International Workshop on Nonlocal Models, PDEs and Applications 13 - 14 May 2019 Caen, Normandy, FRANCE



Keynote n°9 : Zakaria BELHACHMI Université de Haute Alsace, FRANCE

Title: Modelling with high order PDEs for Geometry inpainting

We consider a class of nonstandard high-order PDEs models, based on the $p(\cdot)$ -Laplace operator with variable exponents, for image denoising and image inpainting problems. These models are obtained from the minimization of a family of anisotropic energies that range between the so called $TV-H^{-1}$ and the biharmonic models. The PDEs system consists of quasi-linear equations that we solve with a fixed point iterative method and we prove the convergence of the iterative process. To solve the problems, we consider an algorithm which includes a practical and efficient adaptive strategy for the choice of the exponent 1 , which allows us to fit to the multi-scale nature of the images. We present several numerical examples to test our approach and to make some comparisons with existing methods.