

Automatic ship positioning and radar biases correction using the hausdorff distance

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Abstract

This paper describes a novel technique to obtain radar biases estimates that can effectively reduce mismatches in track association algorithms. This is accomplished by matching ship-borne radar images to geo-referenced satellite images. The matching is performed through the minimization of the averaged partial Hausdorff distance between data points in each image. The minimization rapidly yields robust latitude and longitude position estimates, as well as ship heading and radar biases. The accuracy of the measurements is improved by feeding them into a Kahnhan filter, which also yields estimates for the ship's velocity. The method can be employed for automatic radar calibration of bearing and range biases, while it also serves as an alternative effective position sensor for GPS-denied environments.

Keywords

Marine vehicles, Radar imaging, Spaceborne radar, Radar tracking, Yield estimation, Satellites, Robustness, Velocity measurement, Filters, Calibration.