

博士论坛

## 广义信息熵测度在医学图像配准中的应用

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收稿日期 2007-12-13 修回日期 2007-1-23 网络版发布日期 2008-3-1 接受日期

**摘要** 针对互信息测度在配准医学图像时易陷入局部极值的缺点, 将Shannon熵扩展到广义熵, 提出了三种基于广义熵的信息测度。对于收敛性能的评价, 提出收敛宽度和收敛半径的概念。通过人体脑部CT/MR和MR-T1/T2图像的刚体配准实验, 从计算时间、收敛性能和配准精度方面, 对归一化互信息、广义熵信息测度进行了比较与分析。实验结果表明, 在不损失计算时间和配准精度的前提下, 广义信息熵测度SRI\_0.9和GMI\_0.9的收敛性能优于归一化互信息测度, 对噪声有很强的鲁棒性。

**关键词** [Shannon熵](#) [互信息](#) [广义熵](#) [图像配准](#)

分类号

## Medical image registration based on generalized entropy measures

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### Abstract

In order to reduce local maximum and misregistration of mutual information in medical image registration, three information measures based on generalized entropy instead of the Shannon entropy, named as FRI-alpha, SRI-alpha and GMI-t information measures, are proposed. The convergence width and radius are used for evaluating the measure convergence. The computing time, convergence and accuracy are studied by applying these measures to rigid registration of Computed Tomography (CT) /Magnetic Resonance (MR) and MR-T1/T2 simulated images. The results of tests show that the generalized entropy measures outperform normalized mutual information in convergence performance, without compromising computational speed and registration accuracy.

**Key words** [Shannon entropy](#) [mutual information](#) [generalized entropy](#) [image registration](#)

DOI:

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