

Poles Prediction Map

(Tinos study area)

Version: 0.10



General

This map is a product of Wooden Poles Object Detection project.

The objectives of this project are:

- Detect spatially poles in the study area using aerial imagery.
- Distinguish different types of poles (electrical, lighting, telecommunication poles).
- Evaluate prediction labels with validation labels data.

Validation data were digitized and edited by T.A. Geoforce using aerial imagery 2019. Imagery Data copyright ©NES / Airbus, Maxar Technologies.

T.A. Geoforce used special specifications and criteria for features digitization and labels classification and may be different from the ground truth. The deep learning model is the result of 70%-30% training and validation split data procedure. The training data are not visualized on this map.

Validation study area: 1.601 km²

Validation study perimeter: 5.14 km

Tinos is low vegetation and low-class urban area, with intense landscape and very new construction activity.

Evaluation

Overall

| Class | Telecommunication pole | Electricity pole | Lighting pole | Average |
|--------------|------------------------|------------------|---------------|---------|
| Precision | 0.239 | 0.295 | 0.580 | 0.30 |
| Recall | 0.197 | 0.63 | 0.692 | 0.480 |
| F1 | 0.216 | 0.404 | 0.631 | 0.360 |
| Count error | -0.17 | 1.138 | 0.192 | 0.55 |
| Ground truth | 86 | 123 | 26 | 235 |

Counts

| Class | Telecommunication pole | Electricity pole | Lighting pole | Total |
|-------------------------|------------------------|------------------|---------------|-------|
| Prediction labels count | 71 | 263 | 31 | 365 |
| Validation labels count | 86 | 123 | 26 | 235 |

Comments

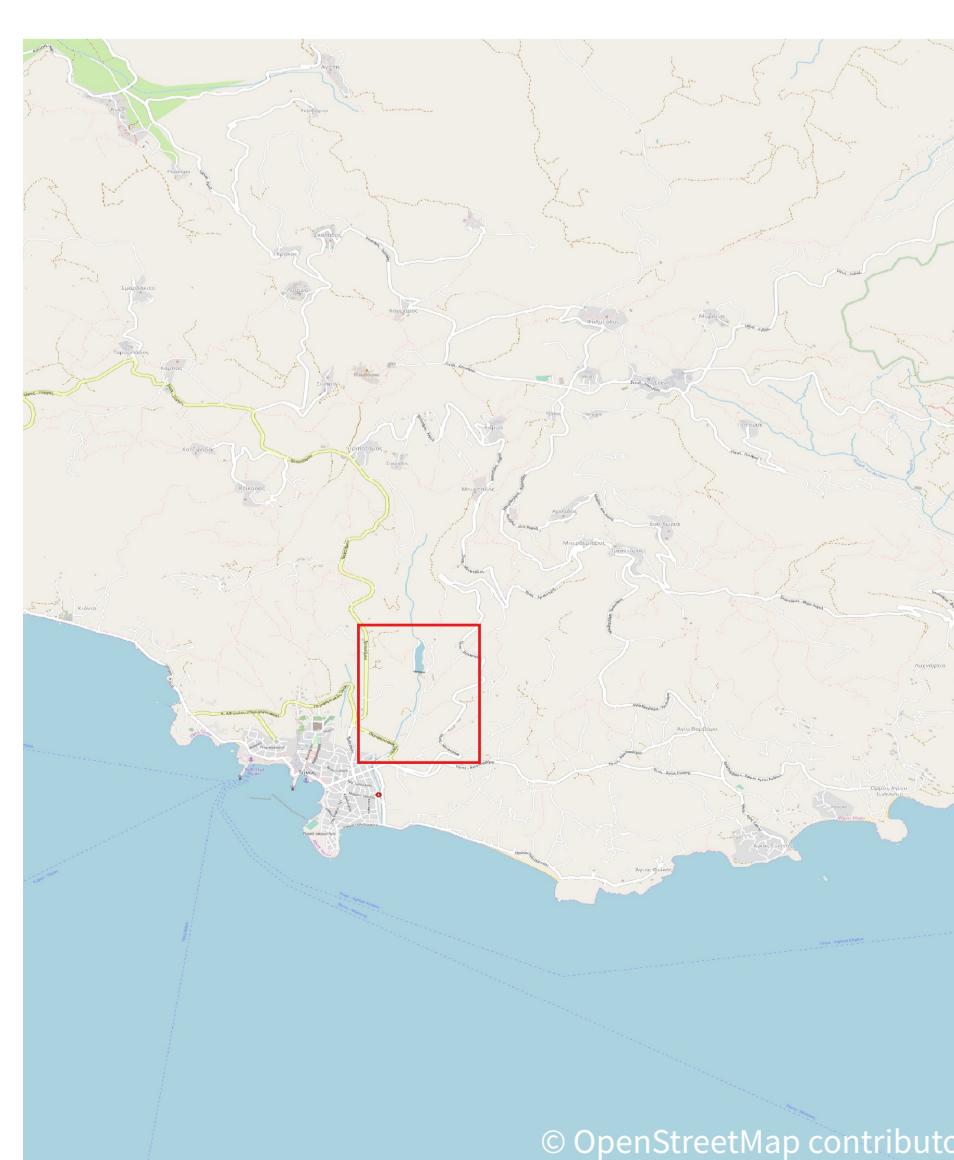
The model's low precision is caused by:

- the minimum amount of train data
- the low number of training epochs.

Also, the confusion between telecommunication and electrical poles is obvious in the validation and prediction data.

The density and distribution of predictions and validation data are very close, sign that the model's chip classification is very efficient. Finally, the validation's data accuracy is not 100%, that's why there are examples that the model is detecting poles, where are not included in the validation data.

Map Preview



Scale 1: 1000

Coordinate Reference System: WGS '84

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Map preview basemap: © OpenStreetMap contributors.

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T.A. GEOFORCE

Legend

Prediction labels

Cyan square: Electricity pole

Yellow square: Lighting pole

Magenta square: Telecommunication pole

Validation labels

Cyan square: Electricity pole

Yellow square: Lighting pole

Magenta square: Telecommunication pole