

Expected Tables for Widefield P-SHG of Breast Tissue Analysis Software

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Full Dataset Classification Results

***** Classification Performance Metrics Mean *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|-------|-------|------|------|---------|---------|----------|----------|---------|---------|----------|----------|----------|----------|------------|---------|
| 64 | 509.6 | 514.5 | 28.5 | 34.4 | 0.93676 | 0.94751 | 0.052486 | 0.063235 | 0.94706 | 0.93736 | 0.052944 | 0.062643 | 0.94213 | 0.9424 | 0.044589 | 0.98363 |

***** Classification Performance Metrics Standard Deviation *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|--------|--------|--------|--------|----------|-----------|-----------|----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|------------|
| 64 | 3.7476 | 3.3417 | 3.3417 | 3.7476 | 0.006889 | 0.0061541 | 0.0061541 | 0.006889 | 0.0060341 | 0.0065033 | 0.0060341 | 0.0065033 | 0.0052482 | 0.0051945 | 0.0024484 | 0.00099449 |

***** Prediction Performance Metrics *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|----|----|----|----|---------|---------|---------|----------|---------|---------|---------|----------|----------|----------|------------|--------|
| 64 | 50 | 44 | 8 | 1 | 0.98039 | 0.84615 | 0.15385 | 0.019608 | 0.86207 | 0.97778 | 0.13793 | 0.022222 | 0.91262 | 0.90722 | 0.067041 | 0.9902 |

Full Dataset Multiple Comparisons Results

***** Multiple Comparisons with Kruskal Wallis Test + Bonferroni Correction *****

| Parameter Name | Normal & -/- | Normal & +/- | Normal & +/+ | -/- & +/- | -/- & +/+ | +/- & +/+ |
|---------------------------------------|--------------|--------------|--------------|-----------|------------|------------|
| SHG Intensity Mean | 4.5968e-13 | 1.6541e-26 | 2.9469e-10 | 1 | 1 | 1 |
| SHG Intensity Mean Absolute Deviation | 1.1193e-18 | 6.9657e-46 | 6.0294e-19 | 1 | 1 | 1 |
| SHG Intensity Contrast | 5.8706e-23 | 1.6772e-62 | 1.4677e-25 | 1 | 1 | 1 |
| SHG Intensity Correlation | 1.6542e-08 | 1.583e-22 | 2.0554e-13 | 1 | 1 | 1 |
| SHG Intensity Entropy | 1.2976e-25 | 1.8098e-63 | 6.9409e-34 | 1 | 1 | 1 |
| SHG Intensity ASM | 9.5535e-18 | 2.8319e-44 | 2.4663e-22 | 1 | 1 | 1 |
| SHG Intensity IDM | 4.85e-15 | 1.7623e-35 | 3.7001e-11 | 1 | 1 | 0.63052 |
| R-Ratio Mean | 2.2564e-07 | 0.00080754 | 1.5643e-16 | 0.025318 | 0.2453 | 1.8314e-07 |
| R-Ratio Mean Absolute Deviation | 1.9136e-09 | 6.4456e-33 | 3.3239e-09 | 0.76425 | 1 | 0.30712 |
| R-Ratio Contrast | 0.2456 | 6.4653e-17 | 0.067351 | 0.0045422 | 1 | 0.010277 |
| R-Ratio Correlation | 6.1172e-18 | 2.0384e-32 | 6.3155e-15 | 1 | 1 | 1 |
| R-Ratio Entropy | 7.7391e-42 | 1.2374e-91 | 1.0337e-56 | 1 | 1 | 0.31251 |
| R-Ratio ASM | 8.3747e-43 | 3.1868e-92 | 1.6589e-56 | 1 | 1 | 0.36749 |
| R-Ratio IDM | 1 | 0.058685 | 0.08161 | 0.22524 | 1 | 0.014132 |
| DCP Mean | 5.8411e-10 | 8.8726e-09 | 4.7013e-19 | 0.098236 | 0.45975 | 1.4467e-05 |
| DCP Mean Absolute Deviation | 1.1996e-16 | 1.3215e-35 | 9.2065e-25 | 1 | 1 | 0.48959 |
| DCP Contrast | 3.1438e-13 | 8.5031e-37 | 7.3293e-18 | 1 | 1 | 1 |
| DCP Correlation | 3.7397e-14 | 1.9915e-21 | 2.1614e-12 | 0.96263 | 1 | 1 |
| DCP Entropy | 1.667e-42 | 1.0724e-91 | 7.5707e-58 | 1 | 1 | 0.21903 |
| DCP ASM | 1.5363e-43 | 2.8495e-92 | 5.8182e-58 | 1 | 1 | 0.23365 |
| DCP IDM | 0.2624 | 0.00024751 | 0.011779 | 1 | 1 | 1 |
| SHG-CD Mean | 0.082785 | 1 | 1 | 0.45909 | 1 | 1 |
| SHG-CD Mean Absolute Deviation | 6.6895e-20 | 1.0821e-60 | 0.00198 | 0.97703 | 1.8121e-05 | 1.8221e-12 |
| SHG-CD Contrast | 1.3486e-31 | 2.8997e-90 | 1.6315e-24 | 1 | 0.76811 | 0.0070374 |
| SHG-CD Correlation | 5.2354e-08 | 1.1805e-08 | 3.8824e-17 | 0.48324 | 0.29521 | 0.00011193 |
| SHG-CD Entropy | 1.559e-41 | 1.8745e-95 | 1.9911e-55 | 1 | 1 | 0.81447 |
| SHG-CD ASM | 3.8351e-42 | 6.3863e-97 | 1.0849e-54 | 1 | 1 | 1 |
| SHG-CD IDM | 2.7601e-19 | 5.4003e-56 | 8.8865e-14 | 1 | 0.88461 | 0.01695 |
| SHG-LD Mean | 0.064943 | 1 | 0.07762 | 0.34639 | 1 | 0.42644 |
| SHG-LD Mean Absolute Deviation | 1.816e-13 | 5.6462e-40 | 4.1996e-09 | 1 | 1 | 0.03024 |
| SHG-LD Contrast | 1.2659e-43 | 1.9943e-98 | 1.4828e-41 | 1 | 1 | 1 |
| SHG-LD Correlation | 9.3532e-13 | 3.011e-20 | 4.0958e-13 | 1 | 1 | 1 |
| SHG-LD Entropy | 1.339e-47 | 2.9195e-100 | 2.7906e-59 | 1 | 1 | 0.5654 |
| SHG-LD ASM | 1.4898e-48 | 3.7842e-100 | 9.7142e-59 | 1 | 1 | 0.64539 |
| SHG-LD IDM | 2.5463e-32 | 2.5916e-62 | 6.7868e-31 | 1 | 1 | 1 |
| Pixel Density | 7.7028e-38 | 7.6556e-84 | 4.2122e-57 | 1 | 0.39581 | 0.060118 |

Data Subset Classification Results

***** Classification Performance Metrics Mean *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|------|------|-----|-----|---------|---------|---------|----------|---------|---------|----------|-----------|----------|----------|------------|---------|
| 64 | 27.6 | 80.3 | 2.7 | 0.4 | 0.90571 | 0.96747 | 0.03253 | 0.014206 | 0.91252 | 0.99509 | 0.007402 | 0.0049009 | 0.97207 | 0.90101 | 0.026472 | 0.90634 |

***** Classification Performance Metrics Standard Deviation *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|--------|--------|--------|--------|----------|----------|----------|----------|----------|-----------|----------|-----------|----------|-----------|------------|-----------|
| 64 | 0.5164 | 1.3375 | 1.3375 | 0.5164 | 0.018443 | 0.016114 | 0.016114 | 0.018443 | 0.039687 | 0.0063384 | 0.039687 | 0.0063384 | 0.012345 | 0.0085146 | 0.013106 | 0.0094208 |

***** Prediction Performance Metrics *****

| Subimages | TN | TP | FN | FP | TNR | TPR | FNR | FPR | NPV | PPV | FOR | FDR | Accuracy | F1-score | BrierScore | AUROC |
|-----------|----|----|----|----|---------|-----|-----|----------|-----|---------|-----|----------|----------|----------|------------|---------|
| 64 | 46 | 52 | 0 | 5 | 0.90196 | 1 | 0 | 0.098039 | 1 | 0.91228 | 0 | 0.087719 | 0.95146 | 0.95413 | 0.049005 | 0.97738 |

Data Subset Multiple Comparisons Results

***** Multiple Comparisons with Kruskal Wallis Test + Bonferroni Correction *****

| Parameter Name | Normal & -/- | Normal & +/- | Normal & +/+ | -/- & +/- | -/- & +/+ | +/- & +/+ |
|---------------------------------------|--------------|--------------|--------------|------------|------------|------------|
| SHG Intensity Mean | 1 | 4.3125e-06 | 8.726e-06 | 0.0017324 | 0.0027794 | 1 |
| SHG Intensity Mean Absolute Deviation | 0.79239 | 4.852e-07 | 4.2447e-08 | 0.0069693 | 0.0017207 | 1 |
| SHG Intensity Contrast | 1 | 3.4199e-08 | 3.2695e-08 | 0.00052026 | 0.00050596 | 1 |
| SHG Intensity Correlation | 0.0097389 | 6.2776e-05 | 2.9917e-09 | 1 | 0.12121 | 0.36413 |
| SHG Intensity Entropy | 0.15541 | 2.9612e-09 | 9.0929e-11 | 0.0063999 | 0.0010969 | 1 |
| SHG Intensity ASM | 1 | 1.0959e-06 | 1.3517e-07 | 0.0016035 | 0.00041287 | 1 |
| SHG Intensity IDM | 1 | 5.3938e-06 | 0.00019545 | 0.00087202 | 0.010787 | 1 |
| R-Ratio Mean | 0.00017096 | 0.17729 | 0.016932 | 0.1124 | 0.62277 | 1 |
| R-Ratio Mean Absolute Deviation | 0.0044114 | 0.00066662 | 1.3678e-09 | 1 | 0.16641 | 0.062236 |
| R-Ratio Contrast | 0.00017651 | 0.55614 | 0.0027807 | 0.03208 | 1 | 0.35777 |
| R-Ratio Correlation | 1 | 0.00011331 | 0.00010239 | 8.9229e-05 | 8.1424e-05 | 1 |
| R-Ratio Entropy | 0.00097474 | 6.6863e-11 | 1.4226e-14 | 0.16799 | 0.008066 | 1 |
| R-Ratio ASM | 0.00076348 | 8.6665e-11 | 1.4662e-14 | 0.21348 | 0.010106 | 1 |
| R-Ratio IDM | 0.07539 | 1 | 1 | 0.016373 | 0.19159 | 1 |
| DCP Mean | 3.3905e-05 | 0.020606 | 0.0015963 | 0.24573 | 0.96843 | 1 |
| DCP Mean Absolute Deviation | 2.2133e-07 | 0.0019197 | 9.0228e-10 | 0.089489 | 1 | 0.022042 |
| DCP Contrast | 1.6522e-07 | 0.0056147 | 0.00020316 | 0.036232 | 0.27422 | 1 |
| DCP Correlation | 1 | 0.0017204 | 1.9087e-05 | 0.0044004 | 0.00010311 | 1 |
| DCP Entropy | 0.00087268 | 7.0432e-11 | 1.5573e-14 | 0.18353 | 0.0092077 | 1 |
| DCP ASM | 0.00062355 | 7.4186e-11 | 2.3015e-14 | 0.23016 | 0.014205 | 1 |
| DCP IDM | 0.00028681 | 1 | 0.63867 | 0.0027067 | 0.037943 | 1 |
| SHG-CD Mean | 1 | 0.020464 | 1 | 1 | 1 | 0.075949 |
| SHG-CD Mean Absolute Deviation | 0.00014432 | 8.9927e-11 | 3.5045e-07 | 0.54065 | 1 | 1 |
| SHG-CD Contrast | 1.9056e-05 | 2.3386e-07 | 6.2671e-13 | 1 | 0.37584 | 0.26799 |
| SHG-CD Correlation | 0.0068635 | 1 | 0.0023654 | 0.003901 | 1 | 0.0010546 |
| SHG-CD Entropy | 0.00087268 | 4.4024e-11 | 2.6728e-14 | 0.15741 | 0.011312 | 1 |
| SHG-CD ASM | 0.00074659 | 5.7188e-11 | 2.4435e-14 | 0.18948 | 0.012493 | 1 |
| SHG-CD IDM | 3.9452e-08 | 1.3292e-05 | 1.8669e-11 | 0.50698 | 1 | 0.12254 |
| SHG-LD Mean | 0.026811 | 5.9164e-07 | 1 | 0.39117 | 0.0013071 | 8.2019e-10 |
| SHG-LD Mean Absolute Deviation | 0.18017 | 9.3156e-05 | 1.7696e-08 | 0.61338 | 0.012605 | 0.5696 |
| SHG-LD Contrast | 4.0309e-06 | 1.431e-05 | 1.2176e-16 | 1 | 0.077138 | 0.00056101 |
| SHG-LD Correlation | 5.8027e-06 | 0.60523 | 0.00088865 | 0.0022169 | 0.61006 | 0.15482 |
| SHG-LD Entropy | 0.0014121 | 1.2117e-10 | 4.208e-15 | 0.16007 | 0.0035368 | 0.94485 |
| SHG-LD ASM | 0.0012344 | 2.6312e-10 | 6.7495e-15 | 0.22565 | 0.0048556 | 0.84634 |
| SHG-LD IDM | 7.2895e-09 | 0.015866 | 5.1131e-11 | 0.0022956 | 1 | 0.00045472 |
| Pixel Density | 0.00060953 | 3.144e-10 | 4.2713e-15 | 0.36397 | 0.0076857 | 0.71637 |