AUTOMATIC LOCATION OF LEFT VENTRICLE IN MAGNETIC RESONANCE IMAGING

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ABSTRACT

MAGNETIC RESONANCE IMAGING (MRI) IS CURRENTLY THE MOST POWERFUL RADIOLOGICAL TOOL, BUT ONE MAJOR DRAWBACK OF MRI IS THAT THE HUGE NUMBER OF IMAGES CAUSES ONLINE DATA ANALYSIS VISUALLY IMPRACTICAL. AN EFFECTIVE COMPUTER AIDED DIAGNOSIS SYSTEM HELPS MEDICAL DOCTORS HANDLE THE PROBLEM EFFICIENTLY. THE PURPOSE OF THIS RESEARCH IS TO FIND AN ALGORITHM THAT CAN DETECT THE LOCATION OF LEFT VENTRICLE AUTOMATICALLY AND REPLACE THE STEP OF DEFINING ROI MANUALLY. IN THIS THESIS, THREE ALGORITHMS: HOUGH TRANSFORM (CONVENTIONAL METHOD), MATCHING PURSUIT (CURRENT METHOD), AND MATCHING PURSUIT MASK ALGORITHM (IMPROVED MATCHING PURSUIT METHOD) ARE USED TO DETECT THE LOCATION OF LEFT VENTRICLE. THE MATCHING PURSUIT MASK ALGORITHM DEVELOPED IN THIS RESEARCH HAS SUCCESSFULLY OVERCOME THE PROBLEMS OF THE LOW DETECTING RATE AND LONG PROCESSING TIME. SINCE THE DETECTING RATE IS HIGH AND THE PROCESSING TIME IS SHORT, THE MATCHING PURSUIT MASK ALGORITHM IS PROMISING TO REPLACE MANUAL DEFINITION OF ROI. THE MATCHING PURSUIT MASK ALGORITHM WILL IMPROVE EFFICIENCY OF DIAGNOSIS AND PROMOTE THE EFFECTIVENESS OF THE COMPUTER AIDED DIAGNOSTIC SYSTEM.

Keywords : MATCHING PURSUIT, HOUGH TRANSFORM, COMPUTER AIDED DIAGNOSIS, MAGNETIC RESONANCE IMAGING

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