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Title:

A chromaticity-brightness model for imaging processing in a " $u + v$ " framework

Abstract:

In imaging processing many important issues arise such as image segmentation, color restoration, and image denoising. A rigorous mathematical analysis is needed to validate the extensive numerical analysis literature in this field, and to open new avenues on image recolorization using the chromaticity-brightness model, usually considered as reducing shadowing and providing better simulation results.

In this seminar we will address an imaging processing problem aimed at denoising colored images using a " $u+v$ " model as in [Me] coupled with a chromaticity-brightness decomposition approach as in [KaMa]. It amounts to solve a minimization problem associated with functionals defined in the product of the space BV of functions of bounded variation with the set of S^2 -valued BV functions. The key step is the derivation of an integral representation of the associated relaxed functionals. This is a joint work with Irene Fonseca (Carnegie Mellon University) and Luísa Mascarenhas (Faculdade de Ciências e Tecnologia - UNL).

[KaMa] S.H. Kang and R. March, Variational Models for Image Colorization via Chromaticity and Brightness Decomposition, IEEE Trans. Image Process. 16 (9), 2251-2261 (2007)

[Me] Y. Meyer, Oscillating Patterns in Image Processing and Nonlinear Evolutions Equations. The Fifteenth Dean Jacqueline B. Lewis Memorial Lectures, University Lecture Series, Vol. 22, Amer. Math. Soc., 2001