Speckle Filtering of SAR Images Based on Adaptive Windowing

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Abstract

Coherent processing of synthetic aperture radar (SAR) data makes images susceptible to speckle noise. The most well-known image domain speckle filters are the adaptive filters using local statistics such as mean and standard deviation (Lee, Frost, Kuan etc). The local statistics filters adapt a filter coefficient from a fixed running window size, there exists trade-off between the degree of speckle noise suppression and the capability of preserving fine details. So, it is possible to improve the local statistics filters by combining an algorithm which has window size changed adaptively. In this paper, we introduce an adaptive windowing algorithm for speckle noise suppression, which can be combined with a local statistics filter. The local statistics filtering technique and the proposed technique are applied to ERS-1 SAR images, and their performance is compared.