Open Up Bright Future

2025
Spring

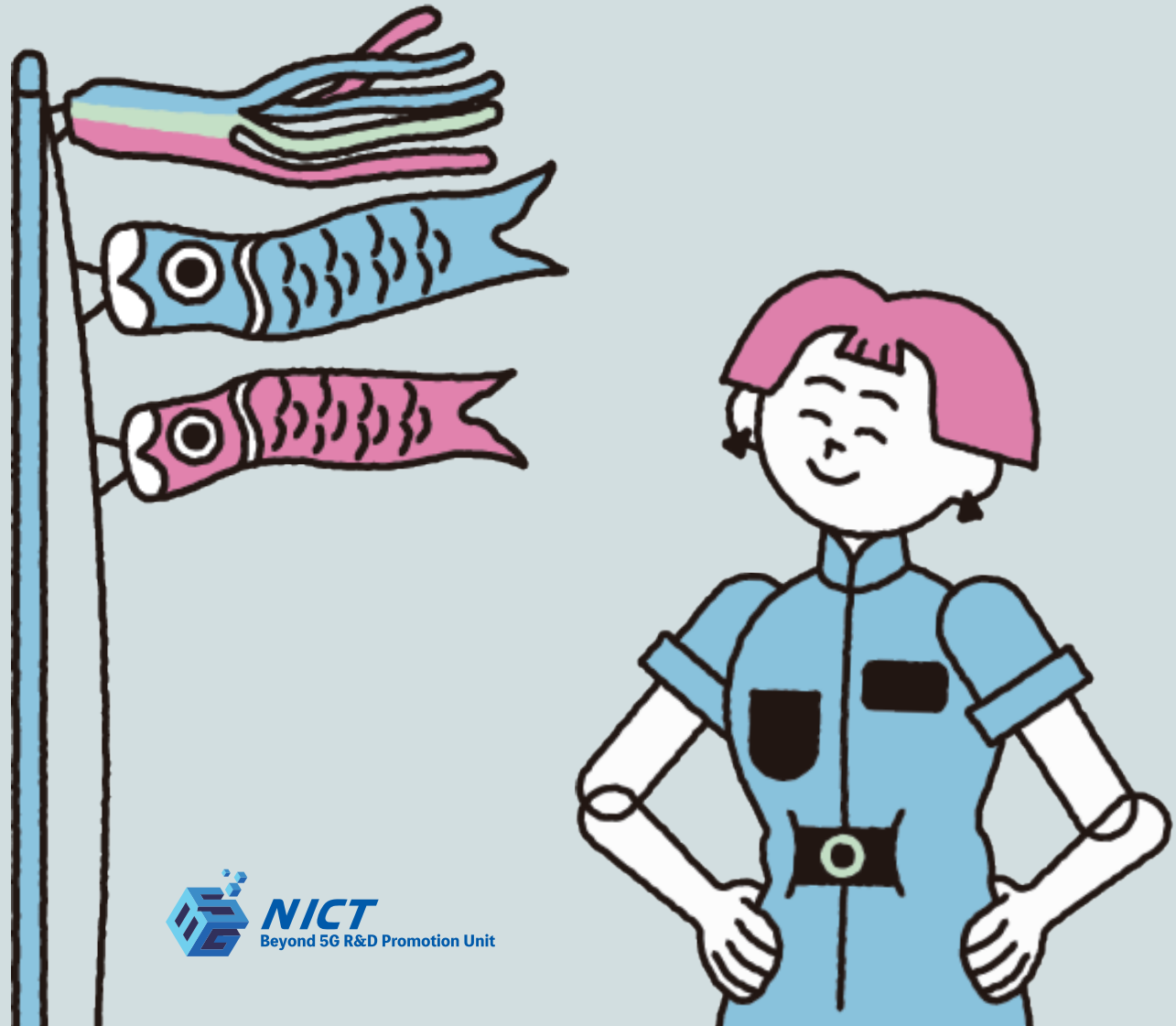
Xross B5G

English Edition

Beyond 5G R&D Promotion Unit
National Institute of Information and Communications Technology

Expanding Circle of Dialogue Through Events

The 5th Germany–Japan Beyond 5G/6G Research Workshop Held
Beyond 5G Zero-Gravity Event 2024
Exhibited at MWC 2025 in Barcelona
Event Briefs



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XrossB5G 2025 Spring

Feature

Expanding Circle of Dialogue Through Events

Update

The 5th Germany–Japan Beyond 5G/6G Research Workshop Held

– Promoting Collaboration through Interactive Dialogue –

"The 5th Germany–Japan Beyond 5G/6G Research Workshop" was held on January 21–22, 2025, at Sakura Hall on the Katahira Campus of Tohoku University in Sendai. Co-hosted by NICT and the German 6G Platform, the workshop aimed to promote researcher exchange and revitalize collaboration between Germany and Japan in the Beyond 5G/6G field. The previous workshops were held at NICT Headquarters in April 2023, in Berlin in June 2023, at NICT Nihonbashi in February 2024, and again in Berlin in July 2024. The 5th workshop was held in Sendai—marking the first time it took place outside Tokyo in Japan. Despite initial concerns about attendance, the event welcomed a total of 124 participants – 30 from Germany, 49 from Japan (excluding NICT), and 45 from NICT – making it the largest workshop to date.

On the first day, following the opening session, Mr. MATSUI Masayuki, Director of the Technology Policy Division at the Ministry of Internal Affairs and Communications (MIC) of Japan, and Mr. Daniel Behrendt from the Federal Ministry of Education and Research (BMBF) of Germany, delivered presentations on their respective countries' latest Beyond 5G/6G-related policies. This workshop marked the first time that policy representatives from both countries gave presentations in the same session. Mr. MATSUI provided an overview of Japan's Beyond 5G Promotion Strategy 2.0 and the Germany–Japan International Joint Research Project under the Innovative ICT Fund Projects for Beyond 5G/6G. Mr. Behrendt introduced Germany's 6G Initiative and its Next Generation Funding Program.

Following this, in the invited lecture session, Dr. INOUE Masugi, Director General of the Resilient ICT Research Center at NICT, gave a presentation in which he explained the background behind the establishment of the center, along with the damage caused by the Great East Japan Earthquake in the surrounding region. The importance of disaster response – and the deep feelings of the Japanese people toward it – were likely conveyed to the German participants as well.

On the morning of the second day, activities were introduced by Dr. NAKAO Akihiro, Professor at the University of Tokyo, on behalf of the XG Mobile Promotion Forum (XGMF), a Japanese organization

promoting Beyond 5G/6G initiatives. Additionally, Mr. Adam Kapovits from Eurescom presented on behalf of INPACE, a European hub for digital partnerships in the Indo-Pacific region. In the afternoon, Dr. ITAYA Satoko, Research Manager of the Wireless Systems Laboratory at NICT, introduced the Flexible Factory Project, highlighting collaborative activities with Germany. These examples particularly captured the interest of the German participants.

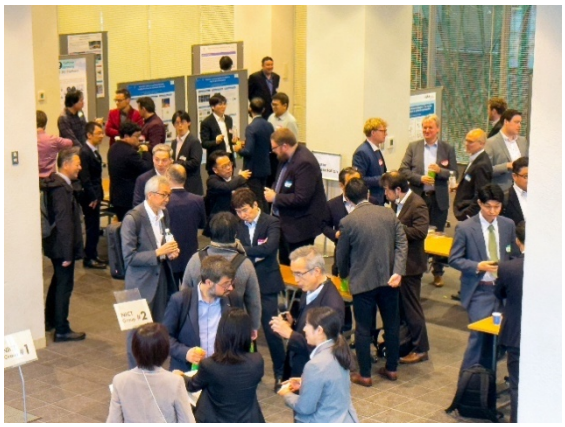
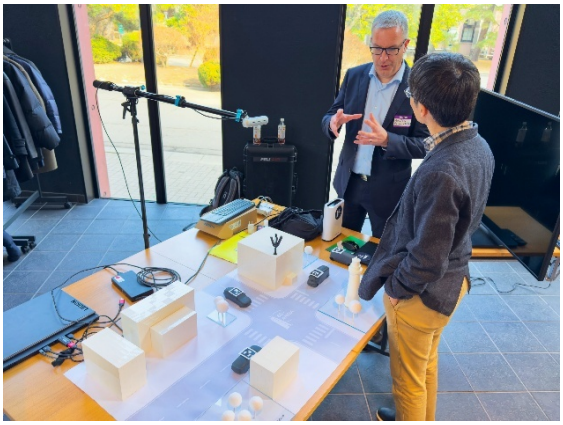
In addition, poster presentation and demonstration exhibition sessions, panel discussions, and site visits were conducted on both days. The poster presentation and demonstration exhibition sessions were highly successful, featuring a total of 44 poster presentations (24 from Germany and 20 from Japan) and 9 demonstration exhibitions (1 from Germany, 6 from Japan, and 2 joint presentations). To facilitate effective exchange of opinions between Japanese and German participants, the sessions were divided: the German side presented on the first day, and the Japanese side on the second day. During the panel discussions, each panelist actively engaged in discussions within their areas of expertise in response to issues raised by the moderators. There was also a candid exchange of opinions involving the participants. Particularly regarding AI-related topics, while there was consensus on their importance, diverse opinions emerged on how to utilize AI. Some participants argued that considerations should extend beyond network applications to encompass the entire system, leading to heated exchanges. As part of the site visits, participants toured the laboratories of the NICT Resilient ICT Research Center and the Research Institute of Electrical Communication, Tohoku University, visiting demonstration systems and research facilities operating in real-world environments.

In addition, lunches on both days and the networking event on the first evening were arranged in a standing buffet style, and extended coffee breaks were provided to encourage informal conversations. By emphasizing interactive dialogue throughout the event, further research collaboration and matchmaking between Japan and Germany was effectively promoted.

The 6th Germany–Japan Workshop is scheduled to be organized as one of the sessions within the Berlin 6G Conference, to be held in Berlin from July 1 to 3, 2025.

Participants at the Japan-Germany Workshop (Day 2)


Panel sessions (Day 1: left, Day 2: right)

Preparing for the poster session (left) and demonstration exhibition (right)


Site visit (NICT Resilient ICT Research Center [left] and Research Institute of Electrical Communication, Tohoku University [right])

Report

Beyond 5G Zero-Gravity Event 2024

– Identifying Challenges for Implementation –

In fiscal year 2024, the Beyond 5G Research and Development Promotion Unit hosted the Beyond 5G Zero-Gravity Event. This year's theme was "Discussing challenges, ideas, and potential use cases for the implementation of Beyond 5G." The event was structured as a three-part series of discussions. The first session provided an overview of the event's objectives along with an introduction to NICT's research activities. The second session featured a site visit to Mishima City in Shizuoka Prefecture, a municipality actively engaged in smart city initiatives. The series concluded with a final session in which key ideas and insights were consolidated. A total of 35 participants, including 19 from outside NICT, took part in the event. Experts and business professionals from diverse backgrounds contributed to vibrant discussions.

– What is "Zero Gravity" in the first place? –

"Zero Gravity" refers to a discussion environment that is flat and open, where all participants respect each other's diverse backgrounds and values. It means eliminating notions of hierarchy, majority versus minority, or any assumptions of superiority or inferiority.

■ Session 1

At the outset, Dr. ISHIZU, Director of the Beyond 5G Design Initiative at NICT, explained the purpose of the event, stating: "To realize Beyond 5G, we aim not only to generate ideas but also to identify challenges related to implementation. This year, we hope to advance our discussions beyond idea generation and focus on how these ideas can actually be deployed in real-world society." Subsequently, five researchers from NICT delivered presentations on their respective research topics. In addition, Mr. TAKAYASU from Reficcia Co., Ltd. introduced a technology capable of determining latitude, longitude, and altitude with centimeter-level accuracy using GPS satellites and L6 signals. Mr. KUMAGAI from Gems Co., Ltd. gave a talk on supply chains in the convenience store industry. These presentations provided fresh perspectives, setting the stage for an engaging and fruitful discussion.

Discussion:

Participants were divided into groups to discuss issues related to the implementation of Beyond 5G.

Opinions included:

"It is essential to clearly define the incentives and benefits that promote collaboration and co-creation, and it is necessary to sort out common points."

"Rather than relying entirely on automated systems, it may be important to delineate roles between analog elements—where human involvement is preferable—and digital technologies such as AI."

In addition, many valuable insights were shared from the perspective of participants engaged in emerging businesses, including those in telecommunications, manufacturing, transportation, and the electric power sector.

■ **Session 2**

On this day, we visited Mishima City in Shizuoka Prefecture, which is promoting smart city initiatives. After experiencing the city's characteristic "City of Water" through a walking tour, we visited Mishima City Hall to receive an explanation of their ongoing efforts. Subsequently, we moved to the Mishima Mirai Research Institute, where Mr. UMEYAMA and Mr. KUSHIYA from T2N Co., Ltd., who serve as smart city advisors for Mishima City, delivered lectures on "Introduction of Mishima City's Smart City Initiatives" and the "Vision for a Digital Garden City Nation" proposal.

Discussion:

Participants were divided into groups according to their backgrounds: disaster prevention, telecommunications, and urban development. Based on the actual field experiences and prior inputs, they shared their insights and identified key issues and keywords while examining potential utilization scenarios for the "Mishima City × NICT Concept and Research."

Various ideas emerged from the discussions, including:

"Create a platform that can be used not only by a single municipality but also nationwide."

"A system that benefits both local residents and tourists is desirable."

"Develop applications that alleviate resistance to data collection."

"Provide motivation to wear wearable sensors–'being monitored without feeling monitored.'"

"In the context of disaster prevention, build systems that are usable in both peacetime and emergency situation."

■ Session 3

In the third session, two new experts gave lectures to deepen the discussion.

Ms. SUNADA Kaoru of the International University delivered a lecture in which she emphasized that **"among various technologies, there are general-purpose technologies that have the potential to significantly transform the economy and society over the long term. Most of them are not technology radicals (technology-driven) but rather use radicals (utilization-driven). It is essential to engage in backcasting from the actual needs and issues faced by people."**

Additionally, Mr. KUMANO of TEPCO Holdings presented a lecture stating that **"the electric power industry has entered a time of transformation, where integration with other sectors such as the automotive industry is progressing, and the operation of power systems is expanding to broader regions. Even focusing solely on communication within the electric power sector, it is evident that significant changes are occurring in response to the times."**

Discussion:

Building on the expert presentations, participants refined the outcomes from the previous two sessions and examined the challenges and necessary actions for the implementation of Beyond 5G.

Specific opinions for implementation included:

"It is essential to identify funding sources and methods for collecting accurate data to be incorporated into applications."

"A large number of facilities need to be prepared to support the deployment of ultra narrow spot wireless service."

“Incorporate the concept of ‘oshi-katsu’ (fan-support activities). For example, for people who enjoy feeding animals when traveling, they could choose a ‘My Animal’ and receive timely updates on where it is and what it is doing.”

■ Summary

We were able to reach deeper points of discussion than last year by holding three sessions with the same members over a short period. Through this series of sessions on the theme of “Issues for Implementation,” we found that, in addition to technical challenges related to Beyond 5G, social issues—such as how to facilitate the collection and sharing of data, and how to present clear monetary benefits—remain significant barriers to implementation. Moving forward, we hope to promote further collaboration and development by applying the insights gained through this initiative to future research and demonstration projects.

We would be grateful for your continued interest in and support for NICT’s initiatives.

Report

Exhibited at MWC 2025 in Barcelona

– Converge. Connect. Create. –

"MWC Barcelona (Mobile World Congress Barcelona)" is one of the world's largest mobile technology exhibitions and conferences, held annually in Barcelona, Spain. The event attracts over 100,000 attendees from more than 200 countries and regions, including key figures from companies representing various sectors. It serves as a global focal point, drawing attention not only from Europe but also from the Americas, Asia, and other regions worldwide. The venue showcases a wide array of international technologies, focusing on areas such as 5G/6G, AI, IoT, and AR/VR. Many new products and cutting-edge technologies are introduced in alignment with MWC, leading to numerous business negotiations. This large-scale global event offers a firsthand experience of world-class technology trends.

Last year (2024), when NICT participated in MWC for the first time, we showcased three exhibits in part of the Japan Pavilion, which was supported by the Ministry of Internal Affairs and Communications (MIC). This year, however, NICT established its own pavilion at booth 6F68 (Hall 6) and exhibited the latest R&D achievements—including those in the field of Beyond 5G—over four days from Monday, March 3 to Thursday, March 6, 2025. This contributed to enhancing NICT's presence in the ICT sector.

To clearly explain NICT's latest achievements in the field of Beyond 5G, five exhibits were showcased by the Network Architecture Laboratory, the Beyond 5G Research and Development Promotion Unit, and the Social-ICT System Laboratory.

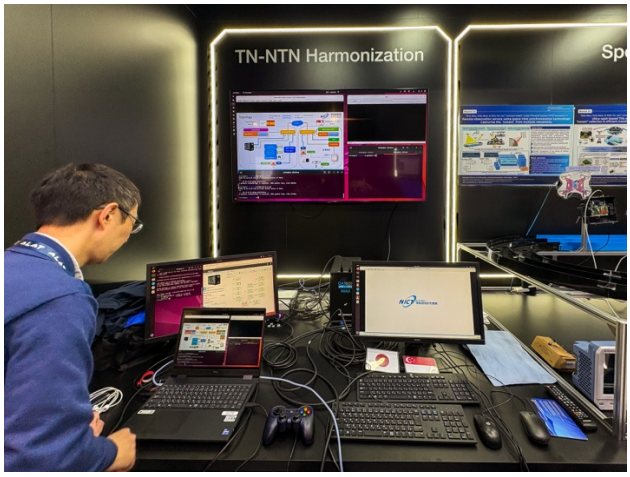
Exhibit 1: A diorama demonstrating that the combined use of terrestrial networks (TN) and non-terrestrial networks (NTN) can dramatically improve radio wave utilization in areas not covered by TN infrastructure alone.

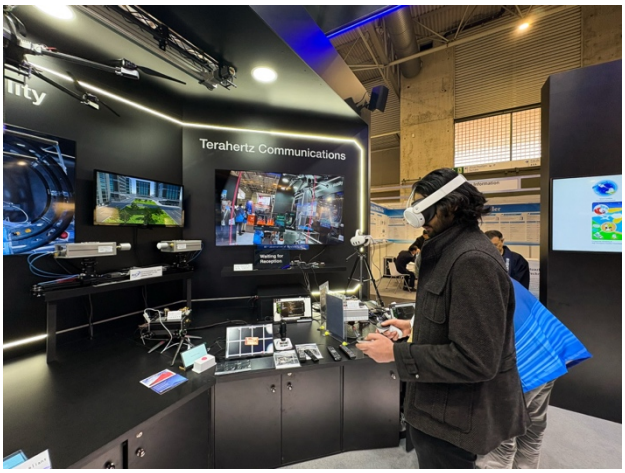
Exhibit 2: A demonstration showcasing energy-saving and communication quality optimization through the fusion of TN and NTN, including a live remote-control demonstration from Barcelona of a drone located in Singapore.

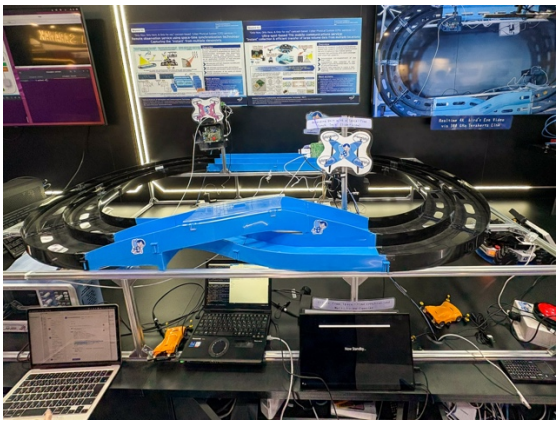
Exhibit 3: An introduction to orchestration functions that enable collaboration among systems from different industries according to user requirements, presenting a social vision aligned with Society 5.0.

Exhibit 4: A dynamic exhibition of space-time synchronization technology using 60 GHz-band radio waves, demonstrating high-capacity data transmission between a robot car and a drone.

Exhibit 5: A dynamic exhibition of uncompressed 4K video transmission and instantaneous video file transfer using 300 GHz-band radio waves — marking the first overseas demonstration of terahertz radio transmission technology.





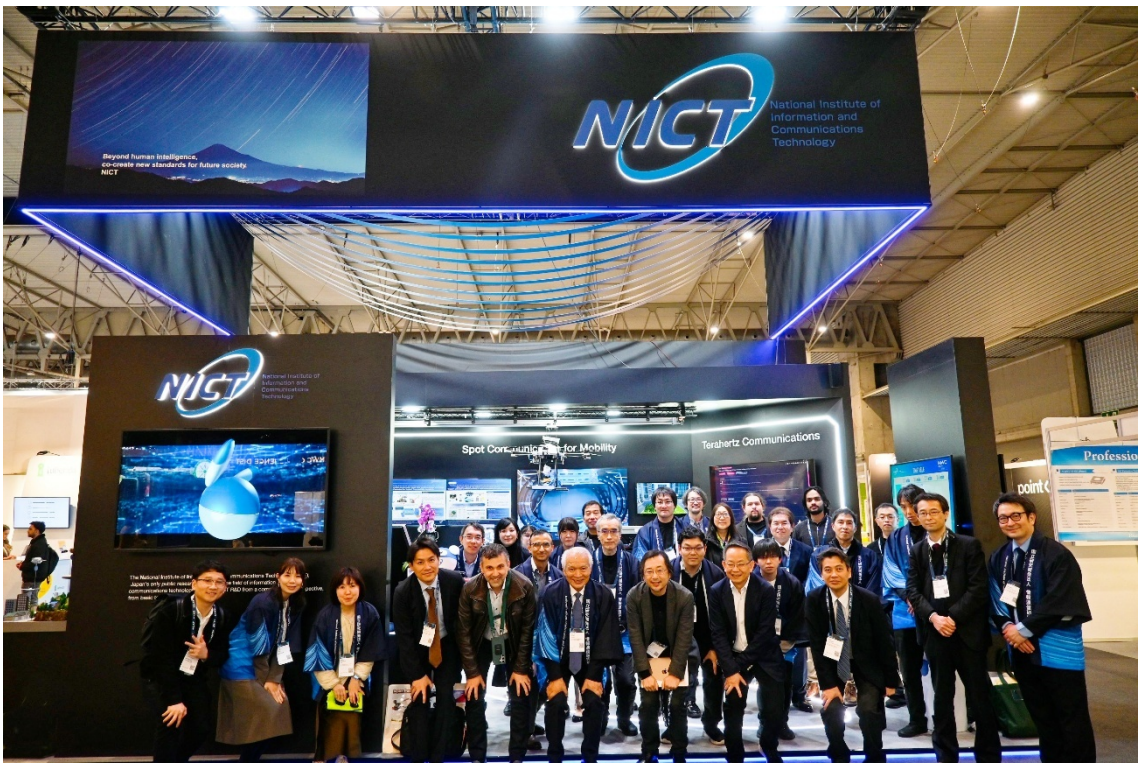


From the top: Exhibit 1 Exhibit 2
German Exhibit Exhibit 3
Exhibit 4 Exhibit 5

MWC, one of the world's largest annual tech exhibitions, delivered an experience of unprecedented scale — both in total visitor numbers and exhibition space. The large, brilliantly decorated booth is beautifully decorated and staged to catch the eye. People from across the globe gathered to showcase cutting-edge technologies, and vibrant discussions and business negotiations unfolded throughout the hall. The atmosphere was nothing short of electric, reflecting the energy and momentum of the global tech community.

"NICT to Exhibit Again at MWC Barcelona This Year"

In addition to NICT's research laboratories, the Global Alliance Department and the Public Relations Department took the lead in planning, management, and exhibit design, with extensive deliberation carried out over several months. Overseas exhibitions entail complex procedures, requiring significant time and effort beyond just preparing the exhibits themselves. This year's MWC presentation, which welcomed over 1,800 visitors, was a highly rewarding endeavor made possible not only by NICT but also through collaboration with universities in Japan and abroad that are engaged in joint research. Including the preparation phase, it was a months-long project, and in the end, everyone involved felt a strong sense of accomplishment. We would like to express our sincere appreciation for the cooperation and support we received.



Report

Event Briefs

– A summary of lectures and other events held at various locations –

Thursday, March 6, 2025

We participated in the final round of the "National Institute of Technology (KOSEN) Wireless Tech Contest 2024 (WiCON2024)."

The final competition and award ceremony of the "College of Technology Wireless Tech Contest 2024 (WiCON 2024)," sponsored by NICT, was held on March 6. Each team tackled pressing social and community-based issues in Japan, demonstrating not only creative ideas but also advanced technical skills and strong teamwork to complete their projects. This event highlighted the promising future of Japan's wireless technology. As a result of the selection process, the team "Reiwa Latest Technical Students" from the National Institute of Technology, Kurume College received the Minister for Internal Affairs and Communications Award (Grand Prize) for their project titled "High-Precision and Low-Cost Operation Support System for Agricultural Machinery Using RTK-GNSS." Their efforts were highly evaluated for developing precise and affordable positioning equipment and integrating virtual reality to enhance agricultural work efficiency. Additionally, the team "B5G Chrysalis" from the National Institute of Technology, Hakodate College was honored with the NICT Collaboration Award for their research and development on a compact, low-power, high-performance analog signal processing circuit for Massive-MIMO. We were deeply impressed by these future engineers, who are actively conducting applied research on wireless technologies aimed at real-world implementation to support the Beyond 5G society. We look forward to the continued advancement of their research.

As part of our sponsorship activities, we engaged in in-depth exchanges with students and faculty of the colleges of technology not only through the interim report and the preliminary and final competitions, but also through on-site visits and guest lectures. In fiscal year 2025, we will continue our efforts as a supporting member to further strengthen our collaboration.

Venue: Ito Hall, The University of Tokyo
Organizer: Communications and Information Network Association of Japan (CIAJ)
Related information: https://wicon.jp/2024/final

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