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Irene Fonseca is an educator and researcher in applied mathematics and is currently the Director of Carnegie Mellon University's Center for Nonlinear Analysis (CNA). In recognition for her contributions to the advancement of research in her area of expertise, Irene Fonseca was bestowed a knighthood in the Military Order of St. James (Grande Oficial da Ordem Militar de Santiago da Espada) by the then-President of Portugal, Jorge Sampaio, in 1997. Irene Fonseca received the Mellon College of Science chair in Mathematics in 2003 and was appointed to the rank of University Professor in 2014. In 2012, she was elected President of the Society for Industrial and Applied Mathematics (SIAM), one of the largest organizations dedicated to mathematics and computational science in the world. Irene Fonseca was also named a Fellow of SIAM in 2009 and a Fellow of the American Mathematical Society in 2012. Irene Fonseca's recent work is focused on variational techniques as they apply to contemporary problems in materials sciences and computer vision, including the mathematical study of ferroelectric and magnetic materials, composites, thin structures, phase transitions, epitaxy and dislocations, and image segmentation and denoising in imaging science.

A Chromaticity-Brightness Model for Color Images Denoising in a Meyer's "u + v" Framework

Abstract

A variational model for imaging denoising aimed at restoring color images is proposed. The model combines Meyer's "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 compact manifold is provided.