

Overview of the Constellation Dataset

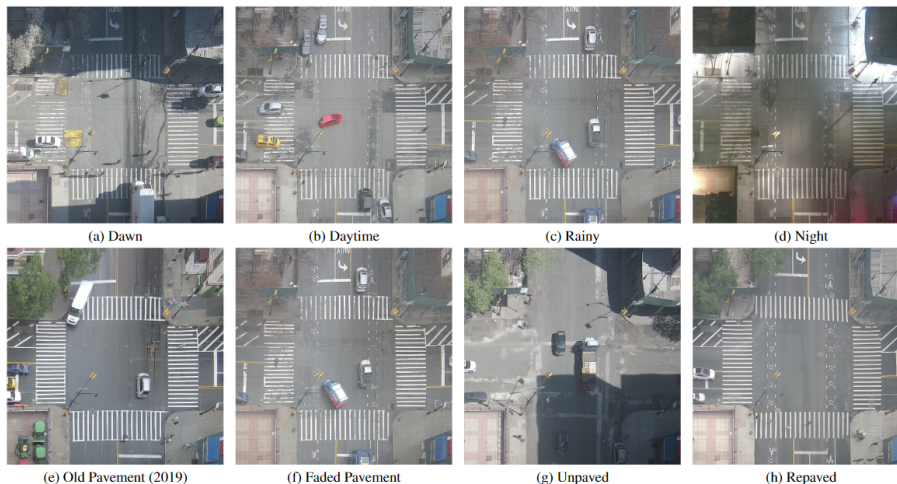


Figure 1: Example images from the dataset. (a-d) Different time of day conditions; (e-f) Different background conditions for the intersection.

Weather	Split	# of Images
Overcast	Train	1,205
	Test	602
Sunny	Train	7,355
	Test	1,282
Night	Train	1,600
	Test	450
Sun/Sharp Shadows	Train	70
	Test	150
Foggy	Train	-
	Test	600

Table 1: Summary of the dataset, grouped by weather conditions.

Model Name	Pedestrian AP@0.5	Vehicle AP@0.5	mAP@0.5	Inference Time (ms)
YOLOv8x	87.4	98.6	93.0	11.5
YOLOv8n (2x)	91.2	98.5	94.8	7.2
YOLOv8x (2x)	91.2	98.4	94.8	43.6
YOLOv8n (2x+SR)	90.1	98.4	94.2	7.2
YOLOv8x (2x+SR)	91.3	98.7	95.0	43.6
YOLOv8x (P2)	89.5	98.6	94.0	15.1
YOLOv8x (P6)	89.4	98.7	94.0	7.6
YOLOv8x (P2-P6)	89.9	98.7	94.3	24.5
DETR-l	86.5	98.1	92.6	9.8
DETR-x	87.3	97.8	92.3	14.5
CFINet	82.8	95.8	89.3	31.4

Table 2: Performance of different state-of-the-art real-time object detection models on the dataset on an A100 GPU.