



IEEE IoT Vertical & Topical Summit at RWW2020

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The 3rd IEEE Internet of Things (IoT) Vertical and Topical Summit at RWW2020 addresses the important role that mmWaves play in the IoT ecosystem. The theme for the Summit is: “The Internet of Things and the Millimeter Wave Frontier.” It is motivated by the attention from regulators to new allocations of licensed and unlicensed mmWave spectrum, increased adoption of mmWave technologies, and significant increases in end use commitments to actual deployment. The driving factors behind policy and regulatory changes for mmWave spectrum include: (1) Congestion of available spectrum and the resulting scarcity of spectrum for current cellular communications systems below 6GHz to meet demand; (2) Significant advances in mmWave and complementary enabling technologies such as wide band amplifiers, multi-element antennas, and signal processing; (3) the value and uniqueness of mmWave solutions in meeting challenging new requirements for a wide range of emerging applications and for supporting the infrastructure in communications, sensing, and industrial processes; (4) and lastly the easing of regulatory regimes for experimentation and trials in the mmWave spectrum, thus fueling innovation.

The Summit is a one and one half day event designed to foster a dialog between stakeholders and experts on IoT and specialists in mmWave technology. This includes participation from industry, the public sector, and the research community, in a highly interactive setting, to explore applications for IoT with a focus on the opportunities and challenges for adoption of mmWave solutions (ranging from 30GHz to 300GHz as well as the adjacent spectrum from 6GHz to 30GHz and 300GHz to 1,000GHz). For the topics we hope to cover, there will be presentations by experts from around the world who will also be part of panel discussions with audience participation. We encourage all of the speakers and attendees to attend the Summit for its duration. The Summit will address a broad range of IoT applications and IoT ecosystem issues where electromagnetic millimeter waves are exploited as a principal technology for: (i) Communications which includes 5G, point-point, and space based arrays; (ii) Sensors for applications ranging from space based mapping to radars for autonomous vehicles; and (iii) Manufacturing/Industrial Processes.

The Internet of Things has seen significant growth and continued investment in the last two years and according to MarketWatch [1] and Forbes [2] IoT is projected to achieve a greater than 21% CAGR in the next eight years, capping out a decade of consistently accelerating adoption.

“May 20, 2019 (WiredRelease via COMTEX) -- The global internet of things (IoT) market is estimated to value US\$ 847.0 Bn in 2016 and is projected to register a CAGR of over 21% in terms of value during the forecast period 2017-2026. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.”

The “mmWave Frontier” has a key role in satisfying the challenging requirements for many of the applications that are emerging as part of IoT landscape. The specific characteristics that are inherent to communication devices in the “expanded” mmWave spectrum include: (i) ultrahigh bandwidth; (ii) beam forming; (iii) miniaturization; (iv) power efficiency; and (v) electronic steering. The devices required also have to be suitable for: end user terminals; integration in the terrestrial communications infrastructure; operation on mobile platforms; and to support the reinvigorated needs of satellite systems, including large low earth orbit arrays. In a similar way mmWave devices used in industrial processes and as sensors may be much more concerned with (i) high resolution; (ii) spatial agility; (iii) multi-band operation; and for some applications (iv) high power. There is a significant range of opportunities for mmWaves to play a major role in the many facets of IoT which includes both the IoT infrastructure and end use applications. Examples of use cases include:

- The delivery of broadband services to consumers and enterprises, as an access technology, significantly impacting the economics of the “Last Mile” problem.
- The ability to deliver broadband in rural areas, greatly improving the consumer experience and viability for communities in sparsely populated and underserved areas.
- Enabling the digitization of industries such as agriculture, mining, energy production, and transportation in rural settings.
- The enablement of high band width Satellite communications arrays in LEO, MEO, and GEO orbits as part of infrastructure for IoT with an emphasis on both fixed and mobile applications.
- Sensors providing high resolution and low latency data for IoT applications such as Mapping and Geographic Information Systems, automotive, agriculture, smart utilities, logistics and industrial uses.
- As an essential component of 5G evolution providing ultrahigh bandwidth services for cellular systems.
- Communications for connected platforms requiring area coverage beyond the reach of cellular systems such as for aircraft and drones, railroads, and other connected vehicles.

There are four specific aspects that the Summit will consider:

- State of the art mmWave technologies, components, phenomenology, and performance characteristics important for mmWave solutions.
- Exploratory use cases and differentiated IoT solutions and applications that rely on mmWave technologies.
- Lessons learned from deployments, demonstrations, and experiments exploiting mmWave technologies.
- The choices of policy, regulatory regimes, and legal aspects of operating in the mmWave and adjacent bands.

The website and program for the upcoming summit and as well as presentation material from past summits can be found:

<https://rww2020.iot.ieee.org/> - San Antonio, TX at RWW2020 draft program

<http://rww2019.iot.ieee.org/program/> - Orlando, FL at RWW2019 program and presentations

<http://sites.ieee.org/rww-2018/program/> - Anaheim, CA at RWW2018 program and presentations

If you are a policy maker, corporate manager, administrator, product developer, an IoT or mmWave Engineer, researcher, educator, or just curious about IoT, you will find the Summit stimulating and rewarding. We look forward to having you join us in San Antonio on January 26th and 27th, 2020.

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[1] <https://www.marketwatch.com/press-release/cagr-of-21-internet-of-things-iot-market-elevate-with-a-cagr-of-21-by-2026-2019-05-20>

[2] <https://www.forbes.com/sites/louiscolombus/2018/12/13/2018-roundup-of-internet-of-things-forecasts-and-market-estimates/#4fd561e57d83>