Tables:

Table 1 (explanation of input parameters)

|  |  |
| --- | --- |
| **Parameter** | **Meaning** |
| *r* | The neighborhood radius |
| *Km* | The assignment deviation at which the sigmoidal scoring function assigns a score of 0.5 |
| *n* | The degree of cooperativity of the sigmoidal scoring function. Higher values of n make the function increasingly sigmoidal. Values of 1 or lower result in a hyperbolic function. |
| Punishment Level | The assignment score given to unpaired points |
| Punishment Type | Whether to assign the punishment score to unpaired points. If True, punish all unpaired points. If False, punish only those that fall within the convex hull of assigned points. |
| Assignment Type | Whether to use a euclidean or sigmoidal assignment cost function. If True, use a the euclidean distance as the assignment cost. If False, use the sigmoidal scoring function. |
| Reorientation Boolean | Whether to apply ICP reorientation during the calculation of the IoD. If a numerical value, the ICP is applied until 20 iterations have elapsed or the deviation is less than the value supplied, whichever comes first. If False, no reorientation is applied. |

Table 2 ( summary of classification results)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Study Area** | **Disordered Group** | **Ordered Group** | **Peak κ** | **Corresponding Accuracy** |
| Orchard in Crab Orchard, TN | Natural forest | Orchard | 0.81 | 0.96 |
| Reforested area in Mooresville, NC | Natural forest | Reforested zone | 0.74 | 0.87 |
| Neighborhood in Nashville, TN | Auxillary structures (sheds, detached garages) | Major buildings (homes and commerical buildings) | 0.44 | 0.76 |

Table 3 (sensitivity evaluation for Site 1)

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cohen's κ | | Km (m) | | | | | | | | | | |
| 1 | 3 | 5 | 7 | 9 | 11 | 13 | 15 | 17 | 19 | 21 |
| Radius (m) | 30 | 0.05 | 0.38 | 0.31 | 0.19 | 0.12 | 0.09 | 0.07 | 0.06 | 0.05 | 0.05 | 0.04 |
| 40 | 0.02 | 0.42 | 0.47 | 0.19 | 0.10 | 0.06 | 0.05 | 0.04 | 0.03 | 0.03 | 0.03 |
| 50 | 0.00 | 0.29 | 0.65 | 0.21 | 0.07 | 0.04 | 0.03 | 0.03 | 0.02 | 0.02 | 0.02 |
| 60 | 0.00 | 0.24 | 0.78 | 0.26 | 0.08 | 0.04 | 0.03 | 0.02 | 0.02 | 0.02 | 0.01 |
| 70 | 0.00 | 0.06 | 0.81 | 0.31 | 0.09 | 0.05 | 0.03 | 0.02 | 0.02 | 0.02 | 0.01 |
| 80 | 0.00 | 0.02 | 0.81 | 0.35 | 0.09 | 0.05 | 0.03 | 0.03 | 0.02 | 0.01 | 0.01 |
| 90 | 0.00 | 0.00 | 0.78 | 0.39 | 0.11 | 0.06 | 0.03 | 0.02 | 0.02 | 0.01 | 0.01 |
| 100 | 0.00 | 0.00 | 0.73 | 0.43 | 0.11 | 0.06 | 0.04 | 0.02 | 0.02 | 0.01 | 0.01 |
| 110 | 0.00 | 0.00 | 0.65 | 0.44 | 0.12 | 0.07 | 0.04 | 0.02 | 0.02 | 0.01 | 0.01 |
| 120 | 0.00 | 0.00 | 0.57 | 0.45 | 0.12 | 0.07 | 0.04 | 0.03 | 0.02 | 0.01 | 0.01 |
| 130 | 0.00 | 0.00 | 0.51 | 0.47 | 0.13 | 0.07 | 0.04 | 0.03 | 0.02 | 0.01 | 0.01 |
| 140 | 0.00 | 0.00 | 0.43 | 0.44 | 0.13 | 0.07 | 0.05 | 0.03 | 0.02 | 0.01 | 0.01 |
| 150 | 0.00 | 0.00 | 0.33 | 0.45 | 0.14 | 0.07 | 0.05 | 0.03 | 0.02 | 0.01 | 0.01 |

Table 4 (sensitivity evaluation for Site 2)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cohen's κ | | Km (m) | | | | | | | | | | | |
| 0.25 | 0.5 | 0.75 | 1 | 1.25 | 1.5 | 1.75 | 2 | 2.25 | 2.5 | 2.75 | 3 |
| Radius (m) | 5 | 0.00 | 0.02 | 0.05 | 0.05 | 0.06 | 0.06 | 0.06 | 0.08 | 0.07 | 0.07 | 0.07 | 0.08 |
| 10 | 0.00 | 0.01 | 0.10 | 0.25 | 0.39 | 0.48 | 0.51 | 0.52 | 0.50 | 0.45 | 0.41 | 0.36 |
| 15 | 0.00 | 0.00 | 0.01 | 0.15 | 0.37 | 0.55 | 0.64 | 0.62 | 0.50 | 0.36 | 0.25 | 0.18 |
| 20 | 0.00 | 0.00 | 0.00 | 0.06 | 0.29 | 0.51 | 0.67 | 0.72 | 0.55 | 0.36 | 0.22 | 0.15 |
| 25 | 0.00 | 0.00 | 0.00 | 0.03 | 0.22 | 0.44 | 0.62 | 0.74 | 0.59 | 0.36 | 0.21 | 0.14 |
| 30 | 0.00 | 0.00 | 0.00 | 0.01 | 0.16 | 0.38 | 0.58 | 0.73 | 0.59 | 0.36 | 0.21 | 0.15 |
| 35 | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.30 | 0.52 | 0.69 | 0.60 | 0.36 | 0.21 | 0.15 |
| 40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.24 | 0.45 | 0.65 | 0.59 | 0.35 | 0.22 | 0.15 |

Table 5 sensitivity evaluation for Site 3)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Cohen's κ | | Km (m) | | | | | | | | | | | | |
| 4.5 | 5 | 5.5 | 6 | 6.5 | 7 | 7.5 | 8 | 8.5 | 9 | 9.5 | 10 |
| Radius (m) | 15 | 0.10 | 0.09 | 0.08 | 0.08 | 0.09 | 0.09 | 0.07 | 0.05 | 0.06 | 0.04 | 0.03 | 0.02 |
| 17 | 0.31 | 0.33 | 0.34 | 0.37 | 0.37 | 0.37 | 0.37 | 0.36 | 0.35 | 0.34 | 0.33 | 0.31 |
| 19 | 0.34 | 0.37 | 0.40 | 0.43 | 0.44 | 0.42 | 0.40 | 0.39 | 0.38 | 0.38 | 0.37 | 0.37 |
| 21 | 0.33 | 0.36 | 0.39 | 0.41 | 0.43 | 0.41 | 0.39 | 0.39 | 0.38 | 0.37 | 0.37 | 0.36 |
| 23 | 0.32 | 0.33 | 0.35 | 0.37 | 0.37 | 0.37 | 0.35 | 0.33 | 0.32 | 0.30 | 0.29 | 0.28 |
| 25 | 0.28 | 0.31 | 0.33 | 0.34 | 0.34 | 0.33 | 0.32 | 0.30 | 0.27 | 0.25 | 0.23 | 0.20 |
| 27 | 0.25 | 0.28 | 0.30 | 0.31 | 0.31 | 0.29 | 0.28 | 0.24 | 0.20 | 0.17 | 0.15 | 0.13 |
| 29 | 0.24 | 0.26 | 0.28 | 0.28 | 0.27 | 0.25 | 0.24 | 0.21 | 0.19 | 0.17 | 0.14 | 0.12 |
| 31 | 0.27 | 0.28 | 0.31 | 0.31 | 0.31 | 0.30 | 0.25 | 0.23 | 0.20 | 0.19 | 0.15 | 0.12 |