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A Deep Learning Based Auto Segmentation for H&N Organs On Treatment Planning CT Images

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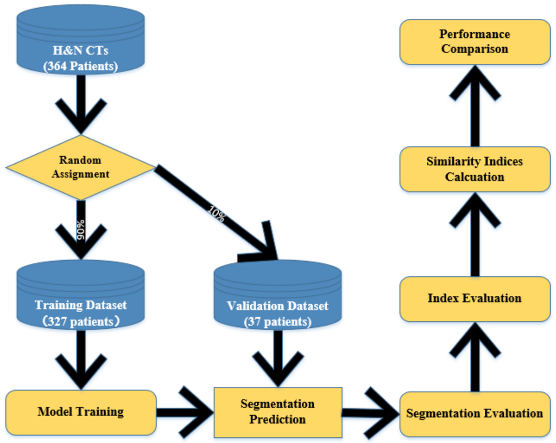
Methods

Workflow



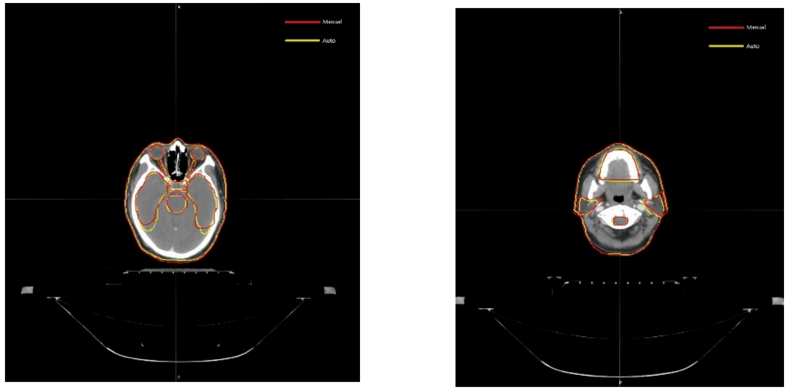
The model was developed with 2D U-net network structure and trained with CT scans of 364 NPC patients.

Results

OARs	Dice	OARs	Dice
SpinalCord	0.83±0.09	Eye_R	0.85±0.04
BrainStem	0.86±0.05	Eye_L	0.85±0.05
TemporalLobe_R	0.79±0.08	Parotid_R	0.78±0.05
TemporalLobe_L	0.76±0.07	Parotid_L	0.79±0.05
OpticNerve_R	0.60±0.11	OralCavity	0.69±0.17
OpticNerve_L	0.59±0.11	Larynx	0.79±0.10
Chiasm	0.49±0.15		

Four indices, included HD, DSC, MDA, Jaccard, were calculated to evaluate the performance.

Compare



Auto-segmented results compared with human work which was segmented by some experienced radiation oncologists (>5 year experience) .

Highlights

- We found CNN-based OARs auto-segmentation can perform similar or even better than manual work on the segmentation of spinal cord, brain stem, but sometimes inferior on the small-volume structures like chiasm and optic nerve.
- We collected as many patients' CT images as possible to improve the accuracy of learning and we believe that the different of sample size for auto-segmentation could have a significant effect.

Info.

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