

IEEE ICC 2022, Seoul, Korea Intelligent Connectivity for Smart World

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ICC 2022 CONFERENCE HIGHLIGHTS

IEEE International Conference on Communications (ICC) 2022 was held in Seoul, Korea, on 16–20 May 2022. As the global pandemic continued to shift dynamically, we had eventually decided to change the originally planned face-to-face conference to the hybrid conference to make a successful and safe event for all conference participants both from onsite and remote.

ICC 2022 hybrid (in-person & virtual) conference is featured by the theme “*Intelligent Connectivity for Smart World*” and we planned to go above and beyond the expectations. Our 2022 conference vision was to discuss important future communication issues, share ideas and information, and accelerate innovation. More importantly we aimed to spread the latest research results on communications and networking around the world. On this road, we made a few new initiatives, considering the pandemic situation globally:

- Along with the 2-day Virtual Program of Tutorials and Workshops, the 3-day In-person Conference Program highlighted two Special Workshops in the emerging areas of wireless communications research, such as Reconfigurable Intelligent Surface (RIS) and 6G, to gather all world-renowned speakers from industry and academia to give presentations on their latest research works.
- A newly planned Demo Competition was held in person at venue COEX and also through virtual participation via the virtual platform and Gather.Town. The demo session offered an excellent way to showcase tangible results of the most recent and innovative implementation of wireless communications and networking. The Best/Outstanding Demos were featured as *Magnetic MIMO for Alzheimer’s Treatment*, *Low-Power Communications Based on RIS and AI for 6G*, and *SDR Implementation of a Fully Distributed Cell-Free MIMO System*.
- To enhance the interaction with industry, ICC 2022 organized the attractive Industry Programs, comprised of 18 Industry Panels/Presentations, and 3 Executive Forums highlighting 8 Industry Keynotes in the following areas of *Global Trend & Future Plan on 5G Vertical Industry Convergence*, *Opportunities & Challenges for Future 6G Wireless*, and *Roll-out Vision for Digital Transformation and Industry 4.0 Based on 5G*.

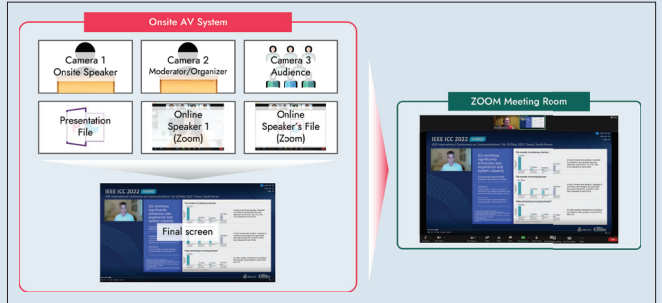
In close collaboration with world leading companies, such as Samsung, LGE, Huawei, Qualcomm, Ericsson, ZTE, and ETRI, which were also sponsoring IEEE ICC 2022, all speakers participating in the industry programs were invited to represent the regions equally, thus enhancing the diversity. In this endeavor, we shed light on the new initiative and paradigm shift towards 6G which would bring up *AI-Native Wireless Communications*, *Wireless Semantic Communications*, and *Human-Machine-Intelligence*, leading to our theme (*Intelligent Connectivity*) for ICC 2022. To highlight the vision of ICC 2022, and to have a balanced view of such paradigm shift, the following 8 esteemed Plenary Keynote speakers were invited from industry and academia:

Yonina Eldar from Weizmann Institute of Science, Israel; Sunghyun Choi from Samsung Research; Mung Chiang from Purdue University, USA; Byoung-Hoon Kim from LG Electronics; Merouane Debbah from Technology Innovation Institute, UAE; John E. Smee from Qualcomm, USA; Ruyue YN Li from ZTE, China; and Peiyang Zhu from Huawei, Canada.

Thanks to these new initiatives on top of the existing program layout of ICC, ICC 2022 was successfully offered in hybrid format with 743 registered in-person attendees and 1,602 remote ones (total 2,345).



The Entrance to the Exhibit Hall



CONflux virtual platform and broadcasting overview



LG OMNIPOD, Exhibit Hall



Welcome Reception Performance (May 16)

HYBRID CONFERENCE PROGRAMS

The conference included:

- Plenary Keynotes/Industry Keynotes/Special Workshops/ Industry Panels/Presentations
- (Hybrid, In-person, On-demand) Technical Sessions with Live Q&A via Gather.Town
- (Live Keynotes/Panels, On-demand) Workshops with Live Q&A via Gather.Town
- On-demand Tutorials with Live Q&A via Gather.Town
- Exhibitions/Demo Competitions/Podium Pitches
- ICC Best Paper Awards

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Banquet Dinner Performance

ICC 2022 used **CONFlux** as the virtual platform. Live broadcasting sessions (Keynotes, Industry Programs, Special Workshops), pre-recorded videos, and on-demand recordings for live sessions were available to watch on the platform until 15 June 2022. The following programs of Technical Symposia/Workshops/Tutorials/Demos offered virtual live Q&A sessions via **Gather.Town** — a metaverse platform where the attendees create their own avatar, interact with others, visit poster presentations and exhibitions.

The high-quality A/V production required a dedicated **1Gb/s connection** to be able to broadcast live to over 1,000 remote users at 1,080p video quality. To prepare for technical difficulties and any latency issue over the internet, the pre-recorded presentation videos of remote speakers were ready to play. For the live streaming sessions, remote presenter's video, onsite presenter's video, and PPT presentation slides were mixed into one final A/V production by using vMix software.

Especially, Technical Symposium Paper Sessions were comprised of hybrid (in-person & virtual) Special (Best Paper) sessions, in-person presentation sessions, virtual sessions, and e-poster Q&A sessions at venue COEX. In-person participants who do not want to make oral presentations chose to have live Q&A sessions via e-poster at the venue.

EXHIBITIONS/DEMO COMPETITIONS/PODIUM PITCHES

Due to COVID-19 related travel restrictions, several patrons were not able to participate in the physical booths at the venue. Fortunately, all exhibitions were available both at physical exhibit booth and virtual exhibit booth via Gather.Town. In the exhibit areas at the venue, virtual booths were provided as well. Attendees could watch videos on the monitors provided at the booth.

Demo Competitions and Podium Pitches were held in person in the Exhibit Hall. Demo areas and Podium Pitch stage were located next to the Networking Lounge. During 3 conference days, there were 6 slots for Podium Pitches (each slot in the morning & afternoon). Invited speakers from the exhibit companies and universities introduced their exhibit systems for 10 minutes.

While all 14 Demo videos were available both at the virtual platform and Gather.Town, 10 Demos were also lively presented onsite. All Demos had a Q&A session via Gather.Town.

SPECIAL EVENTS

As the opening ceremony of the conference, Welcome Reception was held on Monday, 16 May. The ceremony was held in the Exhibit Hall where the attendees toured the exhibits, enjoyed buffet and performances.

ICC Award Ceremony honors the achievements of IEEE and IEEE Communications Society (ComSoc) members with various paper awards for their outstanding contributions to the society. The ceremony was held on Tuesday, 17 May, hosted by Xuemin Shen, the President of IEEE ComSoc.

Conference Banquet was celebrated on Wednesday, 18 May. During this exclusive event, attendees networked and enjoyed the banquet with the musical gala performances.

On the last night of the onsite conference day, OC Dinner was organized at the Seoul Sky 123 Lounge, which is located at the top of the Lotte World Tower, the world's fifth tallest building. 65 attendees including OC members, ComSoc BoG members and keynote speakers spent the night above the clouds with great food, wine, and live music.

COLOCATED EVENTS

Two hybrid programs were organized for WICE (Women in Communications Engineering) under the topic "How to Become a Fellow member of ComSoc" and "Talk: Technology empowering Leadership and Management." On Tuesday, 17 May, in-person networking event was co-organized with YP (Young Professionals).

Three virtual YP Programs were organized. The first session on "The Long Journey through PhD to Research and Academia" featured speakers with experience from Industry & Academia. The second program, Industry Fireside Chat featured speakers with leading industry experience. The last one was Panel on "Opportunities for Young Professionals (YPs) in Communications Engineering" which featured speakers with extended experience in volunteering within IEEE.

The i-YES (Young Engineers & Scientists) Education Track organized by the IEEE ComSoc Education Services Board (ESB) featured an exciting Session on "From Performance Modeling to Federated Learning: Lessons Learned from the Strange/Unusual" having three Keynote Speeches followed by interactive discussion with the audience.

CONCLUDING REMARKS – LESSONS LEARNED

ICC 2022 conference team made tremendous effort in bridging the gap between offline program and virtual program by integrating the two components in hybrid format. To further improve this, we would like to provide some lessons learned for upcoming venues below.

- Incorporating new components on top of the traditional layout of ICC/GLOBECOM program is very critical in attracting more attention from industry and academia:
 - Special Workshop 1 (on RIS) & Special Workshop 2 (on 6G)
 - Special (Best Paper) Technical Session 1 & 2 in Hybrid (In-person & Virtual) Format
 - Demo Competition (14 proposals)
- Organizing industry programs such as Industry Keynotes at Executive Programs, Industry Panels and Presentations with full support from leading companies globally, in an early stage (with more time), is also very crucial in increasing the number of registrations.
- Securing financial support from Patrons with a sustained period is the prerequisite to engaging industry people more actively into the industry programs above.
- Hybrid programs will continue to grow because of the convenience and flexibility via virtual platforms as long as the A/V system integrated with virtual platforms (e.g., CON-Flux and Gather.Town) can be made affordable. However, it is still challenging to fully integrate the onsite presentations with virtual presentations, considering the different time zones.
- ICC 2022 offered workshop authors the preference time slots for Live Q&A via Gather.Town, considering their different time zones. But we realized that it is impossible to implement this preference time slots for Live Q&A with technical symposium papers (~1,000).

We strongly suggest having the Demo Competition in the Exhibit Area which is quite helpful to attract lots of attention, in conjunction with Podium Pitches during Networking Breaks.

In closing, our sincere thanks should go to the fully committed OC members and all volunteers involved for their great efforts without which both the excellence and diversity of hybrid programs would not have been achieved.