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SOME IDEAS ON IMAGE PROCESSING AND APPLICATIONS ON TEXTURE ANALYSIS AND IMAGE RECONSTRUCTION

The present work consists, mainly, in the development of theoretical and numerical results in the study of a new functional proposed in the field of image processing. Basically the considered functionals are some non local approximations of the well-known Mumford-Shah functional, used widely in image processing. The objective of this functional is to perform a task called segmentation and texture analysis, which basically consists in the recognition of edges and patterns of different objects in a (digital) image.

Joint work with: Takeshi ASAHI, Matías GODOY, Rodrigo LECAROS and Alfredo LOPEZ

References:

- [1] D. Mumford and J. Shah, Optimal approximations by piecewise smooth functions and associated variational problems, Communications on Pure and Applied Mathematics, vol. 42, pp. 577-684, 1989.
- [2] G. Aubert and P. Kornprobst, Mathematical Problems in Image Processing: Partial Differential Equations and the Calculus of Variations (second edition), vol. 147 of Applied Mathematical Sciences, Springer-Verlag, 2006.
- [3] T. Chan and L. Vese, Active contours without edges, IEEE Transactions on Image Processing, vol. 10 Issue:2, pp. 266-277, August 2001.
- [4] L. Ambrosio and V.M. Tortorelli, Approximation of functionals depending on jumps by elliptic functionals via Γ -convergence, Communications on Pure and Applied Mathematics, vol. XLIII, pp. 999-1036, 1990.

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