Abstract

The level set method was devised by Osher and Sethian [2] in as a simple and versatile method for computing and analyzing the motion of an interface ? in two or three dimensions. ? bounds a region ?. The goal is to compute and analyze the subsequent motion of ? under a velocity field v [1]. This velocity can depend on position, time, the geometry of the interface and the external physics. The interface is captured for later time as the zero level set of a smooth function ?(x, t), i. e., ?(t) = {x | ?(x, t) = 0}. ? is positive inside ?, negative outside ? and is zero on ? (t) [1]. This paper presents a reaction-diffusion method used to describe a physico-chemical phenomenon that comprises two elements, namely chemical reactions and diffusion for implicit active contours[21][37][39][40], which is completely free of the costly re-initialization procedure in level set evolution (LSE). A diffusion term is introduced into LSE, resulting in a diffusion-augmented level set method with efficient two step implementation. First we iteratively solve the diffusion term and then iteratively solve the level set equation. By solving equation in two steps we can stabilize the level set function without re-initialization. This is also called two step splitting method for image segmentation.
A Diffusion-Augmented Level Set Method with Efficient Two Step Implementation

References

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