



Miniaturization of Ultra-wideband Antennas

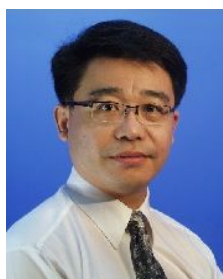
IEEE AP Distinguished Lecturer

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Chair & Organizer : Prof. Masahiko Nishimoto, IEEE AP-S Fukuoka Chapter
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This talk briefly introduces design challenges of ultra-wideband (UWB) antennas. An outlined of special design considerations are presented from a systems point of view, followed by some state-of-the-art solutions. Then, the miniaturization technology of UWB antennas is addressed. The planar designs are highlighted due to their unique merits and wide adoption in applications. First, the ground plane dependence of the antenna performance in small antenna design is addressed. Using a newly developed technique, the dependence of small antenna performance on system ground plane is alleviated. A design example is used to elaborate the mechanism of the method. Based on this concept, the antenna with further reduced size is designed to fit the size of wireless USB dongle. Furthermore, an innovative compact diversity UWB antenna shows the advantage of ground-independence small antenna in diversity applications. Last, a UWB antenna integrated with bandpass filter is proposed to reduce the overall size of devices by using the concept of co-design. In the end of the talk, the trend of UWB antenna R&D is offered according to application and market demands.



Dr Zhi Ning Chen received his BEng, MEng, PhD, and DoE degrees all in Electrical Engineering from Institute of Communications Engineering, China and University of Tsukuba, Japan, respectively. During 1988-1995, he worked as Teaching Assistant, Lecturer, Postdoctoral Fellow and later Associate Professor at Institute of Communications Engineering and Southeast University, China. During 1995-1997, he joined in City University of Hong Kong, China as Research Assistant, later Research Fellow. In 1997, he conducted his research at University of Tsukuba, Japan as JSPS Fellow. In 2001 and 2004, he visited University of Tsukuba under JSPS Fellowship Program (senior level). In 2004, he worked at IBM T. J. Watson Research Center, USA as Academic Visitor. Since 1999, he has worked with Institute for Infocomm Research as Member of Technical Staff (MTS) and later Principal MTS. He is currently appointed as Principal Scientist and Head for RF & Optical Department as well as PIs for multiple academic and industry projects. He is concurrently holding the adjunct/guest professorships at Southeast

University, Nanjing University, Shanghai Jiao Tong University, and National University of Singapore. He has also been Technical Advisor of Complex Systems (listed) since 2006.

Dr Chen has organized many international technical events as general chairs, technical program committee chairs. He founded IEEE International Workshop on Antenna Technology (iWAT) in 2005, which has become one of the most important international antenna events. He has delivered invited talks, keynote speeches and short courses at many international events. He is serving several international journals as Editor, Associate Editors, Guest Editors, and Reviewers. Dr Chen has published more than 230 journal and conference papers. He has authored and edited the books entitled "Broadband Planar Antennas", "UWB Wireless Communication" and "Antennas for Portable Devices" all published by John Wiley & Sons as well as "Antennas for Base-stations in Wireless Communications" (to be published in 2009). He also contributed to the books of "UWB Antennas and Propagation for Communications, Radar, and Imaging" published by John Wiley & Sons and "Antenna Engineering Handbook" published by McGraw Hill. He is the co-/inventor of more than 20 granted and filed patents. Several of his antenna designs have been licensed to industry for production. His current research interest includes applied electromagnetics, antennas, and bio-electromagnetics.

Dr. Chen is a Fellow of the IEEE for his contribution to small and broadband antennas for wireless applications and IEEE Antennas and Propagation Society Distinguished Lecturer. (more information can be found at www1.i2r.a-star.edu.sg/~chenzn)