Statistical inversion for 3D x-ray tomography with sparse data

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Abstract

In x-ray tomography the structure of a 3D body is reconstructed from a collection of projection images of the body. In many applications, only a few projections from a limited angle of view is available. Image reconstruction from a few projections is complicated since the data does not contain sufficient information to completely describe the 3-D body. Bayesian inversion is well suited framework for reconstruction from such incomplete data. In Bayesian inversion, the ill-posed reconstruction problem is formulated in a well-posed stochastic form in which a priori information is used to compensate for the incomplete information of the projection data. In this talk, we present a parallelized Bayesian method for 3D reconstruction in dental radiology.