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Remote Analysis of Myocardial Fiber Information In Vivo Assisted by Cloud Computing

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Abstract

A cloud-based analysis system of cardiac images is constructed to realize the remote sharing of cardiac images and related computing services. In its core service, a novel image post-processing approach is presented to obtain information on individual in vivo myocardial fibers. This approach is based on the anisotropic decomposition of the local deformation using tagged magnetic resonance (tMR) images of the heart. The local sine wave model (SinMod) is used in our approach to trace the motion in image sequences. Within this motion framework, a pair of anisotropic deformation components for each pixel is then extracted by Poisson orthogonal composition, which can represent exactly the local Poisson Effect. Based on these pair components, the direction structure (by the major deformation vector field) and the elastic property (by Poisson ratio) of myocardial fiber can be estimated. The experimental results demonstrate that our proposed approach is useful in analyzing information of in vivo myocar-

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