

Team Name: sivanesu

Name: Umaseh Sivanesan

Email: umaseh.sivanesan@medportal.ca

Institution: McMaster University

Method:

First, use RCF+NMS to decompose real CT + MR volumes (from the CHAOS training set) into edges. Then, train a 3D GAN to generate volumes from edges, and use pix2pixHD to refine each transverse slice of these volumes. Then, create fake edges (with fake organ segmentations) based on an anatomy atlas from openanatomy.org (with slight modifications). Put the fake edges through the GAN + pix2pixHD to create fake volumes.

Train a 3D Mask-RCNN (using the fake segmentations and fake volumes) to predict the 3D bounding boxes of the segmentations from the volumes. Use 2D Mask-RCNN to refine the segmentations produced by 3D Mask-RCNN (just like how we used pix2pixHD in 2D to refine the 3D output from the first GAN). Use the Mask-RCNNs (with some post-processing) to generate predicted segmentations of the CHAOS training set.

Train nnUNet on the volumes of the training set, and the predicted segmentations of the training set. Then, use this nnUNet to predict the segmentations of the CHAOS test set. We have now generated predictions for the test set without ever using the ground truth segmentations of the training set, i.e. a fully unsupervised method.