Abstract

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Performance Analysis and Evaluation of UWB Wireless Computer Network for Multi-Users and Dynamic Channel Environment

ultra wideband (UWB) technology has been widely used for wireless communication systems including long and short ranges. Wireless computer network is a short range communication system. The present study provides a detailed analysis and performance evaluation of an Ultra-Wideband wireless computer network in a dynamic environment. This includes multi-users state, various modulation schemes and different channel models. Time-Hopping multiple access technique (TH) has been ed to evaluate the network performance in multi-users environment. In addition, three modulation techniques including Pulse Position Modulation (TH-PPM), Binary Phase Shift Keying (TH-BPSK) and quadrature amplitude modulation (QAM) have been used in this analysis. Two types of channel models for each modulation scheme have been used to simulate dynamic environment. The channel models are CM1 (line-of-sight) and/or CM3 (Non-line-of-sight) along with AWGN (IEEE 802.15.3a). Simulation results show that performance of the local area wireless computer network is highly dependent on the channel environment, the maximum allowable number of active users, and the receiver structure. Therefore, prior information of the channel model as well as maximum number of active users is required to optimize the desired performance of the wireless computer network for a specific receiver model.