



TECHNOLOGY

Weighted OFDM Modulation Technology for Radar Parameter Estimation

OVERVIEW

Background:

Scarcity of the radio frequency spectrum is a growing problem. Spectrum congestion limits the operational capabilities of competing wireless systems due to mutual interference. Traditionally, fixed spectrum allocation has been used to prevent interference between radar and communications systems that operate in close ranges. Due to reasons such as the huge success in wireless connectivity, the proliferation of cellular communication systems and increasingly more frequency bands being allocated for commercial applications, it has become increasingly difficult to implement the fixed spectrum allocation approach.

Invention:

Researchers at the University of Maryland have addressed the problem of spectrum sharing and coexistence between radar and communication systems by using a reconfigurable, dual-use radar/communication system on a single RF platform. Usually, the intended radar and communications systems functions and characteristics are quite different. Radar relies on transmission waveforms with the goal of achieving high resolution in its detection and tracking operations. Communication systems rely on waveform modulation and demodulation with the primary goal of achieving high spectral efficiency and throughput. The proposed maximum likelihood method for range and velocity estimation of moving targets using weighted orthogonal frequency division multiplexing (WOFDM) waveform modulation scheme provides a promising means for co-existence between radar and communications systems on a reconfigurable RF platform.

APPLICATIONS

Combined RF system for vehicle or unmanned aerial system communication and radar system assisting in traffic related operations:

- collision avoidance
- lane shifting
- vehicle to vehicle communication
- unmanned aerial systems communication

ADVANTAGES

Low cost implementation to meet SWAP (size, weight and power) constraints

Improved accuracy for range estimation

Lower peak to average power ratio

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Additional Information

INSTITUTION

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EXTERNAL RESOURCES

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