Supplementary material for Conv-MCD: A Plug-and-Play Multi-task Module for Medical Image Segmentation

No Author Given

No Institute Given

Table 1. Quantitative comparison of our proposed module (Conv-MCD) with baseline networks on the ORIGA Cup Segmentation Dataset[2]. The results indicate an increase in performance compared to 1Enc 2Dec MC and 1Enc 2Dec MD (with a significant decrease in the number of parameters). Since the ROI in the ORIGA Cup Dataset does not exhibit large variations in shape as well as multi-instance occurrences, the increase in performance is not as significant as observed in the polyp GIANA Dataset.

Architecture	Cup		
	Dice	Jaccard	Hausdorff
1Enc 1Dec M	0.8655	0.7628	14.832
1Enc 2Dec MC	0.8715	0.7722	14.775
1Enc 2Dec MD	0.8723	0.7735	14.814
1Enc 1Dec Conv-MCD (Ours)	**0.8731**	**0.7747**	**14.679**

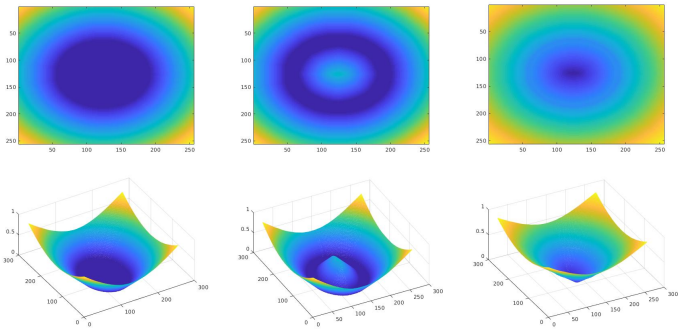

Fig. 1. Left to right: Distance maps (Euclidean distance transform of mask (D1), Euclidean distance transform of contour (D2), Signed distance transform of contour (D3))

[2] Zhang, Z., Yin, F.S., Liu, J., Wong, W.K., Tan, N.M., Lee, B.H., Cheng, J., Wong,T.Y.: Origa-light: An online retinal fundus image database for glaucoma analysis and research. In: Engineering in Medicine and Biology Society (EMBC), 2010 Annual International Conference of the IEEE. pp. 30653068. IEEE (2010)

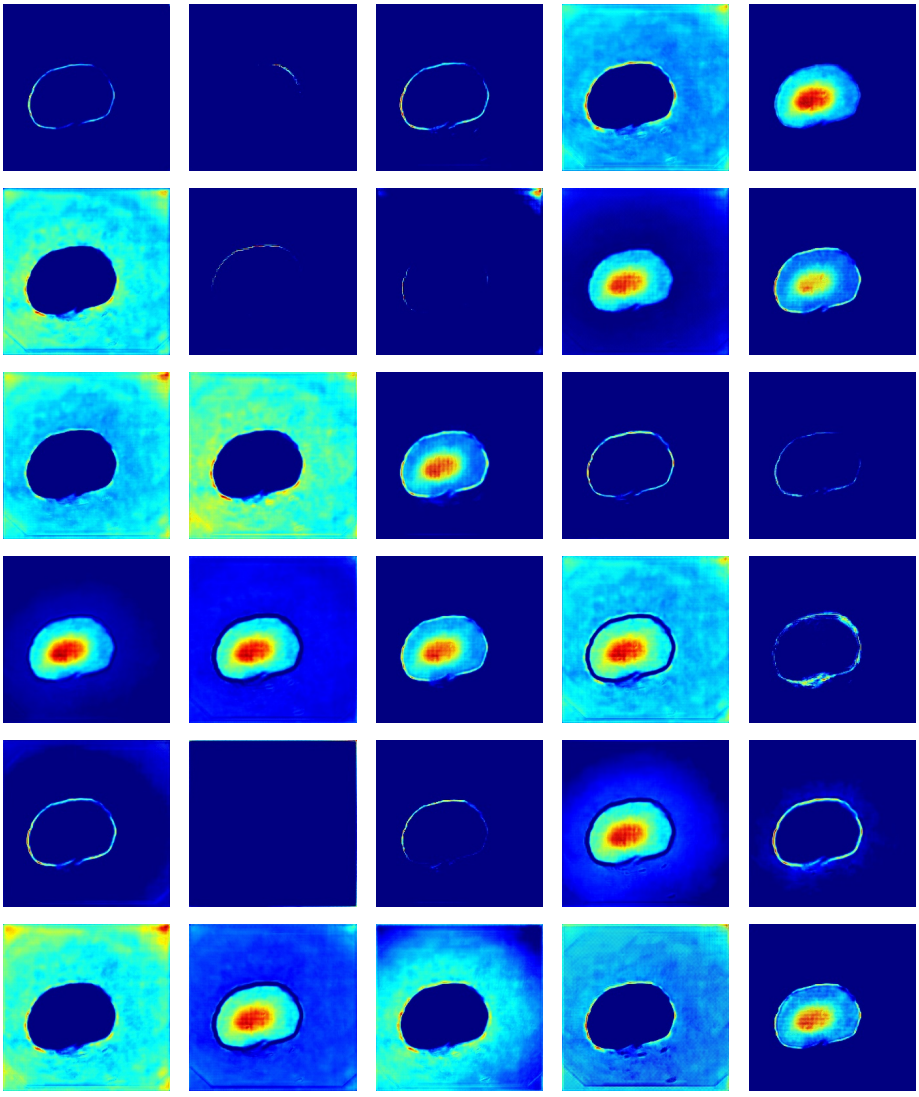

Fig. 2. Visualization of feature maps. Row-wise order: Images like 5,9 and 13 represents mask, Images like 1,3 and 14 represents contour, Linear combination of images 11 and 27 represents Distance Map.

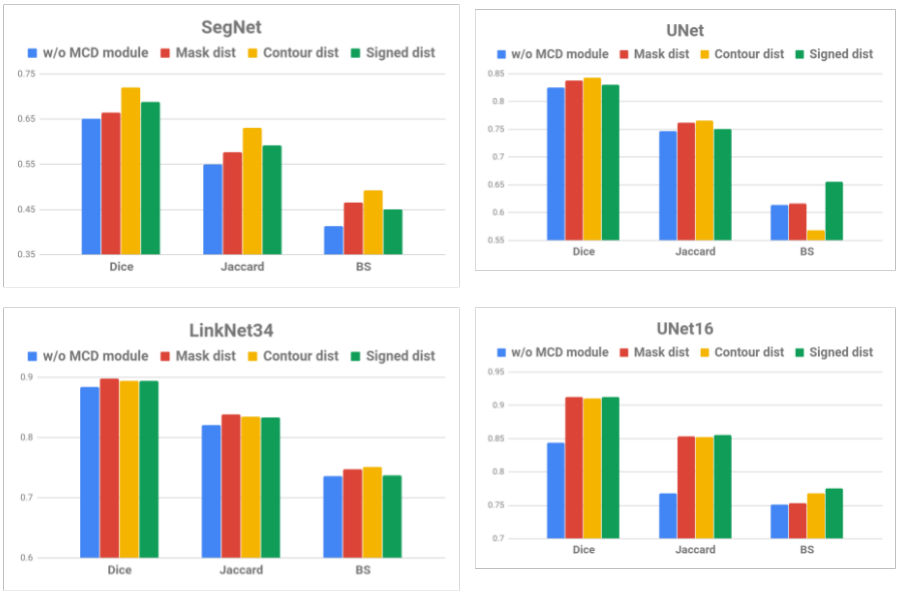

Fig. 3. Comparison of evaluation metrics for different state-of-the networks with different distance maps.

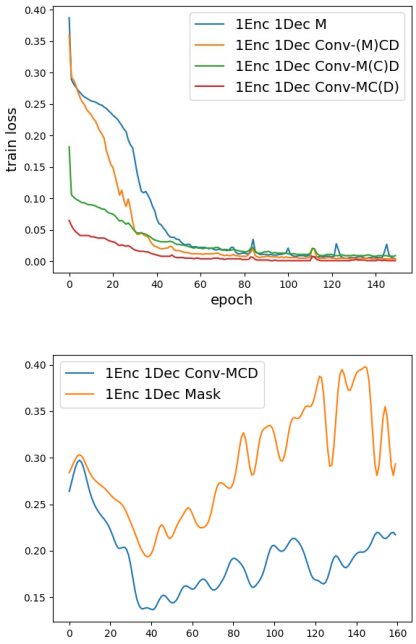

Fig. 4. Top: Training plot comparison between 1Enc 1Dec M(Blue) and 1Enc 1Dec Conv-MCD(Orange). The plot indicates that including our module results in the model converging in earlier epochs. Also, it can be observed from the plot that contour extraction and distance map estimation tasks converge as well. Bottom: Validation plot comparison between 1Enc 1Dec M(orange) and 1Enc 1Dec Conv-MCD(blue). The plot indicates that including our module reduces overfitting.