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About the Author

Mehrdad Soumekh has served as a consultant on signal and image processing for electronic sensors. In that capacity, he has worked for the Air Force Laboratories at Albuquerque, Eglin, Rome and Wright Patterson, the Army Laboratories at Adelphi and Fort Belvoir, the Navy Laboratory at San Diego, MITRE, Northrop Grumman and Rockwell Collins. He is the author of the books *Fourier Array Imaging* (Prentice Hall, 1994), and *Synthetic Aperture Radar Signal Processing with MATLAB Algorithms* (Wiley, 1999). He holds a patent for SAR wavefront (range migration or omega-k) reconstruction algorithm.

Research interest

Signal and image processing for electronic sensors

Summary

Overview of Existing Bistatic SAR Processing

This presentation provides an analysis of the information base in a bistatic SAR system, and its manipulation for imaging. The role of the coherent bistatic radar amplitude pattern of a target in its bistatic SAR signature is discussed. Three classes of bistatic SAR imaging algorithms for a platform that moves with an arbitrary constant velocity in the three-dimensional spatial domain are examined. One is based on motion compensation of the bistatic SAR data to the scene center, and spatial frequency assignment of the resultant; this is known as bistatic polar format processing (PFP). The second class of imaging methods relies on a slow-time Fourier (Doppler) analysis of the bistatic SAR data via decomposition of propagating waves; this class is referred to as the bistatic wavefront reconstruction. The third imaging algorithm utilizes the two-dimensional correlation processing of the bistatic SAR data in the fast-time and slow-time domains; this is known as the backprojection method. A discussion on the relative merits of these methods is provided.