

Aero2Astro
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Today i had trained Yolo v4 model upto 10600 epochs. And also evaluated with both train and test dataset.

Train :

Threshold_IoU = 0.2

```
calculation mAP (mean average precision)...
Detection layer: 139 - type = 28
Detection layer: 150 - type = 28
Detection layer: 161 - type = 28
396
detections_count = 1552, unique_truth_count = 663
class_id = 0, name = tower_lattice, ap = 99.92%      (TP = 274, FP = 8)
class_id = 1, name = tower_tucohy, ap = 98.18%      (TP = 166, FP = 14)
class_id = 2, name = tower_wooden, ap = 98.90%      (TP = 211, FP = 12)

for conf_thresh = 0.25, precision = 0.95, recall = 0.98, F1-score = 0.97
for conf_thresh = 0.25, TP = 651, FP = 34, FN = 12, average IoU = 77.32 %

IoU threshold = 20 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.20) = 0.989974, or 99.00 %
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 = 552, unique_truth_count = 202
class_id = 0, name = tower_lattice, ap = 89.84%      (TP = 78, FP = 5)
class_id = 1, name = tower_tucohy, ap = 83.37%      (TP = 39, FP = 10)
class_id = 2, name = tower_wooden, ap = 63.96%      (TP = 41, FP = 16)

for conf_thresh = 0.25, precision = 0.84, recall = 0.78, F1-score = 0.81
for conf_thresh = 0.25, TP = 158, FP = 31, FN = 44, average IoU = 63.69 %

IoU threshold = 20 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.20) = 0.790570, or 79.06 %
Total Detection Time: 16 Seconds
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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 = 1552, unique_truth_count = 663
class_id = 0, name = tower_lattice, ap = 97.66%      (TP = 270, FP = 12)
class_id = 1, name = tower_tucohy, ap = 93.71%      (TP = 160, FP = 20)
class_id = 2, name = tower_wooden, ap = 94.59%      (TP = 203, FP = 20)

for conf_thresh = 0.25, precision = 0.92, recall = 0.95, F1-score = 0.94
for conf_thresh = 0.25, TP = 633, FP = 52, FN = 30, average IoU = 75.98 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.953220, or 95.32 %
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 = 552, unique_truth_count = 202
class_id = 0, name = tower_lattice, ap = 74.28%      (TP = 69, FP = 14)
class_id = 1, name = tower_tucohy, ap = 78.74%      (TP = 37, FP = 12)
class_id = 2, name = tower_wooden, ap = 43.55%      (TP = 33, FP = 24)

for conf_thresh = 0.25, precision = 0.74, recall = 0.69, F1-score = 0.71
for conf_thresh = 0.25, TP = 139, FP = 50, FN = 63, average IoU = 59.54 %

IoU threshold = 60 %, used Area-Under-Curve for each unique Recall
mean average precision (mAP@0.60) = 0.655221, or 65.52 %
Total Detection Time: 17 Seconds
```

Detection Result : At 10600 epochs.
Threshold_detection = 0.2
Image : 08_1725.jpg



Tower wooden is mis-classified as tower_tucohy with high confidence. Tree is classified as wooden tower.

Image : 14_00051.jpg



Tower lattice has multiple detection due to less threshold.

Image : 14_02226.jpg



Wooden tower and other some lattice towers are not detected.

Image : 22_00331.jpg



Wooden tower is mis-classified as tower tucohy.

Image : 22_01901.jpg



Wooden tower is mis-classified as Tucohy tower.

Image : 26_1050.jpg



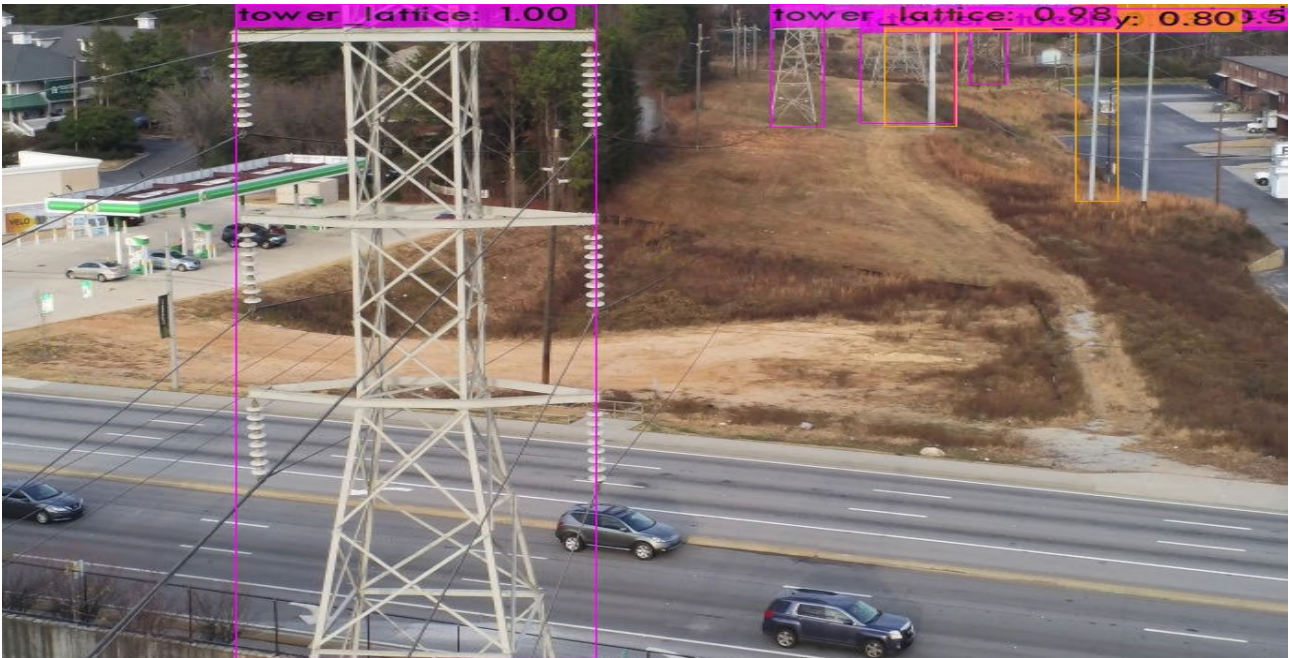
All detections are correct.

Image : 32_6285.jpg



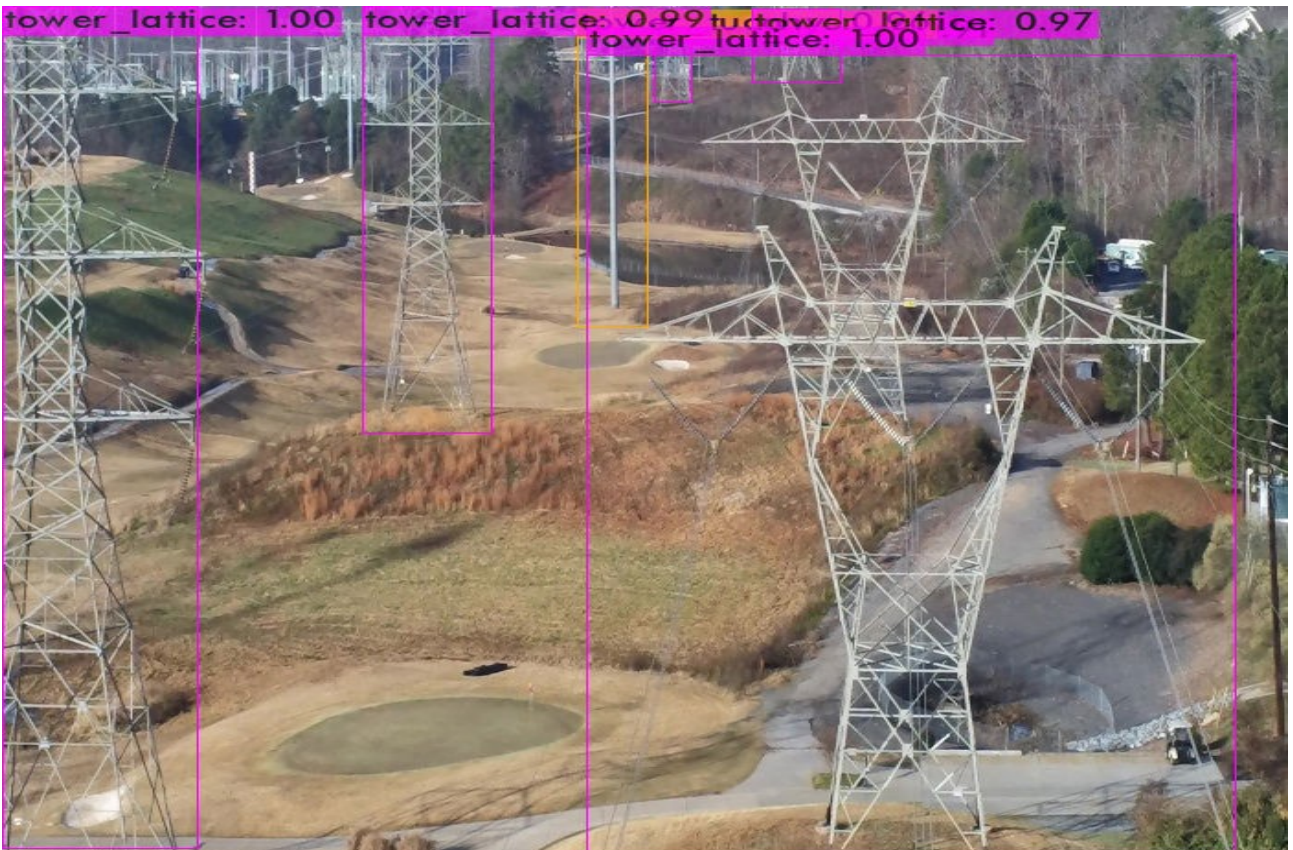
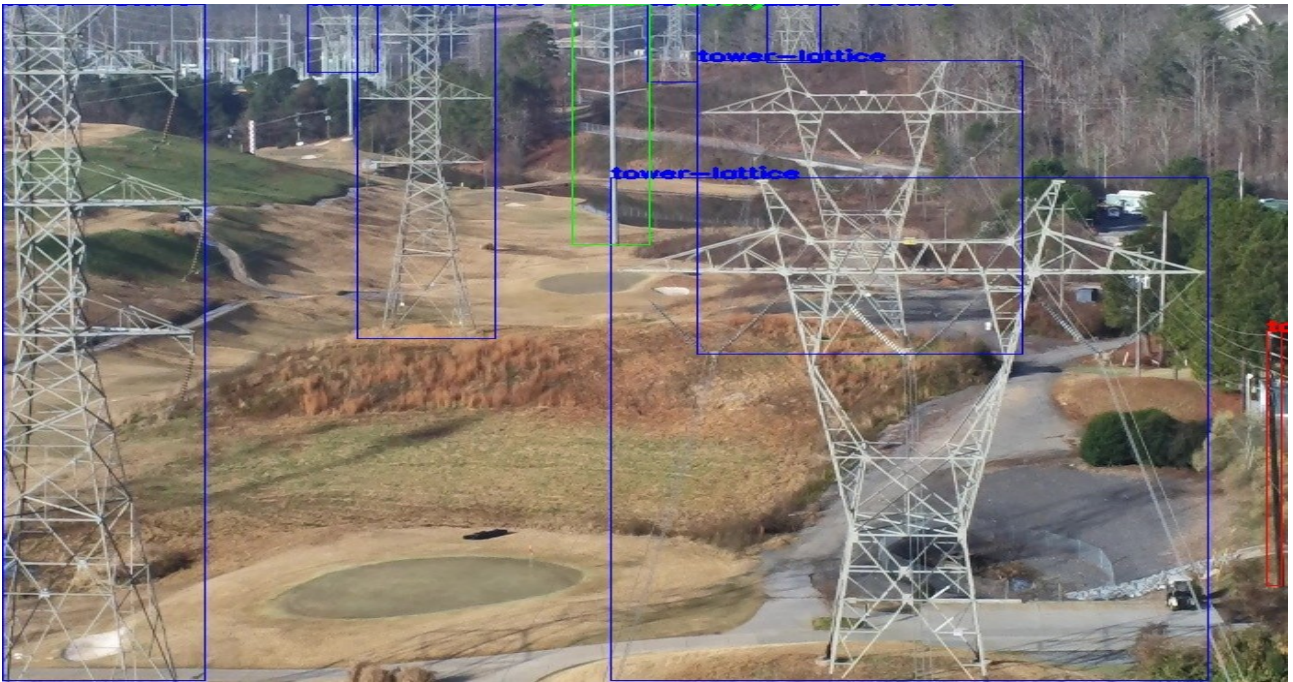
Tower Tucohy is not detected.

Image : 36_825.jpg



Wooden tower and one tucohy tower is not detected.

Image : 63_00891.jpg



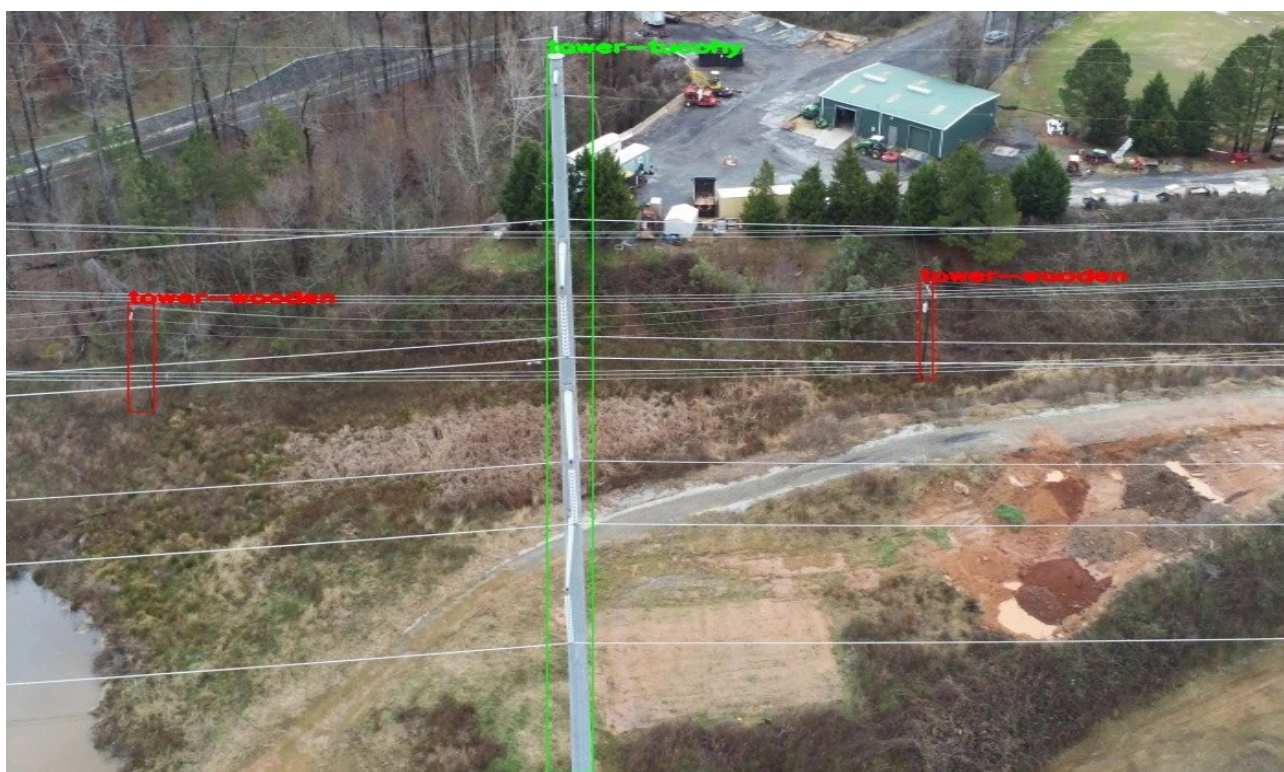
One lattice tower is not detected in right side of image. And also wooden tower is not detected.

Image ; 70_01114.jpg



All detections are correct.

Image : 91_15.jpg



Wooden towers are not detected.