Invited Seminar

Range Estimation for Tactical Multiband Multirole Radio (TMMR) Waveforms Using Link Budget Analysis (LBA)

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Abstract: In the modern warfare, reliability, flexibility and interoperability in radio communication is crucial factors towards effective tactical operations. An integrated form of the 21st century military radio called Tactical Multiband Multirole Radio (TMMR) aims to cover wide range of radio spectrum including AM, FM, VHF and WNW (Wideband Network Waveform based on OFDM for broadband multimedia data transmission), towards flexible and reliable tactical communications in the battlefield on ground, sea, air and space, without any help from built-in communication infrastructures. Major issues in this regard are the maximum radio delivery range estimation of the respective waveforms and QoS, related to the delivered tactical information, under the constraints of low transmit power, antenna height, lower error probability and minimum receiver signal sensitivity of the man-pack and vehicle-mounted (armored carrier, battleship and fighter) equipment. Aspects of radio waveforms and propagation environments under obstacles are introduced along with the methodology of suitable modeling in the range estimation using link budget analysis (LBA). Based on the results of numerous case studies, effects of critical design parameter variations are analyzed towards assessment of the optimal waveforms under specific propagation environment.

Speaker Biography

Junghwan Kim earned his B.S.E.E degree in Electronics Engineering from the Seoul National University, Korea in 1975, M.S. and Ph.D. degrees in Electrical Engineering from the Virginia Tech, Blacksburg, VA, U.S.A in 1985 and 1988 respectively. He has been in LG Communication Research Laboratory, Korea for 7 years. In 1988, he joined the EECS Dept, University of Toledo. His research is in the areas of satellite/mobile/wireless, performance evaluation of radio waveforms, coding/encryption associated with jamming and spread spectrum techniques. His research has been sponsored by NSF, NASA, ETRI, Defense Agency of Korea, Samsung and LG of Korea. He is an Associate Editor of IEEE Transactions on Broadcasting and the recipient of the 2009 EECS Dept research award.