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Image Segmentation using various Snakes

ABSTRACT - Masterthesis

Snakes are curves which once initialized, uses the energy minimization criteria to automatically adjust itself to the desired object boundary. Thus snake is an efficient tool for image segmentation. We are having several snakes differing greatly in accuracy, capture range, speed etc, due to their difference in the force fields. Our aim is to compare the working of these different snakes and to investigate on the possible improvements by grouping the positive qualities from individual snakes.

Thus hereby we compare the Traditional snake, Gradient Vector Flow (GVF) snake, Generalized Gradient Vector Flow (GGVF) Snake and Balloon model. We make the comparisons by observing the behavior of these snakes on simple binary images, synthetic grayscale images and Synthetic Aperture Sonar (SAS) images. And through the close observation we try to adopt the positive features of individual snakes and to model a new force field which improves the speed of convergence without sacrificing the accuracy of segmentation. Thus ultimately we aim in a well furnished snake model capable of semi automatic practical segmentation for sonar images. The simulation works for this is done in Matlab.