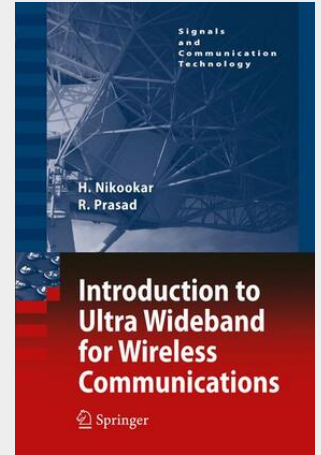


Introduction to Ultra Wideband for Wireless Communications

asakta-buddhah sarvatra. jitatma vigata-sprahā. naiskarmya-siddhim paramam. sannyasenadhigacchati Detached by spiritual intelligence from everything controlling the mind, without material desires, one attains the paramount perfection in cessation of actions by renunciation. The Bhagavad Gita (18.49) Compared to traditional carrier-based, Ultra-Wide Band (UWB), or carrier-less, systems implement new paradigms in terms of signal generation and reception. Thus, designing an UWB communication system requires the understanding of how excess bandwidth and very low transmitted powers can be used jointly to provide a reliable radio link. UWB offers systems transceiver potential for very simple implementations. Comparison between UWB and traditional narrow-band systems highlights the following features: Large bandwidth enables very fine time-space resolution for accurate location of the UWB nodes and for distributing network time stamps. Very short pulses are effectively counter-fighting the channel effect in very dense multipath environments. Data rate (number of pulses transmitted per bit) can be traded with power emission control and distance coverage. Very low power density leads to low probability of signal detection and adds security for all the layers of the communication stack. Very low power density is obtained through radio regulation emission masks; UWB systems are suitable for coexistence with already deployed narrow-band systems.

Ultra Wideband (UWB) Technology is the cutting edge technology for wireless communications with a wide range of applications. In Introduction to Ultra Wideband for Wireless Communications UWB principles and technologies for wireless communications are explained clearly. Key issues such as UWB wireless channels, interference, signal processing as well as applications and standardization activities are addressed. Introduction to Ultra Wideband for Wireless Communications provides easy-to-understand material to (graduate) students and researchers working in the field of commercial UWB wireless communications. Due to tutorial nature of the book it can also be adopted as a textbook on the subject in the Telecommunications Engineering curriculum. Problems at the end of each chapter extend the reader's understanding of the subject. Introduction to Ultra Wideband for Wireless Communications will also be useful for practicing engineers from industry who deal with the wireless systems that are designed and analyzed with the UWB technique.



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