

PALESTRA

(Distinguished Lecturer Tour)

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Recent Advances in Ultrawide Bandwidth Communications and Networks

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Abstract

Ultrawide bandwidth (UWB) transmission systems have gained significant interest in the scientific, commercial and military sectors following a ruling by the US Federal Communications Commission (FCC) concerning UWB emission masks. This ruling allows for coexistence with traditional and protected radio services and enables the potential use of UWB transmission without allocated spectrum. Wide bandwidth provides fine delay resolution, robustness against fading, and superior obstacle penetration, making UWB technology a viable candidate for reliable communications in challenging environments, such as dense urban and forests. UWB transmission systems potentially allow low-cost production and reuse of already populated spectra; and hence they are currently under consideration for a wide variety of applications such as high data-rate communications and low data-rate sensor networks. With its low probability of detection and anti-jam capabilities, UWB also has applications in military and homeland security operations. This talk will present a brief technical overview of UWB communication networks with particular emphasis on recent advances in UWB system design and analysis.

Bio

Moe Win is an Associate Prof. at MIT. Prior to joining MIT, he spent 5 years at AT&T Research Labs. and 7 years at the Jet Propulsion Lab.. His main research interests are the application of mathematical and statistical theories to communication, detection, and estimation problems. He has been involved actively in organizing and chairing a number of international conferences. He served as the chair and secretary for the Radio Communications Committee of the IEEE Communications Soc.. He is currently an Editor for IEEE Trans. on Wireless Communications, and he has previously served as Editor for a number of other journals. He received the IEEE Antennas and Propagation Soc. Sergei A. Schelkunoff Transactions Prize Paper Award and the Office of Naval Research Young Investigator Award in 2003. In 2004, he received the Fulbright Fellowship, the Institute of Advanced Study Natural Sciences and Technology Fellowship, and the Presidential Early Career Award for Scientists and Engineers from the US White House. He was honoured with the 2006 IEEE Eric E. Sumner Award “for pioneering contributions to UWB communications science and technology”, and he is an IEEE Distinguished Lecturer and elected Fellow.