

Plenary title:

Qualitative features of the minimizers of energies and implications on modelling

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Plenary outline:

We address all applications that are solved by minimizing an energy function combining a data-fidelity and a regularization term. Energy functions are classically defined either from a PDE standpoint or in a Bayesian estimation framework. Our approach is to characterize the essential features exhibited by the minimizers of such energies as a function of the shape of the energy. For instance, the recovery of homogeneous regions, textures and edges, the processing of outliers or spikes, the obtaining of sparsity, are shown to be determined by some attributes of the energy relevant to its (non)smoothness or its (non)convexity. Our point of view provides a framework to address rigorously the problem of the choice of energies for image reconstruction and invokes a new understanding of modelling.