

IMAGE SEGMENTATION OF SAR IMAGES USING EXTENDED EDGE OPERATORS

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Abstract

Edge detection is a well-developed field on its own within image processing. Due the presence of speckle, which can be modeled as a strong, multiplicative noise, edge detection in synthetic aperture radar (SAR) images is extremely difficult. A common approach is to identify edges as local maxima of the gradient magnitude in the gradient direction. We here proposed a new extended mask as an edge detector for SAR images. For some applications 3 x 3 mask operators gives over segmentation. So here we propose extension of these 3 x 3 masks of sobel, prewitt and kirsch edge operators to 5 x 5 masks to normalize over segmentation. After finding horizontal and vertical edges it computes actual magnitude of slope by using edge operators and then the resultant of these gradients of slope obtained is used to construct image of slope magnitude. On this image of slope magnitude Canny's edge operator is used for getting segmented image. The results are compared with 3x3 masks results for Sobel, Prewitt and Kirsch edge operators. Experimental results obtained for Manaus Brazil, L-Band image acquired by the Space borne Imaging Radar-C and X-band Synthetic Aperture Radar on board the space shuttle Endeavour are given in this paper.

Keywords : Edge detection, segmentation, synthetic aperture radar, slope magnitude image.