A Weakly-supervised Multi-lesion Segmentation Framework Based on Target-level Incomplete Annotations

Jianguo Ju[1], Shumin Ren[1], Dandan Qiu[1], Huijuan Tu[2(✉)], Juanjuan Yin[1], Pengfei Xu[1], and Ziyu Guan[1(✉)]

[1] School of Information Science and Technology, Northwest University, Xi'an, China
`ziyuguan@nwu.edu.cn`
[2] Department of Radiology, Kunshan Hospital of Chinese Medicine, Kunshan, China
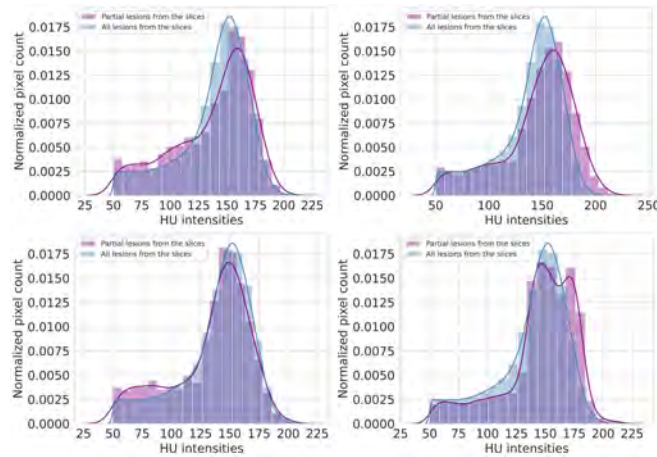`20214132014@stu.suda.edu.cn`

Fig. 1. Distribution of all lesions (blue) and partial lesions (purple) in each slice. (a) all lesions from the slices. (b), (c), and (d) randomly sample a single lesion's region per slice.

Table 1. Comparison of the segmentation performance for labeling different target areas.

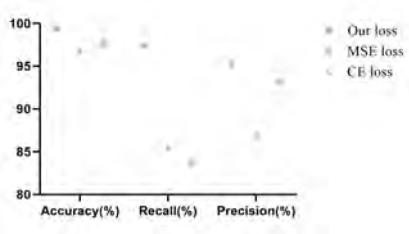| Annotation strategy	DSC	mIOU
random	15.15	6.76
maximum	16.14	7.12
minimum	14.56	5.88
salient	16.73	7.87

Fig. 2. Comparison of classification performance of local classification branch under different classification losses.

Table 2. Comparison of the segmentation performance for different weak annotation forms.

Annotation form	DSC	mIOU
image-level	37.54	24.33
points	39.97	28.25
scribbles	41.94	30.63
bounding boxes	45.44	35.71
incomplete annotations	45.78	35.90
TIA	**47.80**	**38.41**