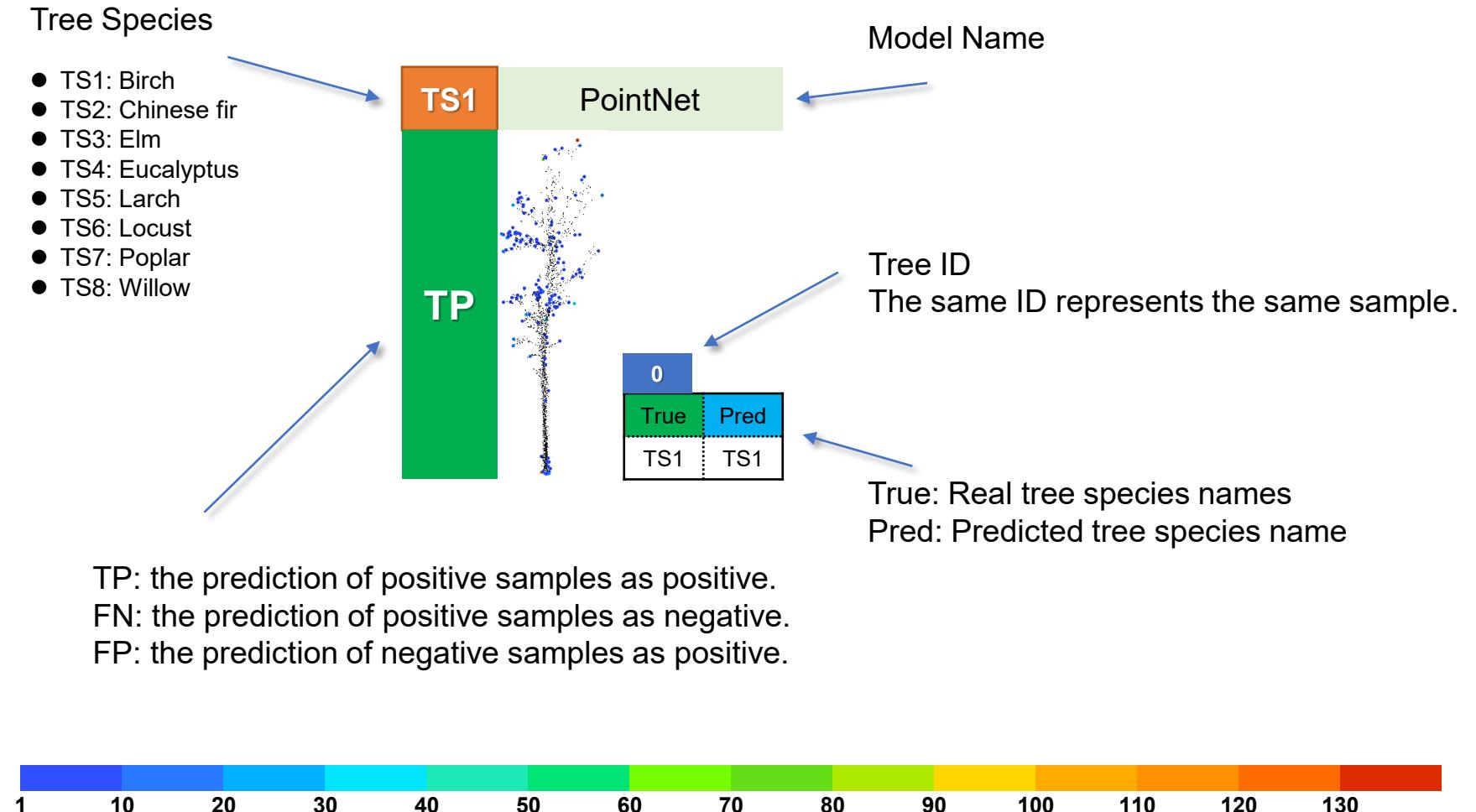


# Figure S1. Visualization of Critical Points



TS1

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

|     |      |      |
|-----|------|------|
| 0   | True | Pred |
| TS1 | TS1  |      |

FN

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS2  |      |

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 10  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 3   | True | Pred |
| TS1 | TS6  |      |

|     |      |      |
|-----|------|------|
| 7   | True | Pred |
| TS1 | TS2  |      |

FP

|     |      |      |
|-----|------|------|
| 59  | True | Pred |
| TS2 | TS1  |      |

|     |      |      |
|-----|------|------|
| 94  | True | Pred |
| TS4 | TS1  |      |

|     |      |      |
|-----|------|------|
| 108 | True | Pred |
| TS5 | TS1  |      |

|     |      |      |
|-----|------|------|
| 108 | True | Pred |
| TS5 | TS1  |      |

|     |      |      |
|-----|------|------|
| 74  | True | Pred |
| TS2 | TS1  |      |

|     |      |      |
|-----|------|------|
| 213 | True | Pred |
| TS7 | TS1  |      |

TS2

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS1  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

|     |      |      |
|-----|------|------|
| 50  | True | Pred |
| TS2 | TS2  |      |

FN

|     |      |      |
|-----|------|------|
| 59  | True | Pred |
| TS2 | TS1  |      |

|     |      |      |
|-----|------|------|
| 59  | True | Pred |
| TS2 | TS4  |      |

|     |      |      |
|-----|------|------|
| 45  | True | Pred |
| TS2 | TS3  |      |

|     |      |      |
|-----|------|------|
| 59  | True | Pred |
| TS2 | TS4  |      |

|     |      |      |
|-----|------|------|
| 59  | True | Pred |
| TS2 | TS4  |      |

FP

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS2  |      |

|     |      |      |
|-----|------|------|
| 144 | True | Pred |
| TS5 | TS2  |      |

|     |      |      |
|-----|------|------|
| 94  | True | Pred |
| TS4 | TS2  |      |

|     |      |      |
|-----|------|------|
| 94  | True | Pred |
| TS4 | TS2  |      |

|     |      |      |
|-----|------|------|
| 94  | True | Pred |
| TS4 | TS2  |      |

|     |      |      |
|-----|------|------|
| 96  | True | Pred |
| TS4 | TS2  |      |

TS3

PointNet

PointNet++MSG

PointNet++SSG

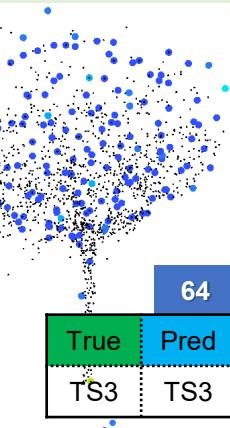
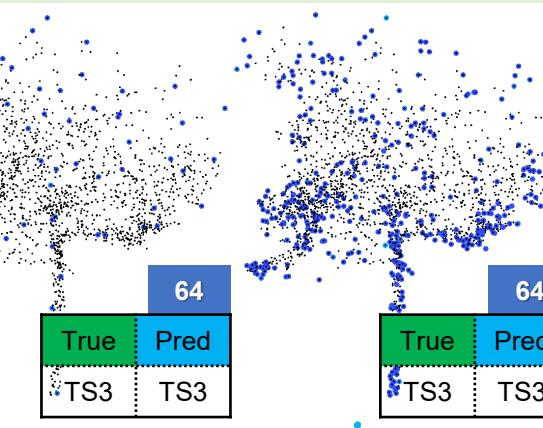
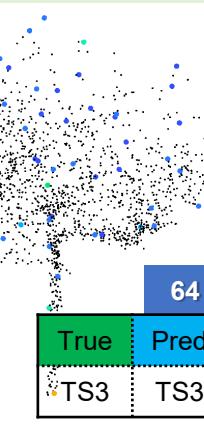
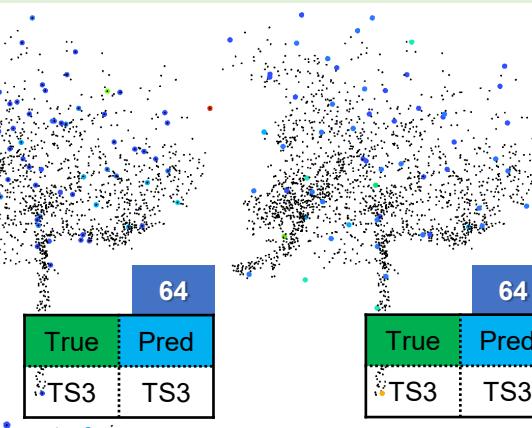
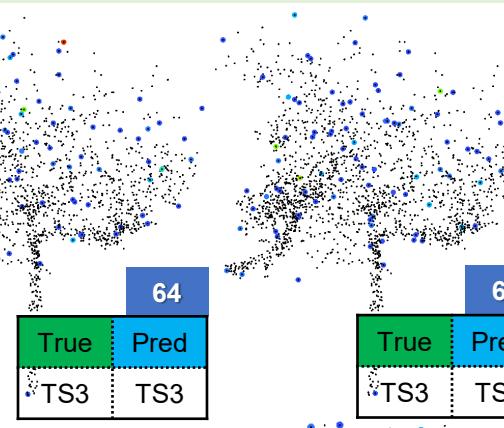
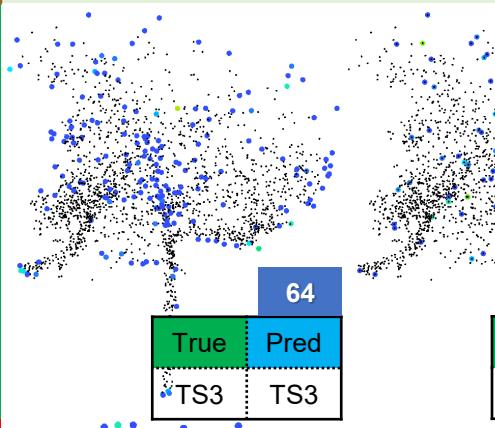
PointMLP

PointMLP-elite

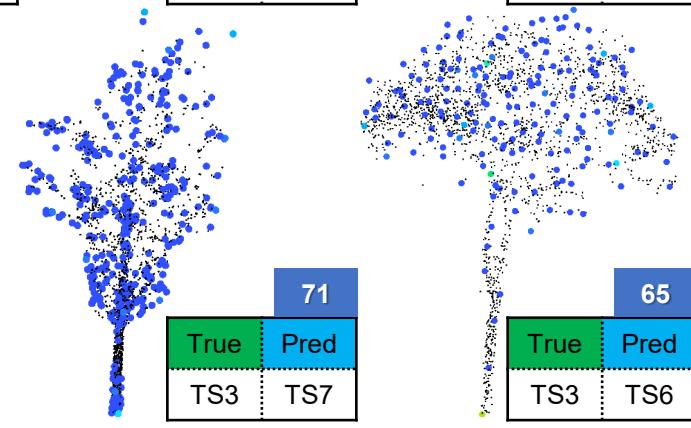
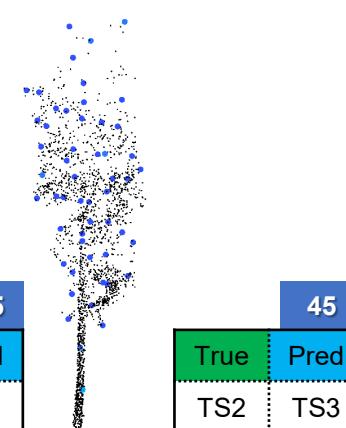
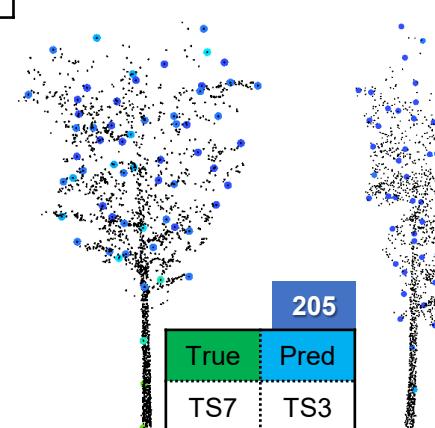
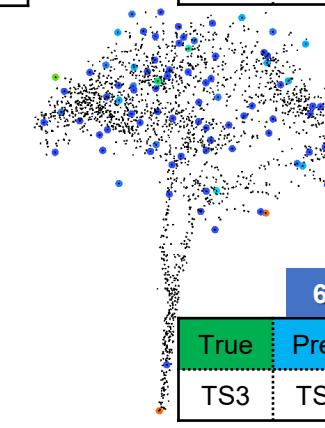
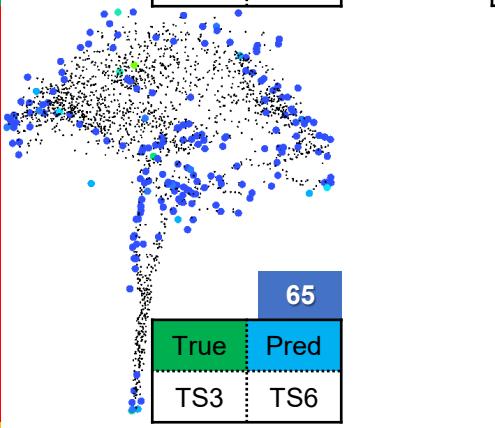
DGCNN

PCT

TP



FN



FP

TS4

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

81

| True | Pred |
|------|------|
| TS4  | TS4  |

FN

94

| True | Pred |
|------|------|
| TS4  | TS1  |

94

| True | Pred |
|------|------|
| TS4  | TS1  |

94

| True | Pred |
|------|------|
| TS4  | TS2  |

94

| True | Pred |
|------|------|
| TS4  | TS2  |

94

| True | Pred |
|------|------|
| TS4  | TS2  |

94

| True | Pred |
|------|------|
| TS4  | TS2  |

96

| True | Pred |
|------|------|
| TS4  | TS2  |

FP

2

| True | Pred |
|------|------|
| TS1  | TS4  |

59

| True | Pred |
|------|------|
| TS2  | TS4  |

59

| True | Pred |
|------|------|
| TS2  | TS4  |

59

| True | Pred |
|------|------|
| TS2  | TS4  |

TS5

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

|     |      |      |
|-----|------|------|
| 109 | True | Pred |
| TS5 | TS5  |      |

FN

|     |      |      |
|-----|------|------|
| 144 | True | Pred |
| TS5 | TS2  |      |

|     |      |      |
|-----|------|------|
| 144 | True | Pred |
| TS5 | TS2  |      |

|     |      |      |
|-----|------|------|
| 108 | True | Pred |
| TS5 | TS1  |      |

|     |      |      |
|-----|------|------|
| 108 | True | Pred |
| TS5 | TS1  |      |

|     |      |      |
|-----|------|------|
| 144 | True | Pred |
| TS5 | TS2  |      |

FP

|     |      |      |
|-----|------|------|
| 47  | True | Pred |
| TS2 | TS5  |      |

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 13  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 10  | True | Pred |
| TS1 | TS5  |      |

|     |      |      |
|-----|------|------|
| 44  | True | Pred |
| TS2 | TS5  |      |

TS6

PointNet

PointNet++MSG

PointNet++SSG

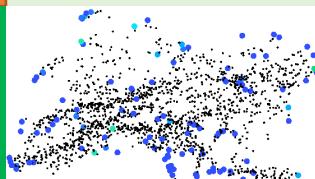
PointMLP

PointMLP-elite

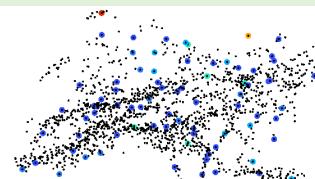
DGCNN

PCT

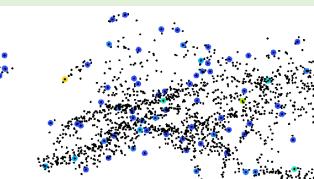
TP



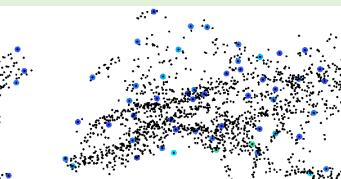
|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |



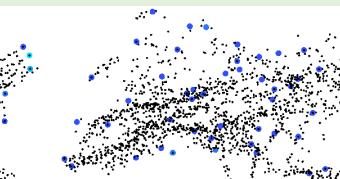
|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |



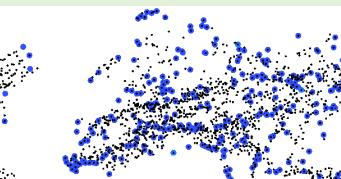
|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |



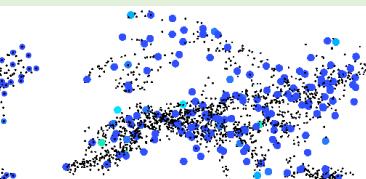
|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |



|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |

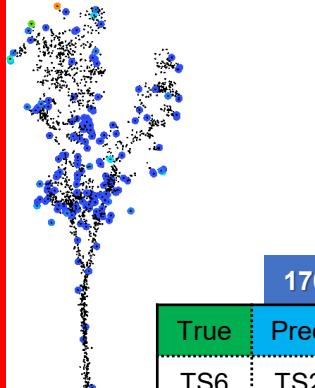


|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |

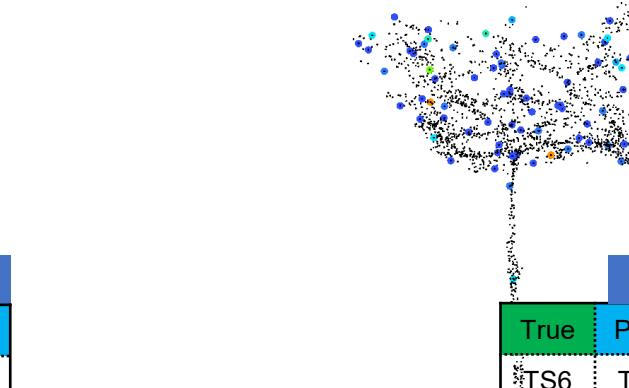


|      |      | 166 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS6  |     |

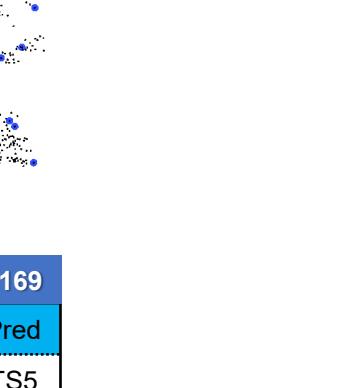
FN



|      |      | 176 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS2  |     |



|      |      | 169 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS5  |     |



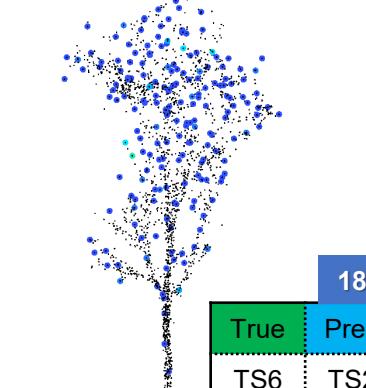
|      |      | 185 |
|------|------|-----|
| True | Pred |     |
| TS6  | TS2  |     |



|      |      | 3 |
|------|------|---|
| True | Pred |   |
| TS1  | TS6  |   |

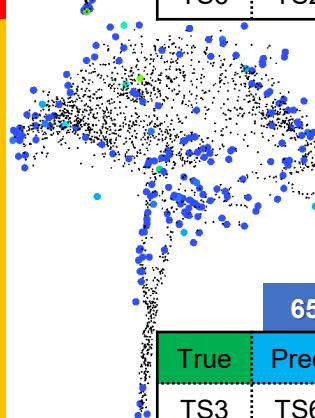


|      |      | 65 |
|------|------|----|
| True | Pred |    |
| TS3  | TS6  |    |

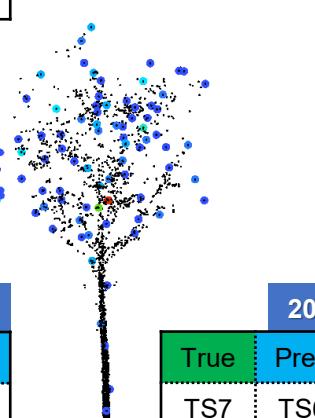


|      |      | 65 |
|------|------|----|
| True | Pred |    |
| TS3  | TS6  |    |

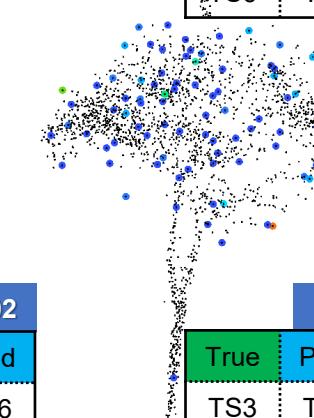
FP



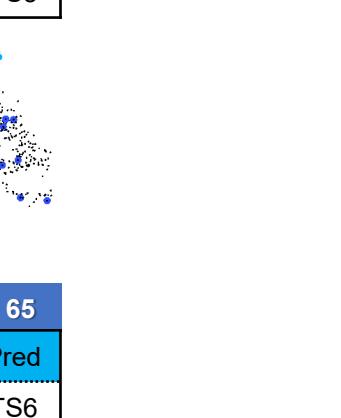
|      |      | 65 |
|------|------|----|
| True | Pred |    |
| TS3  | TS6  |    |



|      |      | 202 |
|------|------|-----|
| True | Pred |     |
| TS7  | TS6  |     |



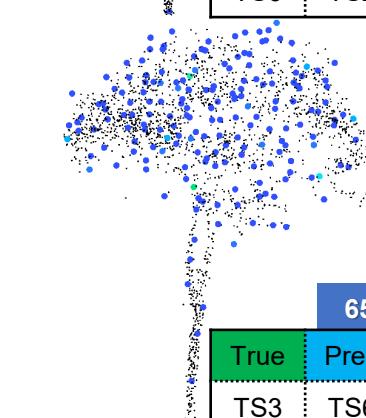
|      |      | 65 |
|------|------|----|
| True | Pred |    |
| TS3  | TS6  |    |



|      |      | 3 |
|------|------|---|
| True | Pred |   |
| TS1  | TS6  |   |



|      |      | 65 |
|------|------|----|
| True | Pred |    |
| TS3  | TS6  |    |



TS7

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 196 | True | Pred |
| TS7 |      | TS7  |
|     |      |      |

FN

|     |      |      |
|-----|------|------|
| 222 | True | Pred |
| TS7 |      | TS8  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 223 | True | Pred |
| TS7 |      | TS8  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 223 | True | Pred |
| TS7 |      | TS8  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 205 | True | Pred |
| TS7 |      | TS3  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 223 | True | Pred |
| TS7 |      | TS8  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 213 | True | Pred |
| TS7 |      | TS1  |
|     |      |      |

FP

|     |      |      |
|-----|------|------|
| 44  | True | Pred |
| TS2 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 71  | True | Pred |
| TS3 |      | TS7  |
|     |      |      |

|     |      |      |
|-----|------|------|
| 71  | True | Pred |
| TS3 |      | TS7  |
|     |      |      |

TS8

PointNet

PointNet++MSG

PointNet++SSG

PointMLP

PointMLP-elite

DGCNN

PCT

TP

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

| 227  |      |
|------|------|
| True | Pred |
| TS8  | TS8  |

FN

| 248  |      |
|------|------|
| True | Pred |
| TS8  | TS2  |

| 222  |      |
|------|------|
| True | Pred |
| TS7  | TS8  |

| 223  |      |
|------|------|
| True | Pred |
| TS7  | TS8  |

| 223  |      |
|------|------|
| True | Pred |
| TS7  | TS8  |

FP

| 223  |      |
|------|------|
| True | Pred |
| TS7  | TS8  |