基于分段线性模板先验的正电子成像重建

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　　正电子发射成像的噪声性能较其它的一些成像方法要差得多, 为了提高重建结果的分辨率和噪声特性, 一般采用Bayesian重建。Bayesian方法需要选择恰当的先验, 这种先验既要能够抑止重建结果的噪声, 又要能够保留图像密度的突变信息。分段线性模板图像模型利用从其它模态的形态学成像得到的组织结构信息, 构造适合要求的先验分布函数。由于采用的先验函数是非凸的并包含超验参数, 一般的优化方法难以处理, 采用动态后验模拟的方法可以很好地解决这些问题。

POSITRON EMISSION TOMOGRAPHY RECOSTRUCTION BASED ON A PIECE-WISE LINEARITY MEMBRANE PRIORI

　　Positron Emission Tomography（PET） is much noisy than many other imaging methods. In order to improve the resolution and noise properties of PET reconstruction results, generally Bayesian method is used. The premise of the Bayesian method is to select a proper prior distribution. The a priori should coincide with the principle of the positron emission and remain the breaks of the density data. The piecewise linearity membrane prior obtained from the reconstruction of other imaging models can be used. Due to the non-convex of the prior function and hyper-parameters, we use the dynamic posterior simulation rather than the general optimization methods to get reconstruction image.

关键词

　　正电子成像(Positron emission tomography); 图像重建(Image reconstruction); 分段线性模板先验(Piecewise linearity membrane prior); 动态后验模拟(Dynamic posterior sampler)