

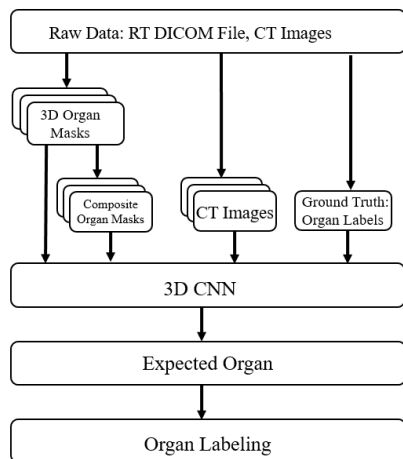
Automated Standardization of Organ Labeling in Head and Neck Using Deep Learning

Presenting Author: Timothy Rozario | Session Title: Advanced Computing Applications

Date and Time: 07/30/2018 | 4:30PM — 4:40PM

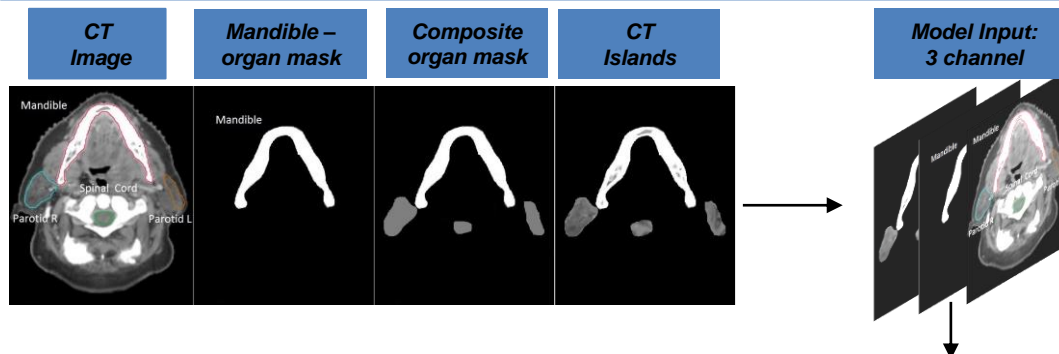
Overview

Flow chart illustrating the process for Organ Labeling

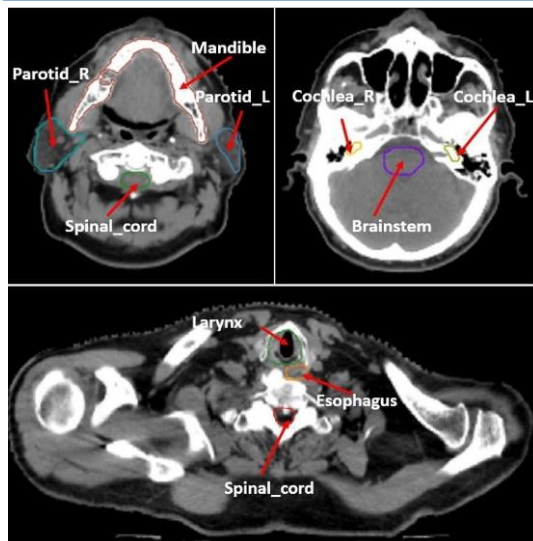


Methods and Materials

Raw patient images used to create model specific input images for training and testing



Model Output: Standardized organ labels assigned to CT slices after organ identification using ResNeXt-44

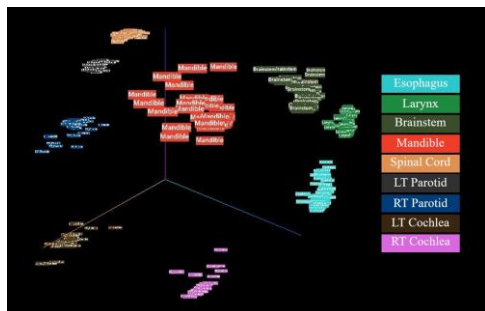


Deep ResNeXt-44 model used for critical organ identification

stage	output	ResNeXt-44
conv1	96X96	5x5, 32, stride2
conv2	48 x48	3x3 max pool, stride 2
		1x1, 64
		3x3, 64, C = 32
		1x1, 128
		}] x3
conv3	24x24	1x1, 128
		3x3, 128, C = 32
		1x1, 256
		}] x4
conv4	12x12	1x1, 256
		3x3, 256, C = 32
		1x1, 512
		}] x4
conv5	6x6	1x1, 512
		3x3, 512, C = 32
		1x1, 1024
		}] x3
	1x1	global average pool
		29-d fc, softmax

Results

3D Visualization of ResNeXt-44 classification for 9 critical organs using top 3 PCA modes on tensorboard



Overall organ identification accuracy (29 organs) : 96%
Top 9 critical organ accuracy : 100%