

Mammographic X-Ray and MR correspondence

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Abstract

This paper presents a novel approach to tackle the problem of multi-modality correspondence in mammography. More precisely, this work focuses on finding a methodology to correspond areas in X-ray and MR images of the same breast. If correspondence between modalities is achieved, this information can be combined into a model providing a better understanding of the region of interest and making diagnosis and cytology evaluation easier tasks.

Initially, we aim to match a X-ray view to a projection (simulating the same view) of the MR volume. To provide a realistic projection we segment the MR image into different tissue types and a projection image is generated taking the attenuation coefficients of the tissue types into account.

Subsequently, the X-ray and MR projection images are matched using previously developed methods which are based on finding correspondence between linear structures in both images.

To establish correspondence between the X-ray image and the 3-D MR volume we find the likelihood of salient points in the MR volume of being the matched points in the MR projection image. A point in the 3D volume will be a likely match if it maximises a measure of local correlation with a point in the X-ray image. If a match is found, it means that both points correspond to a common area in both modalities.

Initial results based on MR projections only have proved the validity of our approach. Further results on X-ray and MR data are evaluated currently and will be included in the full paper.