A Chromaticity-Brightness Model for Denoising of Color Images

RITA FERREIRA, IRENE FONSECA, M. LUÍSA MASCARENHAS

Affiliation: Carnegie Mellon University, Pittsburgh, USA

email: fonseca@andrew.cmu.edu

A variational model for imaging denoising aimed at restoring color images is proposed. The model combines Meyers u+v decomposition with a chromaticity-brightness framework, and is expressed in terms of a minimization of energy integral functionals depending on a small parameter $\varepsilon > 0$. The asymptotic behavior as $\varepsilon \to 0^+$ is characterized, and convergence of infima, almost minimizers, and energies are established. In particular, an integral representation of the lower semicontinuous envelope, with respect to the L^1 -norm, of functionals with linear growth and defined for maps taking values on a certain manifold is provided.