

Kevin Karsch, Computer Science

University: University of Missouri

Year in School: Senior

Hometown: St. Louis, Missouri

Faculty Mentor: Dr. Ye Duan, Computer Science

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A hybrid MRI-based hippocampus segmentation algorithm

Kevin Karsch, Qing He, and Ye Duan

We propose a new hippocampus segmentation method from MRI by integrating region-growing methods such as K-means clustering with PDE-based level set methods. Starting from a single point provided by the user, our algorithm will first automatically generate an initial seed contour that closely resembles the hippocampus. The seed will then deform based on dynamic level-set equations, and will stop to obtain the final 3D shape when the equilibrium of the PDE is reached. In comparison with other hippocampus algorithms, our method is very efficient; most segmentations can be completed in under one minute using inexpensive hardware. Based on our experiments, our new algorithm is relatively robust to image noise and can work well with low contrast images.