

Electrical Conductance Image Reconstruction using Iteratively Regularized Gauss-Newton (IRGN) Algorithm

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Abstract: The problem of conductance imaging (a.k.a impedance tomography) is to recover a spatially varying conductivity from boundary measurement, this problem is an exponentially nonlinear ill-posed problem. In this work, we investigate a two-dimensional inverse problem in conductance imaging using iteratively regularized Gauss-Newton (IRGN) algorithm for non-linear ill-posed problem. We demonstrate the efficacy of the IRGN algorithm with discrepancy principle by reconstructing the conductivity parameter relevant to the inverse problem of conductivity imaging. The complete electrode model is used for the forward problem which is now becoming the adopted standard model in biomedical/biophysics applications.

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