

Aero2Astro
Panneerselvam N
(12/10/2021)

Today i had trained Yolo v4 model upto 8000 epochs. And also evaluated with both training and test dataset.

Threshold_IOU = 0.2

Train :

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
396
detections_count = 1432, unique_truth_count = 663
class_id = 0, name = tower_lattice, ap = 99.78%      (TP = 273, FP = 15)
class_id = 1, name = tower_tucohy, ap = 97.61%      (TP = 167, FP = 21)
class_id = 2, name = tower_wooden, ap = 99.28%      (TP = 215, FP = 13)

for conf_thresh = 0.25, precision = 0.93, recall = 0.99, F1-score = 0.96
for conf_thresh = 0.25, TP = 655, FP = 49, FN = 8, average IoU = 78.44 %

IoU threshold = 20 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.20) = 0.988901, or 98.89 %
Total Detection Time: 52 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 = 562, unique_truth_count = 202
class_id = 0, name = tower_lattice, ap = 90.68%      (TP = 79, FP = 16)
class_id = 1, name = tower_tucohy, ap = 82.37%      (TP = 38, FP = 14)
class_id = 2, name = tower_wooden, ap = 68.48%      (TP = 44, FP = 10)

for conf_thresh = 0.25, precision = 0.80, recall = 0.80, F1-score = 0.80
for conf_thresh = 0.25, TP = 161, FP = 40, FN = 41, average IoU = 61.52 %

IoU threshold = 20 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.20) = 0.805125, or 80.51 %
Total Detection Time: 17 Seconds
Set _points_flag:
```

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 = 1432, unique_truth_count = 663
class_id = 0, name = tower_lattice, ap = 99.10%      (TP = 273, FP = 15)
class_id = 1, name = tower_tucohy, ap = 93.96%      (TP = 161, FP = 27)
class_id = 2, name = tower_wooden, ap = 93.58%      (TP = 202, FP = 26)

for conf_thresh = 0.25, precision = 0.90, recall = 0.96, F1-score = 0.93
for conf_thresh = 0.25, TP = 636, FP = 68, FN = 27, average IoU = 77.19 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.955466, or 95.55 %
Total Detection Time: 51 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 = 562, unique_truth_count = 202
class_id = 0, name = tower_lattice, ap = 78.38%      (TP = 71, FP = 24)
class_id = 1, name = tower_tucohy, ap = 77.46%      (TP = 36, FP = 16)
class_id = 2, name = tower_wooden, ap = 43.36%      (TP = 32, FP = 22)

for conf_thresh = 0.25, precision = 0.69, recall = 0.69, F1-score = 0.69
for conf_thresh = 0.25, TP = 139, FP = 62, FN = 63, average IoU = 57.31 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.664009, or 66.40 %
Total Detection Time: 17 Seconds
```

Set_points_flag:

Evaluation result:

Confidence : 0.2

Image : 08_1725.jpg



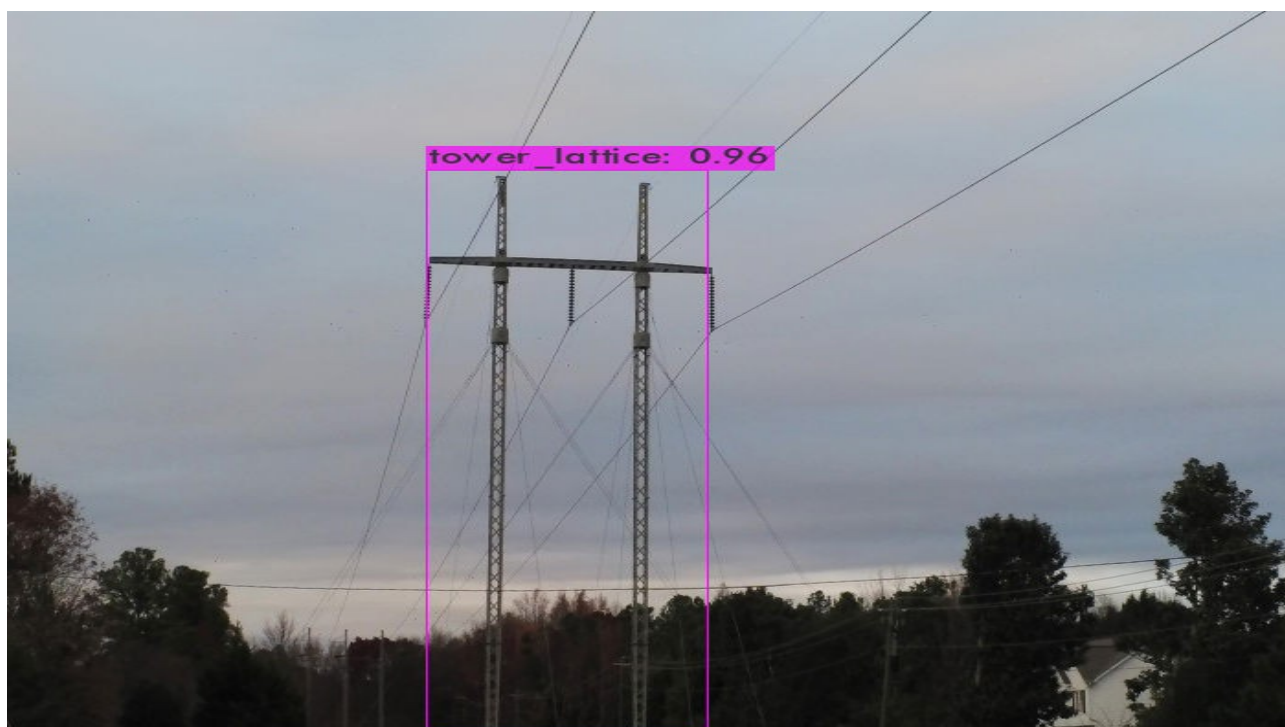
Inference : In Predicted image , wooden tower is classified as both tucohy and wooden.

Image : 14_00051.jpg



Inference : In predicted image, Wooden tower is not detected.

Image : 14_02226.jpg



Inference : Wooden tower is not detected.

Image : 22_00331.jpg



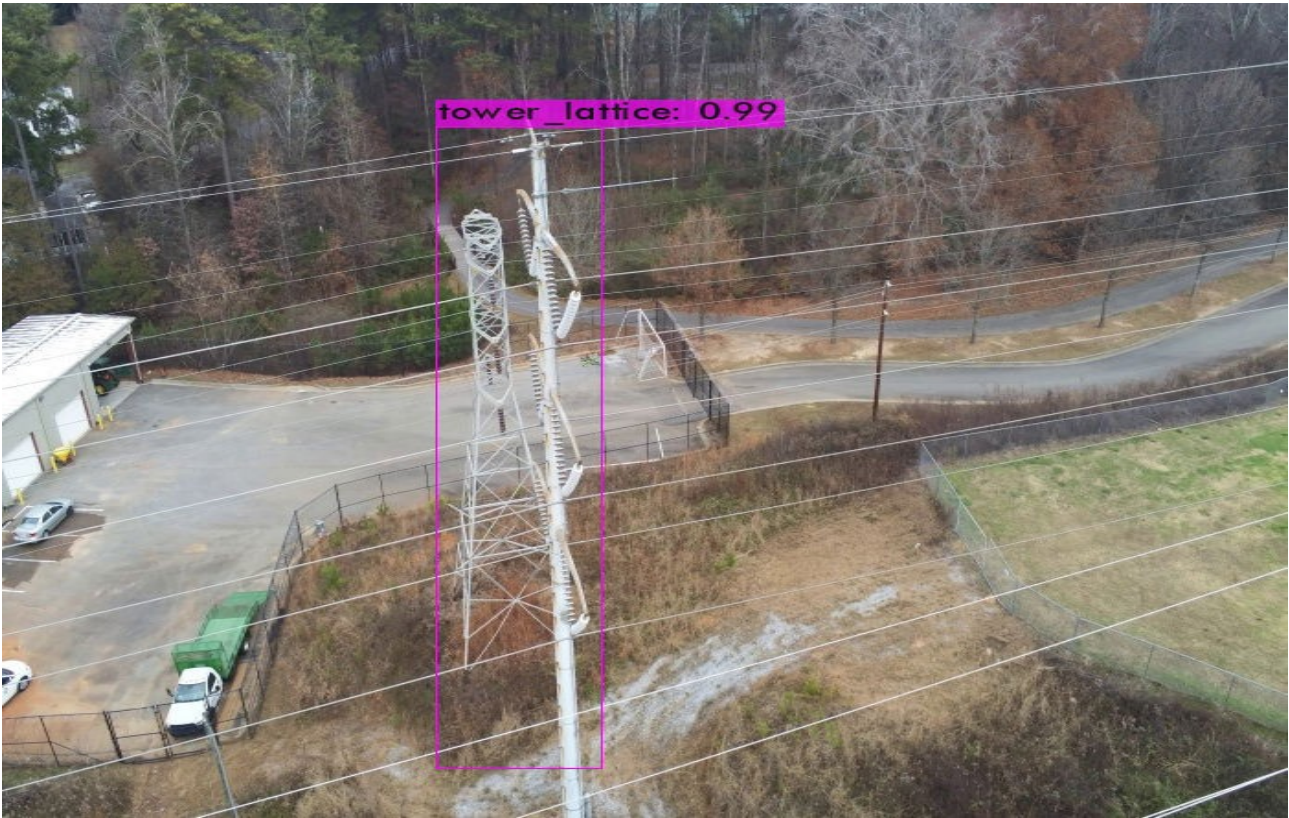
Inference : Wooden tower is mis-classified as tucohy tower.

Image : 22_01901.jpg



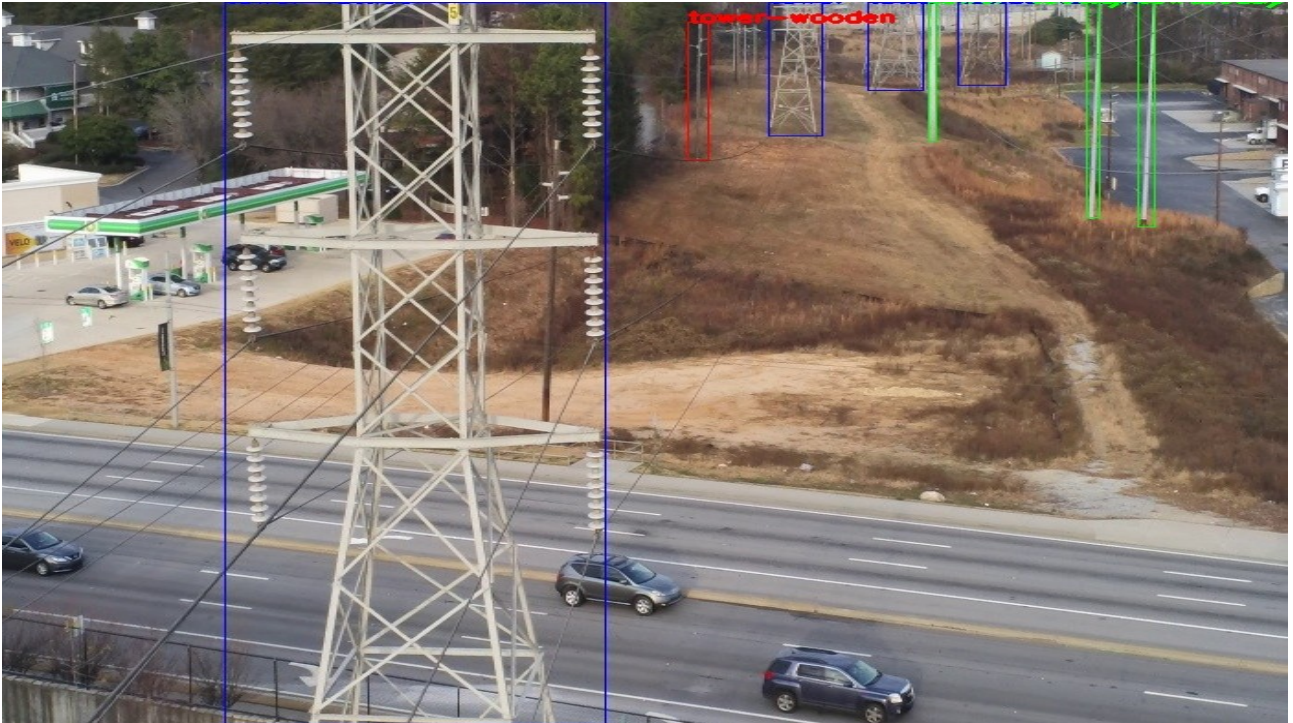
Inference: Wooden tower is mis-classified as tucohy tower.

Image : 32_6285.jpg



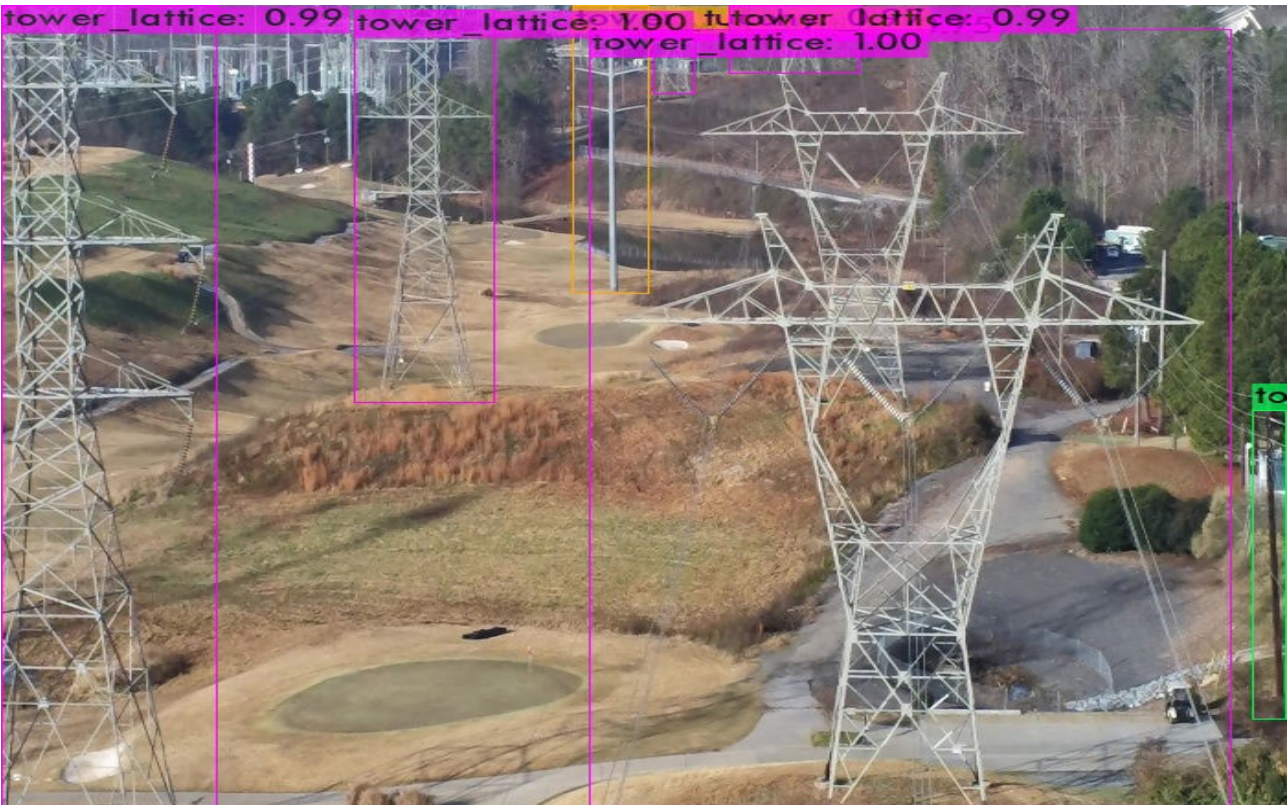
Inference: Wooden and tocohy tower is not detected.

Image : 36_825.jpg



Inference: Wooden and tocohy tower is not detected.

Image : 63_00891.jpg



Inference : All are correct prediction.

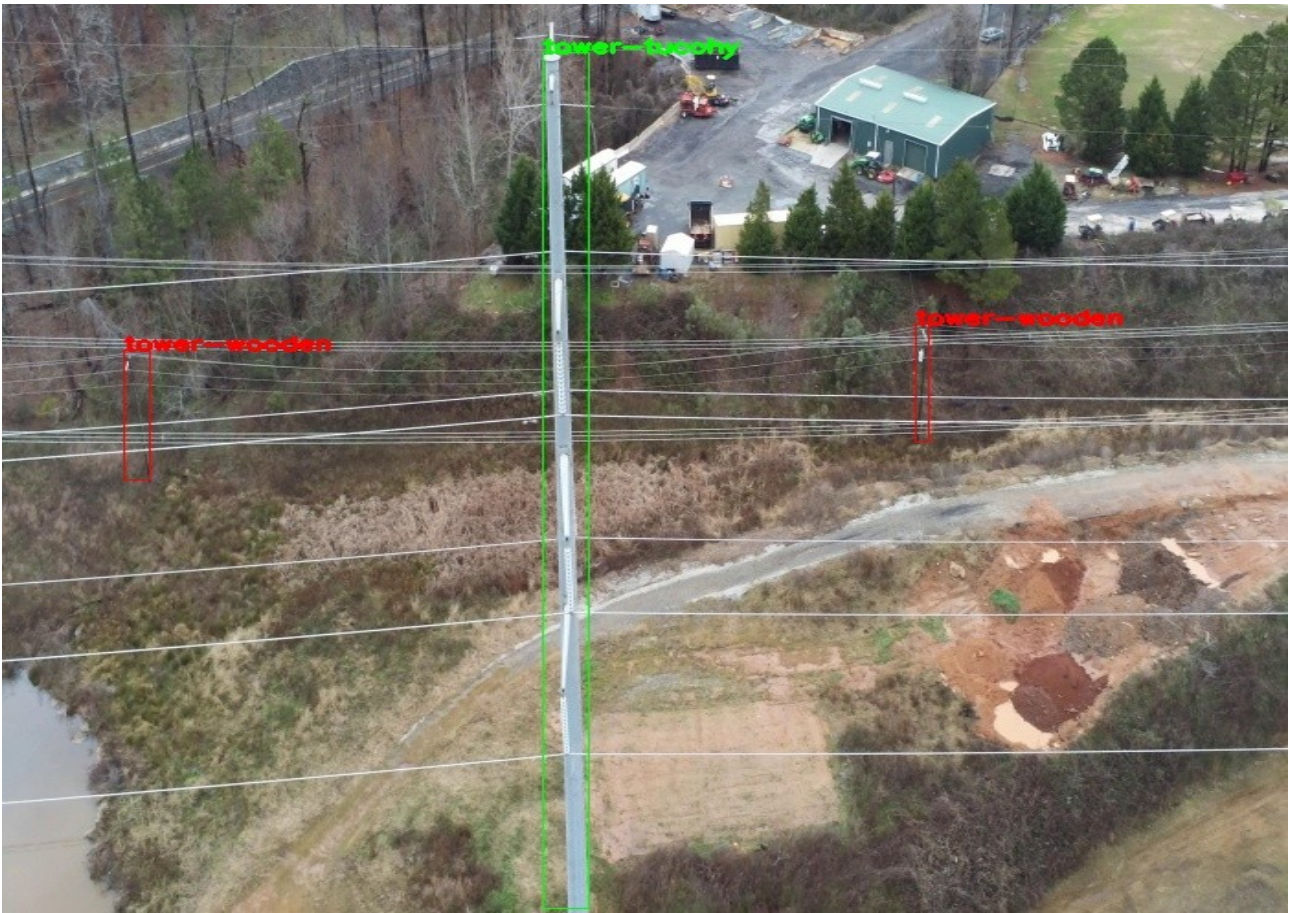
Image : 70_01114.jpg





Inference : All are correct prediction.

Image : 91_15.jpg



Inference: Wooden tower is not detected.