Appendix A

Table A1. Microsoft Building Footprints distribution of area (m2) and nearest neighbor distance by region and material type.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Material** | **Region** | **Mean Area (m2)** | **90th Percentile Area (m2)** | **Mean Side Length (m)** | **90th Percentile Side Length (m)** | **Nearest Neighbor Distance (m)** |
| AP | Denver | 220.3 | 334.7 | 15.4 | 21.9 | 26.6 |
| CN | Denver | 379.3 | 590.0 | 21.2 | 34.8 | 44.5 |
| CS | DC | 95.6 | 166.2 | 9.8 | 17.8 | 14.2 |
| CS | Denver | 173.9 | 255.9 | 13.6 | 20.2 | 20.5 |
| ME | DC | 82.7 | 116.7 | 10.0 | 19.9 | 8.8 |
| SH | DC | 104.7 | 182.1 | 10.6 | 19.0 | 71.4 |
| SL | DC | 107.9 | 184.2 | 10.6 | 19.0 | 18.8 |
| SL | Denver | 542.7 | 1027.9 | 27.1 | 54.1 | 214.8 |
| TG | Denver | 498.9 | 825.0 | 22.8 | 49.1 | 175.9 |
| TL | DC | 126.2 | 222.3 | 11.5 | 20.6 | 48.9 |
| TL | Denver | 261.4 | 440.4 | 16.5 | 26.7 | 63.6 |
| UR | DC | 87.1 | 117.2 | 10.5 | 20.8 | 29.0 |
| WS | DC | 109.3 | 212.3 | 10.6 | 19.0 | 50.9 |
| WS | Denver | 250.8 | 393.9 | 16.7 | 27.5 | 44.6 |
| **Average** | Denver | 332.5 | 552.5 | 19.0 | 33.5 | 84.4 |
| **Average** | DC | 101.9 | 171.6 | 10.5 | 19.4 | 34.6 |

Figure A1. Band correlation matrices for (A) Washington, D.C. and (B) Denver, Colorado.

A comparison of colors and numbers

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Figure A2. ResNet-18 hyperparameter tuning results for Washington, D.C. (A) validation loss during the 12-epoch model training across all trials; (B) validation F1-score across trials. The variability in validation F1-score and, to a lesser extent, in model loss, highlights the importance of hyperparameter tuning for ResNet-18 architecture.

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Table A2. Holdout accuracy for unlabeled image chunk classification.

Figure A3. Spectral similarity across roof material classes for (A) Washington, D.C., and (B) Denver, Colorado.