## **SUPPLEMENTS:**

**Supplement A:** Statistical analysis for original, parenchyma-only, and tumor-only dataset across classification groups (blue < 0.001, 0.001 < green < 0.01, 0.01 < yellow < 0.05).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Features** | **TP-FP** | **TP-FN** | **TN-FP** | **TN-FN** | **TN-TP** | **FN-FP** |
| **Maximum Diameter** | |  |  |  |  |  |
| *Original* | 1.86E-03 | 1.49E-03 | 0.448 | 0.855 | 1.12E-08 | 0.711 |
| *Parenchyma-Only* | 2.76E-05 | 5.37E-03 | 0.959 | 0.320 | 7.61E-07 | 0.338 |
| *Tumor-Only* | 1.08E-01 | 2.57E-04 | 5.01E-04 | 0.287 | 2.93E-12 | 0.096 |
| **Laa950** |  |  |  |  |  |  |
| *Original* | 0.690 | 0.076 | 0.721 | 0.019 | 0.992 | 0.073 |
| *Parenchyma-Only* | 0.552 | 0.270 | 0.843 | 0.255 | 6.84E-01 | 0.270 |
| *Tumor-Only* | 0.854 | 0.053 | 0.641 | 0.046 | 6.51E-01 | 0.258 |
| **Mean Intensity** |  |  |  |  |  |  |
| *Original* | 5.71E-04 | 5.60E-03 | 9.65E-03 | 0.0389 | 2.01E-14 | 0.999 |
| *Parenchyma-Only* | 9.29E-06 | 0.101 | 0.026673 | 1.87E-03 | 4.69E-10 | 0.154 |
| *Tumor-Only* | 3.43E-04 | 9.92E-04 | 3.52E-03 | 0.0716 | 9.72E-13 | 0.490 |
| **Compactness** |  |  |  |  |  |  |
| *Original* | 3.51E-03 | 2.39E-03 | 0.331 | 0.556 | 5.63E-10 | 0.7833 |
| *Parenchyma-Only* | 6.71E-06 | 0.044920 | 0.624 | 0.157 | 6.14E-06 | 0.048756 |
| *Tumor-Only* | 0.0630 | 0.000225 | 2.82E-03 | 0.250 | 6.36E-12 | 0.180635 |
| **Sphericity** |  |  |  |  |  |  |
| *Original* | 3.07E-03 | 0.0149 | 0.829 | 0.509 | 4.13E-07 | 0.658 |
| *Parenchyma-Only* | 0.000437 | 1.54E-05 | 0.588 | 0.851 | 7.33E-09 | 0.781 |
| *Tumor-Only* | 0.760 | 6.15E-05 | 1.23E-07 | 0.205 | 4.71E-14 | 1.90E-03 |
| **Gray Levels** |  |  |  |  |  |  |
| *Original* | 9.94E-06 | 5.64E-04 | 0.423 | 0.216 | 1.64E-13 | 0.728 |
| *Parenchyma-Only* | 1.08E-07 | 3.25E-03 | 0.633 | 0.028 | 4.67E-12 | 0.139 |
| *Tumor-Only* | 7.16E-03 | 5.64E-07 | 1.29E-05 | 0.107 | 2.65E-20 | 0.049 |
| **Nodule Energy** |  |  |  |  |  |  |
| *Original* | 0.812 | 0.205 | 0.819 | 0.433 | 0.890 | 0.590 |
| *Parenchyma-Only* | 5.37E-03 | 0.068 | 0.398 | 0.142 | 0.095 | 0.505 |
| *Tumor-Only* | 0.85211 | 0.113 | 0.930 | 0.406 | 0.971 | 0.352 |
| **Nodule Entropy** |  |  |  |  |  |  |
| *Original* | 0.656 | 0.077 | 0.107 | 0.596 | 1.38E-09 | 0.410 |
| *Parenchyma-Only* | 2.57E-07 | 0.116 | 0.478 | 0.844 | 0.0953 | 0.215 |
| *Tumor-Only* | 0.822 | 0.051 | 0.050 | 0.643 | 1.99E-11 | 0.310 |
| **Nodule Skewness** |  |  |  |  |  |  |
| *Original* | 0.360 | 0.023 | 0.033 | 0.436 | 4.47E-05 | 0.227 |
| *Parenchyma-Only* | 0.057 | 0.191 | 0.134 | 0.125 | 7.49E-04 | 0.802 |
| *Tumor-Only* | 7.19E-04 | 3.09E-03 | 0.90129 | 0.97314 | 3.05E-03 | 0.940 |
| **Nodule Kurtosis** |  |  |  |  |  |  |
| *Original* | 0.964 | 0.504 | 0.110 | 0.079 | 5.70E-03 | 0.445 |
| *Parenchyma-Only* | 0.490 | 0.474 | 0.086 | 0.119 | 2.30E-03 | 0.923 |
| *Tumor-Only* | 0.690 | 0.103 | 0.278 | 0.216 | 2.87E-03 | 0.334 |