IMAGE SEGMENTATION USING ACTIVE CONTOURS ON NOISY IMAGES: MATHEMATICAL APPROACHES

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Abstract

In this paper, we apply a Mathematical approached to develop a novel image segmentation method using active contours on noisy images with fifteen percentages of salt and pepper noise. This was implemented by selective binary and Gaussian filtering method to regularized level set evolution. Normally we selectively penalize the level set function to be binary and then use a Gaussian smoothing kernel to regularize it. The benefits of our method is to proposed new region based signed pressure force (SPF) function, which can step effectively the contour at blurred as well as weak edges and automatically detect the interior and exterior boundaries with the initial contour being anywhere in the images affected with noise. Also we demonstrate the advantages of the proposed method over the Chan-vase active contour model. The proposed method can implement by the finite difference scheme with experiment results shown in Matirix laboratory.

Key-words: Active contour, Chan-vase model, Level-set model, Finite Difference Scheme.