HALO:
High-efficiency Autonomous Low-SWaP Operations

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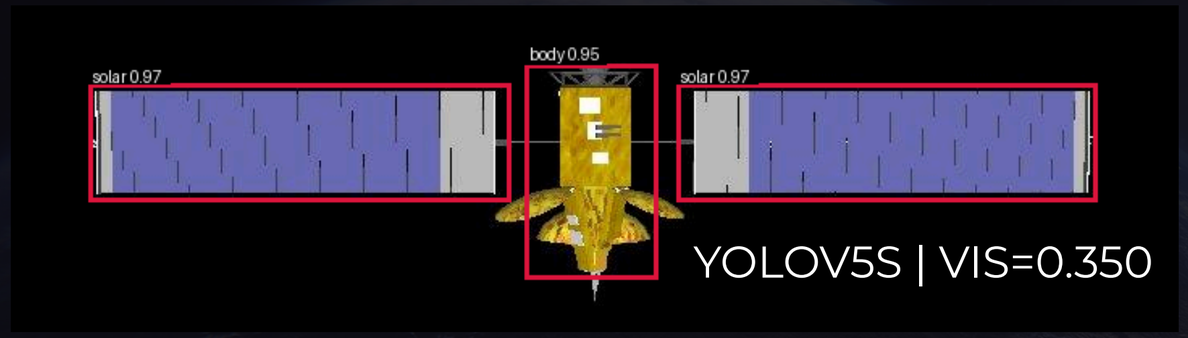
MILESTONE 5 PROGRESS MATRIX

Task	Completion %	Sloan	To Do
Finalize Showcase Poster	100%	100%	None
Demo Video	100%	100%	None
User/Developer Manual	100%	100%	None
Finalize performance metrics and results for all CNN and ViT models	100%	100%	None
Record metrics for quantized 8-bit ViT for CNN comparison if feasible	100%	100%	None

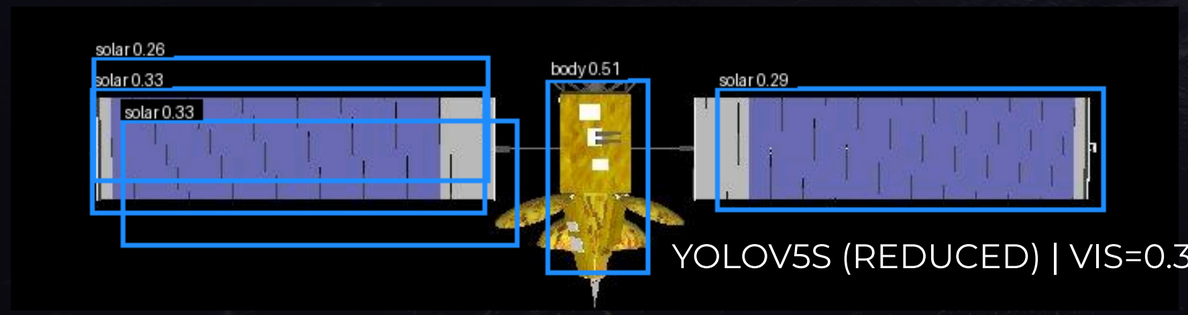
MODEL COMPARISON

Precision	mAP @0.50	mAP @[0.50:0.95]	GFLOPs	Model Size (MB)	Runtime Memory (MB)	FPS
YOLOv5s	0.853	0.667	15.8	26.82	230.38	16.066
YOLOv5s (Reduced)	0.701	0.491	10.4	14.24	184.93	12.9063
YOLOv5n	0.808	0.57	4.1	6.75	111.31	10.8393
FP32 ViT	0.848	0.53	18.6	24.69	288.74	6.3679
FP16 ViT	0.848	0.577	18.6	12.34	144.37	1.249

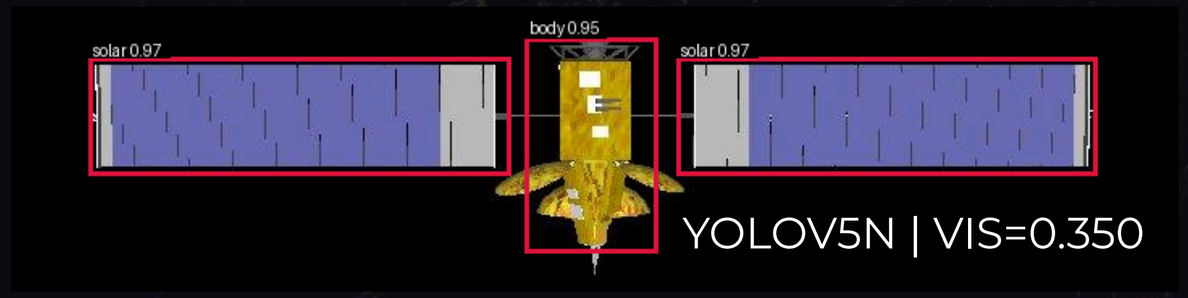
DEMO



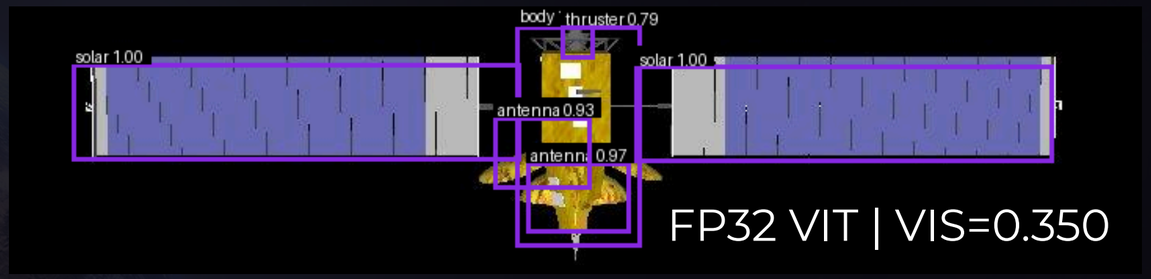
YOLOV5S | VIS=0.350



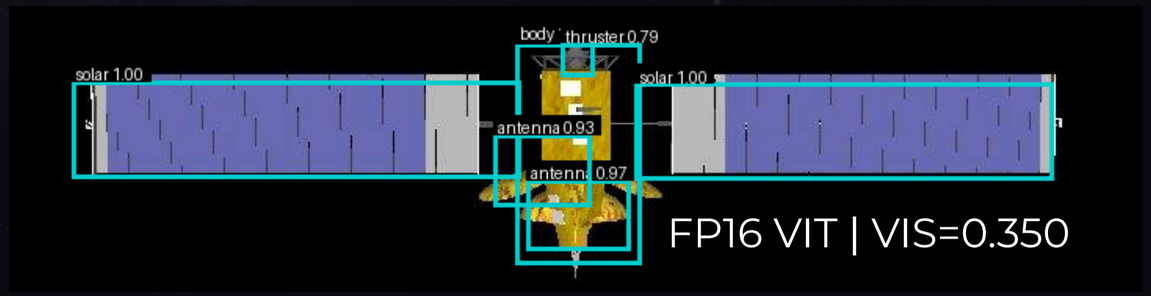
YOLOV5S (REDUCED) | VIS=0.350



YOLOV5N | VIS=0.350



FP32 VIT | VIS=0.350



FP16 VIT | VIS=0.350

FUTURE WORK

- Improve the 8-bit ViT model for deployment
- Achieve true 4- and 2-bit representations of a Vision Transformer
- Further analysis of CNN vs ViT comparisions

THANK YOU!
QUESTIONS?