

## عنوان مقاله:

Frame Rate Up-Conversion in Echocardiography Images, Using Dimension Reduction and Image Registration

## محل انتشار:

هفدهمین کنفرانس ملی دانشجویی مهندسی برق ایران (سال: 1393)

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## خلاصه مقاله:

High frame rate echocardiography is especially important in studying intra-cardiac moving structures such as mitral valve. Available ultrasound imaging systems have a limited frame rate because of the time it takes to send and receive all of the ultrasound beams necessary to reconstruct an image. In this paper, we propose a novel algorithm for frame rate up-conversion (FRUC) in echocardiography images. This algorithm employs a combination of dimension reduction and image registration techniques to increase the number of frames. The dimension reduction algorithm is applied on echocardiography images to find out the relationship between the frames. By this approach the nonlinear embedded temporal information in sequential images is represented in a three-dimensional manifold by the LLE algorithm and each image is depicted by a point on reconstructed manifold. Greater difference between frames, results greater distance between corresponding embedded points. Thus, the distance between embedded points is a scale for the number of frames needed between two successive frames to show fast motions of heart more precise. We averaged the distances between all successive frames, and divided them to this average value, and rounded the result. These rounded numbers were integers between zero, and three. Registration techniques were employed to produce a number of frames between successive frames, equal to this rounded number. But, putting unequal number of frames between consecutive frames, we remove temporal harmony of the echocardiography image set. To solve this problem, in places that inserted frames between original frames are less than the maximum (for echocardiography images, maximum is equal to three), we put equal number of frames of the maximum minus the (inserted frames by averaging between the available frames (original plus primary inserted frames

## کلمات کلیدی:

echocardiography; frame rate up conversion; manifold learning; registration

## لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/1605074>



