Rasmussen Nils Henry Williams: New examples of curves with a one-dimensional family of pencils of minimal degree

Abstract: We give a geometric construction of sub-linear systems on a K3 surface consisting of smooth curves C with infinitely many g(gon(C))(1)'s.

ARCHIV DER MATHEMATIK, 97 (2), 135-140, august 2011.

Liu Jun; Tai Xue-cheng; Huang Haiyang; et al.: A fast segmentation method based on constraint optimization and its applications: Intensity inhomogeneity and texture segmentation.

Abstract: We propose a new constraint optimization energy and an iteration scheme for image segmentation which is connected to edge-weighted centroidal Voronoi tessellation (EWCVT). We show that the characteristic functions of the edge-weighted Voronoi regions are the minimizers (may not unique) of the proposed energy at each iteration. We propose a narrow banding algorithm to accelerate the implementation, which makes the proposed method very fast. We generalize the CVT segmentation to handle intensity inhomogeneous and texture segmentation by incorporating the global and local image information into the energy functional. Compared with other approaches such as level set method, the experimental results in this paper have shown that our approach greatly improves the calculation efficiency without losing segmentation accuracy.

PATTERN RECOGNITION, 44 (9), Special Issue, 2093-2108, september 2011.

Rosman, Guy; Dascal, Lorina; Tai, Xue-Cheng; Kimmel, Ron: On semi-implicit splitting schemes for the Beltrami color image filtering.

Abstract: The Beltrami flow is an efficient nonlinear filter, that was shown to be effective for color image processing. The corresponding anisotropic diffusion operator strongly couples the spectral components. Usually, this flow is implemented by explicit schemes, that are stable only for very small time steps and therefore require many iterations. In this paper we introduce a semi-implicit Crank-Nicolson scheme based on locally one-dimensional (LOD)/additive operator splitting (AOS) for implementing the anisotropic Beltrami operator. The mixed spatial derivatives are treated explicitly, while the non-mixed derivatives are approximated in an implicit manner. In case of constant coefficients, the LOD splitting scheme is proven to be unconditionally stable. Numerical experiments indicate that the proposed scheme is also stable in more general settings. Stability, accuracy, and efficiency of the splitting schemes are tested in applications such as the Beltrami-based scale-space, Beltrami denoising and Beltrami deblurring. In order to further accelerate the convergence of the numerical scheme, the reduced rank extrapolation (RRE) vector extrapolation technique is employed.

Sigvat K. Stensholt; Alf H. Øien: Lattice Boltzmann simulations of the motion induced by variable surface tension.

Advances in Engineering Software, 42 (11), 944-953, November 2011.