##--Targets ==> 405 | 344 | 61 --##

##--Train Split ==> 211 Slides

-------------------------

Number of Slides: 211

Number of tiles: 131716

Max tiles: 1875

Min tiles: 16

Average tiles: 624.2464454976304

nonMSI: 178

MSI: 33

##--Val Split ==> 94 Slides

-------------------------

Number of Slides: 94

Number of tiles: 55618

Max tiles: 1682

Min tiles: 6

Average tiles: 591.6808510638298

nonMSI: 81

MSI: 13

##--Test Split ==> 100 Slides

-------------------------

Number of Slides: 100

Number of tiles: 55849

Max tiles: 1942

Min tiles: 30

Average tiles: 558.49

nonMSI: 85

MSI: 15

211

Train Epoch: [ 1/ 4] Batch: 1, Training Loss: 0.7911, Acc: 40.43%

Train Epoch: [ 1/ 4] Batch: 101, Training Loss: 0.3565, Acc: 84.94%

Train Epoch: [ 1/ 4] Batch: 201, Training Loss: 0.3122, Acc: 87.03%

Training Epoch: [1/4] Loss: 0.2953 Accuracy: 87

Inference Epoch: [ 1/ 4] Batch: [ 1/109] Validation Loss: 0.2007, acc: 92.38%

Inference Epoch: [ 1/ 4] Batch: [101/109] Validation Loss: 0.5014, acc: 83.73%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.460 AVG=0.457 MAX=0.440 top10=0.447

Balanced Acc (Val): MV=0.494 AVG=0.488 MAX=0.457 top10=0.469

AUC-scores (Val): AVG=0.555 MAX=0.439 top10=0.458

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Train Epoch: [ 2/ 4] Batch: 1, Training Loss: 0.2396, Acc: 90.04%

Train Epoch: [ 2/ 4] Batch: 101, Training Loss: 0.2122, Acc: 91.34%

Train Epoch: [ 2/ 4] Batch: 201, Training Loss: 0.2025, Acc: 91.77%

Training Epoch: [2/4] Loss: 0.1983 Accuracy: 91

Inference Epoch: [ 2/ 4] Batch: [ 1/109] Validation Loss: 0.1813, acc: 93.95%

Inference Epoch: [ 2/ 4] Batch: [101/109] Validation Loss: 0.5451, acc: 84.73%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.460 AVG=0.460 MAX=0.508 top10=0.453

Balanced Acc (Val): MV=0.494 AVG=0.494 MAX=0.514 top10=0.481

AUC-scores (Val): AVG=0.481 MAX=0.445 top10=0.433

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Train Epoch: [ 3/ 4] Batch: 1, Training Loss: 0.1678, Acc: 92.97%

Train Epoch: [ 3/ 4] Batch: 101, Training Loss: 0.1722, Acc: 93.10%

Train Epoch: [ 3/ 4] Batch: 201, Training Loss: 0.1663, Acc: 93.31%

Training Epoch: [3/4] Loss: 0.1640 Accuracy: 93

Inference Epoch: [ 3/ 4] Batch: [ 1/109] Validation Loss: 0.1854, acc: 91.80%

Inference Epoch: [ 3/ 4] Batch: [101/109] Validation Loss: 0.5768, acc: 85.54%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.463 AVG=0.460 MAX=0.522 top10=0.552

Balanced Acc (Val): MV=0.500 AVG=0.494 MAX=0.521 top10=0.546

AUC-scores (Val): AVG=0.510 MAX=0.435 top10=0.463

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Train Epoch: [ 4/ 4] Batch: 1, Training Loss: 0.1438, Acc: 94.53%

Train Epoch: [ 4/ 4] Batch: 101, Training Loss: 0.1501, Acc: 94.07%

Train Epoch: [ 4/ 4] Batch: 201, Training Loss: 0.1455, Acc: 94.23%

Training Epoch: [4/4] Loss: 0.1440 Accuracy: 94

Inference Epoch: [ 4/ 4] Batch: [ 1/109] Validation Loss: 0.3396, acc: 86.33%

Inference Epoch: [ 4/ 4] Batch: [101/109] Validation Loss: 0.6932, acc: 84.07%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.460 AVG=0.457 MAX=0.440 top10=0.447

Balanced Acc (Val): MV=0.494 AVG=0.488 MAX=0.457 top10=0.469

AUC-scores (Val): AVG=0.489 MAX=0.399 top10=0.420

------------------------------------------------------------------

Inference Epoch: [ 4/ 4] Batch: [ 1/110] Validation Loss: 1.1504, acc: 73.83%

Inference Epoch: [ 4/ 4] Batch: [101/110] Validation Loss: 0.6490, acc: 75.51%

Predicted Tiles: 55849, classes: 2, total targets: 100

----------------------Test Set Results-------------------------------

Test F1-scores: MV=0.611, AVG=0.601, MAX=0.646, top10=0.632

Test Balanced Acc: MV=0.588, AVG=0.582, MAX=0.631, top10=0.610

Test AUC-scores: AVG=0.666, MAX=0.713, top10=0.660

Confusion Matrix (Average Predictions):

[[82 3]

[12 3]]

Classification Report (Average Predictions):

precision recall f1-score support

0 0.87 0.96 0.92 85

1 0.50 0.20 0.29 15

accuracy 0.85 100

macro avg 0.69 0.58 0.60 100

weighted avg 0.82 0.85 0.82 100

------------------------------------------------------

..............Test set done ...............

##--Targets ==> 405 | 344 | 61 --##

##--Train Split ==> 200 Slides

-------------------------

Number of Slides: 200

Number of tiles: 119899

Max tiles: 1942

Min tiles: 18

Average tiles: 599.495

nonMSI: 172

MSI: 28

##--Val Split ==> 111 Slides

-------------------------

Number of Slides: 111

Number of tiles: 67666

Max tiles: 1849

Min tiles: 16

Average tiles: 609.6036036036036

nonMSI: 91

MSI: 20

##--Test Split ==> 94 Slides

-------------------------

Number of Slides: 94

Number of tiles: 55618

Max tiles: 1682

Min tiles: 6

Average tiles: 591.6808510638298

nonMSI: 81

MSI: 13

200

Train Epoch: [ 1/ 4] Batch: 1, Training Loss: 0.7292, Acc: 50.20%

Train Epoch: [ 1/ 4] Batch: 101, Training Loss: 0.3223, Acc: 87.03%

Train Epoch: [ 1/ 4] Batch: 201, Training Loss: 0.2784, Acc: 88.84%

Training Epoch: [1/4] Loss: 0.2689 Accuracy: 89

Inference Epoch: [ 1/ 4] Batch: [ 1/133] Validation Loss: 0.5732, acc: 81.05%

Inference Epoch: [ 1/ 4] Batch: [101/133] Validation Loss: 1.0172, acc: 71.23%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.557 AVG=0.557 MAX=0.724 top10=0.712

Balanced Acc (Val): MV=0.553 AVG=0.553 MAX=0.712 top10=0.692

AUC-scores (Val): AVG=0.720 MAX=0.721 top10=0.714

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Train Epoch: [ 2/ 4] Batch: 1, Training Loss: 0.1832, Acc: 93.36%

Train Epoch: [ 2/ 4] Batch: 101, Training Loss: 0.1973, Acc: 92.12%

Train Epoch: [ 2/ 4] Batch: 201, Training Loss: 0.1890, Acc: 92.45%

Training Epoch: [2/4] Loss: 0.1865 Accuracy: 92

Inference Epoch: [ 2/ 4] Batch: [ 1/133] Validation Loss: 0.8442, acc: 66.41%

Inference Epoch: [ 2/ 4] Batch: [101/133] Validation Loss: 1.1883, acc: 71.19%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.450 AVG=0.450 MAX=0.521 top10=0.486

Balanced Acc (Val): MV=0.500 AVG=0.500 MAX=0.528 top10=0.509

AUC-scores (Val): AVG=0.663 MAX=0.633 top10=0.621

------------------------------------------------------------------

Train Epoch: [ 3/ 4] Batch: 1, Training Loss: 0.1398, Acc: 93.36%

Train Epoch: [ 3/ 4] Batch: 101, Training Loss: 0.1556, Acc: 93.77%

Train Epoch: [ 3/ 4] Batch: 201, Training Loss: 0.1527, Acc: 93.89%

Training Epoch: [3/4] Loss: 0.1518 Accuracy: 93

Inference Epoch: [ 3/ 4] Batch: [ 1/133] Validation Loss: 0.2522, acc: 90.23%

Inference Epoch: [ 3/ 4] Batch: [101/133] Validation Loss: 1.4505, acc: 73.10%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.617 AVG=0.617 MAX=0.599 top10=0.599

Balanced Acc (Val): MV=0.595 AVG=0.595 MAX=0.584 top10=0.584

AUC-scores (Val): AVG=0.661 MAX=0.658 top10=0.630

------------------------------------------------------------------

Train Epoch: [ 4/ 4] Batch: 1, Training Loss: 0.1040, Acc: 96.09%

Train Epoch: [ 4/ 4] Batch: 101, Training Loss: 0.1328, Acc: 94.79%

Train Epoch: [ 4/ 4] Batch: 201, Training Loss: 0.1313, Acc: 94.79%

Training Epoch: [4/4] Loss: 0.1314 Accuracy: 94

Inference Epoch: [ 4/ 4] Batch: [ 1/133] Validation Loss: 0.9469, acc: 61.72%

Inference Epoch: [ 4/ 4] Batch: [101/133] Validation Loss: 1.3341, acc: 70.27%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.591 AVG=0.584 MAX=0.659 top10=0.626

Balanced Acc (Val): MV=0.578 AVG=0.573 MAX=0.651 top10=0.612

AUC-scores (Val): AVG=0.746 MAX=0.728 top10=0.704

------------------------------------------------------------------

Saved checkpoint\_best\_AUC.pth

Inference Epoch: [ 4/ 4] Batch: [ 1/109] Validation Loss: 0.3454, acc: 88.28%

Inference Epoch: [ 4/ 4] Batch: [101/109] Validation Loss: 0.8239, acc: 79.47%

Predicted Tiles: 55618, classes: 2, total targets: 94

----------------------Test Set Results-------------------------------

Test F1-scores: MV=0.561, AVG=0.561, MAX=0.608, top10=0.561

Test Balanced Acc: MV=0.552, AVG=0.552, MAX=0.591, top10=0.552

Test AUC-scores: AVG=0.632, MAX=0.498, top10=0.526

Confusion Matrix (Average Predictions):

[[77 4]

[11 2]]

Classification Report (Average Predictions):

precision recall f1-score support

0 0.88 0.95 0.91 81

1 0.33 0.15 0.21 13

accuracy 0.84 94

macro avg 0.60 0.55 0.56 94

weighted avg 0.80 0.84 0.81 94

------------------------------------------------------

..............Test set done ...............

##--Targets ==> 405 | 344 | 61 --##

##--Train Split ==> 194 Slides

-------------------------

Number of Slides: 194

Number of tiles: 111467

Max tiles: 1942

Min tiles: 6

Average tiles: 574.5721649484536

nonMSI: 166

MSI: 28

##--Val Split ==> 100 Slides

-------------------------

Number of Slides: 100

Number of tiles: 64050

Max tiles: 1875

Min tiles: 18

Average tiles: 640.5

nonMSI: 87

MSI: 13

##--Test Split ==> 111 Slides

-------------------------

Number of Slides: 111

Number of tiles: 67666

Max tiles: 1849

Min tiles: 16

Average tiles: 609.6036036036036

nonMSI: 91

MSI: 20

194

Train Epoch: [ 1/ 4] Batch: 1, Training Loss: 0.4820, Acc: 86.91%

Train Epoch: [ 1/ 4] Batch: 101, Training Loss: 0.2700, Acc: 89.73%

Train Epoch: [ 1/ 4] Batch: 201, Training Loss: 0.2388, Acc: 90.83%

Training Epoch: [1/4] Loss: 0.2346 Accuracy: 90

Inference Epoch: [ 1/ 4] Batch: [ 1/126] Validation Loss: 0.0893, acc: 97.66%

Inference Epoch: [ 1/ 4] Batch: [101/126] Validation Loss: 0.8925, acc: 80.13%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.604 AVG=0.660 MAX=0.680 top10=0.695

Balanced Acc (Val): MV=0.577 AVG=0.615 MAX=0.642 top10=0.648

AUC-scores (Val): AVG=0.578 MAX=0.602 top10=0.629

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Train Epoch: [ 2/ 4] Batch: 1, Training Loss: 0.1453, Acc: 95.12%

Train Epoch: [ 2/ 4] Batch: 101, Training Loss: 0.1688, Acc: 93.36%

Train Epoch: [ 2/ 4] Batch: 201, Training Loss: 0.1634, Acc: 93.53%

Training Epoch: [2/4] Loss: 0.1621 Accuracy: 93

Inference Epoch: [ 2/ 4] Batch: [ 1/126] Validation Loss: 0.0458, acc: 98.83%

Inference Epoch: [ 2/ 4] Batch: [101/126] Validation Loss: 0.9806, acc: 78.53%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.539 AVG=0.604 MAX=0.667 top10=0.592

Balanced Acc (Val): MV=0.538 AVG=0.577 MAX=0.637 top10=0.571

AUC-scores (Val): AVG=0.676 MAX=0.710 top10=0.734

------------------------------------------------------------------

**Resuming training from Fold 3, Epoch 3**

Train Epoch: [ 3/ 4] Batch: 1, Training Loss: 0.1395, Acc: 95.12%

Train Epoch: [ 3/ 4] Batch: 101, Training Loss: 0.1375, Acc: 94.56%

Train Epoch: [ 3/ 4] Batch: 201, Training Loss: 0.1340, Acc: 94.76%

Training Epoch: [3/4] Loss: 0.1335 Accuracy: 94

Inference Epoch: [ 3/ 4] Batch: [ 1/126] Validation Loss: 0.0769, acc: 96.88%

Inference Epoch: [ 3/ 4] Batch: [101/126] Validation Loss: 1.2179, acc: 80.24%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.539 AVG=0.539 MAX=0.646 top10=0.646

Balanced Acc (Val): MV=0.538 AVG=0.538 MAX=0.610 top10=0.610

AUC-scores (Val): AVG=0.613 MAX=0.615 top10=0.655

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Train Epoch: [ 4/ 4] Batch: 1, Training Loss: 0.1271, Acc: 95.12%

Train Epoch: [ 4/ 4] Batch: 101, Training Loss: 0.1179, Acc: 95.42%

Train Epoch: [ 4/ 4] Batch: 201, Training Loss: 0.1145, Acc: 95.56%

Training Epoch: [4/4] Loss: 0.1138 Accuracy: 95

Inference Epoch: [ 4/ 4] Batch: [ 1/126] Validation Loss: 0.1193, acc: 95.51%

Inference Epoch: [ 4/ 4] Batch: [101/126] Validation Loss: 1.0731, acc: 80.80%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.660 AVG=0.660 MAX=0.667 top10=0.695

Balanced Acc (Val): MV=0.615 AVG=0.615 MAX=0.637 top10=0.648

AUC-scores (Val): AVG=0.671 MAX=0.745 top10=0.763

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Inference Epoch: [ 4/ 4] Batch: [ 1/133] Validation Loss: 0.1084, acc: 95.90%

Inference Epoch: [ 4/ 4] Batch: [101/133] Validation Loss: 1.2147, acc: 76.08%

Predicted Tiles: 67666, classes: 2, total targets: 111

----------------------Test Set Results-------------------------------

Test F1-scores: MV=0.448, AVG=0.448, MAX=0.617, top10=0.572

Test Balanced Acc: MV=0.495, AVG=0.495, MAX=0.595, top10=0.564

Test AUC-scores: AVG=0.763, MAX=0.734, top10=0.754

Confusion Matrix (Average Predictions):

[[90 1]

[20 0]]

Classification Report (Average Predictions):

precision recall f1-score support

0 0.82 0.99 0.90 91

1 0.00 0.00 0.00 20

accuracy 0.81 111

macro avg 0.41 0.49 0.45 111

weighted avg 0.67 0.81 0.73 111

------------------------------------------------------

..............Test set done ...............

##--Targets ==> 405 | 344 | 61 --##

##--Train Split ==> 205 Slides

-------------------------

Number of Slides: 205

Number of tiles: 123284

Max tiles: 1849

Min tiles: 6

Average tiles: 601.3853658536585

nonMSI: 172

MSI: 33

##--Val Split ==> 100 Slides

-------------------------

Number of Slides: 100

Number of tiles: 55849

Max tiles: 1942

Min tiles: 30

Average tiles: 558.49

nonMSI: 85

MSI: 15

##--Test Split ==> 100 Slides

-------------------------

Number of Slides: 100

Number of tiles: 64050

Max tiles: 1875

Min tiles: 18

Average tiles: 640.5

nonMSI: 87

MSI: 13

205

Train Epoch: [ 1/ 4] Batch: 1, Training Loss: 0.7160, Acc: 48.63%

Train Epoch: [ 1/ 4] Batch: 101, Training Loss: 0.3127, Acc: 87.36%

Train Epoch: [ 1/ 4] Batch: 201, Training Loss: 0.2722, Acc: 89.01%

Training Epoch: [1/4] Loss: 0.2610 Accuracy: 89

Inference Epoch: [ 1/ 4] Batch: [ 1/110] Validation Loss: 0.6878, acc: 77.15%

Inference Epoch: [ 1/ 4] Batch: [101/110] Validation Loss: 0.6829, acc: 77.91%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.582 AVG=0.634 MAX=0.745 top10=0.654

Balanced Acc (Val): MV=0.567 AVG=0.600 MAX=0.694 top10=0.622

AUC-scores (Val): AVG=0.703 MAX=0.824 top10=0.719

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Train Epoch: [ 2/ 4] Batch: 1, Training Loss: 0.1664, Acc: 93.36%

Train Epoch: [ 2/ 4] Batch: 101, Training Loss: 0.1829, Acc: 92.60%

Train Epoch: [ 2/ 4] Batch: 201, Training Loss: 0.1750, Acc: 92.98%

Training Epoch: [2/4] Loss: 0.1725 Accuracy: 93

Inference Epoch: [ 2/ 4] Batch: [ 1/110] Validation Loss: 0.7390, acc: 78.71%

Inference Epoch: [ 2/ 4] Batch: [101/110] Validation Loss: 0.8270, acc: 80.80%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.524 AVG=0.524 MAX=0.654 top10=0.722

Balanced Acc (Val): MV=0.533 AVG=0.533 MAX=0.622 top10=0.667

AUC-scores (Val): AVG=0.766 MAX=0.781 top10=0.779

------------------------------------------------------------------

Train Epoch: [ 3/ 4] Batch: 1, Training Loss: 0.1538, Acc: 94.73%

Train Epoch: [ 3/ 4] Batch: 101, Training Loss: 0.1468, Acc: 94.25%

Train Epoch: [ 3/ 4] Batch: 201, Training Loss: 0.1400, Acc: 94.54%

Training Epoch: [3/4] Loss: 0.1386 Accuracy: 94

Inference Epoch: [ 3/ 4] Batch: [ 1/110] Validation Loss: 0.8285, acc: 76.76%

Inference Epoch: [ 3/ 4] Batch: [101/110] Validation Loss: 0.9681, acc: 75.01%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.591 AVG=0.591 MAX=0.714 top10=0.698

Balanced Acc (Val): MV=0.576 AVG=0.576 MAX=0.720 top10=0.692

AUC-scores (Val): AVG=0.707 MAX=0.765 top10=0.731

------------------------------------------------------------------

Train Epoch: [ 4/ 4] Batch: 1, Training Loss: 0.1115, Acc: 95.51%

Train Epoch: [ 4/ 4] Batch: 101, Training Loss: 0.1234, Acc: 95.08%

Train Epoch: [ 4/ 4] Batch: 201, Training Loss: 0.1224, Acc: 95.17%

Training Epoch: [4/4] Loss: 0.1212 Accuracy: 95

Inference Epoch: [ 4/ 4] Batch: [ 1/110] Validation Loss: 0.7957, acc: 75.20%

Inference Epoch: [ 4/ 4] Batch: [101/110] Validation Loss: 0.7351, acc: 80.52%

----------------------Validation Results -------------------------------------

F1-scores (Val): MV=0.582 AVG=0.634 MAX=0.749 top10=0.680

Balanced Acc (Val): MV=0.567 AVG=0.600 MAX=0.716 top10=0.633

AUC-scores (Val): AVG=0.835 MAX=0.878 top10=0.845

------------------------------------------------------------------

Saved checkpoint\_best\_F1.pth

Saved checkpoint\_best\_AUC.pth

Inference Epoch: [ 4/ 4] Batch: [ 1/126] Validation Loss: 0.5072, acc: 81.05%

Inference Epoch: [ 4/ 4] Batch: [101/126] Validation Loss: 1.0018, acc: 79.09%

Predicted Tiles: 64050, classes: 2, total targets: 100

----------------------Test Set Results-------------------------------

Test F1-scores: MV=0.660, AVG=0.660, MAX=0.657, top10=0.707

Test Balanced Acc: MV=0.615, AVG=0.615, MAX=0.652, top10=0.675

Test AUC-scores: AVG=0.684, MAX=0.774, top10=0.782

Confusion Matrix (Average Predictions):

[[87 0]

[10 3]]

Classification Report (Average Predictions):

precision recall f1-score support

0 0.90 1.00 0.95 87

1 1.00 0.23 0.38 13

accuracy 0.90 100

macro avg 0.95 0.62 0.66 100

weighted avg 0.91 0.90 0.87 100

------------------------------------------------------

..............Test set done ...............