

[Interview] Meet the Engineers Responsible for the Global Standardization of UWB



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The world of today is an interconnected one. At a given moment, for instance, your smartphone might be connected to your laptop, your laptop to your TV, and your TV to a wireless speaker. Now, imagine a world without the technologies, like Wi-Fi and Bluetooth, that make this kind of connectivity possible. The impact of their absence would be significant, ranging from small inconveniences in everyday life to much bigger constraints on broader innovation.

Now, a next-generation wireless communications technology called ultra-wideband (UWB) has emerged and promises to permeate users' lives and change the way the world connects.

Samsung Newsroom sat down with the Standards Research Team from the Advanced Communications Research Center at Samsung Research – engineers who have provided communications technology leadership and set the standard for UWB – to learn about the progress they have made so far and what they believe the future holds for UWB technology.

Struggling to pass through a subway turnstile while carrying something, arriving home to find you've forgotten your key, or having to wait for your computer to start up before you can complete an urgent task – what if these inconveniences could all be reconciled with a single solution? Well, that is precisely the convenience that UWB technology stands to bring to our lives with its ability to utilize distance information between devices.

More wireless services than we realize connect us to peripheral devices and facilities. Some services use near field

communication (NFC) technology, which exchanges wireless data over a short distance, but in most cases a mobile phone or card must be taken out of your pocket and touched to an NFC reader directly.

UWB, a broadband communications technology, removes the inconvenience of having to make physical contact by using very short-wavelength signals to measure precise distances as well as transmit data. UWB enables distance measurement that is precise down to the centimeter and has a smaller margin of error than Wi-Fi or Bluetooth. In addition, this technology can limit the distance measurement function to pre-authorized devices, minimizing the risk of malicious hacking attempts.

Speaking about the benefits of UWB technology, Haeyoung Jun of the Standards Research Team remarked that, “UWB’s precise distance measurement and locating capabilities will bring a new paradigm to a variety of industries, including smart homes, cities, mobility, retail and buildings.”

UWB technology was developed decades ago, but it is only recently that it has begun garnering real attention within the industry. Though UWB has faced limitations in terms of data transmission, services that harness the technology’s distance measurement capabilities have now proliferated, bringing UWB and the unique features it offers into the spotlight. In this climate, Samsung Electronics has refined UWB technology by taking a close look at factors such as consumer experiences and service convergence.

During this process, the biggest hurdle that Samsung faced was the establishment of the necessary infrastructure. UWB is a technology that focuses on the connectivity between devices, meaning that close collaboration with industry stakeholders is key to its inception. The company concluded that global standardization would be a must for an open UWB ecosystem, however it proved far from easy to focus the industries’ attention on the ‘forgotten technology’ that was UWB. Still Samsung endured, confident as it was in the great potential that UWB offered. The company embarked on a protracted journey to establish a global organization for UWB

standardization, utilizing expertise it had established over more than 20 years of work in the global standardization sphere.

The journey to realize global UWB standardization began in 2018. Although many corporations initially had doubts over the technological feasibility of UWB, Samsung Electronics was steadfast in its efforts to persuade them. Jun recalls, “We initially spent time outlining our plans for numerous global companies, sharing Samsung’s vision for the development of UWB technology. Finally, in January of 2019, in a small conference room at the CES exhibition hall in Las Vegas, the relevant industry leaders in devices, chipsets and service areas gathered and agreed to establish a global coalition for UWB standardization. Thus, the “FiRa” (Fine-Ranging) Consortium was born.”

With its contingent of strong supporters, the UWB global standardization movement proceeded to go from strength to strength. The Consortium, which began as a collection of just three companies, has now grown to include more than 50 global corporations from across a range of industries that deal in areas such as chipsets, door locks, smartphones and software solutions. Jun relates that, “With new members joining the Consortium all the time, we’ll continue to deliver a robust ecosystem where UWB is applied in a broad context.”

Presently, the industry has reached a consensus that UWB is the most optimal technology for measuring the distance between devices. This is the result of the efforts of the Standards Research Team and related teams in persistently making the case for UWB technology. After successfully rolling out UWB technology on its devices (the new Galaxy Note20 Ultra and Galaxy Z Fold2), Samsung Electronics has opened up a new era of wireless communication.

Now that standardization has been agreed upon by the necessary industrial players, those parties have a great responsibility to see that the process is seen through so that everyone may benefit. Mingyu Lee says, “We are working systematically and consulting experts to ensure fair competition and continued growth in the industry. As the

process progresses, we are also gaining valuable experience by collaborating with colleagues from a broad range of disciplines.”

As they work towards pioneering a whole new market together, the Consortium members both cooperate and engage in spirited debate. Sehee Han explains, “I have actually had meetings with professionals who authored textbooks that I studied in university and debated with renowned open source code developers. As a result of these experiences I have realized that standardization is not about pursuing victory, but rather is a protracted journey towards reaching the consensuses that will allow us to create better technologies and products.”

In our everyday lives our queries are often met with open-ended answers, requiring us to strike out and find new ways forward. With this in mind, the Standards Research Team remains committed to blazing new trails into the unknown as they look to forge a pathway forward for UWB technology.

Jun says, “Having technological debates with top engineers from global corporations has been a great experience for the engineers of the Standards Research Team. Going forward, we will continue working to express our vision and develop solutions that are based on clear logic and grounded in the necessary values.”

As UWB technology takes its first steps, the team is staying focused on the positive changes the technology could deliver in the future. Han says, “We plan to broaden the scope of UWB standardization, implementing it first with digital key services and later with other services such as payment services, IoT device control solutions and location-based services.” He goes on to say, “Our work to broaden the UWB ecosystem will continue until devices and services that utilize UWB are much more portable and UWB technology becomes prominent.”

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