

**Aero2Astro**  
**Panneerselvam N**  
**(23/10/2021)**

Today i had trained Yolo v4 model upto 15500 epochs with jitter = 0.45. And also evaluated with both training ,val and test dataset.

Threshold\_IOU = 0.6

Train :

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
396
detections_count = 1085, unique_truth_count = 663
class_id = 0, name = tower_lattice, ap = 99.51%           (TP = 273, FP = 10)
class_id = 1, name = tower_tucohy, ap = 95.67%           (TP = 162, FP = 12)
class_id = 2, name = tower_wooden, ap = 97.52%           (TP = 211, FP = 14)

for conf_thresh = 0.25, precision = 0.95, recall = 0.97, F1-score = 0.96
for conf_thresh = 0.25, TP = 646, FP = 36, FN = 17, average IoU = 85.14 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.975677, or 97.57 %
Total Detection Time: 49 Seconds
```

Test:

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
124
detections_count = 379, unique_truth_count = 202
class_id = 0, name = tower_lattice, ap = 75.12%           (TP = 67, FP = 18)
class_id = 1, name = tower_tucohy, ap = 81.51%           (TP = 38, FP = 10)
class_id = 2, name = tower_wooden, ap = 48.65%           (TP = 33, FP = 17)

for conf_thresh = 0.25, precision = 0.75, recall = 0.68, F1-score = 0.72
for conf_thresh = 0.25, TP = 138, FP = 45, FN = 64, average IoU = 64.70 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.684285, or 68.43 %
Total Detection Time: 15 Seconds
```

Val :

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
56
detections_count = 182, unique_truth_count = 103
class_id = 0, name = tower_lattice, ap = 78.64%           (TP = 32, FP = 6)
class_id = 1, name = tower_tucohy, ap = 63.96%           (TP = 10, FP = 8)
class_id = 2, name = tower_wooden, ap = 49.46%           (TP = 20, FP = 9)

for conf_thresh = 0.25, precision = 0.73, recall = 0.60, F1-score = 0.66
for conf_thresh = 0.25, TP = 62, FP = 23, FN = 41, average IoU = 62.78 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.640192, or 64.02 %
Total Detection Time: 7 Seconds
```

Epochs : 14700

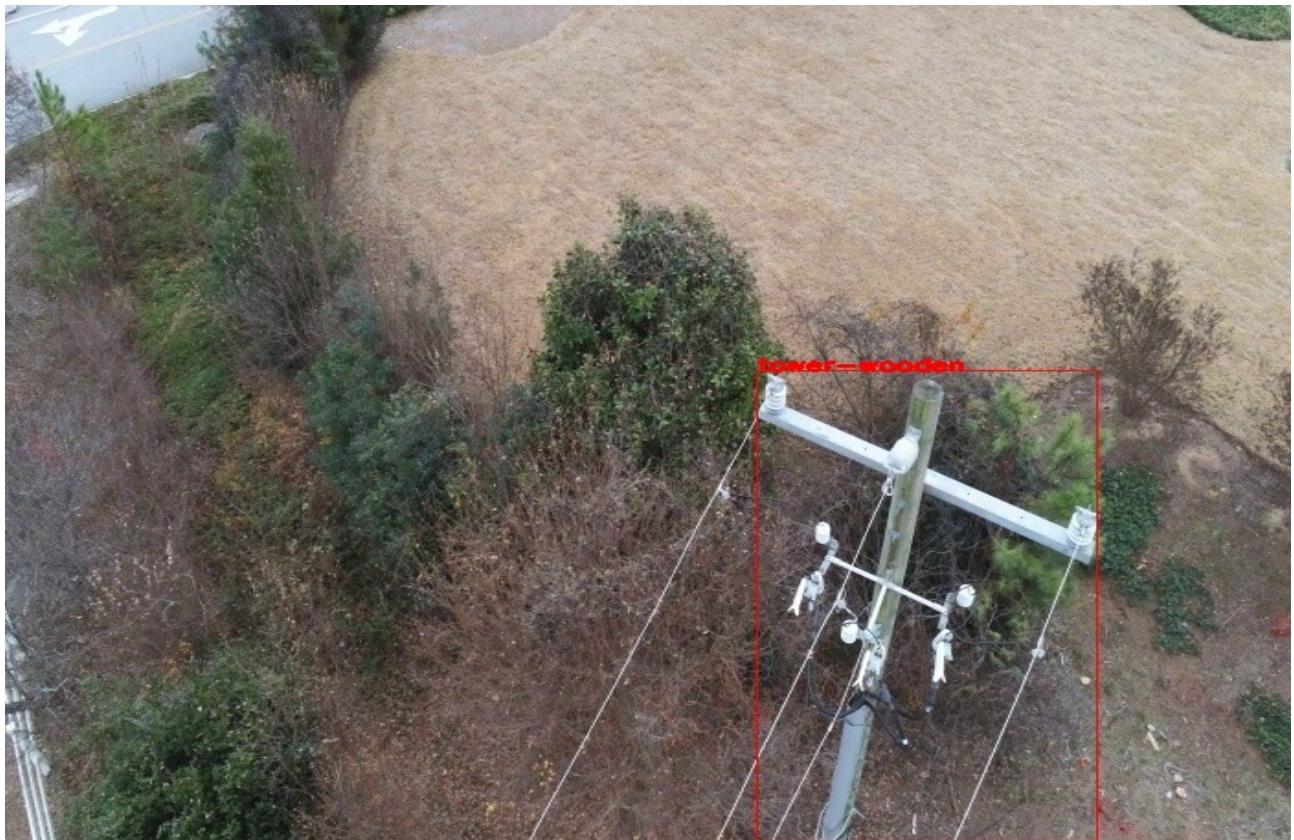
Threshold\_Conf = 0.2

Image : 08\_1830.jpg



Wooden tower is mis-classified as tower tucohy.

Image : 08\_1890.jpg



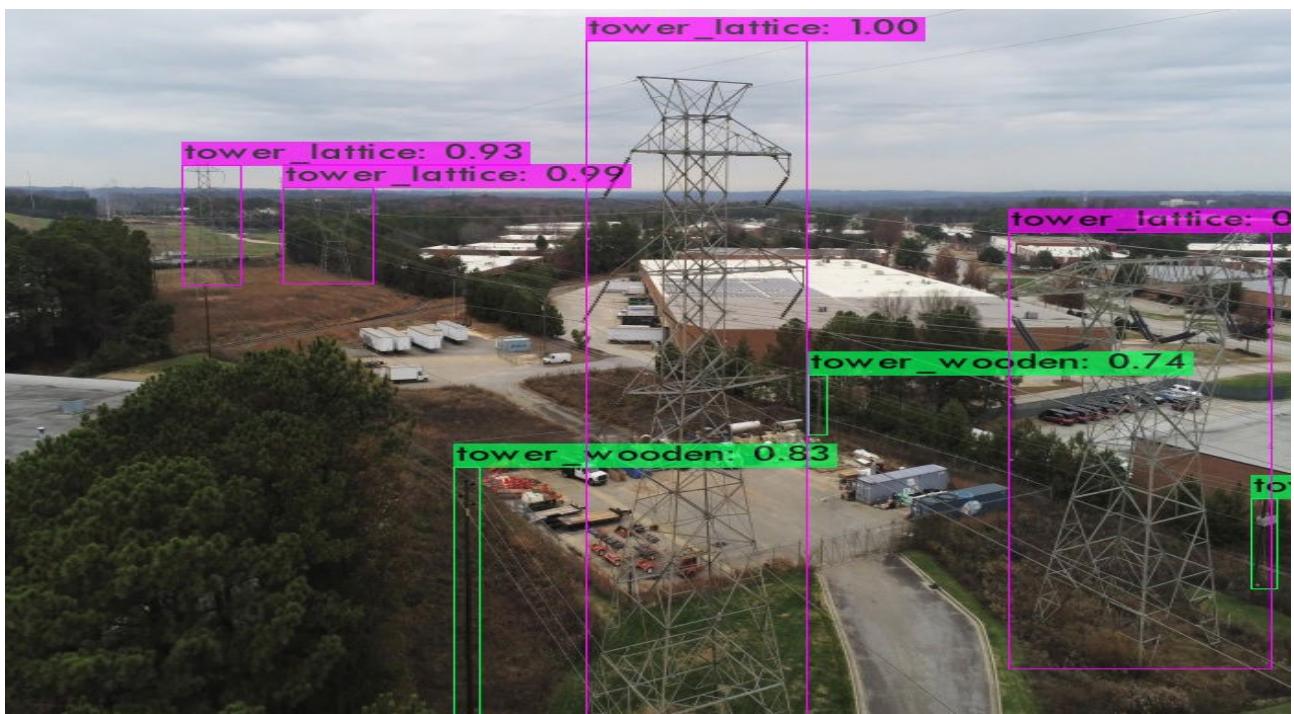
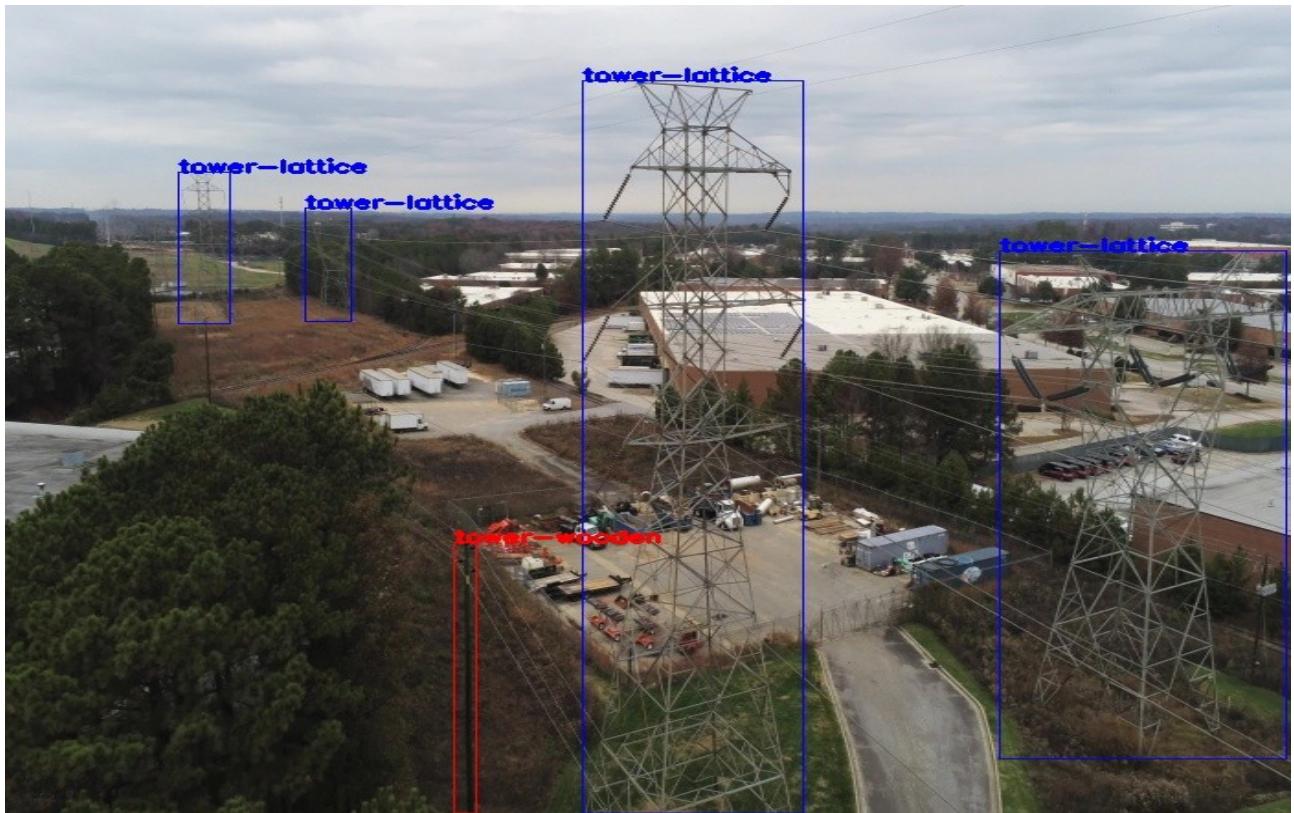
Wooden tower is classified as both tucohy and wooden.

Image :14\_01171.jpg



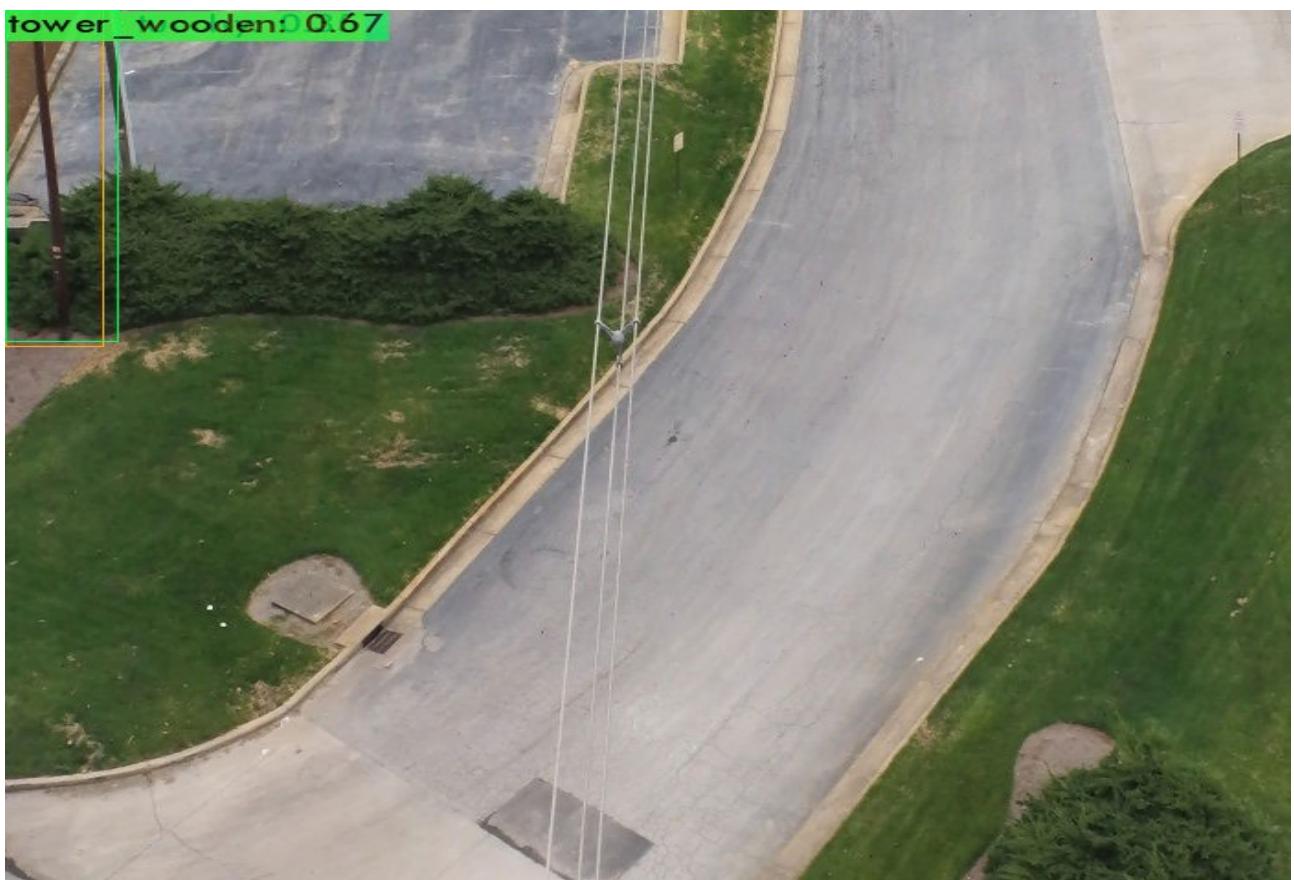
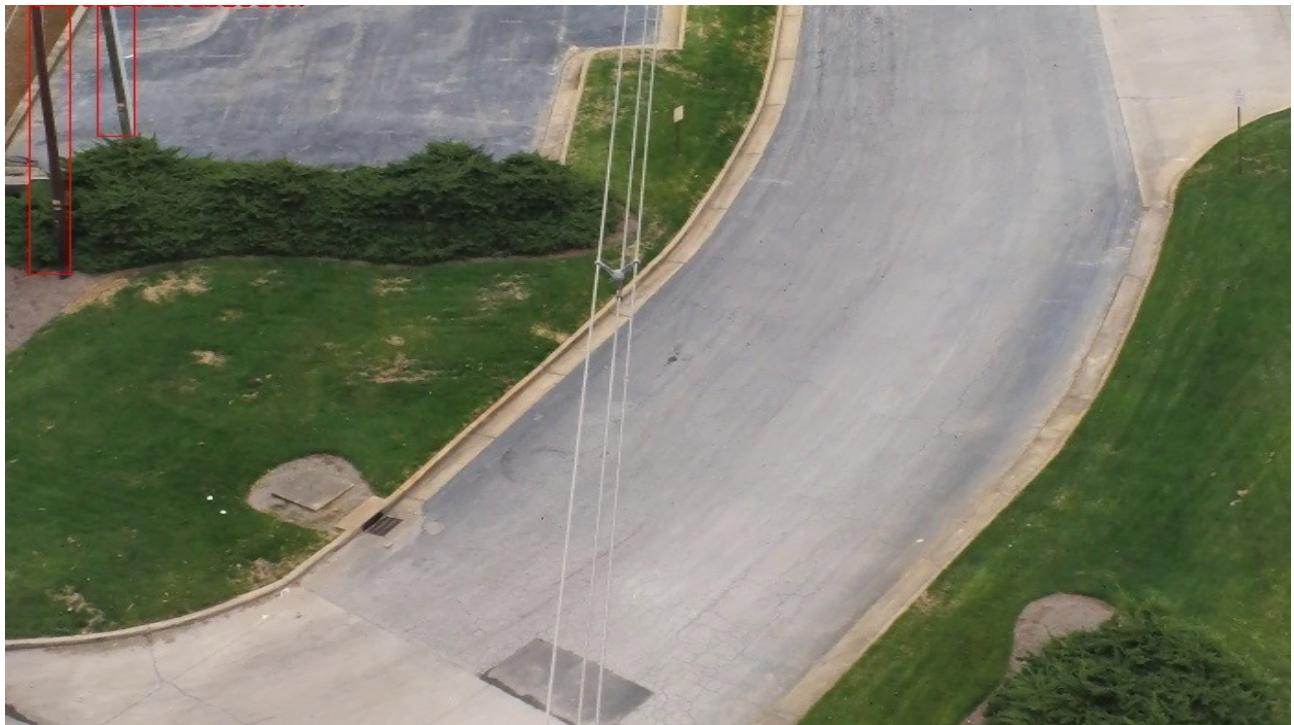
Some wooden towers are not detected .

Image : 19\_00137.jpg



Correctly predicted some wooden towers which is not present in Ground truth.

Image : 20\_7215.jpg



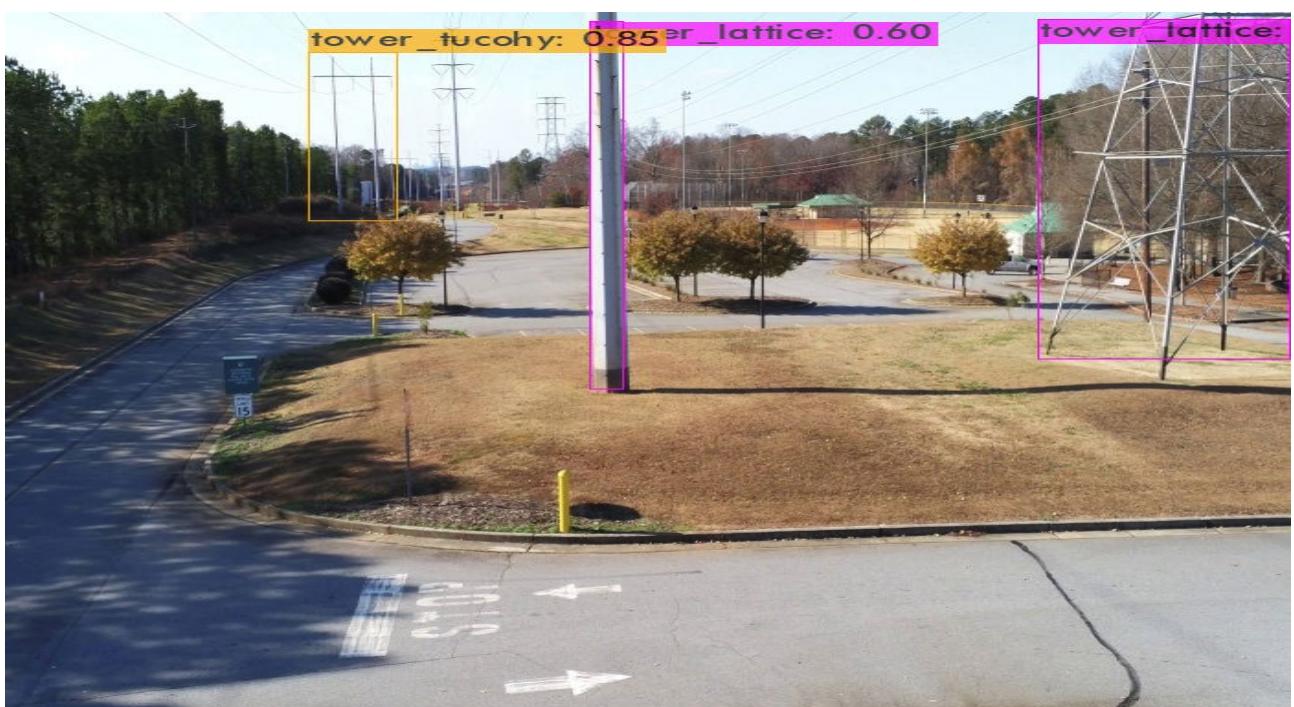
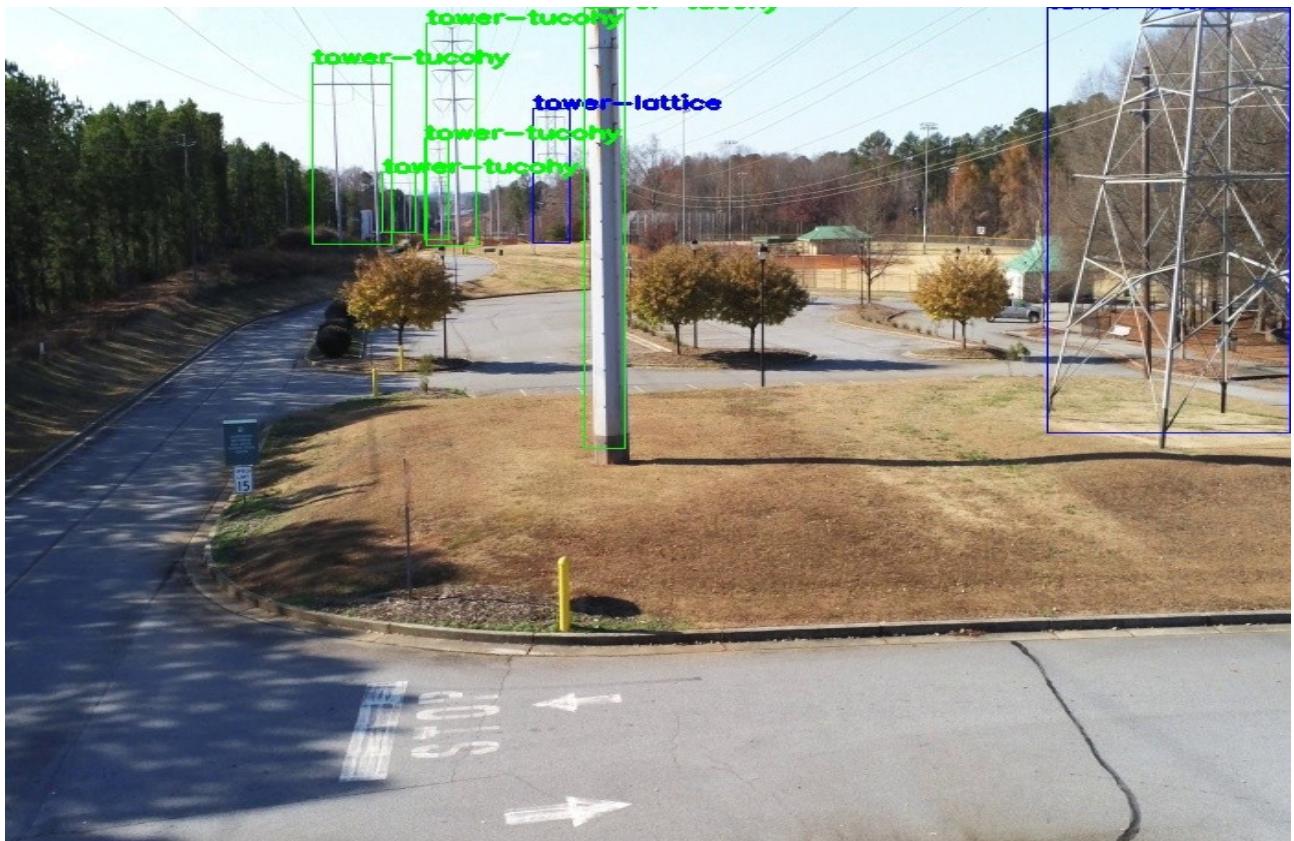
Wooden tower is classified as both Wooden and tucohy , And also one wooden tower is snot detected.

Image : 22\_02021.jpg



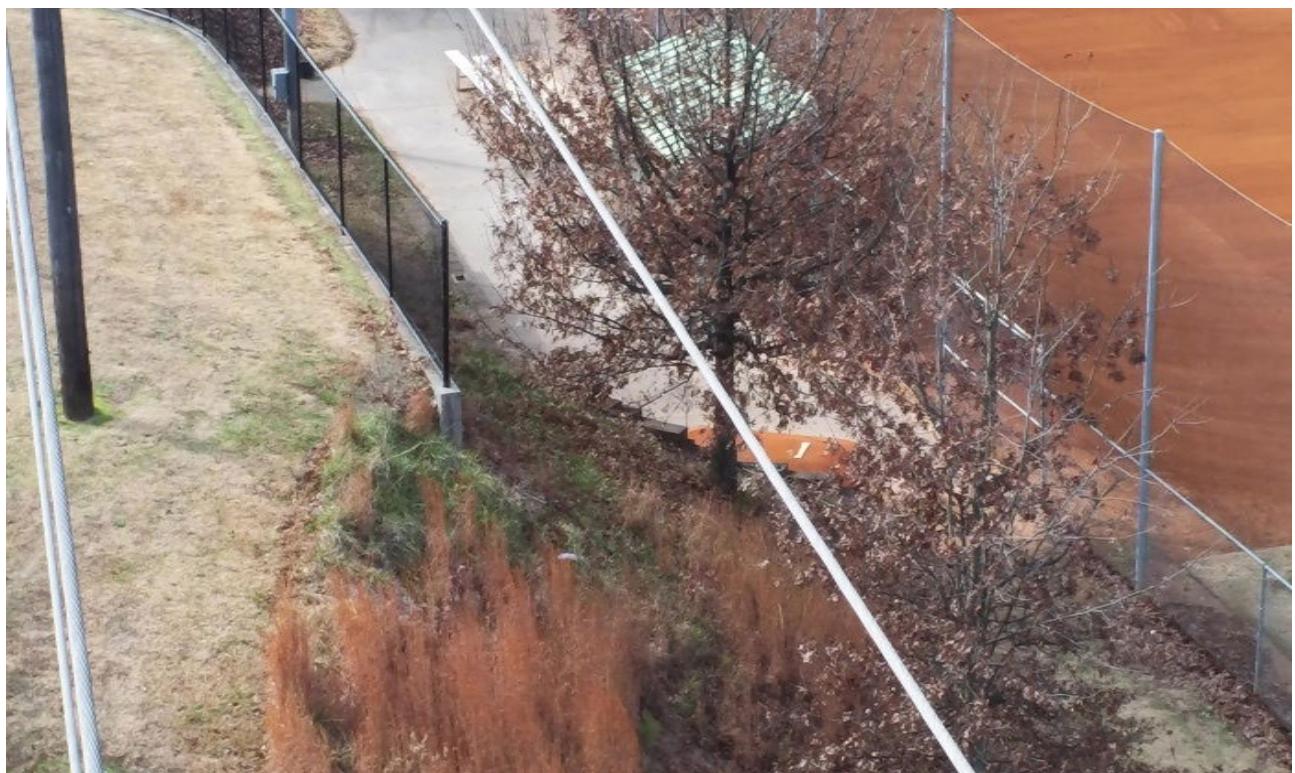
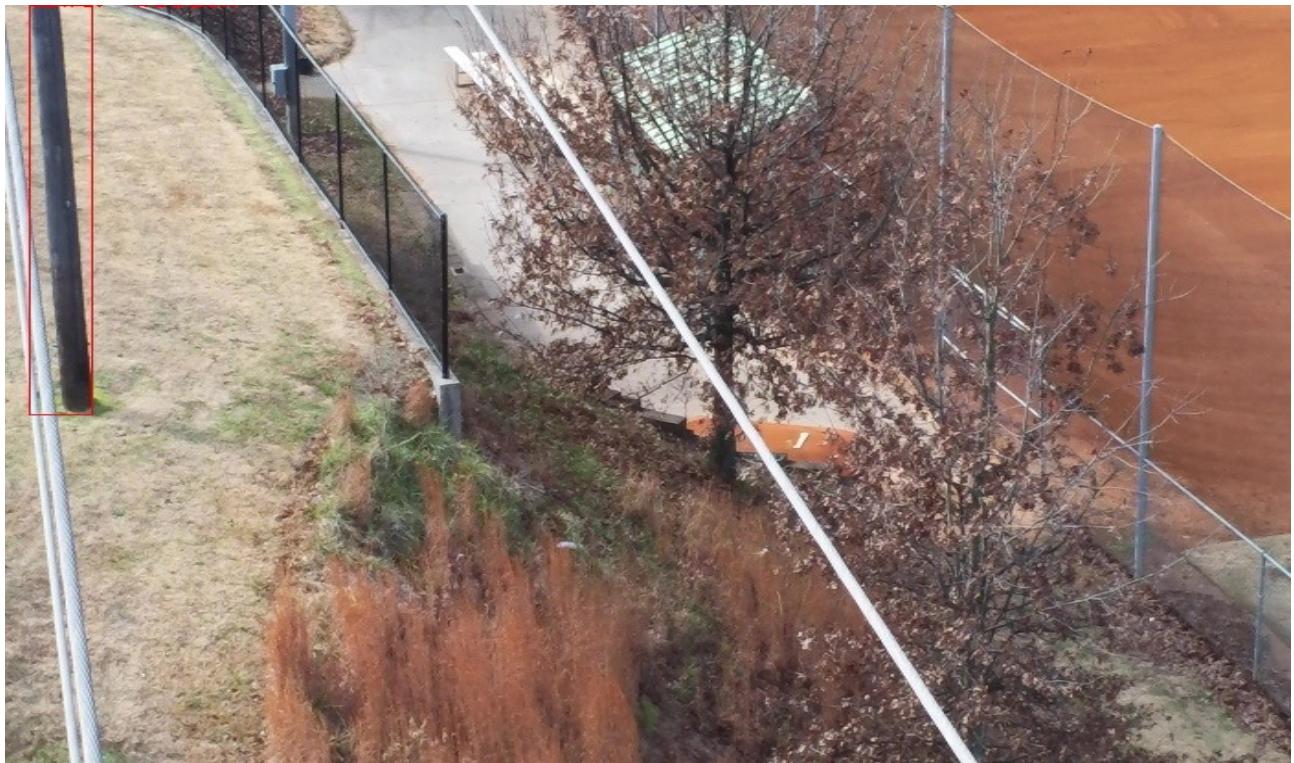
Wooden towers are mis-classified as Tucohy tower.

Image : 25\_00029.jpg



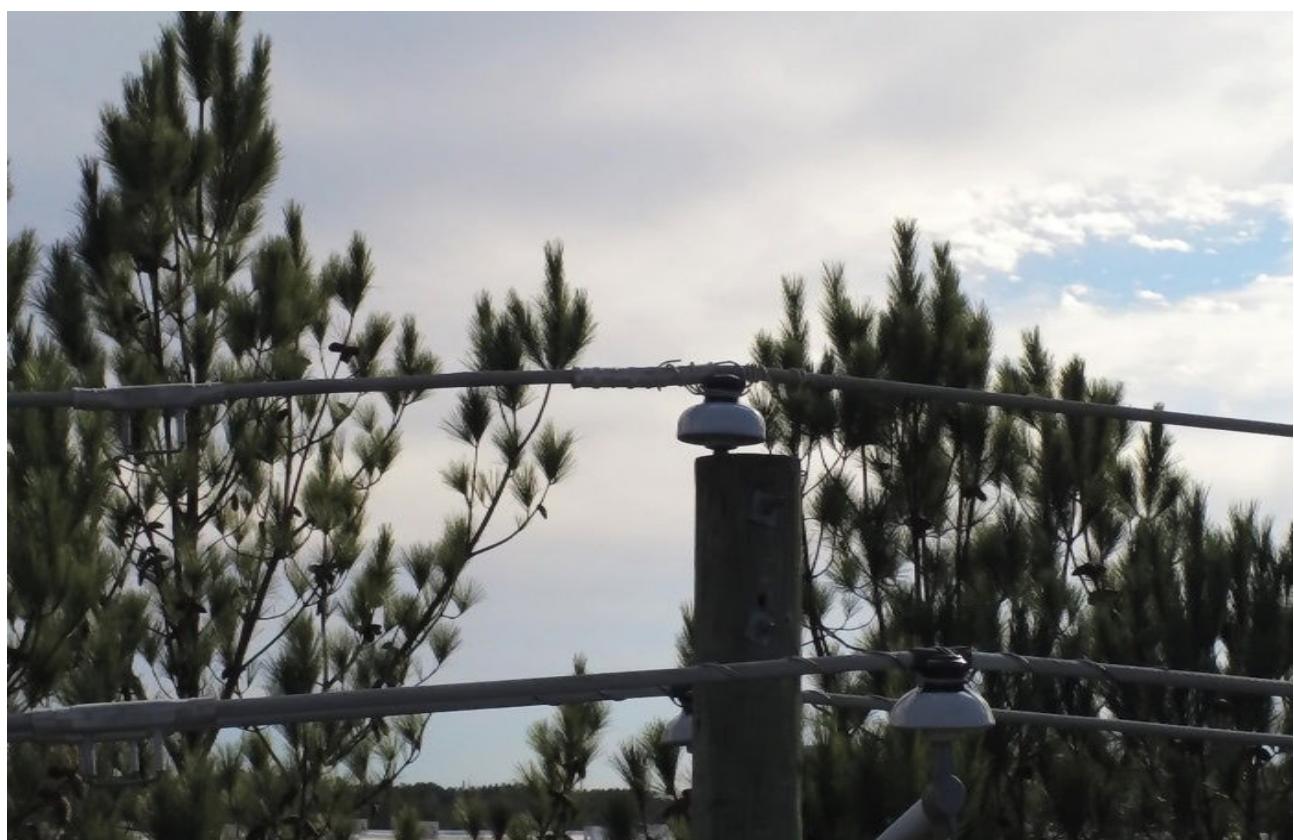
Some Tucohy towers are not detected and also one lattice tower is mis-classified as tucohy tower.

Image : 41\_00961.jpg



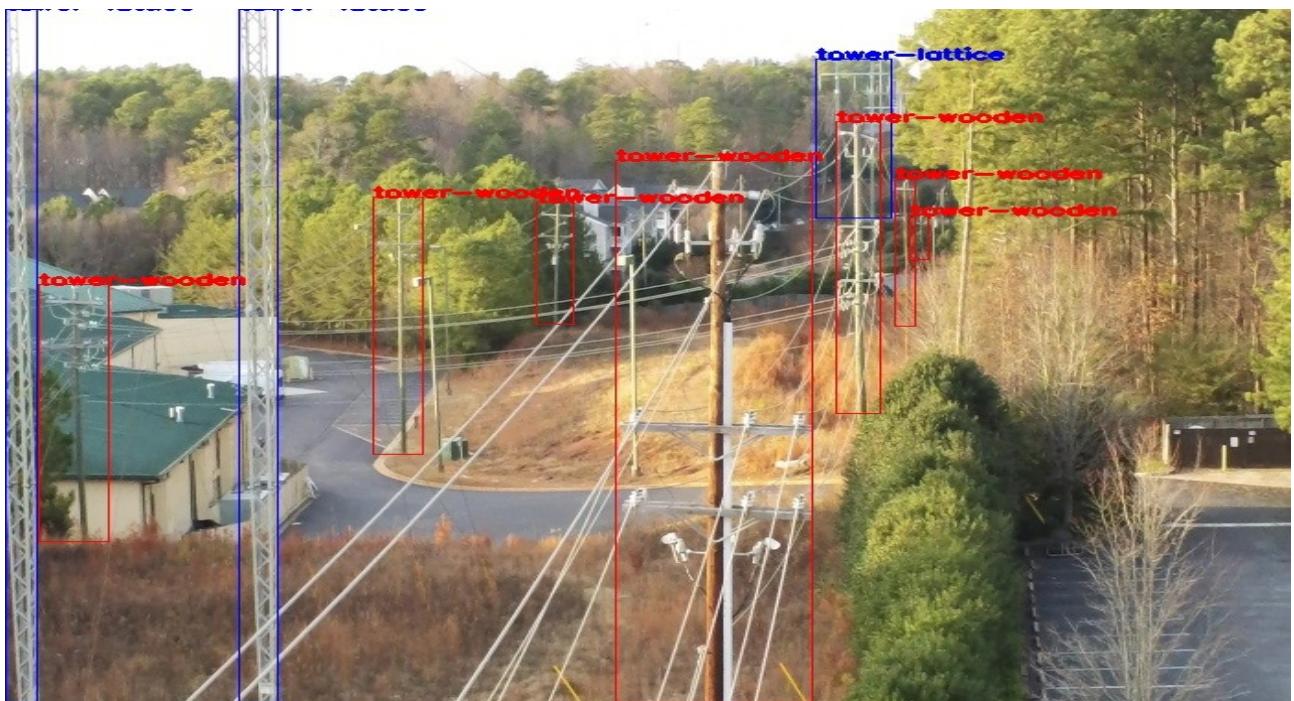
Wooden tower is not detected.

Image : 43\_00591.jpg



Wooden tower is not detected.

Image : 58\_00956.jpg



Some wooden tower and one lattice tower are not detected and one wooden tower is mis-classified as tuohy tower.

Image : 66\_00191.jpg



Some lattice towers are mis-classified as Tuchoy towers.

Image : 67\_02716.jpg



Some wooden towers are not detected and left side lattice tower has two detection due to less threshold=0.2 .

Image : 71\_3880.jpg



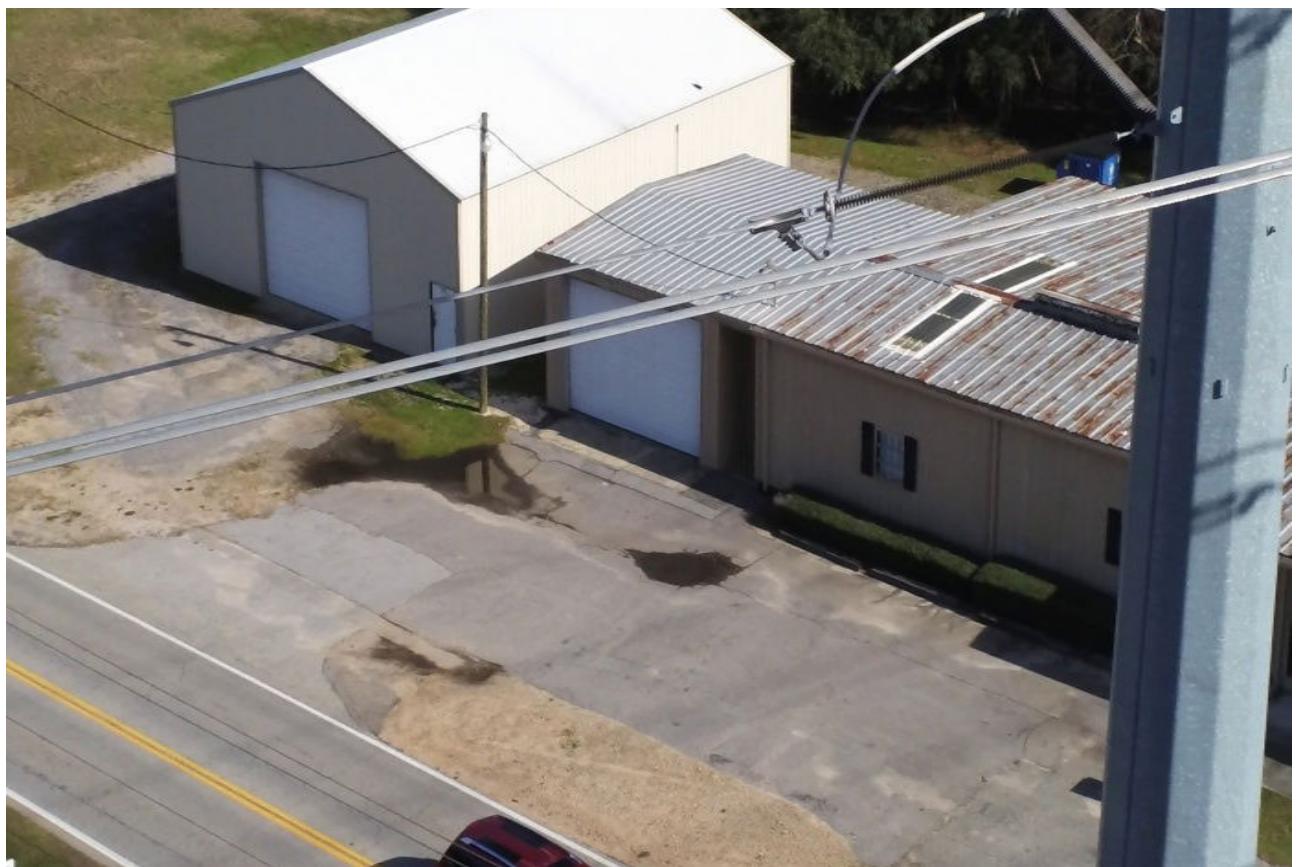
Wooden tower is not detected.

Image : 105\_4350.jpg



Wooden tower is not detected.

Image : 112\_165.jpg



Tucohy tower is not detected.