Numerical solutions for image processing problems

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Abstract

Numerical schemes for regularized curvature driven level set equation in 2D and 3D are proposed. The scheme is based on the linear semi-implicit discrete duality finite volume (DDFV) methodology.
Stability and convergence for obtained numerical solution in 2D to the solution of the regularized curvature driven level set equation are presented. Numerical experiments in 2D and 3D concerning image filtering using proposed schemes are included.
Affine morphological scale space (AMSS) model is studied from numerical point of view. Explicit, semi- implicit, fully implicit and Crank-Nicolson type of schemes are presented and compared.

Keywords: mean curvature flow, level set equation, numerical solution, semi-implicit scheme, discrete duality finite volume method, stability, convergence