

Samuli Siltanen
GE Healthcare Finland

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Low-dose three-dimensional medical X-ray imaging

Abstract:

In medical X-ray tomography, three dimensional structure of tissue is reconstructed from a collection of projection images. In many practical imaging situations only a small number of truncated projections is available from a limited range of view. Traditional reconstruction algorithms, such as filtered backprojection, do not give satisfactory results when applied to such data. More suitable reconstruction algorithms based on Bayesian inversion are studied. In this approach, a priori information is used to compensate for the incomplete information of the measurement data. Examples with in vitro measurements from dental radiology and mammography are presented.