasing the number of transmitted bits in addition to packet transmission. However, prior time synchronization between the transmitter and receiver is required when detecting time slot indexes. On the other hand, inexpensive IoT terminals are expected to have low precision in the oscillator of the microcontroller used for transmission timing control, which will affect the practical application of PLIM. In this presentation, we present our results on packet-level index modulation and its implementation in wireless devices for practical use.	
Invite Session 3 (11/26 PM2) Chair: Katsuyoshi Iida (Hokkaido Univ.)		
I3-01	Bending induced optical properties in a coupled muti-core fiber	Ryota Imada (NTT Corporation)
	Abstract: Bending loss in a coupled-multi-core fiber (CMCF) varies with the bending direction. This property also affects an effective cut-off wavelength of the CMCF. This paper provides general design guideline of a CMCF considering the bending loss and its influence on the cut-off wavelength.	
I3-02	Simulation and measurement for the effect of aircraft fuselage on the antenna radiation pattern	Takuya Okura (NICT)
	Abstract: Owing to the increasing demand for Ka-band communications, Resolution 169 (WRC 19) allocated additional frequencies to ESIM in satellite communications and specified the technical requirements for ESIM that can be shared with terrestrial systems. To protect terrestrial systems, Resolution 169 limits the PFD per aircraft. To accurately determine the PFD at the base station of terrestrial systems, it is important to estimate the effect of attenuation due to the fuselage. This paper reports the radiation pattern with and without the mockup of the fuselage using fixed-aperture mechanically steered antenna and AESA in an anechoic chamber. The measured radiation pattern in the rear direction of the antenna had a back lobe suppression of about 20 dB for the fixed-aperture mechanically steered antenna and about 10 dB for the AESA. The effect of mockup was only in the back lobe, the half value angle of main beam and the side lobe level were almost the same characteristics. The PFD limits were converted to the EIRP limits and compared with the measured radiation pattern to verify the aircraft attenuation effect. It is considered that the verification of the fuselage effect contributes to the improvement of evaluation accuracy of the compliance with Resolution 169.	
I3-03	Acoustic Image Transmission from AUV in seafloor to support vessel	Kazuo Ishii (Kyushu Institute of Technology)
	Abstract: As Autonomous Underwater Vehicles (AUVs) can cruise with a constant depth and altitude, they contribute as stable underwater observation platforms. AUVs can capture images of large seabed areas and generate mosaic images from them, so become the practical method for ocean surveys. The next step is expected to be sampling of seafloor objects specified by the operator on support vessel or remote place. To build a system where AUVs cruise the deep sea floor and sample targets instructed by operators on board ships, it's necessary to have a robot system that can transmit seafloor images on site and realtime. We reports the results of acoustic image transmission from seafloor to support vessel.	
Invite Session 4 (11/27 PM1) Chair: Masaaki Inoue (NTT)		
I4-01	Linear optical sampling for optical fiber characterization and LiDAR applications	Chao Zhang (Shimane University)
	Abstract: Extensive research on MCFs, MMFs, and MM-MCFs has been done to overcome the capacity limitation of single-core SMFs. Since the transmitted optical signals are demodulated after MIMO processing, the total spread of the signal delay and the coupling strength of such fibers determines the load of the MIMO processor. Thereafter, measurement of differential delay etc. between different modes or cores is necessary for design and implementation of digital signal processors. Such impairments can be characterized by measurement of impulse responses of optical fibers. In this talk, we would like to introduce our research on measurement of fiber impulse responses employing linear optical sampling including our recent results of two-dimensional linear optical sampling of fiber spatial modes. In addition, this talk will also cover our recent LiDAR research which utilizes linear optical sampling with the CW referencing approach. Such LiDAR are expected to realize high-precision 3D mapping platforms such as 3D infrastructure inspection.	
I4-02	Cost-effective capacity upgrade and smooth migration to multi-band optical networks	Hiroshi Hasegawa (Nagoya University)
	Abstract: Motivated by the steep traffic growth and the saturation in spectrum utilization efficiency within the conventional C-band, the transmission over new frequency bands which have not been utilized yet has been extensively studied recently. However, the transmission on such frequency bands suffers from higher transmission loss and necessitates link and node upgrades to adapt the multi-band transmission. In order to realize smooth migration to future multi-band optical networks, we have proposed a cost-effective network capacity expansion scheme which only upgrades links to be heavily congested. Then by expanding the upgraded area, given network will be smoothly upgraded to one that fully adopts multi-band transmission. In addition to these schemes, possible implementations for the partial multi-band upgrade that adopt waveelength/waveband converters are summarized in this presentation.	
I4-03	Towards Low-cost People Flow Monitoring in Urban Spaces based on BLE Signal Sensing	Yuki Matsuda (Okayama University)
	Abstract: With the arrival of the post-COVID-19 era, as people who had been confined began to resume their activities, social issues such as “over-tourism” have emerged. Consequently, there has been a significant increase in interest regarding the movement of people, crowdedness levels, and pedestrian flows in urban spaces. Existing approaches face challenges such as high device costs and limitations in the areas they can cover. Therefore, this study aims to develop people flow monitoring technologies by scanning Bluetooth Low Energy (BLE) advertising packets transmitted from common mobile devices owned by the general public. The study focuses on (1) estimating crowdedness levels in various public spaces and (2) tracking people's movements within urban areas. In this talk, we will present an overview of the research project, detailed approaches for each method, and the experimental results obtained so far.	

Special Session with KICS

Special Session with KICS (11/26 PM2) Chair: Sungrae Cho (Chung-Ang University, South Korea)		
K1-01	Integrated Sensing and Communication: From Algorithms to Hardware Prototyping	Sunwoo Kim (Hanyang University, South Korea)
	Abstract: Integrated Sensing and Communication is becoming increasingly important as we move towards 6G communication. Extensive research efforts are being made many across the world from the algorithm development to hardware prototyping. In this talk, the up-to-date overview of the ongoing research on the integrated sensing and communication will be given, which includes various sensing, radar algorithms, and beam management techniques, and hardware prototypes for the 6G ISAC.	Biography: Sunwoo Kim received his B.S degree from Hanyang University, Seoul, Korea in 1999, and his Ph.D. degree, in 2005, from the Department of Electrical and Computer Engineering, University of California, Santa Barbara. Since 2005, he has been working in the Department of Electronic Engineering at Hanyang University, Seoul, Korea, where he is currently a professor. He is now the director of Beyond-G Global Innovation Center and was the director of the 5G/Unmanned Vehicle Research Center, funded by the Ministry of Science and ICT of Korea. He is also a frequent visitor to the Laboratory for Information and Decision Systems, Massachusetts Institute of Technology. He served as an associate editor of IEEE Transactions on Vehicular Technology and is a senior member of the IEEE. His research interests include wireless communication, sensing, and localization.
K1-02	Experimental measurement of Turbulence in Free Space Optics Channels	Young-Chai Ko (Korea University, South Korea)
	Abstract: In this talk, we propose a beam pointing algorithm to find optimal beam coordinates maximizing link performance in multiple-input multiple-output (MIMO) free space optical communications (FSOC) with spatial diversity. We first derive the received signal-to-noise ratio (SNR) with spatial diversity and analyze the convexity condition of SNR function with respect to transmit beam coordinates. Then, we obtain the beam coordinates maximizing the received SNR through an alternating optimization (AO) algorithm and Newton’s method. However, the proposed algorithm requires instantaneous channel state information (CSI), which requires a high signaling overhead in MIMO FSOC. Thus, instead of exploiting instantaneous CSI, we utilize statistical CSI and propose a robust beam pointing algorithm with respect to atmospheric turbulence and pointing error. Numerical results show that our proposed algorithm outperforms conventional schemes in a dynamic FSOC network. Furthermore, we confirm that the optimal coordinates which are robust to the channel conditions approach to the centroid of receiver lenses as the strength of turbulence and pointing error increases.	Biography: Young-Chai Ko {S'97, M'01, SM'06} (koyc@korea.ac.kr) received his B.Sc. degree in electrical and telecommunication engineering from Hanyang University, Seoul, Korea, and his M.S.E.E. and Ph.D. degrees in electrical engineering from the University of Minnesota, Minneapolis, MN in 1999 and 2001, respectively. He was with Novatel Wireless as a research scientist from January 2001 to March 2001. In March 2001, he joined Texas Instruments, Inc., wireless center, San Diego, CA, as a senior engineer. He has been with the school of electrical engineering at Korea university as a professor since 2004. His research interests include the design and evaluation of wireless communication systems. In particular, his main research focuses on the designs of free space optical communications with application to inter-satellite link and wireless interconnect between computing nodes and 6G cellular systems.
K1-03	Spectrum status and issues in Korea	Seung-Hoon Hwang (Dongguk University, South Korea)
	Abstract: In this talk, the Spectrum Committee of the 6G Forum is introduced, followed by a description of the current spectrum status in the Republic of Korea. Finally, the Republic of Korea’s spectrum plan is summarized.	Biography: Seung-Hoon Hwang (Senior Member, IEEE) received a Ph.D. in Electrical Engineering from Yonsei University, Seoul, Republic of Korea in 1999. From 1999 to 2004, he worked for UMTS standardization at LG Electronics, Republic of Korea. From 2003 to 2004, he served as a Visiting Research Fellow with Prof. Lajos Hanzo at the University of Southampton, U.K. He is a recipient of the British Chevening Scholarship funded by the Foreign and Commonwealth Office, U.K. He is currently a Professor in the Division of Electronics and Electrical Engineering and the Dean of Engineering School at Dongguk University, Seoul, Republic of Korea. In 2010, he was a Visiting Professor with Prof. John Cioffi at Stanford University, CA, U.S.A. He is a Senior Member of IEEE, a Vice President for the Korean Institute of Communications and Information Sciences, Korea, and the Chairperson of the Spectrum Committee in the 6G Forum, Korea. He has received awards from the Minister of Education and Minister of Science and ICT.

Oral Sessions

Oral Session 1 (11/25 PM1) Chair: Nattapong Kitsuwan (The University of Electro-Communications)		
O1-01	Multi-hop Communication Experiment using LoRa for Bus Location Tracking Systems	Ryotaro Sakauchi (Kanazawa Institute of Technology (Japan)), Takato Nakaya (Kanazawa Institute of Technology (Japan)), Yoshiaki Hashimoto (Kanazawa Institute of Technology (Japan)), Aoi Yoshida (Kanazawa Institute of Technology (Japan)), Tomonori Suzuki (Kanazawa Institute of Technology (Japan)), Naoto Makino (Kanazawa Institute of Technology (Japan)), Taichi Ishihara (Kanazawa Institute of Technology (Japan)), Shunsuke Katsumata (Kanazawa Institute of Technology (Japan)), Hiroaki Mukai (Kanazawa Institute of Technology (Japan))
O1-02	An evaluation of self-supervised learning-based scheduling scheme under multiple APs environment for sub-terahertz band	Osamu Nakamura (Sharp Corporation (Japan)), Ryota Yamada (Sharp Corporation (Japan)), Hiromichi Tomeba (Sharp Corporation (Japan)), Yasuhiro Hamaguchi (Sharp Corporation (Japan))
O1-03	Toward Scalable and Robust Federated Meta-Learning with Efficient In-Network Computing	Htet Htet Hlaing (National Institute of Information and Communications Technology (NICT) (Japan)), Hitoshi Asaeda (National Institute of Information and Communications Technology (NICT) (Japan))
O1-04	Experiment on centralized control of router switching for preventing internal malware-spreading in metabolic routers	Yuya Suga (Tokai University (Japan)), Hiroki Saruta (Tokai University (Japan)), Junichi Murayama (Tokai University (Japan))
Oral Session 2 (11/25 PM2) Chair: Moriya Nakamura (Meiji University)		
O2-01	Erbium-doped Fiber Nonlinear Transmission Circuit Technique for Improving the Optical Power Resolution in Fiber-optic Measur	Kokoro Kitamura (Shimane university (Japan)), Md Golam Barkatul Abrar (Shimane university (Japan)), Ryuga Harada (Shimane university (Japan)), Yuusuke Doukan (Shimane university (Japan)), Hiroji Masuda (Shimane university (Japan))
O2-02	A New Prioritized Request-Based Dynamic Bandwidth Allocation for Maintaining Fairness in PON with Multiple Heavy Users	Zhenfei YU (kyushu university (Japan)), Amila KARIYAWASAM (kyushu university (Japan)), Shunji KIMURA (kyushu university (Japan))
Oral Session 3 (11/26 PM1) Chair: Takeshi Toda (Nihon University)		
O3-01	Affection of Terrain on Propagation Characteristics of 920 MHz Band Radio Wave from Mountainous Areas	Atsushi Ikaruga (Hiroshima City University (Japan)), Makoto Kobayashi (Hiroshima City University (Japan)), Koichi Shin (Hiroshima City University (Japan)), Masahiro Nishi (Hiroshima City University (Japan))
O3-02	Adaptive Transmit Power Control for SC-FDE MIMO in Dynamic Radio Propagation Environments	Lisa Suzuki (Waseda University (Japan)), Shuhei Saito (Waseda University (Japan)), Fumiaki Maehara (Waseda University (Japan))

O3-03	Performance Evaluation of Wi-Fi CSI Fall Detection in Different Distance between Transmitters and Receivers	Yuki Yanagida (Department of Information Engineering, Graduate School of Information Science and Technology, Hiroshima City University (Japan)), Makoto Kobayashi (Department of Information Engineering, Graduate School of Information Science and Technology, Hiroshima City University (Japan)), Koichi Shin (Department of Information Engineering, Graduate School of Information Science and Technology, Hiroshima City University (Japan)), Masahiro Nishi (Department of Information Engineering, Graduate School of Information Science and Technology, Hiroshima City University (Japan))
O3-04	Improvement of TOF and DOA Estimation with M-FOCUSS Using Weighted Square Norm	Kento Kataoka (Tokai Rika Co., Ltd. (Japan)), (Nagoya Institute of Technology (Japan)), Shotaro Sakakibara (Nagoya Institute of Technology (Japan)), Nobuyoshi Kikuma (Nagoya Institute of Technology (Japan)), Yoshiki Oishi (Tokai Rika Co., Ltd. (Japan)), Tatsuya Koike (Tokai Rika Co., Ltd. (Japan)), Kenichi Koga (Tokai Rika Co., Ltd. (Japan)), Kunio Sakakibara (Nagoya Institute of Technology (Japan)), Yoshiki Sugimoto (Nagoya Institute of Technology (Japan))

Oral Session 4 (11/27 PM1) Chair: Takuya Asaka (Tokyo Metropolitan University)		
O4-01	Dementia Detection Based on Face Image Data and Convolutional Neural Networks	CHUHENG ZHENG (Keio University (Japan)), Mondher Bouazizi (Keio University (Japan)), Taishiro Kishimoto (Keio University (Japan)), Tomoaki Ohtsuki (Keio University (Japan))
O4-02	Secrecy Capacity of Hybrid VLC-RF Systems with Light Energy Harvesting	Tuan Anh Hoang (Hanoi University of Science and Technology (Viet Nam)), Thanh Van Pham (Shizuoka University (Japan)), Chuyen Thanh Nguyen (Hanoi University of Science and Technology (Viet Nam))
O4-03	Selection of suitable magnetic cores for contactless signal application in power line communication	Shoryu Minami (Kyushu Institute of Technology (Japan)), Toshiyuki Wakisaka (Panasonic Holdings Corporation (Japan)), Tohlu matsushima (Kyushu Institute of Technology (Japan)), Daisuke Nakayama (Kyushu Institute of Technology (Japan)), Yuji Igata (Kyushu Institute of Technology (Japan)), Yuki Fukumoto (Kyushu Institute of Technology (Japan))

Poster Sessions

Poster Session 1 (11/25 PM3)		
P1-01	MACKEY with a single layer substrate for multi frequency	Hayato Ide (Kanazawa Institute of Technology (Japan)), Toru Fukasawa (Kanazawa Institute of Technology (Japan)), Shigeru Makino
P1-02	MiWiL: LoRaWAN Packet Airtime Adaptation for Better Coexistence with Wi-Fi Networks	Chenglong Shao (Kyushu Institute of Technology (Japan))
P1-03	Overfitting characteristics of reservoir-computing-based nonlinear equalizer trained on PRBSs in optical communication systems	Yuta Ito (Meiji University (Japan)), Kai Ikuta (Meiji University (Japan)), Tsuyoshi Yamada (Meiji University (Japan)), Takumi Yamamoto (Meiji University (Japan)), Moriya Nakamura (Meiji University (Japan))
P1-04	Evaluation of Access Control Mechanisms within Inter-Terminal Cooperation in Millimeter-Wave Communication Systems	Yiche Li (Nagoya University (Japan)), Hiraku Okada (Nagoya University (Japan)), Chedlia Ben Naila (Nagoya University (Japan))
P1-05	Suppression of fiber fuse initiation using 24 ns optical pulses with an average power of a few milliwatts	Masahiro Ono (Kitami Institute of Technology (Japan)), Ukyo Haruki (Kitami Institute of Technology (Japan)), Kenji Kurokawa (Kitami Institute of Technology (Japan))
P1-06	On Performance Analysis of Quantized Unsupervised Learning for In-Kernel Flow-Based Intrusion Detection Systems	Hotaka Taguchi (Nara Institute of Science and Technology (Japan)), Takanori Hara (Nara Institute of Science and Technology (Japan)), Shoji Kasahara (Nara Institute of Science and Technology (Japan))
P1-07	Improvement of Bit Error Rate by Randomized Constellation on One-Bit BPSK-OFDM Receivers Using Stochastic Resonance	Ryota Ichikawa (Toyohashi University of Technology (Japan)), Kazuki Komatsu (Toyohashi University of Technology (Japan)), Hideyuki Uehara (Toyohashi University of Technology (Japan))
P1-08	Numerical analyses of optical 3R operation of QPM-detuned PPLNs	Naoto Suzuki (Tokyo University of Science (Japan)), Ryo Sugiura (Tokyo University of Science (Japan)), Daiki Shiratori (Tokyo University of Science (Japan)), Ryoichi Miyauchi (Tokyo University of Science (Japan)), Tomotaka Kimura (Doshisha University (Japan)), Kouji Hirata (Kansai University (Japan)), Yutaka Fukuchi (Tokyo University of Science (Japan))
P1-09	Joint Optimization of Routing and Control Inputs for Asynchronous Multi-Hop Networked Control System with Disturbance	Koki Yoshida (Kagawa University (Japan))
P1-10	Measurement Result of Broadband Circularly Polarized MACKEY	Yuto Usuda (Kanazawa Institute of Technology (Japan)), Yoichi Murakami (Kanazawa Institute of Technology (Japan)), Turu Fukasawa (Kanazawa Institute of Technology (Japan)), Shigeru Makino
P1-11	Experimental verification of noise suppression effect of multiband compatible near-field noise suppression device	Miki Otani (Tokai University (Japan)), Kimitoshi Murano (Tokai University (Japan))
P1-12	Effectiveness evaluation of flexible power ratio and bandwidth allocation on hybrid multiple access scheme using simultaneously	Nozomi Sasaki (Waseda University (Japan)), Shuhei Saito (Waseda University (Japan)), Hirofumi Suganuma (Waseda University (Japan)), Fumiaki Maehara (Waseda University (Japan))
P1-13	Spectrum Slot Allocation Based on Transmission Finishing Time in Elastic Optical Network	Tsubasa Hachiya (The University of Electro-Communications (Japan)), Kitsuwan Nattapong (The University of Electro-Communications (Japan))
P1-14	Design and Analysis of stacked MACKEY for Dual-Band Wi-Fi Applications	Ryoya Kishi (Kanazawa Institute of Technology (Japan)), Toru Fukasawa (Kanazawa Institute of Technology (Japan)), Shigeru Makino
P1-15	Logical Channel Error Performance Comparison for Binary Phase Shift Keying based Time-Domain Index Modulation	Daichi Aoki (Kindai University (Japan)), Ichiro Matsui (Kindai University (Japan)), Wataru Imajuku (Kindai University (Japan))
P1-16	Proposal of Energy Saving Operation in Optical Access Networks with Coherent Time-Domain Index Modulation	Wataru Imajuku (Kindai University (Japan)), Daichi Aoki (Kindai University (Japan)), Ichiro Matsui (Kindai University (Japan))
P1-17	Optical twin-SSB detection using single homodyne receiver and MIMO-based digital signal processing	Jun Yokoyama (Meiji University (Japan)), Syouma Kanaya (Meiji University (Japan)), Kai Ikuta (Meiji University (Japan)), Moriya Nakamura (Meiji University (Japan))
P1-18	Activity Detection for GF-NOMA with Interference Suppression Filter	Shimpei Ohshita (Ibaraki University (Japan)), Teruyuki Miyajima (Ibaraki University (Japan))
P1-19	Reception Characteristics of Multi-channel Transmission Systems using Modulated Vibration and Mach–Zehnder Interferometer	Nozomi Nagamatsu (Mie University (Japan)), Tetsuya Manabe (Mie University (Japan)), Atsushi Nakamura (Access Network Service Systems Laboratories, NTT (Japan)), Yusuke Koshikiya (Access Network Service Systems Laboratories, NTT (Japan))
P1-20	Design and Implementation of an Eco /Patient-Friendly Medical Surveillance Record App for Healthcare Optimization in Banglad	MD RAYHAN UDDIN (Faculty of Science and Engineering (Japan)), Eisuke Eisuke Hanada (Faculty of Science and Engineering (Japan))
P1-21	Vibration Detection Sensitivity of Optical Fiber Vibration Sensor using Two-Mode Region of Conventional Single-mode Fibers	Kohei Morikane (Mie university (Japan)), Tetsuya Manabe (Mie university (Japan)), Atsushi Nakamura (Access Network Service Systems Laboratories, NTT (Japan)), Yusuke Koshikiya (Access Network Service Systems Laboratories, NTT (Japan))
P1-22	Gradual Route Modification in Mobile Wireless Multihop Network with Combination of Carrying and Forwarding	Ryota Kurabayashi (Tokyo Denki University (Japan)), Hiroaki Higaki (Tokyo Denki University (Japan))
P1-23	Simplified Beamforming Design for Integrated Sensing and Wireless Power Transfer	Yuto Hiruta (Ibaraki University (Japan)), Teruyuki Miyajima (Ibaraki University (Japan))
P1-24	Optical access network monitoring using bidirectionally applied polarizer-based fiber optic sensors system	Shohei Takahashi (Mie University (Japan)), Tetsuya Manabe (Mie University (Japan)), Atsushi Nakamura (NTT (Japan)), Yusuke Koshikiya (NTT (Japan))
P1-25	Evaluation of Heterogeneous Cache Capacity in Content-Centric Networking	Shohei Nakajima (The University of Electro-Communications (Japan)), Nattapong Kitsuwan (The University of Electro-Communications (Japan))
P1-26	Edge Quantum Server Selection for High-Accuracy Task Processing in Multi-Access Quantum Edge Computing	Shimba Nozaki (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P1-27	Impact of Pedestrian and Man-made Structure Blockage on Transmission Performance in mmWave UAV Communications	Shota Muroki (Waseda University (Japan)), Shuhei Saito (Waseda University (Japan)), Hirofumi Suganuma (Waseda University (Japan)), Fumiaki Maehara (Waseda University (Japan))
P1-28	RTS/CTS with Receipt Opportunity Compensation in Wireless Ad-Hoc Network	Wakana Nomura (Tokyo Denki University (Japan)), Hiroaki Higaki (Tokyo Denki University (Japan))
P1-29	A Study on Implementation of Fundamental Controls for Automotive SDN by P4	Yuma Sakurai (Nagoya Institute of Technology (Japan)), Yoshihiro Ito (Nagoya Institute of Technology (Japan))
P1-30	NFT-Based System for Accurate Carbon Emission Tracking: Addressing Double Counting Issues in Supply Chain Management	Shuhei Yamauchi (Nara Institute of Science and Technology (Japan)), Shoji Kasahara (Nara Institute of Science and Technology (Japan))
P1-31	Integer Linear Programming Formulation for Energy Efficient Mobility-aware Network Slicing in an Open Radio Access Network	Lewiss Quarm (Nara Institute of Science and Technology (Japan)), Takanori Hara (Nara Institute of Science and Technology (Japan)), Shoji Kasahara (Nara Institute of Science and Technology (Japan))
P1-32	Application of Forward Error Correction to the Vibration Transmission System Using the Mach-Zehnder Interferometer	Yuto Ito (Graduate School of Engineering, Mie University (Japan)), Nozomi Naganatsu (Graduate School of Engineering, Mie University (Japan)), Tetsuya Manabe (Graduate School of Engineering, Mie University (Japan)), Atsushi Nakamura (Access Network Systems Laboratories, NTT Corporation (Japan)), Yasuke Koshikiya (Access Network Systems Laboratories, NTT Corporation (Japan))
P1-33	Impulse response characteristics of reservoir computing with tapped delay line for optical nonlinear compensation	Tsuyoshi Yamada (Meiji University (Japan)), Kai Ikuta (Meiji University (Japan)), Yuta Ito (Meiji University (Japan)), Moriya Nakamura (Meiji University (Japan))
P1-34	Precise failure localization with P4 for software-defined networks	Badr Mochizuki (The Kyoto College of Graduate Studies for Informatics (Japan))

Poster Session 2 (11/26 PM3)		
P2-01	Toward Reliable Detection of Close Physical Contact in Mobile LoRaWAN	Chenglong Shao (Kyushu Institute of Technology (Japan))
P2-02	The Integration of Personal Health Records in Bangladesh: Outcomes and Challenges in Patient Information Exchange	MD RAYHAN UDDIN (Faculty of Science and Engineering (Japan)), Eisuke Hanada (Faculty of Science and Engineering (Japan))
P2-03	Improved Transmitter Design for OFDMA-Based Distributed Wireless Powered Communication Networks	Yoshiki Ito (Ibaraki University (Japan)), Teruyuki Miyajima (Ibaraki University (Japan))
P2-04	A compact cavity bandpass filter design using packaged quarter-wavelength microstrip resonators	Hao-Hui Chen (Department of Electronic Engineering (First Campus), National Kaohsiung University of Science and Technology (Taiwan)), Yao-Wen Hsu (Department of Electronic Engineering (First Campus), National Kaohsiung University of Science and Technology (Taiwan))
P2-05	A study of drone flight planning in limited wireless communication area deployment	Yuto Shimodaira (Shinshu University (Japan)), Kohei Akimoto (Akita Prefectural University (Japan)), Osamu Takyu (Shinshu University (Japan))
P2-06	Aggregation Frequency Control Method Considering Spatial Correlation among Sensors	Yudai Koike (Shinshu University (Japan)), Osamu Takyu (Shinshu University (Japan))
P2-07	Experiment Evaluation of Fishing Prediction System with Federated Learning	Yutaka Hatazawa (University of Fukui (Japan)), Shota Miyagoshi (University of Fukui (Japan)), Tomoya Kawakami (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-08	Performance Evaluation of E2E and HBH Transmissions in Quantum Networks with Quantum Memory	Haruna Kimura (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-09	Sector Coupling Based on Quasi-Newton Method in Power and Traffic Networks	Koga Nakamura (University of Fukui (Japan)), Ryuto Shigenobu (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-10	Spatio-Temporal Transmission Filtering for Single-Carrier Asynchronous NOMA Downlink	Tomonari Kurayama (Ibaraki University (Japan)), Teruyuki Miyajima (Ibaraki University (Japan))
P2-11	Storage Placement for Quantum Overlay Networks to Minimize Transmission Delay	Hayata Matsumiya (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-12	Region Segmentation for Real-Time Synchronization of Sub-Cyberspaces	Takahiro Shinya (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-13	Incentive Mechanism for Maximizing Social Surplus in Cross-Device Federated Learning	Shotaro Kitano (University of Fukui (Japan)), Takuji Tachibana (University of Fukui (Japan))
P2-14	Low-Complexity IRS Design for Multiuser OFDMA-Based Wireless Powered Communication Networks	Kazuya Toshima (Ibaraki University (Japan)), Teruyuki Miyajima (Ibaraki University (Japan))
P2-15	Grant-Free Access with Spatial and Temporal Domain Code	Koki Ono (Kagawa University (Japan)), Koji ISHII (Kagawa University (Japan))
P2-16	Evaluation of CoAP and COCOA for Burst Traffic in IoT Networks	Archana K Rajan (Sophia University (Japan)), Masaki Bandai (Sophia University (Japan))
P2-17	Evaluation of Prefetching Method for Routing Information in IPFS Video Streaming	Shota Minegishi (Sophia University (Japan)), Masaki Bandai (Sophia University (Japan))
P2-18	Study on Effectiveness of Gradual Alarms on Driver's Behavior in Automated Driving	Hironobu Nonoyama (Tohoku University (Japan)), Makoto Takahashi (Tohoku University (Japan)), Daisuke Karikawa (Tohoku University (Japan))
P2-19	DOA Estimation by SD-MFOCUSS to Reduce the Mutual Coupling Effect Considering the Symmetry of Uniform Circular Array	Akihiro Kakimi (Nagoya Institute of Technology (Japan)), Nobuyoshi Kikuma (Nagoya Institute of Technology (Japan)), Kunio Sakakibara (Nagoya Institute of Technology (Japan)), Yoshiki Sugimoto (Nagoya Institute of Technology (Japan))
P2-20	A Simulation Study to Minimize Power Consumption for Data Center Cooling	Naruto Arai (Nippon Telegraph and Telephone Corporation (Japan)), Naoki Hanaoka (Nippon Telegraph and Telephone Corporation (Japan)), Kazuya Akiyama (Nippon Telegraph and Telephone Corporation (Japan))
P2-21	An Efficient Secure Learning Model Integration Scheme on Federated Learning Environment	Yuma Takeda (Graduate School of Science and Engineering, Kindai University (Japan)), Kimihiro Mizutani (Faculty of Informatics, Kindai University (Japan)), (Cyber Informatics Research Institute, Kindai University (Japan))
P2-22	A Study of an Enhanced Method for Indoor Human Posture Classification Using 3D mm-Wave Radar with a Small Number of Ch	XUANYU PENG (Nihon University (Japan)), YAOKUN HU (Fujitsu Limited (Japan)), TAKESHI TODA (Nihon University (Japan))
P2-23	On Quantifying the Trustworthiness of End Nodes Based on User Communication Behaviors	Yuya Yamamoto (Osaka Electro-Communication University (Japan)), Yasuhiro Sato (Osaka Electro-Communication University (Japan))
P2-24	A Load Balancing Method in Cache Allocation and Searching using Self-organizing Map for Information-centric Networking	Shuhei Sakuma (Tokyo Metropolitan University (Japan)), Takuya Asaka (Tokyo Metropolitan University (Japan))
P2-25	Statistical Analysis of Communication Flows for Inline Classification of VR Streaming	Kohei Furusaki (Osaka Electro-Communication University (Japan)), Yasuhiro Sato (Osaka Electro-Communication University (Japan))
P2-26	Investigation of the Relationships between Characteristics of Advertising Campaigns and the Number of Followers in X	Tatsuya Goto (Osaka Electro-Communication University (Japan)), Yasuhiro Sato (Osaka Electro-Communication University (Japan))
P2-27	Sparsified characteristics of complex-valued reservoir-computing-based nonlinear equalizer for optical fiber transmission	Takumi Yamamoto (Meiji University (Japan)), Kai Ikuta (Meiji University (Japan)), Yuta Ito (Meiji University (Japan)), Moriya Nakamura (Meiji University (Japan))
P2-28	Direction-of-Arrival (DOA) Estimation of Desired Waves Using Beamspace MUSIC with Cyclic Correlations	Yasuhiro Teshima (Nagoya Institute of Technology (Japan)), Nobuyoshi Kikuma (Nagoya Institute of Technology (Japan)), Kunio Sakakibara (Nagoya Institute of Technology (Japan)), Yoshiki Sugimoto (Nagoya Institute of Technology (Japan))
P2-29	Comparative study of neural networks and MMSE techniques for channel estimation in frequency selective fading channel	Sixian Luo (Sharp Corporation (Japan)), Osamu Nakamura (Sharp Corporation (Japan)), Ryota Yamada (Sharp Corporation (Japan)), Hiromichi Tomeba (Sharp Corporation (Japan)), Yasuhiro Hamaguchi (Sharp Corporation (Japan))
P2-30	Frequency-selective EM shielding sheets consisting of metallic pattern periodic arrangement structures	Takuma Horie (University of Hyogo (Japan)), Shinichiro Yamamoto (University of Hyogo (Japan)), Satoru Aikawa (University of Hyogo (Japan)), Teruhiro Kasagi (Sanyo-Onoda City University (Japan))
P2-31	K-Factor Characteristics According to the Polarizations of Drone-to-Ground Communication	Kaisei Aoki (University of Toyama (Japan)), Kazuhiro Honda (University of Toyama (Japan))
P2-32	Induced Electric Field Analysis Using a Computational Human Model with Various Human Positions near WPT device	Yoshinobu Yanaga (National Institute of Information and Communications Technology (Japan)), (Tokyo University of Agriculture and Technology (Japan)), Yuto Shimizu (National Institute of Information and Communications Technology (Japan)), Takuji Arima (Tokyo University of Agriculture and Technology (Japan)), Tomoaki Nagaoka (National Institute of Information and Communications Technology (Japan))
P2-33	An Effective Hierarchical Object Detection Scheme for High Resolution Image Analysis	Shogo Hayakawa (Kindai University (Japan)), Kimihiro Mizutani (Kindai University (Japan))
P2-34	Adjusting Neural Network Layer Transfer in a Federated Learning Environment	Yu Yoshimura (Kindai University (Japan)), Kimihiro Mizutani (Kindai University (Japan))

Poster Session 3 (11/27 PM2)		
P3-01	Location estimation comparison by Logbee and Zigbee wireless modules using multiple items of sensed information	Shunki Sato (Tohoku Institute of Technology (Japan)), Eisuke Kudoh (Tohoku Institute of Technology (Japan))
P3-02	A Consideration on Application of Weight Orthogonalization in Blind Source Separation Using Array Antenna with Kurtosis Maxir	Shogo Osakabe (Nagoya Institute of Technology (Japan)), Nobuyoshi Kikuma (Nagoya Institute of Technology (Japan)), Kunio Sakakibara (Nagoya Institute of Technology (Japan)), Yoshiki Sugimoto (Nagoya Institute of Technology (Japan))
P3-03	Experimental Performance Verification of Linear MIMO Receiver Using Null-Space Expansion Technique	Yuki Ohi (Yamaguchi University (Japan)), Shohei Kobayashi (Yamaguchi University (Japan)), Xin Du (Yamaguchi University (Japan)), Hidekazu Murata (Yamaguchi University (Japan))
P3-04	Throughput Evaluation by Estimating the Number of Effective Interfering STAs in Tight-Lattice Environment	Daiki Iijima (Suwa Univercity of Scisense (Japan)), Hayato Soya (Suwa Univercity of Scisense (Japan)), Hideya So (Shonan Institute of Technology (Japan))
P3-05	A Study on Multi-hop Data Transmission Using Drones in Disaster Situations	Kazuki Inagaki (Suwa University of Science (Japan)), Hayato Soya (Suwa University of Science (Japan)), Hideya So (Shonan Institute of Technology (Japan))
P3-06	Relay Selection Performance of Collaborative Amplify-and-Forward Relaying in Double Selection Fading Channel	Hiroki Nishimura (Okayama University (Japan)), Satoshi Denno (Okayama University (Japan)), Yafei Hou (Okayama University (Japan))

P3-07	Number of SAR Test Reduction for Conformity Assessment in Human Head Phantom Using Machine Learning	Yuto Shimizu (NICT (Japan)), Hiroshi Kawakami (NICT (Japan)), Tetsuo Saji (NICT (Japan)), Tomoaki Nagaoka (NICT (Japan))
P3-08	DOA Estimation Performance of SLS-VESPA with Multiple Guiding Sensors for Closely Spaced Incident Waves	Kenta Noda (Nagoya Institute of Technology (Japan)), Nobuyoshi Kikuma (Nagoya Institute of Technology (Japan)), Kunio Sakakibara (Nagoya Institute of Technology (Japan)), Yoshiki Sugimoto (Nagoya Institute of Technology (Japan))
P3-09	Experimental Evaluation of 169 MHz Propagation Characteristics between Unmanned Aerial Vehicles	Jo Osoreda (Kyushu Institute of Technology (Japan)), Miyuki Hirose (Kyushu Institute of Technology (Japan)), Takashi Matsuda (National Institute of Information and Communications Technology (Japan)), Takeshi Matsumura (National Institute of Information and Communications Technology (Japan))
P3-10	PPP-B2b Augmentation Messages Broadcast from the BeiDou Positioning Satellite	Satoshi Takahashi (Hiroshima City University (Japan))
P3-11	A Study on Multicast Coordination for Live Streaming in Information-Centric Networking	Kai Sakamoto (Kansai University (Japan)), Yusaku Hayamizu (National Institute of Information and Communications Technology (NICT) (Japan)), Masaki Bandai (Sophia University (Japan)), Miki Yamamoto (Kansai University (Japan))
P3-12	Implementation of Database-Oriented Unified Control System for Heterogeneous SDN Controllers	Renma IWAMOTO (Osaka Electro-Communication University (Japan)), Yasuhiro SATO (Osaka Electro-Communication University (Japan))
P3-13	Fingerprint localization using multi-input CNN model and direction information	Taiga Arata (University of Hyogo (Japan)), Satoru Aikawa (University of Hyogo (Japan)), Shin-ichiro Yamamoto (University of Hyogo (Japan))
P3-14	A Study on Chirp Selection Diversity to Improving Estimation Accuracy in Non-contact Heart Rate Measurement based on mm-W	Tatsunori Saito (Nihon Univ. (Japan)), Yaokun Hu (Nihon Univ. (Japan)), (Fujitsu Ltd. (Japan)), Takeshi Toda (Nihon Univ. (Japan))
P3-15	Mobile communication adopting pile PSK metods, using in LTE base station and mobile nodes with DPLL, enabling high speed t	Hideo Tatsuno (personal (Japan))
P3-16	Bridging the Auditory Gap: AR Smart Glasses for Real-time Speech-to-Text Transcription for Hearing Impaired	Ryo Midorikawa (Tokyo Metropolitan University (Japan)), Taito Baba (Tokyo Metropolitan University (Japan)), Takumi Senaha (Tokyo Metropolitan University (Japan)), Takuya Asaka (Tokyo Metropolitan University (Japan))
P3-17	Evaluation of Local 5G Network Performance at Tokyo Metropolitan University.	Ryota Daido (Tokyo Metropolitan University (Japan)), Yuki Norimatsu (Tokyo Metropolitan University (Japan)), Takuya Asaka (Tokyo Metropolitan University (Japan))
P3-18	Channel Measurement Results of UHF Band for Terminal-Collaborated MIMO Transmission	Shohei Kobayashi (Yamaguchi University (Japan)), Tianhan Zhong (Yamaguchi University (Japan)), Xin Du (Yamaguchi University (Japan)), Hidekazu Murada (Yamaguchi University (Japan))
P3-19	Numerical Assessment of SAR Enhancement Due to Implanted Metal Plates under Exposure from Wireless Charging Coils in 6	Shuhei Waki (Hokkaido University (Japan)), Funa Tsumura (Hokkaido University (Japan)), Takashi Hikage (Hokkaido University (Japan)), Tomoaki Nagaoka (National Institute of Information and Communications Technology (Japan))
P3-20	Feature Selection for Improving Deep Neural Network-based Intrusion Detection System	Anh Sy Do (Nagaoka University of Technology (Japan)), Akiko Manada (Nagaoka University of Technology (Japan)), Kohei Watabe (Saitama University (Japan))
P3-21	A MPQUIC-Enhanced WebRTC System with Adaptive Fuzzy Logic Path Scheduling	Yue Ren (The University of Electro-Communications (Japan)), Celimuge Wu (The University of Electro-Communications (Japan)), Zhaoyang Du (The University of Electro-Communications (Japan)), Yangfei Lin (The University of Electro-Communications (Japan)), Wugedele Bao (Hohhot Minzu College (China))
P3-22	On OAM mode multiplexing and LoS MIMO with linear or rectangular array: a comparison of eigenvalues in free space	Makoto Taromaru (Fukuoka Univarsity (Japan))
P3-23	A crutch gait recognition method integrating floor sensors and IMUs	Youji Ochi (Kindai University (Japan))
P3-24	Circuit analysis of noise coupling and signal transmission characteristics between bundled power and signal wires	Mao Inoue (Kyushu Institute of Technology (Japan)), Tohlu Matsushima (Kyushu Institute of Technology (Japan)), Daisuke Nakayama (Kyushu Institute of Technology (Japan)), Yuki Fukumoto (Kyushu Institute of Technology (Japan))
P3-25	Malicious Behavior Detection Method based on Feature Extraction of Malware DNS Traffic Data	Toshiki Koga (Kyushu Institute of Technology (Japan)), Daiki Nobayashi (Kyushu Institute of Technology (Japan)), Takeshi Ikenaga (Kyushu Institute of Technology (Japan))
P3-26	Macro modelling for EMC estimation of oscillator IC by utilizing evaluation board of conducted emission	KOHEI YANO (Kyushu Institute of Technology, Graduate School of Engineering (Japan)), Shohei Nishida (Kyushu Institute of Technology, Graduate School of Engineering (Japan)), Tohlu Matsushima (Kyushu Institute of Technology, Graduate School of Engineering (Japan)), Yuki Fukumoto (Kyushu Institute of Technology, Graduate School of Engineering (Japan)), Hiroyuki Okumura (Panasonic Holdings Corporation, Product Analysis Center (Japan))
P3-27	Data Collection Method for MEC integrated with STD Retention System on Floating-CPS Platform	Meiya Tanaka (Kyushu Institute of Technology (Japan)), Daiki Nobayashi (Kyushu Institute of Technology (Japan)), Kazuya Tsukamoto (Kyushu Institute of Technology (Japan)), Takeshi Ikenaga (Kyushu Institute of Technology (Japan)), Myung Lee (City College of New York (United States of America))
P3-28	A Study on Outlier Filtering for Estimated Heart Rate in mm-Wave Radar based Vital Signs Sensing	Sora Nagayama (Nihon University (Japan)), Tatsunori Saito (Nihon University (Japan)), Kosuke Otsu (Nihon University (Japan)), Yaokun Hu (Nihon University (Japan)), (Fujitsu Ltd. (Japan)), Takeshi Toda (Nihon University (Japan))
P3-29	A Study on Null Forming based Near-target Separation in Non-contact Vital Signs Detection Using mm-Wave 3D MIMO Radar	Haoran Liu (Nihon University (Japan)), Tatsunori Saito (Nihon University (Japan)), Kosuke Otsu (Nihon University (Japan)), Xuanyu Peng (Nihon University (Japan)), Yaokun Hu (Nihon University (Japan)), (Fujitsu.Ltd (Japan)), Takeshi Toda (Nihon University (Japan))
P3-30	Performance Improvement of Large Spatio-Temporal Data With Encoded Packets	Naoki Tanaka (Kyushu Institute of Technology (Japan)), Daiki Nobayashi (Kyushu Institute of Technology (Japan)), Kazuya Tsukamoto (Kyushu Institute of Technology (Japan)), Takeshi Ikenaga (Kyushu Institute of Technology (Japan))
P3-31	Packet Scheduling Algorithm for Improving Fairness under Different Congestion Control Contention using P4	Koshi Ono (Kyushu Institute of Technology (Japan)), Daiki Nobayashi (Kyushu Institute of Technology (Japan)), Takeshi Ikenaga (Kyushu Institute of Technology (Japan))
P3-32	A Comparison of Computational Time and Estimation Accuracy Between ICEEMDAN and VMD in mm-wave Radar based Heart	Takahiro Ishimoto (Nihon University (Japan)), Tatsunori Saito (Nihon University (Japan)), Kosuke Otsu (Nihon University (Japan)), Yaokun Hu (Nihon University (Japan)), (Fujitsu Ltd. (Japan)), Takeshi Toda (Nihon University (Japan))
P3-33	A Study on Improved Heart IMF Selection and Heart Rate Frequency Estimation in ICEEMDAN/FFT Analysis of Non-contact He	Yuto Imada (Nihon University (Japan)), Tatsunori Saito (Nihon University (Japan)), Kosuke Otsu (Nihon University (Japan)), Yaokun Hu (Nihon University (Japan)), (Fujitsu Ltd. (Japan)), Takeshi Toda (Nihon University (Japan))