The definitive, up-to-the-minute guide to UWB theory and practice!

Due to rapid technical and regulatory progress, Ultra Wide Band (UWB) radio communications is quickly coming of age. Now, there’s a comprehensive guide to UWB theory and practice. Drawing heavily on realistic examples, this book systematically covers both UWB signal transmission and UWB network organization – including signal generation, performance analysis, channel modeling, receiver structures, and more. The authors provide customizable MATLAB® functions that engineers, system designers, and researchers can use to master UWB analysis and optimize performance. Coverage includes:

- Principles of UWB transmission and modulation, including PPM, PAM, DS-UWB for Impulse Radio, and OFDM for multi-band systems
- Time-hopping, direct-sequence, and multi-band UWB signals: generation and power spectral density
- UWB performance analysis: power limits, emission masks, and link budgets
- Pulse shaping, pulse width variation, and pulse differentiation
- UWB channel modeling and receiver structures for impulse radio, including isolated pulse and multi-pulse receivers for both PPM and PAM, and RAKE receiver
- Multi-user interference modeling and management: multiple access, Standard Gaussian approximation, and more
- UWB ranging and positioning
- Network organization: advanced MAC design strategies
- New UWB standards and standardization activities

The companion Web site at http://authors.phptr.com/dibenedetto/ includes customizable MATLAB® codes in text format compatible with any MATLAB® system.