

OFDM Radar for High Accuracy Target Tracking

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Abstract : For a number of years, the problem of simultaneous detection and tracking of a target has been one of the most relevant and challenging issues in a wide variety of military and civilian systems. We develop methods for detecting and tracking a target using an orthogonal frequency division multiplexing (OFDM) based radar. As a preliminary step we introduce the target trajectory and Gaussian noise model in discrete time form. Then resorting to match filter and Kalman filter we derive a detector and target tracker. After that we propose an OFDM radar in order to achieve further improvement in tracking performance. The motivation for employing multiple frequencies is that the different scattering centers of a target resonate differently at each frequency. Numerical examples illustrate our analytical results, demonstrating the achieved performance improvement due to the OFDM signaling method.

Keywords : matched filter, target trashing, OFDM radar, Kalman filter

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