



Next Generation Radio Technologies, Links and Applications

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Next-Generation wireless radios will rely on the millimeter-wave (mm-Wave) 30-300GHz spectrum to deliver faster data speeds with ultra-low latency in the context of spectrally agile resource allocation for reliable communications. Realizing this promise requires high speed digital technology and wideband RF hardware that are still lossy, less linear, and prone to in-band and out-of-band interferers. While modest bandwidths have been sufficient in the past, higher data rates, multiple beams, and higher transmit/receive gains are likely to be the norm for future commercial and government applications. To keep up with the aforementioned evolving needs, there is a strong interest to develop newer and more efficient hardware infrastructure and protocols.

As noted in the Figure below, there are growing 6G applications for satellite communications, health care, IoT, tactile internet, virtual/augmented reality, secure transportation and holographic communication with digital twin technology, to mention a few. Concurrently, there is need for wide bandwidth (1000x more speed) and mobility support up to 1000km/h. These 6G networks will impact health delivery, ubiquitous sensor and sensing, self-driving vehicles, remote manufacturing that will benefit from advances in artificial intelligence and machine learning (AI/ML). And the need for secure wideband communications using novel waveforms and secure unspoofable protocols is as great as ever. Within this contest, at the conference we will present an overview of FutureG requirements, and present concepts for secure radios, low cost beamformers, wideband technologies with notch filtering and simultaneous transmit receiver radios to double the available bandwidth without using additional spectrum.

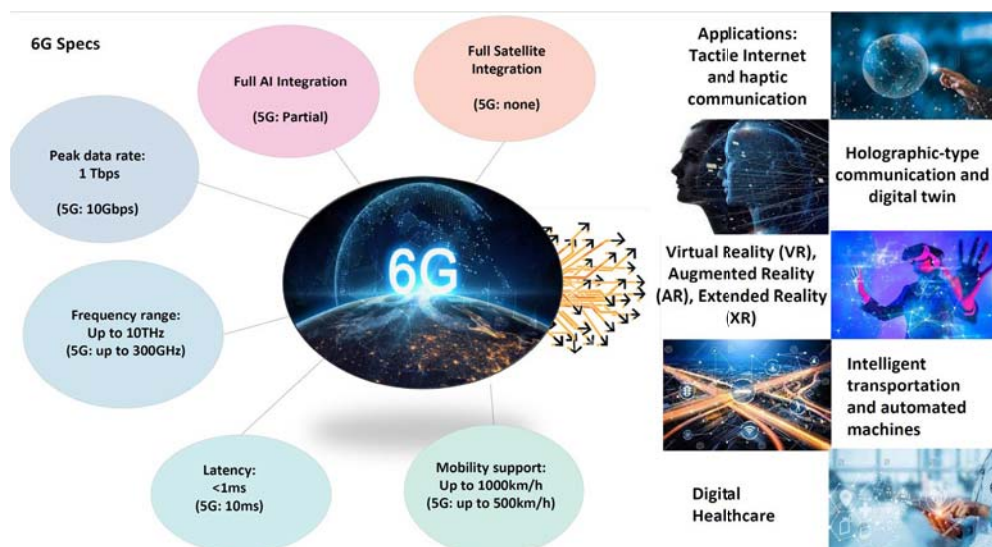


Figure 1. Some future G technologies, specifications and applications.