COUNTING PHOTOVOLTAIC AND SOLAR PANELS FROM AERIAL IMAGERY

Lacuna Solar Survey Challenge

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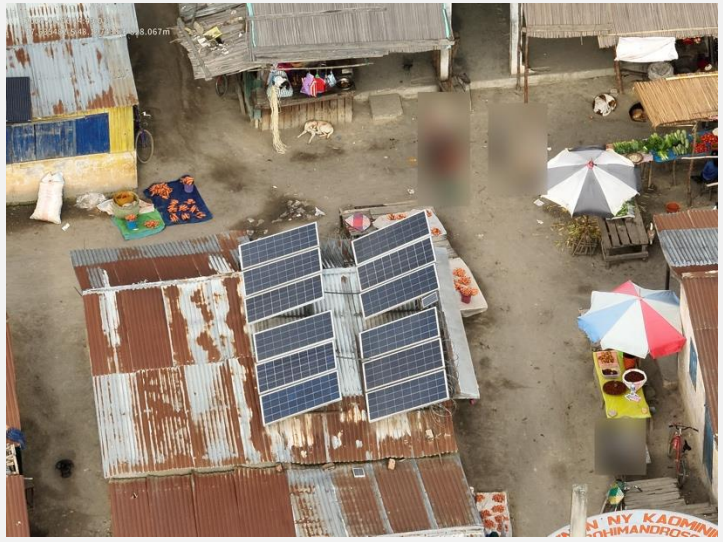
Complements of Machine Learning 24/25



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- TABELAS
- TEXTOS
- …

Hyperparameter	Possible Values	Best Value
C	$[0, 100]$	6.93
γ	{scale, auto, 0.1, 0.01, 0.001}	auto
Kernel	{linear, rbf, poly, sigmoid}	rbf
Degree	{1, 2, 3}	
Coef_0	$[-5, 5]$	

Classification Report: Train Set

Class	Precision	Recall	F1-Score	Support
Low/Minimal	0.82	0.74	0.77	170
Optimal	0.52	0.62	0.57	170
Risk/Caution	0.69	0.63	0.65	171
Accuracy			0.66	511
Macro avg	0.68	0.66	0.67	511
Weighted avg	0.68	0.66	0.67	511

Classific

Class	Preci
Low/Minimal	0.7
Optimal	0.4
Risk/Caution	0.6
Accuracy	
Macro avg	0.6
Weighted avg	0.6

CONTENTS

PROJECT OVERVIEW

THE PROBLEM

STATE OF THE ART

DATA ANALYSIS

RAW DATA

Placement Classes

roof

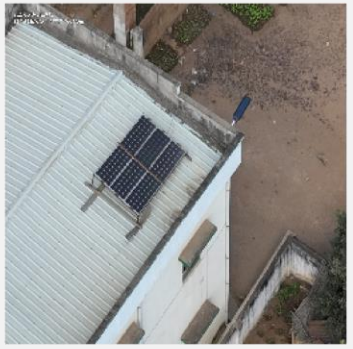
S-unknown

openspace

r_openspace

Origin Classes

D



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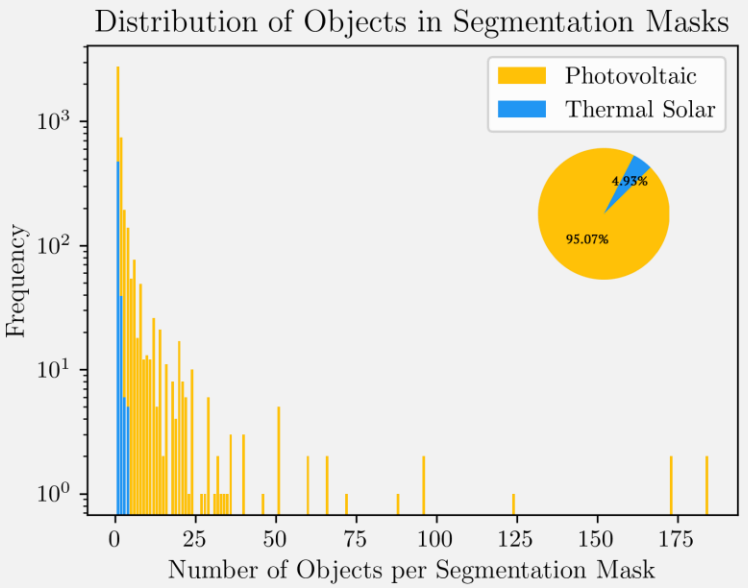

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Segmentation Mask

Inaccuracies in Polygon Annotations

Misaligned Vertices (6/3)

Excessive Object Inclusion (141/8)

SOLUTIONS

DEEP LEARNING MODELS

IMAGE-BASED REGRESSION

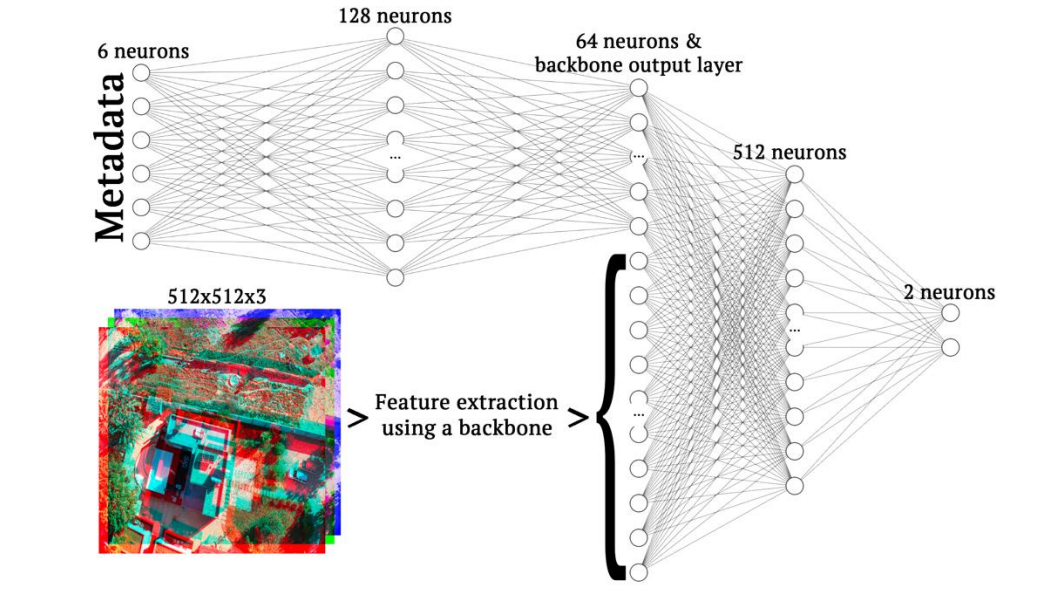
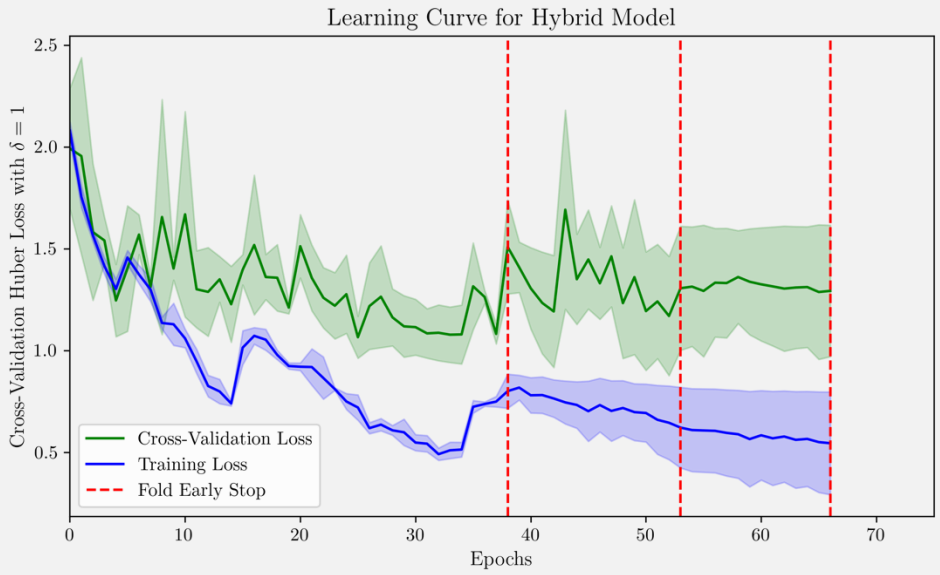
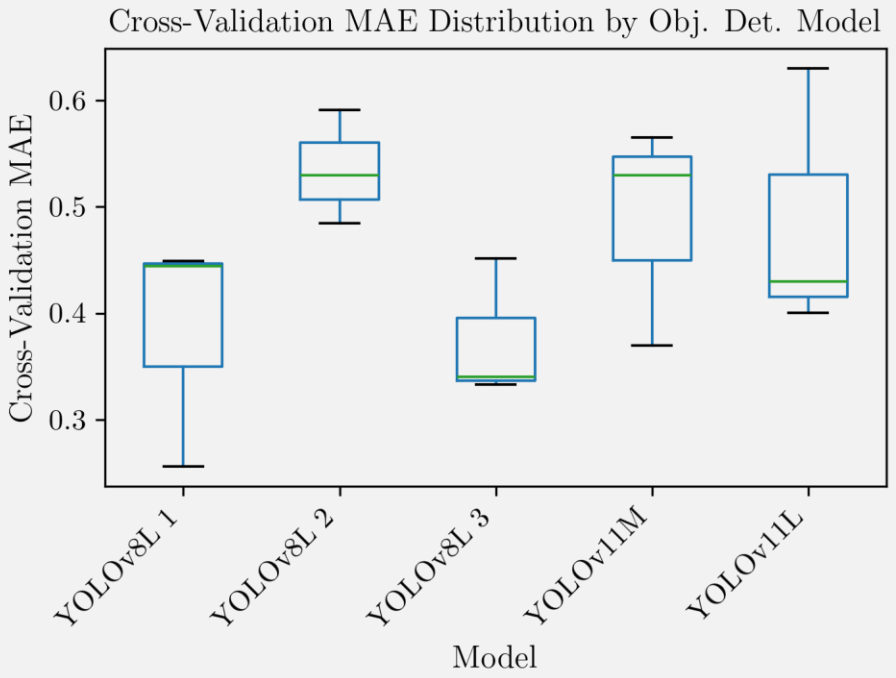


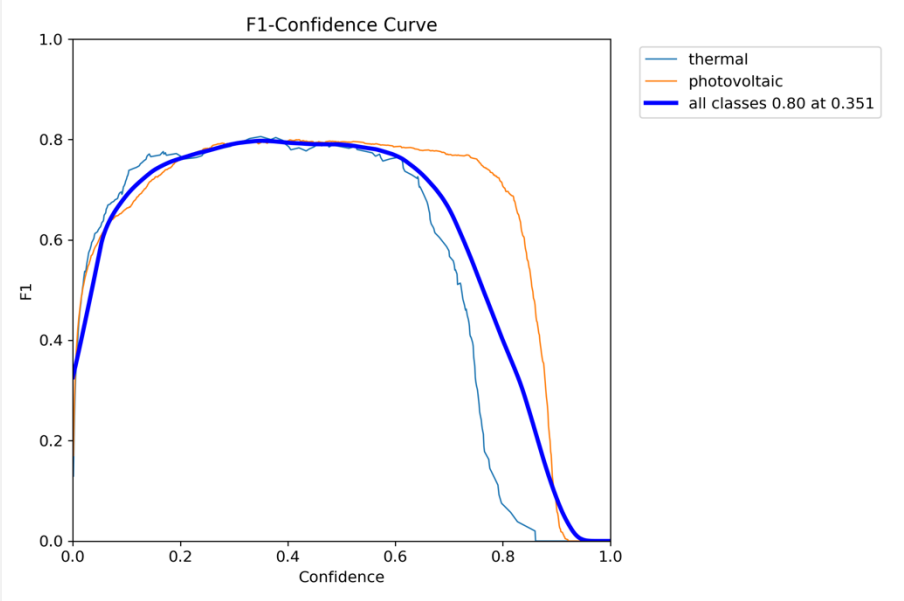
IMAGE-BASED REGRESSION - RESULTS



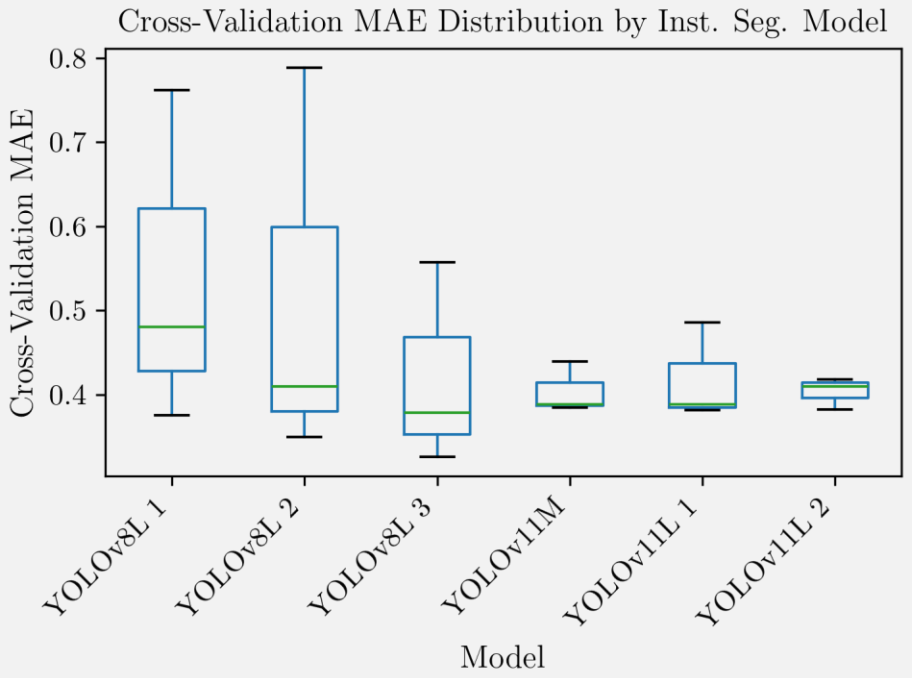
OBJECT DETECTION



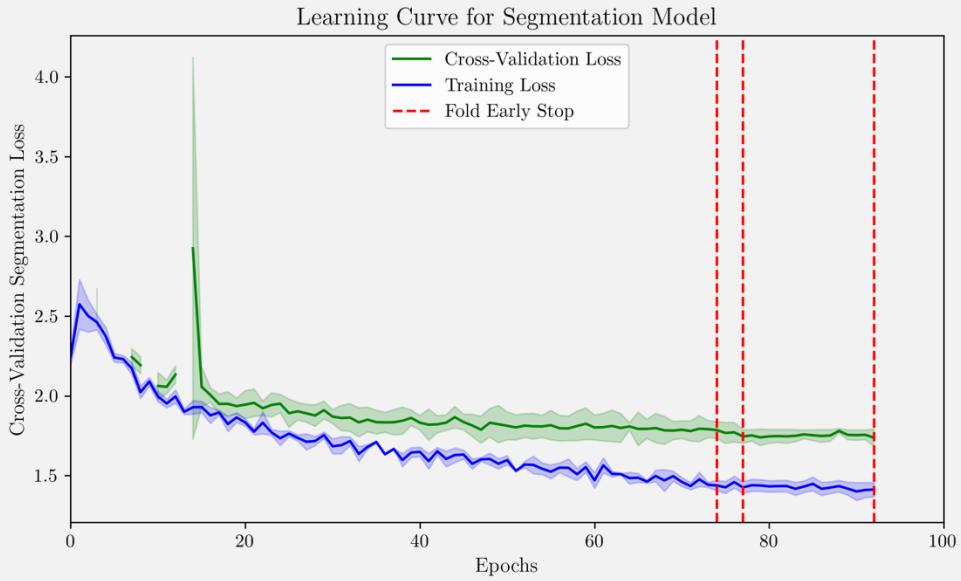
OBJECT DETECTION - RESULTS

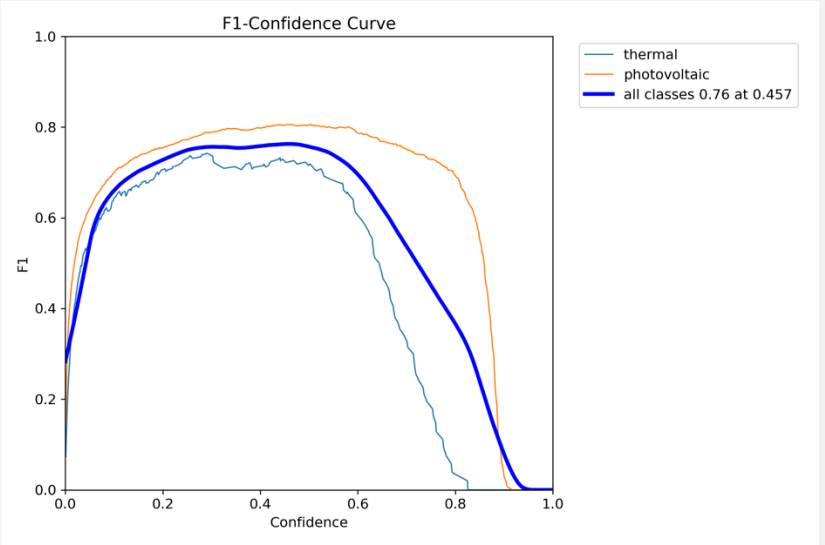


INSTANCE SEGMENTATION

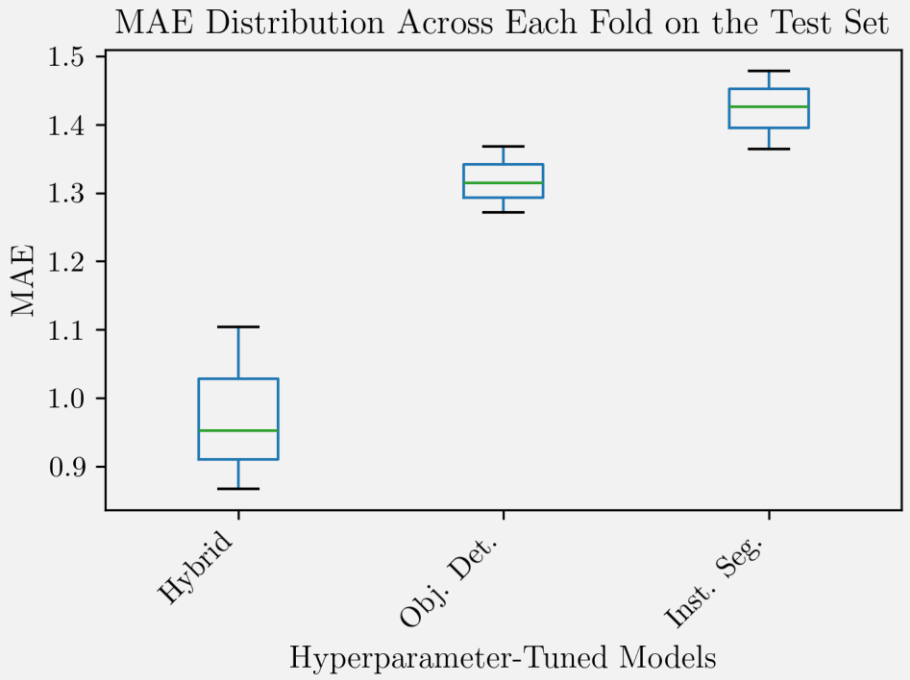


INSTANCE SEGMENTATION - RESULTS





RESULTS ANALYSIS


MAE Distribution Across Each Fold on the Test Set
1.5
1.4
1.3
1.2
1.1
1.0
0.9
MAE
Hybrid
Obj. Det.
Inst. Seg.
Hyperparameter-Tuned Models

AKA DISCUSSION W LIT BENCHMARK

CONCLUSIONS