



Auto-segmentation of Pelvic OARs on MRI Multi-Sequence Using a Fused-Unet

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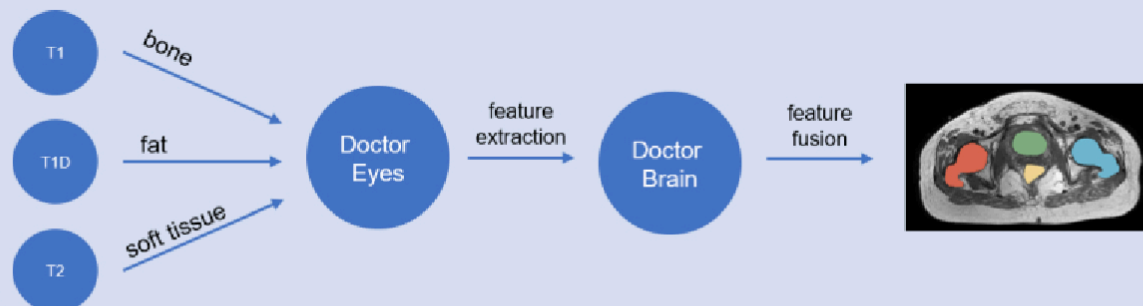
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Motivation

With the increase application of MR-sim in RT, OARs auto-segmentation on MRI multi-sequence is becoming more and more important. Regular auto-segmentation model on MRI can only utilize single sequence. In order to utilize all of the sequences, we use multi-modality model to perform automatic segmentation on MRI multi-sequence.

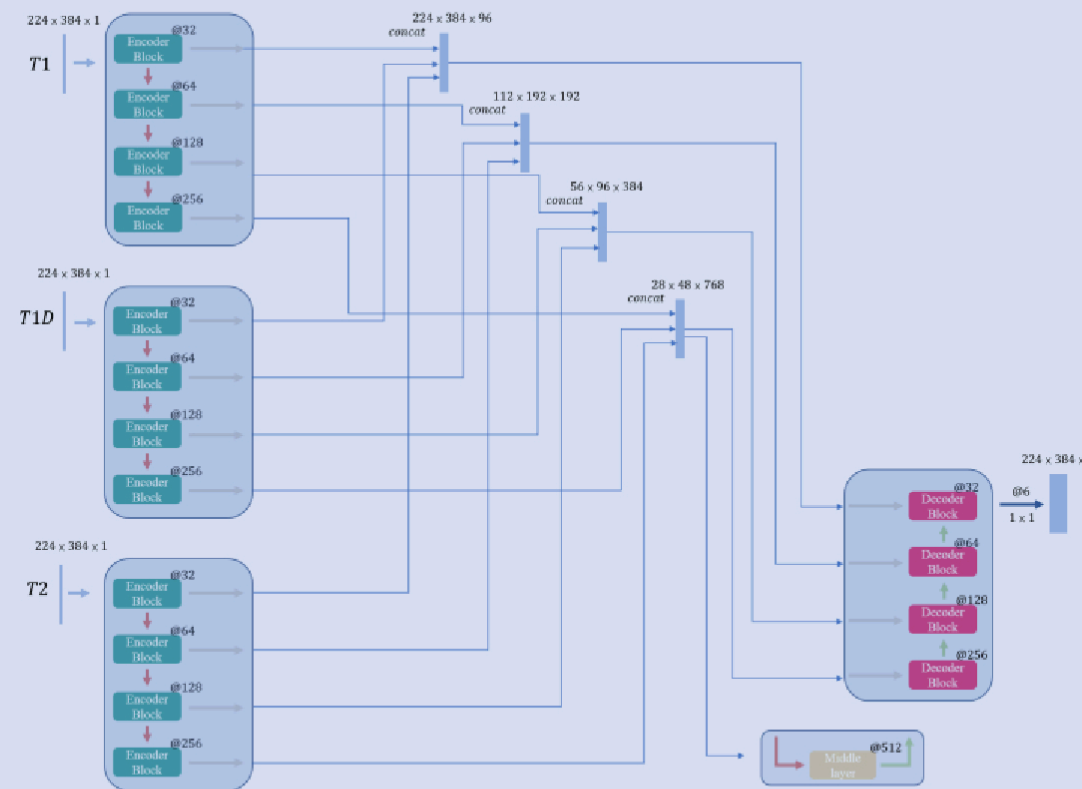
Analysis

During MR-sim radiotherapy, doctors are provided multi-sequence MRI images. Because different sequence has different feature, doctor can get more abundant structure information so that doctor can contour out the tumors and organs at risk more accurately.



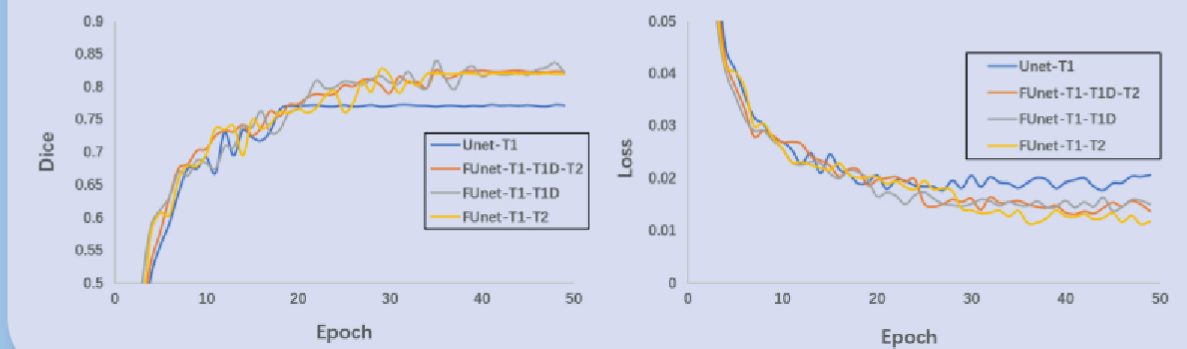
Method

We imitate the workflow of tumors and organs at risk contouring of doctor. We use the encoder part of U-Net as single sequence feature extractor. We use one encoder to encode one sequence MRI image. By doing like so, we can get feature from different sequence. Then the feature from different sequence will fully mix up and share the same decoder. The decoder will decode the fused feature information as a segmentation map.



Experiment

We use T1 sequence manual segmentation map as the ground truth and compare the U-Net and FU-Net. We train the models for 50 epochs.



Result

