The Use of Entropic Thresholding Methods in Reconstruction of Capacitance Tomography Data

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Abstract
High-quality reconstruction of capacitance tomography data is of vital importance to ensure quantitative information from such systems. Several methods have been tested, such as linear back projection (LBP), representing a fast and crude method, and model-based reconstruction (MOR) which significantly improves the results, although at higher computational cost. The main problem of using LBP is the smoothing effect on sharp transitions in the dielectric constant distribution. The reconstruction quality could be improved by including a thresholding procedure in the reconstruction process. In this work, entropic thresholding methods are used. These methods are compared to previously published thresholding techniques such as Xie's method and an implicit model-based reconstruction method. A computer simulated eight-electrode capacitance tomography system has been used for the evaluation.

Keywords
Process tomography;
Image processing;
Pattern recognition