

Comparison of automatic segmentation methods for total body PET/CT imaging

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Segmenting regions of interest from total body Positron Emission Tomography/Computed Tomography (PET/CT) images is time-consuming and susceptible to variability between different operators. Automatic segmenting tools have been developed to address these challenges. In this study, we assessed the performance of two deep learning-based methods, MIWBAS and TotalSegmentator, in segmenting tissues and organs in 30 total-body CT images obtained from the Biograph Vision Quadra total body PET/CT system. The Jaccard index was used to measure the overlap between the segmentation results. The findings indicate a high degree of resemblance between MIWBAS and TotalSegmentator in segmenting the brain, lungs, and liver (Jaccard index ≥ 0.9). MIWBAS failed to segment the brain region in 6 out of the 30 images for unclear reason. Notable differences were observed in the heart region by these two methods, with a mean Jaccard index of 0.566. A systematic difference in the aorta was observed. Next, we plan to expand our analysis by including one more method (MOOSE), and perform a comparison to the manual segmentation approach for more comprehensive assessment.

Field

Software and quantification

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