

SOS Dataset Results

1.1 ResNet34 + Attention (SE, CBAM), Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'senet34', 'cbamnet34'], epochs='best', metrics=['precision', 'recall', 'f1score', 'm_iou'], losses=['bce'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'senet34', 'cbamnet34'] Metrics: ['precision', 'recall', 'f1score', 'm_iou'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.1.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.871748 (16)	0.890777 (32)	0.890949 (15)
LinkNet	0.879640 (34)	0.896109 (6)	0.895860 (12)
PSPNet	0.914801 (8)	0.870158 (35)	0.866524 (6)

1.1.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.882198 (36)	0.912444 (7)	0.890940 (36)
LinkNet	0.875926 (9)	0.897157 (38)	0.895900 (3)
PSPNet	0.871979 (4)	0.840804 (10)	0.846647 (38)

1.1.3 Metric: f1score, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.860053 (8)	0.866432 (12)	0.868049 (13)
LinkNet	0.861503 (11)	0.860693 (13)	0.864862 (7)
PSPNet	0.839691 (38)	0.840147 (10)	0.840942 (10)

1.1.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.808299 (8)	0.816302 (12)	0.816851 (13)
LinkNet	0.811111 (11)	0.807876 (13)	0.815483 (7)
PSPNet	0.783895 (11)	0.784505 (8)	0.786328 (10)

1.2 ResNet34 + Attention (SE, CBAM), Loss function: DICE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'senet34', 'cbamnet34'], epochs='best', metrics=['precision', 'recall', 'f1score', 'm_iou'], losses=['dice'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'senet34', 'cbamnet34'] Metrics: ['precision', 'recall', 'f1score', 'm_iou'] Losses: ['dice'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.2.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.850834 (34)	0.852187 (28)	0.844897 (39)
LinkNet	0.855111 (31)	0.852534 (31)	0.847829 (31)
PSPNet	0.811792 (25)	0.814843 (10)	0.819595 (10)

1.2.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.942584 (1)	0.926279 (32)	0.947426 (2)
LinkNet	0.949421 (1)	0.949826 (1)	0.938521 (3)
PSPNet	0.939783 (1)	0.922160 (5)	0.939705 (2)

1.2.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.862135 (23)	0.864494 (28)	0.864940 (27)
LinkNet	0.860410 (20)	0.861669 (32)	0.861167 (30)
PSPNet	0.840459 (14)	0.842891 (10)	0.839688 (10)

1.2.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.806285 (23)	0.812020 (28)	0.811455 (27)
LinkNet	0.804571 (20)	0.808820 (32)	0.806788 (30)
PSPNet	0.779557 (14)	0.783159 (10)	0.780452 (10)

1.3 ResNet34 + Attention (SE, CBAM), Loss function: Tvsersky

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'senet34', 'cbamnet34'], epochs='best', metrics=['precision', 'recall', 'flscore', 'm_iou'], losses=['tvsersky'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'senet34', 'cbamnet34'] Metrics: ['precision', 'recall', 'flscore', 'm_iou'] Losses: ['tvsersky'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.3.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.820122 (30)	0.800879 (10)	0.813819 (29)
LinkNet	0.791127 (23)	0.808881 (29)	0.815920 (32)
PSPNet	0.762235 (17)	0.756006 (35)	0.766189 (37)

1.3.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.952291 (39)	0.972822 (1)	0.949685 (36)
LinkNet	0.961396 (3)	0.964020 (4)	0.974365 (1)
PSPNet	0.951284 (1)	0.950700 (5)	0.960046 (3)

1.3.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.856982 (30)	0.850607 (15)	0.855357 (20)
LinkNet	0.847863 (23)	0.856881 (15)	0.853984 (32)
PSPNet	0.827610 (15)	0.826248 (29)	0.830044 (16)

1.3.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.799353 (30)	0.787635 (15)	0.796038 (20)
LinkNet	0.784621 (23)	0.796177 (15)	0.795403 (32)
PSPNet	0.757137 (17)	0.754316 (35)	0.760233 (16)

1.4 ResNet34 + Attention (SE, CBAM), Loss function: Joint

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'senet34', 'cbamnet34'], epochs='best', metrics=['precision', 'recall', 'flscore', 'm_iou'], losses=['joint'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'senet34', 'cbamnet34'] Metrics: ['precision', 'recall', 'flscore', 'm_iou'] Losses: ['joint'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.4.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.877703 (37)	0.873462 (38)	0.876008 (3)
LinkNet	0.866839 (13)	0.872439 (36)	0.871679 (37)
PSPNet	0.847329 (17)	0.875696 (40)	0.844940 (37)

1.4.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.955315 (1)	0.915122 (2)	0.929229 (1)
LinkNet	0.961006 (1)	0.909911 (5)	0.930945 (1)
PSPNet	0.938482 (2)	0.921550 (2)	0.924205 (1)

1.4.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.865913 (9)	0.864968 (11)	0.868081 (10)
LinkNet	0.860451 (14)	0.863929 (8)	0.865757 (9)
PSPNet	0.841453 (11)	0.842043 (7)	0.843105 (12)

1.4.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.813041 (9)	0.813643 (28)	0.815514 (10)
LinkNet	0.805644 (14)	0.810087 (8)	0.813755 (13)
PSPNet	0.784295 (13)	0.784372 (7)	0.787513 (12)

1.5 ResNet34 + MR, Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'resnet34_MRv1', 'resnet34_MRv2', 'resnet34_MRv3', 'resnet34_MRv4', 'resnet34_MRv5', 'resnet34_MRv6', 'resnet34_MRv7', 'resnet34_MRv8'], epochs='best', metrics=['precision', 'recall', 'flscore', 'm_iou'], losses='bce', datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'resnet34_MRv1', 'resnet34_MRv2', 'resnet34_MRv3', 'resnet34_MRv4', 'resnet34_MRv5', 'resnet34_MRv6', 'resnet34_MRv7', 'resnet34_MRv8'] Metrics: ['precision', 'recall', 'flscore', 'm_iou'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.5.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.871748 (16)	0.874376 (16)	0.878230 (3)	0.884013 (7)	0.874683 (9)	0.889972 (32)	0.856492 (16)	0.858801 (35)	0.882523 (38)
LinkNet	0.879640 (34)	0.872747 (9)	0.884716 (34)	0.882745 (40)	0.862763 (15)	0.866746 (30)	0.847081 (17)	0.894627 (38)	0.869719 (35)
PSPNet	0.914801 (8)	0.870061 (34)	0.859697 (6)	0.884132 (2)	0.891025 (9)	0.879902 (3)	0.873493 (6)	0.859165 (12)	0.849412 (10)

1.5.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.882198 (36)	0.910446 (33)	0.946815 (37)	0.908492 (10)	0.927850 (35)	0.921586 (11)	0.927958 (33)	0.922466 (40)	0.917902 (37)
LinkNet	0.875926 (9)	0.912895 (32)	0.913036 (12)	0.908383 (5)	0.943492 (40)	0.916973 (35)	0.930827 (5)	0.924889 (5)	0.917268 (37)
PSPNet	0.871979 (4)	0.894849 (40)	0.872520 (28)	0.881382 (10)	0.891232 (31)	0.872448 (39)	0.876932 (33)	0.876040 (15)	0.897293 (4)

1.5.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.860053 (8)	0.866119 (9)	0.867668 (12)	0.867830 (9)	0.867431 (21)	0.866758 (14)	0.859523 (14)	0.866466 (16)	0.870799 (12)
LinkNet	0.861503 (11)	0.866012 (12)	0.866508 (28)	0.863496 (9)	0.866197 (17)	0.870596 (14)	0.859981 (16)	0.869213 (12)	0.865759 (8)
PSPNet	0.839691 (38)	0.847371 (11)	0.845613 (14)	0.844805 (13)	0.841506 (18)	0.846063 (12)	0.840473 (19)	0.847657 (10)	0.843779 (12)

1.5.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.808299 (8)	0.815467 (9)	0.818029 (12)	0.817133 (9)	0.815609 (21)	0.815996 (14)	0.805461 (14)	0.814339 (16)	0.819383 (12)
LinkNet	0.811111 (11)	0.812357 (14)	0.815067 (28)	0.809892 (9)	0.813620 (17)	0.818708 (17)	0.805518 (17)	0.817707 (13)	0.812405 (8)
PSPNet	0.783895 (11)	0.791884 (16)	0.789778 (14)	0.789321 (13)	0.784079 (20)	0.790925 (12)	0.783895 (19)	0.794086 (12)	0.787589 (14)

1.6 ResNet34 + MR + DAL, Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'resnet34_MRv8_MDv1', 'resnet34_MRv8_MDv2', 'resnet34_MRv8_MDv3', 'resnet34_MRv8_MDv4'], epochs='best', metrics=['precision', 'recall', 'f1score', 'm_iou'], losses=['bce'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'resnet34_MRv8_MDv1', 'resnet34_MRv8_MDv2', 'resnet34_MRv8_MDv3', 'resnet34_MRv8_MDv4'] Metrics: ['precision', 'recall', 'f1score', 'm_iou'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

1.6.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.871748 (16)	0.866284 (7)	0.864833 (38)	0.879395 (32)	0.862463 (2)
LinkNet	0.879640 (34)	0.852912 (12)	0.863817 (14)	0.859934 (21)	0.879433 (35)
PSPNet	0.914801 (8)	0.847542 (13)	0.858720 (5)	0.860983 (13)	0.864306 (38)

1.6.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.882198 (36)	0.905300 (33)	0.921375 (40)	0.922851 (38)	0.876161 (4)
LinkNet	0.875926 (9)	0.901408 (4)	0.918906 (2)	0.903768 (10)	0.855957 (8)
PSPNet	0.871979 (4)	0.870303 (15)	0.885675 (9)	0.887353 (8)	0.856608 (4)

1.6.3 Metric: f1score, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.860053 (8)	0.864500 (13)	0.865053 (14)	0.865066 (30)	0.837568 (17)
LinkNet	0.861503 (11)	0.860478 (12)	0.865285 (12)	0.862881 (14)	0.835667 (12)
PSPNet	0.839691 (38)	0.835529 (11)	0.844121 (12)	0.840295 (12)	0.821740 (9)

1.6.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.808299 (8)	0.810308 (13)	0.813103 (37)	0.811361 (30)	0.778712 (14)
LinkNet	0.811111 (11)	0.807592 (12)	0.812023 (12)	0.808004 (14)	0.781171 (12)
PSPNet	0.783895 (11)	0.778935 (11)	0.786997 (12)	0.783088 (13)	0.763598 (9)

2 SOS Augmented Dataset

2.1 ResNet34 + Attention (SE, CBAM), Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'senet34', 'cbamnet34'], epochs='best', metrics=['precision', 'recall', 'f1score', 'm_iou'], losses=['bce'], datasets=['sos_a'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'senet34', 'cbamnet34'] Metrics: ['precision', 'recall', 'f1score', 'm_iou'] Losses: ['bce'] Datasets: ['sos_a'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

2.1.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.884812 (5)	0.874568 (38)	0.872251 (2)
LinkNet	0.875601 (7)	0.891858 (5)	0.887152 (6)
PSPNet	0.875480 (3)	0.879255 (6)	0.878549 (3)

2.1.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.894522 (35)	0.892427 (9)	0.883264 (5)
LinkNet	0.901660 (1)	0.873497 (3)	0.894358 (4)
PSPNet	0.840697 (31)	0.848959 (7)	0.858920 (39)

2.1.3 Metric: f1score, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.864613 (8)	0.862124 (7)	0.869856 (6)
LinkNet	0.857404 (4)	0.860627 (4)	0.864546 (6)
PSPNet	0.838653 (31)	0.843313 (10)	0.845380 (39)

2.1.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+SE	ResNet34+CBAM
UNet	0.810812 (8)	0.807340 (7)	0.817304 (6)
LinkNet	0.803220 (4)	0.808323 (4)	0.812962 (6)
PSPNet	0.779670 (27)	0.785475 (12)	0.787484 (38)

2.2 ResNet34 + Attention (SE, CBAM), Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'resnet34_MRv1', 'resnet34_MRv2', 'resnet34_MRv3', 'resnet34_MRv4', 'resnet34_MRv5', 'resnet34_MRv6', 'resnet34_MRv7', 'resnet34_MRv8'], epochs='best', metrics=['precision', 'recall', 'f1score', 'm_iou'], losses=['bce'], datasets=['sos_a'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'resnet34_MRv1', 'resnet34_MRv2', 'resnet34_MRv3', 'resnet34_MRv4', 'resnet34_MRv5', 'resnet34_MRv6', 'resnet34_MRv7', 'resnet34_MRv8'] Metrics: ['precision', 'recall', 'f1score', 'm_iou'] Losses: ['bce'] Datasets: ['sos_a'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

2.2.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR (
UNet	0.884812 (5)	0.871911 (38)	0.862208 (36)	0.891129 (32)	0.837616 (6)	NA	NA	NA	NA
LinkNet	0.875601 (7)	0.857120 (39)	0.867851 (8)	0.859235 (29)	0.858925 (7)	0.874449 (31)	0.853914 (7)	0.861582 (3)	0.857819 (9)
PSPNet	0.875480 (3)	0.841376 (16)	0.872779 (3)	0.851184 (11)	0.859558 (3)	0.866411 (4)	0.850909 (4)	0.854232 (2)	0.864443 (2)

2.2.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.894522 (35)	0.921935 (2)	0.922148 (1)	0.910517 (38)	0.905457 (5)	NA	NA	NA	NA
LinkNet	0.901660 (1)	0.895286 (7)	0.941932 (4)	0.909247 (5)	0.909600 (6)	0.906476 (7)	0.907082 (6)	0.919608 (6)	0.923469 (7)
PSPNet	0.840697 (31)	0.883254 (6)	0.887868 (9)	0.866934 (6)	0.878933 (6)	0.867057 (11)	0.905024 (2)	0.869115 (35)	0.877085 (36)

2.2.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.864613 (8)	0.865360 (8)	0.868291 (9)	0.865115 (5)	0.862459 (6)	NA	NA	NA	NA
LinkNet	0.857404 (4)	0.867294 (6)	0.866074 (9)	0.861528 (10)	0.863873 (9)	0.864823 (5)	0.859090 (3)	0.868774 (5)	0.864757 (9)
PSPNet	0.838653 (31)	0.841991 (6)	0.841466 (10)	0.843262 (4)	0.839434 (15)	0.843252 (12)	0.837576 (8)	0.843531 (6)	0.841290 (32)

2.2.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+MR (add)	ResNet34+MR (cat)	ResNet34+MR (max)	ResNet34+MR (rand)	ResNet34+MR (alpha)	ResNet34+MR (alpha+pos)	ResNet34+MR (MLP)	ResNet34+MR
UNet	0.810812 (8)	0.810926 (8)	0.812476 (9)	0.810126 (9)	0.804647 (6)	NA	NA	NA	NA
LinkNet	0.803220 (4)	0.812627 (6)	0.812390 (8)	0.803744 (10)	0.808640 (9)	0.811794 (5)	0.801220 (3)	0.814670 (5)	0.809896 (9)
PSPNet	0.779670 (27)	0.780366 (4)	0.782494 (10)	0.782198 (4)	0.779759 (7)	0.784562 (6)	0.777364 (8)	0.782343 (40)	0.781988 (9)

2.3 ResNet34 + Attention (SE, CBAM), Loss function: BCE

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34', 'resnet34_MRv8_MDv1', 'resnet34_MRv8_MDv2', 'resnet34_MRv8_MDv3', 'resnet34_MRv8_MDv4'], epochs='best', metrics=['precision', 'recall', 'flscore', 'm_iou'], losses=['bce'], datasets=['sos_a'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34', 'resnet34_MRv8_MDv1', 'resnet34_MRv8_MDv2', 'resnet34_MRv8_MDv3', 'resnet34_MRv8_MDv4'] Metrics: ['precision', 'recall', 'flscore', 'm_iou'] Losses: ['bce'] Datasets: ['sos_a'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

2.3.1 Metric: precision, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.884812 (5)	0.862908 (8)	0.865751 (31)	0.861292 (38)	0.869136 (2)
LinkNet	0.875601 (7)	0.851188 (10)	0.874085 (6)	0.852533 (10)	0.887553 (8)
PSPNet	0.875480 (3)	0.850930 (8)	0.848771 (3)	0.856191 (7)	0.877964 (34)

2.3.2 Metric: recall, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.894522 (35)	0.948119 (33)	0.903834 (6)	0.912187 (5)	0.817406 (14)
LinkNet	0.901660 (1)	0.929293 (6)	0.907641 (7)	0.910307 (1)	0.834259 (39)
PSPNet	0.840697 (31)	0.876360 (33)	0.877695 (5)	0.864880 (10)	0.815070 (4)

2.3.3 Metric: flscore, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.864613 (8)	0.858746 (13)	0.865382 (8)	0.863921 (9)	0.819902 (6)
LinkNet	0.857404 (4)	0.858381 (8)	0.864481 (10)	0.866136 (9)	0.818269 (14)
PSPNet	0.838653 (31)	0.834174 (32)	0.842278 (9)	0.839563 (10)	0.801434 (32)

2.3.4 Metric: m_iou, training step: test

Models	ResNet34	ResNet34+MR (CNN)+MR+DAL(Channel)	ResNet34+MR (CNN)+MR+DAL(Spatial)	ResNet34+MR (CNN)+MR+DAL(Gated)	ResNet34+MR (CNN)+MR+DAL(Multi)
UNet	0.810812 (8)	0.800553 (10)	0.809713 (7)	0.806977 (9)	0.757843 (6)
LinkNet	0.803220 (4)	0.798968 (8)	0.808077 (9)	0.810799 (9)	0.757504 (14)
PSPNet	0.779670 (27)	0.773004 (9)	0.783059 (4)	0.780865 (7)	0.736510 (40)

3 Losses

3.1 ResNet34, SOS

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Count encoders: 'resnet34': 1 Validate: [False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34'], epochs='best', metrics=['precision', 'recall', 'flscore', 'm_iou'], losses=['bce', 'dice', 'tvsersky', 'joint'], datasets=['sos'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv', operation_mode="") Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34'] Metrics: ['precision', 'recall', 'flscore', 'm_iou'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

3.1.1 Encoder: ResNet34, metrics: precision, training step: test

Models	bce	dice	tvsersky	joint
UNet	0.871748 (16)	0.850834 (34)	0.820122 (30)	0.877703 (37)
LinkNet	0.879640 (34)	0.855111 (31)	0.791127 (23)	0.866839 (13)
PSPNet	0.914801 (8)	0.811792 (25)	0.762235 (17)	0.847329 (17)

3.1.2 Encoder: ResNet34, metrics: recall, training step: test

Models	bce	dice	tvsersky	joint
UNet	0.882198 (36)	0.942584 (1)	0.952291 (39)	0.955315 (1)
LinkNet	0.875926 (9)	0.949421 (1)	0.961396 (3)	0.961006 (1)
PSPNet	0.871979 (4)	0.939783 (1)	0.951284 (1)	0.938482 (2)

3.1.3 Encoder: ResNet34, metrics: flscore, training step: test

Models	bce	dice	tvscopy	joint
UNet	0.860053 (8)	0.862135 (23)	0.856982 (30)	0.865913 (9)
LinkNet	0.861503 (11)	0.860410 (20)	0.847863 (23)	0.860451 (14)
PSPNet	0.839691 (38)	0.840459 (14)	0.827610 (15)	0.841453 (11)

3.1.4 Encoder: ResNet34, metrics: m_iou, training step: test

Models	bce	dice	tvscopy	joint
UNet	0.808299 (8)	0.806285 (23)	0.799353 (30)	0.813041 (9)
LinkNet	0.811111 (11)	0.804571 (20)	0.784621 (23)	0.805644 (14)
PSPNet	0.783895 (11)	0.779557 (14)	0.757137 (17)	0.784295 (13)

4 Textures+Filters

4.1 ResNet34, SOS, Textures

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34'], epochs='best', metrics=['precision', 'recall', 'flscore'], losses=['bce'], datasets=['sos'], dataset_features=['ta', 'td', 'th', 'tn', 'ts', 'tc', 'te', 'tm', 'tr', 'tv'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34'] Metrics: ['precision', 'recall', 'flscore'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

4.1.1 Metric: precision, training step: test

Models	asm	dissimilarity	homogeneity	entropy	std	contrast	energy	mean	correlation	variance
UNet	0.897231 (4)	0.888303 (9)	0.865331 (12)	0.857635 (7)	0.865795 (11)	0.878937 (12)	0.898868 (5)	0.883088 (6)	0.809331 (5)	0.862154 (6)
LinkNet	0.883877 (5)	0.862012 (4)	0.884590 (2)	0.874070 (3)	0.850623 (37)	0.868951 (7)	0.890831 (5)	0.871683 (34)	0.823289 (5)	0.841391 (9)
PSPNet	0.844798 (10)	0.876430 (10)	0.858725 (6)	0.865702 (1)	0.837229 (6)	0.847791 (7)	0.866944 (7)	0.895662 (38)	0.792201 (9)	0.854343 (13)

4.1.2 Metric: recall, training step: test

Models	asm	dissimilarity	homogeneity	entropy	std	contrast	energy	mean	correlation	variance
UNet	0.807130 (14)	0.841905 (3)	0.798553 (1)	0.940277 (1)	0.891326 (1)	0.792971 (5)	0.822980 (9)	0.917716 (3)	0.781801 (8)	0.941116 (1)
LinkNet	0.832903 (3)	0.814532 (9)	0.839463 (3)	0.819158 (1)	0.845448 (31)	0.818625 (13)	0.827281 (10)	0.908615 (7)	0.622347 (31)	0.873298 (11)
PSPNet	0.807620 (6)	0.748341 (34)	0.769910 (3)	0.898983 (34)	0.792159 (33)	0.793680 (37)	0.859126 (38)	0.891187 (2)	0.623812 (4)	0.852321 (4)

4.1.3 Metric: flscore, training step: test

Models	asm	dissimilarity	homogeneity	entropy	std	contrast	energy	mean	correlation	variance
UNet	0.811088 (11)	0.772997 (8)	0.768386 (8)	0.818270 (12)	0.832144 (9)	0.780939 (17)	0.820591 (18)	0.862295 (14)	0.662640 (8)	0.829961 (12)
LinkNet	0.817529 (14)	0.769382 (10)	0.774427 (12)	0.826155 (10)	0.833248 (10)	0.785830 (13)	0.818600 (9)	0.859572 (13)	0.630149 (31)	0.825882 (12)
PSPNet	0.804199 (11)	0.770390 (7)	0.752279 (3)	0.800989 (9)	0.795346 (14)	0.763799 (6)	0.803983 (8)	0.838593 (9)	0.618533 (4)	0.809050 (12)

4.2 ResNet34, SOS, Variance + Textures

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34'], epochs='best', metrics=['precision', 'recall', 'f1score'], losses=['bce'], datasets=['sos'], dataset_features=['o-sv-ta', 'o-sv-tc', 'o-sv-tr', 'o-sv-td', 'o-sv-te', 'o-sv-tn', 'o-sv-th', 'o-sv-tm', 'o-sv-ts', 'o-sv-tv'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34'] Metrics: ['precision', 'recall', 'f1score'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

4.2.1 Metric: precision, training step: test

Models	sar-variance-asm	sar-variance-contrast	sar-variance-correlation	sar-variance-dissimilarity	sar-variance-energy	sar-variance-entropy	sar-variance-homogeneity	sar-variance-mean	sar-variance-std	sar-variance-tau
UNet	0.886592 (12)	0.887693 (35)	0.884017 (40)	0.885641 (37)	0.890841 (34)	0.873016 (30)	0.886589 (37)	0.867818 (4)	0.896732 (39)	0.886592 (12)
LinkNet	0.884674 (10)	0.867358 (9)	0.871872 (28)	0.891690 (4)	0.861513 (34)	0.867087 (20)	0.882157 (13)	0.892970 (38)	0.896052 (30)	0.884674 (10)
PSPNet	0.868928 (8)	0.859381 (9)	0.864607 (12)	0.859277 (6)	0.894222 (6)	0.878826 (11)	0.862828 (9)	0.847431 (30)	0.884374 (4)	0.868928 (8)

4.2.2 Metric: recall, training step: test

Models	sar-variance-asm	sar-variance-contrast	sar-variance-correlation	sar-variance-dissimilarity	sar-variance-energy	sar-variance-entropy	sar-variance-homogeneity	sar-variance-mean	sar-variance-std	sar-variance-tau
UNet	0.906864 (1)	0.905053 (11)	0.895797 (5)	0.889919 (11)	0.913304 (5)	0.907245 (1)	0.922126 (40)	0.930632 (1)	0.918310 (3)	0.906864 (1)
LinkNet	0.876644 (4)	0.906568 (12)	0.901382 (3)	0.913504 (35)	0.894043 (10)	0.893089 (5)	0.928933 (8)	0.911035 (13)	0.912977 (1)	0.876644 (4)
PSPNet	0.840242 (32)	0.872982 (40)	0.857533 (9)	0.851557 (34)	0.841851 (2)	0.871498 (6)	0.859923 (6)	0.855221 (7)	0.859775 (1)	0.840242 (32)

4.2.3 Metric: f1score, training step: test

Models	sar-variance-asm	sar-variance-contrast	sar-variance-correlation	sar-variance-dissimilarity	sar-variance-energy	sar-variance-entropy	sar-variance-homogeneity	sar-variance-mean	sar-variance-std	sar-variance-tau
UNet	0.864447 (10)	0.861884 (12)	0.860132 (11)	0.864389 (12)	0.865882 (11)	0.866592 (10)	0.866164 (15)	0.862316 (14)	0.865632 (11)	0.864447 (10)
LinkNet	0.862136 (5)	0.857616 (9)	0.855568 (7)	0.864677 (11)	0.861825 (10)	0.859798 (14)	0.857473 (12)	0.862899 (15)	0.861157 (11)	0.862136 (5)
PSPNet	0.835808 (13)	0.836444 (28)	0.834877 (32)	0.837586 (25)	0.836507 (4)	0.836686 (39)	0.837735 (17)	0.838825 (6)	0.840073 (9)	0.835808 (13)

4.3 ResNet34, SOS, Moran’s I + Textures

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34'], epochs='best', metrics=['precision', 'recall', 'f1score'], losses=['bce'], datasets=['sos'], dataset_features=['o-pi-ta', 'o-pi-td', 'o-pi-th', 'o-pi-tn', 'o-pi-ts', 'o-pi-tc', 'o-pi-te', 'o-pi-tm', 'o-pi-tr', 'o-pi-tv'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34'] Metrics: ['precision', 'recall', 'f1score'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

4.3.1 Metric: precision, training step: test

Models	sar-morans_i-asm	sar-morans_i-dissimilarity	sar-morans_i-homogeneity	sar-morans_i-entropy	sar-morans_i-std	sar-morans_i-contrast	sar-morans_i-energy	sar-morans_i-mean	sar-morans_i-correlation
UNet	0.880415 (37)	0.866622 (37)	0.880377 (8)	0.907507 (32)	0.874668 (24)	0.894968 (5)	0.877309 (11)	0.863856 (32)	0.884866 (9)
LinkNet	0.889510 (39)	0.875835 (12)	0.871945 (35)	0.863198 (14)	0.870180 (8)	0.878841 (3)	0.871452 (23)	0.882310 (11)	0.879793 (35)
PSPNet	0.898566 (4)	0.864150 (5)	0.866201 (7)	0.859559 (32)	0.871917 (3)	0.877304 (7)	0.890500 (6)	0.847193 (6)	0.856413 (14)

4.3.2 Metric: recall, training step: test

Models	sar-morans_i-asm	sar-morans_i-dissimilarity	sar-morans_i-homogeneity	sar-morans_i-entropy	sar-morans_i-std	sar-morans_i-contrast	sar-morans_i-energy	sar-morans_i-mean	sar-morans_i-correlation
UNet	0.904460 (1)	0.904411 (33)	0.910667 (6)	0.891410 (11)	0.913111 (1)	0.889411 (14)	0.901923 (8)	0.913428 (7)	0.902252 (2)
LinkNet	0.912229 (5)	0.924681 (1)	0.912634 (7)	0.932682 (1)	0.897660 (7)	0.910940 (7)	0.887988 (5)	0.913146 (33)	0.901123 (13)
PSPNet	0.919604 (2)	0.852598 (6)	0.869039 (40)	0.853589 (3)	0.863557 (5)	0.846917 (34)	0.892614 (1)	0.869992 (5)	0.870135 (8)

4.3.3 Metric: flscore, training step: test

Models	sar-morans_i-asm	sar-morans_i-dissimilarity	sar-morans_i-homogeneity	sar-morans_i-entropy	sar-morans_i-std	sar-morans_i-contrast	sar-morans_i-energy	sar-morans_i-mean	sar-morans_i-correlation
UNet	0.861223 (11)	0.862453 (10)	0.863406 (11)	0.860351 (11)	0.862311 (38)	0.862734 (13)	0.865381 (12)	0.867129 (12)	0.860311 (13)
LinkNet	0.861908 (13)	0.863004 (9)	0.861638 (10)	0.859198 (9)	0.866305 (12)	0.858717 (12)	0.866134 (12)	0.860678 (12)	0.859856 (14)
PSPNet	0.833809 (6)	0.841773 (6)	0.829803 (14)	0.839756 (11)	0.843682 (40)	0.836918 (35)	0.836915 (12)	0.837409 (4)	0.833690 (6)

4.4 ResNet34, SOS, Geary’s C + Textures

Count models: 'unet': 1, 'linknet': 1, 'pspnet': 1 Validate: [False, False, False] Namespace(models_names=['unet', 'linknet', 'pspnet'], encoders_names=['resnet34'], epochs='best', metrics=['precision', 'recall', 'flscore'], losses=['bce'], datasets=['sos'], dataset_features=['o-pc-ta', 'o-pc-td', 'o-pc-th', 'o-pc-tn', 'o-pc-ts', 'o-pc-tc', 'o-pc-te', 'o-pc-tm', 'o-pc-tr', 'o-pc-tv'], training_steps=['test'], results_path='results', metrics_path='metrics', metrics_file='epoch_metrics.csv') Models names: ['unet', 'linknet', 'pspnet'] Encoders names: ['resnet34'] Metrics: ['precision', 'recall', 'flscore'] Losses: ['bce'] Datasets: ['sos'] Training steps: ['test'] Results path: results Metrics path: metrics Metrics file: epoch_metrics.csv

4.4.1 Metric: precision, training step: test

Models	sar-gearys_c-asm	sar-gearys_c-dissimilarity	sar-gearys_c-homogeneity	sar-gearys_c-entropy	sar-gearys_c-std	sar-gearys_c-contrast	sar-gearys_c-energy	sar-gearys_c-mean	sar-gearys_c-correlation
UNet	0.878040 (29)	0.870462 (33)	0.870718 (7)	0.875595 (38)	0.881582 (9)	0.892320 (4)	0.898975 (4)	0.873010 (36)	0.888711 (8)
LinkNet	0.868213 (28)	0.877061 (36)	0.862681 (40)	0.867532 (4)	0.905718 (37)	0.863951 (32)	0.901175 (7)	0.863476 (7)	0.878580 (10)
PSPNet	0.872870 (39)	0.862679 (33)	0.882618 (7)	0.885954 (39)	0.855706 (8)	0.864725 (4)	0.876316 (2)	0.844002 (10)	0.898574 (4)

4.4.2 Metric: recall, training step: test

Models	sar-gearys_c-asm	sar-gearys_c-dissimilarity	sar-gearys_c-homogeneity	sar-gearys_c-entropy	sar-gearys_c-std	sar-gearys_c-contrast	sar-gearys_c-energy	sar-gearys_c-mean	sar-gearys_c-correlation
UNet	0.900102 (35)	0.920709 (4)	0.901195 (1)	0.894935 (13)	0.908483 (4)	0.905708 (2)	0.864299 (15)	0.900153 (7)	0.907867 (7)
LinkNet	0.904703 (6)	0.892783 (6)	0.885848 (1)	0.897025 (3)	0.880857 (3)	0.919590 (33)	0.880857 (38)	0.908603 (3)	0.915943 (12)
PSPNet	0.839335 (2)	0.870769 (6)	0.891285 (2)	0.871822 (4)	0.830729 (9)	0.845050 (9)	0.851312 (38)	0.885581 (3)	0.862763 (2)

4.4.3 Metric: flscore, training step: test

Models	sar-gearys_c-asm	sar-gearys_c-dissimilarity	sar-gearys_c-homogeneity	sar-gearys_c-entropy	sar-gearys_c-std	sar-gearys_c-contrast	sar-gearys_c-energy	sar-gearys_c-mean	sar-gearys_c-correlation
UNet	0.857677 (13)	0.858898 (15)	0.862541 (11)	0.865731 (14)	0.863884 (8)	0.859810 (9)	0.857852 (10)	0.865593 (9)	0.857950 (10)
LinkNet	0.860907 (8)	0.859130 (10)	0.857304 (12)	0.860784 (11)	0.861768 (9)	0.856450 (12)	0.856367 (14)	0.860388 (10)	0.857982 (9)
PSPNet	0.835431 (8)	0.832873 (15)	0.830174 (10)	0.833320 (35)	0.833875 (9)	0.833670 (9)	0.833897 (40)	0.838116 (7)	0.832681 (7)