Abstract: Improved Coarse Range Alignment for ISAR Imaging Multiple Targets Flying in Formation

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Abstract

A novel algorithm to coarsely align range profiles derived from multiple targets flying in formation is presented. The flight trajectory is modeled using a combination of a polynomial and Gaussian basis functions. Initial parameters of the polynomial and Gaussian basis functions are determined by fitting the proposed model to the center of mass curve of a new binary image derived from the range profile history using the least square curve-fitting algorithm, and the optimum value is found using particle swarm optimization. This method is computationally more efficient and less sensitive to mismatch between the polynomial and the trajectory than is the existing segmented alignment.

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