

Foreword: Special section on statistical image and signal processing

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An image is worth a thousand words, and the information images provide influence the most important decisions we make on a daily basis. Signals carry information, which should then be processed and understood since we live in what is known as “the Information Society.” Statistics has much to say (and unveil) about image and signals, and this special section is aimed at providing a forum for recent advances on this fertile area.

The current special section of the *Brazilian Journal of Probability and Statistics* provided an opportunity to gather recent results in the broad areas of image and signal processing and analysis, which stem from models for forthcoming imaging devices to high-level techniques for image and video storage and retrieval. This is a multidisciplinary research field, with important connections with signal processing, statistics, computer vision and robotics, to name only a few, and a wide spectrum of applications, for example, remote sensing, surveillance and medical and industrial imaging.

The outline of the current BJPS section is as follows.

The paper by Bustos, Ojeda and Vallejos presents the main properties of spatial ARMA models and their connection to image processing, and then introduces a new robust technique for image filtering.

Levada, Mascarenhas and Tannús derive a compact representation of Pott’s model local configurations which leads to efficient pseudo-likelihood estimators of the interaction parameter with large neighborhoods. Using this approach, the authors consider hypothesis testing by computing the asymptotic variance and the size of the test.

The article by Picco and Palacio employs a non-Gaussian model for the data and a Markovian classification procedure which provides better results than classical approaches on speckled imagery.

Cândido and Marengoni develop a face detection system based on a Bayesian network. Their approach uses information fusion for combining different sources of evidence, which leads to fast and accurate detection.

Almiron, Silva and Miranda conduct a thorough numerical analysis on four free/FLOSS (Free/Libre Open Source Software) platforms widely employed in signal and image processing: Octave, Ox, Phyton and R. These results, added

to the assessment of the theoretical properties of their random numbers generators, lead to informed decisions about the best choice among such platforms.

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