Universal and stable medical images generation for tissues segmentation (Unistable method)

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Abstract

Segmentation of medical images has been one of the most important research areas because of its impact in modeling and diagnosing the structure and the functions of various organs. The lack of unique solution for the segmentation problem of medical images is caused by the wide range of selections among different medical imaging modalities and clustering methods where each setting has its own estimates for solving this problem. Unistable method is a novel method that generates enhanced images with high contrast which can reduce boundary-overlapping between different tissues. This is accomplished by fusion of different clustering maps which are generated from selected medical images using some clustering methods. The improved Unistable-Images are somehow universal, where all estimates of different regular segmentation settings are considered in the solution; and they are relatively stable, because results of their segmentation are proved to be relatively clustering-method-independent.

Keywords: Unistable Method, Unistable Image, Brain, DTI, Segmentation, WM, GM, CSF.