

Adaptive Learning of High-Value Regions for Semi-Supervised Medical Image Segmentation

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1. Supplemental Material

The supplementary materials include supplements to comparative experiments and visualizations.

Method	Labeled	Unlabeled	Dice↑	Jaccard↑	95HD↓	ASD↓
U-Net	7(10%)	0	81.59	70.74	8.07	2.35
U-Net	14(20%)	0	84.83	75.33	7.61	2.09
U-Net	70(All)	0	91.10	84.04	4.90	1.14
MT[NIPS'2017]	7(10%)	63(90%)	83.65	73.15	13.45	3.61
ICT[IJCAI'2019]			84.13	73.67	5.96	2.04
CCT[CVPR2020]			83.62	72.92	9.44	2.54
DTC[AAAI'2021]			85.40	75.49	9.91	2.47
CPS[CVPR'2021]			85.34	75.50	8.78	2.37
MC-Net[MICCAI'2021]			86.07	76.58	11.48	3.37
URPC[MIA'2022]			84.25	74.09	4.28	1.31
SS-Net[MICCAI'2022]			86.95	77.88	4.93	1.56
MCF[CVPR'2023]			85.18	75.22	10.73	2.78
AC-MT[MIA'2023]			86.36	76.86	9.64	2.59
UG-MCL[AJIM'2023]			86.84	77.60	7.77	1.94
EVIL[CBM'2024]			87.25	78.18	5.31	1.35
AAU[MIA'2024]			86.46	76.99	8.00	2.06
MLRP[MIA'2024]			87.10	78.16	4.91	1.30
ours			90.56 ^{3.31}	83.21	2.57	0.78
MT[NIPS'2017]	14(20%)	56(80%)	86.55	77.49	6.86	2.15
ICT[IJCAI'2019]			85.02	75.34	9.79	2.87
CCT[CVPR2020]			85.71	76.41	8.62	2.56
DTC[AAAI'2021]			87.67	78.83	6.80	1.93
CPS[CVPR'2021]			87.03	78.13	6.66	2.12
MC-Net[MICCAI'2021]			86.58	77.68	15.99	4.93
URPC[MIA'2022]			86.07	76.77	6.04	1.66
SS-Net[MICCAI'2022]			87.33	78.45	7.38	2.34
MCF[CVPR'2023]			87.32	78.43	6.53	2.00
AC-MT[MIA'2023]			87.99	79.34	7.85	2.14
UG-MCL[AJIM'2023]			88.40	79.86	9.12	2.44
EVIL[CBM'2024]			88.34	79.90	6.46	1.68
AAU[MIA'2024]			87.71	78.92	8.51	2.14
MLRP[MIA'2024]			88.00	79.54	5.41	1.58
ours			91.09 ^{2.69}	84.05	2.71	0.73

Table 1. Comparisons with state-of-the-art semi-supervised segmentation methods on the ACDC dataset.

Method	Labeled	Unlabeled	Dice↑	Jaccard↑	95HD↓	ASD↓
U-Net	1(5%)	0	67.39	57.14	46.87	11.37
U-Net	3(10%)	0	75.66	66.33	22.44	6.89
U-Net	30(All)	0	86.93	79.27	11.55	2.45
MT[NIPS'2017]	1(5%)	29(95%)	71.82	61.19	42.03	9.23
ICT[IJCAI'2019]			76.40	65.94	36.34	10.62
CCT[CVPR2020]			69.00	58.25	60.98	16.56
DTC[AAAI'2021]			79.61	70.45	24.06	6.27
CPS[CVPR'2021]			78.14	68.32	26.25	6.68
MC-Net[MICCAI'2021]			80.97	71.43	32.98	7.48
URPC[MIA'2022]			74.46	63.84	39.42	9.38
SS-Net[MICCAI'2022]			79.17	68.45	34.97	9.26
MCF[CVPR'2023]			80.79	71.30	26.13	7.81
AC-MT[MIA'2023]			76.18	65.99	36.12	8.89
UG-MCL[AJIM'2023]			74.06	63.58	26.93	7.06
EVIL[CBM'2024]			80.68	71.47	23.72	6.33
AAU[MIA'2024]			80.65	71.03	32.68	9.04
MLRP[MIA'2024]			80.30	70.67	20.94	5.43
ours			84.75 ^{3.78}	76.35	21.15	5.59
MT[NIPS'2017]	3(10%)	27(90%)	78.75	69.10	25.35	6.88
ICT[IJCAI'2019]			80.35	71.06	24.87	6.71
CCT[CVPR2020]			77.03	67.35	36.20	8.91
DTC[AAAI'2021]			82.82	73.85	24.33	5.79
CPS[CVPR'2021]			82.71	74.11	17.30	4.90
MC-Net[MICCAI'2021]			82.94	74.13	19.35	4.59
URPC[MIA'2022]			79.72	70.38	33.11	8.04
SS-Net[MICCAI'2022]			82.84	74.02	16.48	4.39
MCF[CVPR'2023]			83.34	74.63	16.97	4.72
AC-MT[MIA'2023]			82.32	72.97	26.52	7.54
UG-MCL[AJIM'2023]			81.43	72.56	20.29	5.67
EVIL[CBM'2024]			84.24	75.75	18.14	5.25
AAU[MIA'2024]			81.42	71.82	29.69	8.25
MLRP[MIA'2024]			84.55	75.99	13.82	4.05
ours			85.68 ^{1.13}	77.35	21.96	6.22

Table 2. Comparisons with state-of-the-art semi-supervised segmentation methods on the AbdomenCT-1K dataset.

Method	Labeled	Unlabeled	Dice↑	Jaccard↑	95HD↓	ASD↓
V-Net	25(10%)	0	79.23	68.40	15.83	4.34
V-Net	250(All)	0	86.49	77.23	8.68	1.98
MT[NIPS'2017]	25(10%)	225(90%)	80.49	69.99	11.71	3.46
ICT[IJCAI'2019]			83.31	73.45	9.64	2.69
CCT[CVPR2020]			82.64	72.50	11.29	2.82
DTC[AAAI'2021]			82.53	72.73	12.66	3.12
CPS[CVPR'2021]			82.70	72.30	12.99	3.46
MC-Net[MICCAI'2021]			82.51	72.98	14.57	3.78
URPC[MIA'2022]			82.07	72.11	9.92	2.24
SS-Net[MICCAI'2022]			81.64	70.95	15.31	4.83
MCF[CVPR'2023]			81.96	71.76	13.96	3.99
AC-MT[MIA'2023]			82.09	71.65	15.91	4.81
UG-MCL[AJIM'2023]			82.85	72.69	11.12	2.28
EVIL[CBM'2024]			82.60	72.46	11.44	2.76
AAU[MIA'2024]			82.43	72.33	13.83	4.18
MLRP[MIA'2024]			83.96	74.00	15.16	4.21
ours			85.14 ^{1.18}	75.75	7.79	2.00

Table 3. Comparisons with state-of-the-art semi-supervised segmentation methods on the Brats dataset.

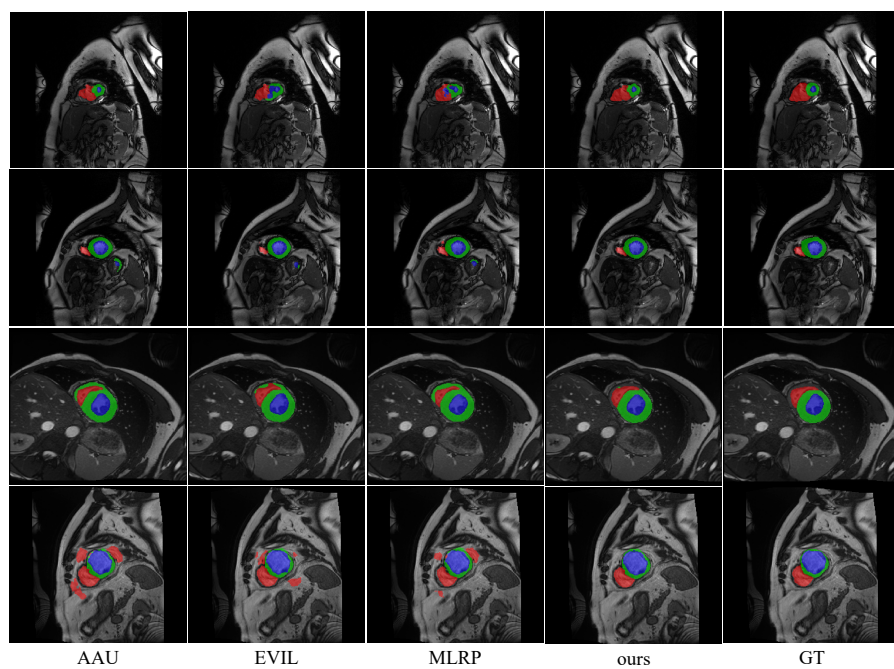


Figure 1. Visualization of some semi-supervised methods based on ACDC dataset.

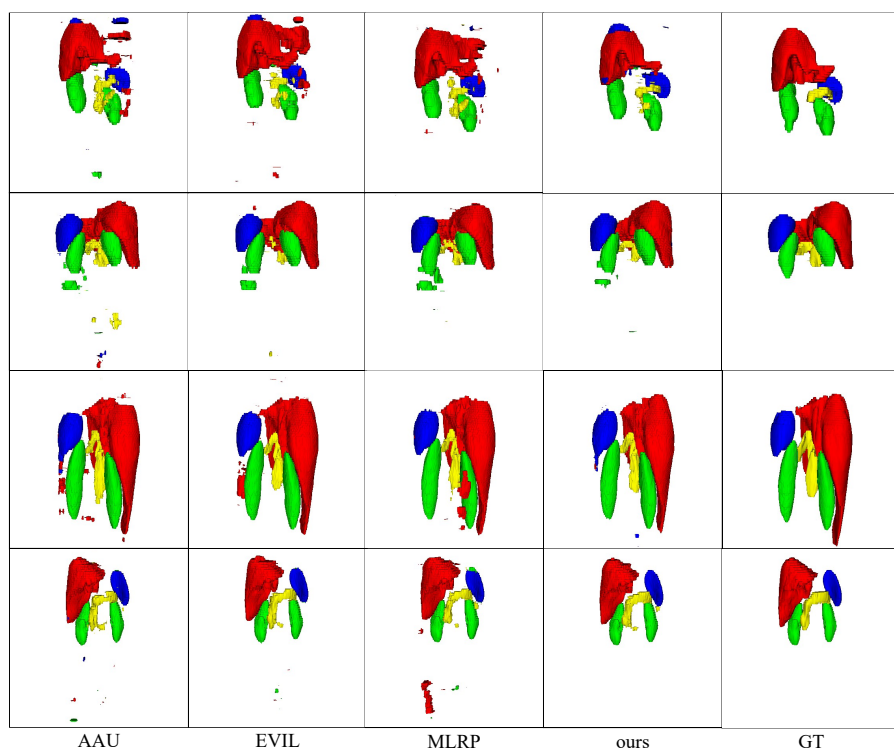


Figure 2. Visualization of some semi-supervised methods based on AbdomenCT-1K dataset.