Wireless AI:
A New Sixth Sense to Deciphering our World

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With more and more bandwidth readily available for the next generation of wireless applications, many intelligent products/services by leveraging the ambient radio waves unimaginable before are now possible. What impact will it bring to our lives? Many may wonder or even speculate if it is science fiction or real? In this talk, we will show that with more bandwidth, one can *see* many multi-paths, which can serve as hundreds of *virtual sensors* around us that can be readily leveraged as new degrees of freedom readily for our use (but we never realized that before!). We discovered for the first time that the time-reversal focusing spot is not a point but exhibiting a stationary power distribution of Bessel function which enabled accurate/reliable speed estimation under non-line-of-sight, severe multipath conditions, uncovering a new physical principle ideal for indoor applications. Together with the use of machine learning, a revolutionary wireless AI platform can be built to enable many IoT applications that have been dreamed for a long time but have never been possibly achieved.

We will show the world's first ever centimeter-accuracy wireless indoor positioning systems that can offer indoor tracking without any costly infrastructure. Such a technology forms the core of a wireless sensing AI platform that can be applied to device-free, non-obtrusive home/office monitoring and security, radio human biometrics, vital signs detection, sleep monitoring, gait recognition, and fall detection, without any wearable but sorely relying on ubiquitous commodity Wi-Fi. In essence, now and in the future, it is the wireless sensing that will forever change Wi-Fi as we know it today, as well as future 5G/6G systems, allowing us to decipher our surrounding world with a new "sixth sense". Some products/services of Origin have been deployed worldwide and will be demonstrated to illustrate how such a fundamental discovery can make the world a better place.