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Iterative relaxation methods for image reconstruction

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Abstract:

The problem of recovering an image (a function of two variables) from experimentally available integrals of its grayness over thin strips is of great importance in a large number of scientific areas. An important version of the problem in medicine is that of obtaining the exact density distribution within the human body from X-ray projections. One approach that has been taken to solve this problem consists of translating the available information into a system of linear inequalities. The size and the sparsity of the resulting system of inequalities (typically, 25,000 inequalities with less than 1% of the coefficients nonzero) makes methods using successive relaxations computationally attractive. A variety of such methods have been proposed with differing relaxation parameters.

Keywords:

Image Reconstruction, Image Processing, Computing Methodologies