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Modeling and Tracking of Deformable Structures in Medical Images

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Abstract : This paper presents a new method based both on Active Shape Model and a priori knowledge about the spatio-temporal shape variation for tracking deformable structures in medical imaging. The main idea is to exploit the a priori knowledge of shape that exists in ASM and introduce new knowledge about the shape variation over time. The aim is to define a new more stable method, allowing the reliable detection of structures whose shape changes considerably in time. This method can also be used for the three-dimensional segmentation by replacing the temporal component by the third spatial axis (z). The proposed method is applied for the functional and morphological study of the heart pump. The functional aspect was studied through temporal sequences of scintigraphic images and morphology was studied through MRI volumes. The obtained results are encouraging and show the performance of the proposed method.

Keywords : active shape model, a priori knowledge, spatiotemporal shape variation, deformable structures, medical images
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