



Project Page



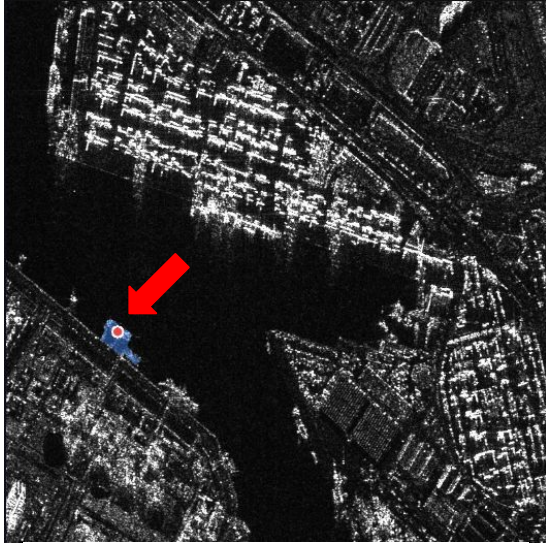
ReSAM: Refine, Requery, and Reinforce: Self-Prompting Point-Supervised Segmentation for Remote Sensing Images

Muhammad Naseer Subhani

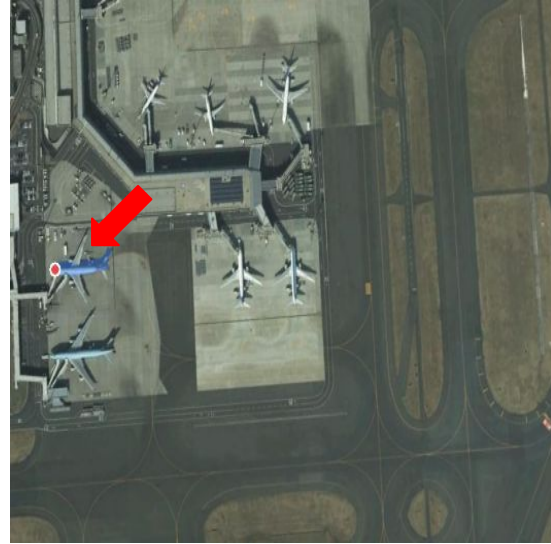
Independent Researcher (Co-founder of Olektra AI)

Motivations

- SAM fails on Remote Sensing Images.



SAR Images

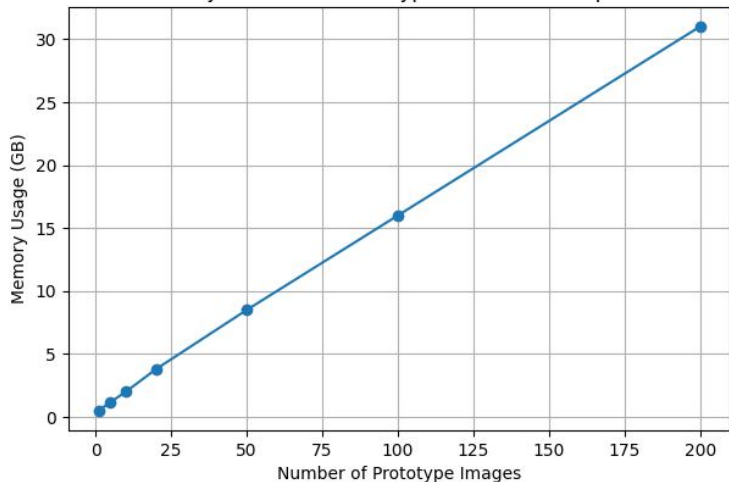


VHR Images

Motivations

- Weak point supervision struggle due to error accumulation.
- Previous prototype based methods use extensive memory and not **Scalable**.

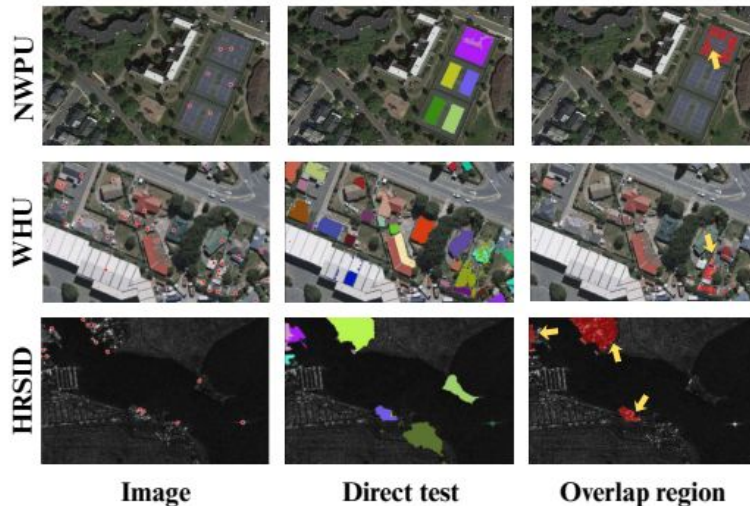
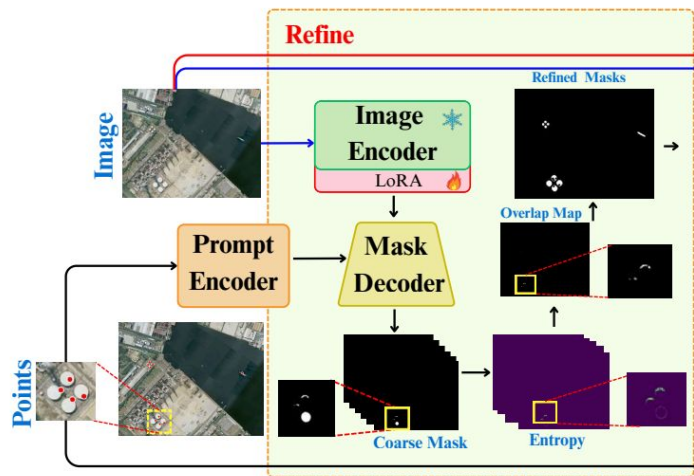
Illustrative Memory Growth for Prototype-Based Point-Supervised Methods



Refine—

$$O_{ij} = \begin{cases} 1, & \text{if } \sum_{k=1}^K C_{ij}^{(k)} > 1, \\ 0, & \text{otherwise,} \end{cases}$$

$$M_{ij}^{\text{ref},(k)} = C_{ij}^{(k)}(1 - O_{ij})$$

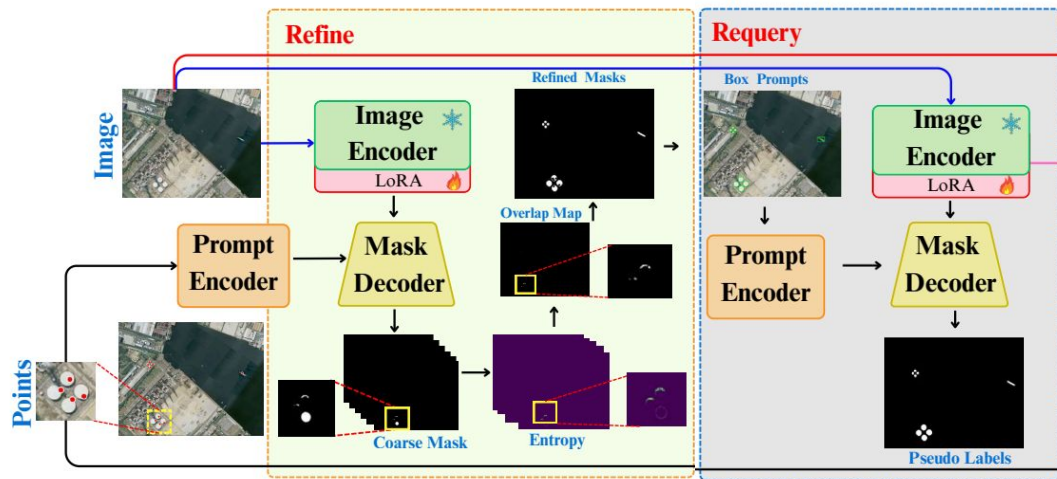


$$C_{ij}^{(k)} = \begin{cases} 1, & \text{if } \hat{M}_{ij}^{(k)}(1 - H_{ij}^{(k)}) > \epsilon, \\ 0, & \text{otherwise,} \end{cases} \quad k = 1, \dots, K$$

Shared Prompt Encoder
 Shared Image Encoder
 Shared Mask Decoder
 Trainable Params
 Freeze Params

Requery—

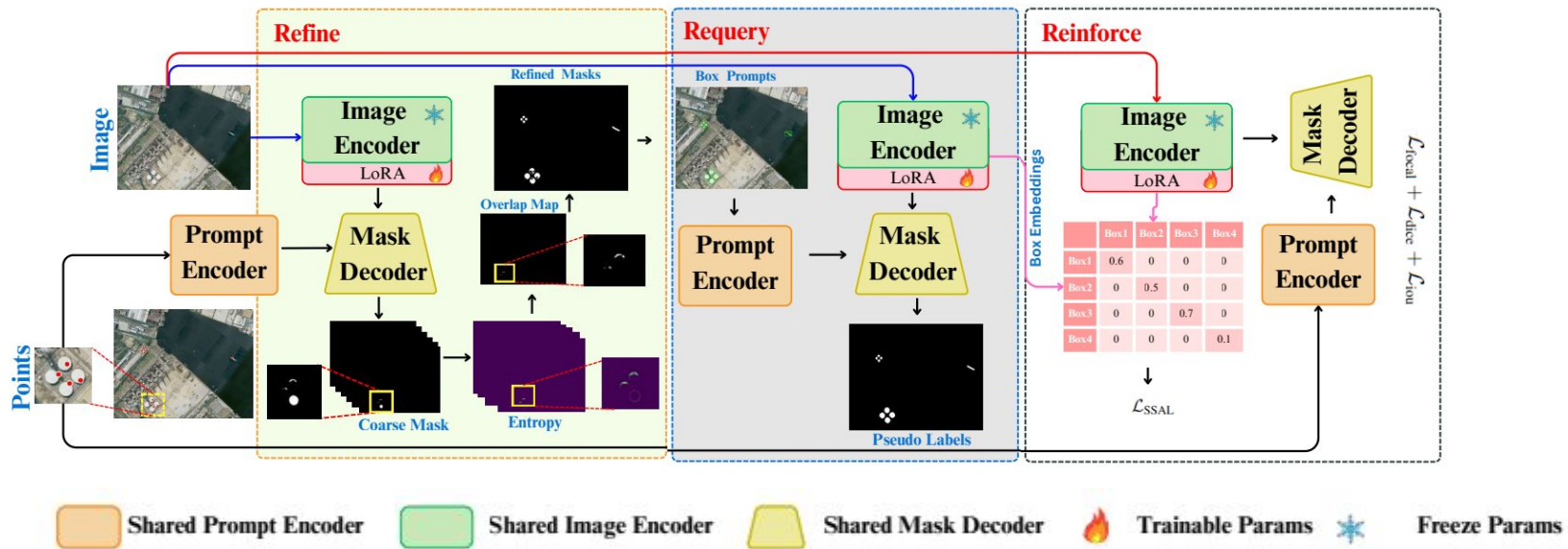
Bounding box as Re prompting.



$$B = \text{Box}(M_{ij}^{\text{ref},(k)}),$$

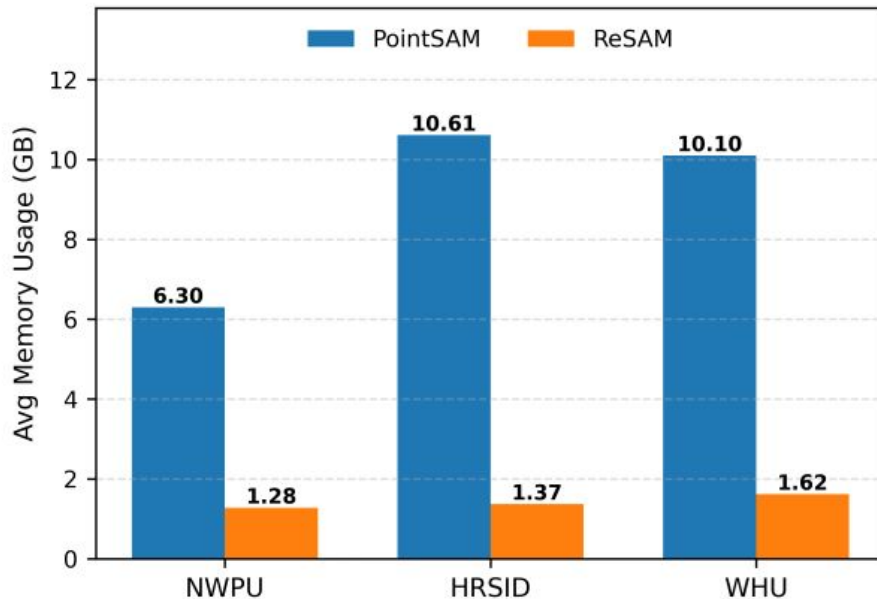
Reinforce – Soft Semantic Alignment (SSA)

$$\mathcal{L}_{SSAL} = \frac{1}{q} \sum_{i=1}^q \left(1 - \hat{s}_i^\top \hat{h}_i \right)$$



Memory Efficient

- **ReSAM is Scalable**
- **Reduce memory 84%**



Quantitatives Results

NWPU Results

Method	SAM-based						SAM2-based					
	1-Point		2-Point		3-Point		1-Point		2-Point		3-Point	
	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1
Direct test [14]	58.06	68.80	63.93	74.92	60.98	71.95	58.28	69.43	62.68	73.87	61.76	73.39
Self-Training [17]	63.94	74.11	65.34	76.05	60.47	71.94	59.62	70.38	63.63	74.36	61.86	73.27
DePT [8]	64.97	74.47	67.13	74.35	64.92	75.82	58.85	69.22	63.98	75.28	63.62	74.58
Tribe [28]	64.27	73.79	64.56	75.60	60.84	71.39	61.59	71.86	65.54	76.05	67.02	77.76
WeSAM [38]	64.85	75.28	64.86	76.00	66.03	76.73	58.89	70.32	69.77	79.83	67.24	78.35
PointSAM [16]	66.66	76.03	67.03	77.42	67.98	78.57	62.26	73.66	70.00	80.22	69.05	80.27
ReSAM (Ours)	70.25	79.80	72.02	81.29	70.00	80.35	64.28	75.42	71.25	82.15	71.52	82.56
Supervised [16]	78.73	86.74	80.88	88.58	81.12	88.79	81.76	88.48	83.14	90.11	83.41	90.32

Diff **-8.43**

WHU Results

Method	SAM-based						SAM2-based					
	1-Point		2-Point		3-Point		1-Point		2-Point		3-Point	
	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1
Direct test [14]	61.03	70.69	65.10	74.76	59.71	69.46	59.97	70.79	65.79	76.31	62.45	73.01
Self-Training [17]	64.91	73.99	68.49	77.57	59.57	69.35	65.01	75.38	68.60	78.60	68.74	77.43
DePT [8]	71.31	79.41	73.69	81.21	73.53	81.47	69.52	77.86	74.33	82.27	73.91	81.88
Tribe [28]	65.55	74.61	71.17	79.56	69.14	77.81	66.67	76.16	72.00	80.81	72.58	81.53
WeSAM [38]	66.29	75.12	74.09	82.07	69.91	78.45	66.16	75.86	72.02	81.08	74.23	82.79
PointSAM [16]	72.63	80.39	76.47	84.10	77.54	85.23	73.69	81.21	76.95	84.55	75.16	83.91
ReSAM (Ours)	75.86	83.80	79.49	86.49	79.42	86.66	74.54	83.75	77.56	86.35	74.15	81.89
Supervised [16]	77.15	84.55	79.73	86.78	80.54	87.49	78.75	85.97	80.40	87.50	88.18	88.70

Diff **-1.29**

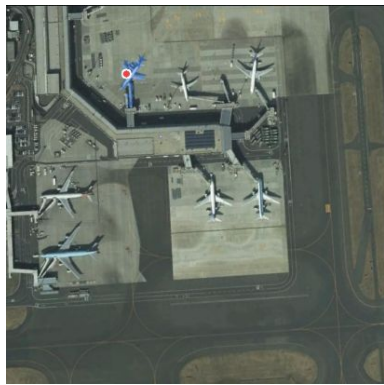
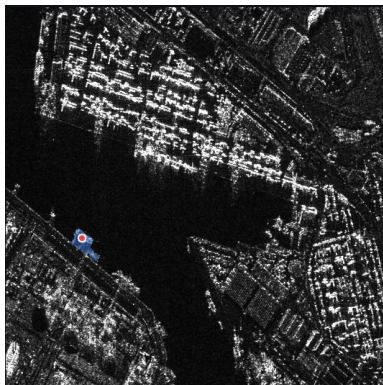
HRSID Results

Method	SAM-based						SAM2-based					
	1-Point		2-Point		3-Point		1-Point		2-Point		3-Point	
	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1	IoU	F1
Direct test [14]	46.56	56.06	37.80	48.34	28.32	37.57	35.40	46.14	37.26	49.07	34.89	46.75
Self-Training [17]	47.44	58.92	38.90	49.99	29.19	39.19	37.39	47.56	44.14	56.42	42.46	54.99
DePT [8]	50.19	58.74	43.52	55.58	34.73	46.08	55.18	67.86	54.76	68.04	54.13	67.17
Tribe [28]	51.22	61.43	42.32	53.39	32.61	42.77	42.12	55.12	46.51	59.90	39.19	51.11
WeSAM [38]	50.50	62.53	41.95	53.58	35.51	46.54	47.61	60.02	47.70	60.77	45.30	59.06
PointSAM [16]	56.06	68.38	57.79	70.50	59.37	72.43	52.45	65.11	55.79	68.82	58.83	71.98
ReSAM (Ours)	58.40	70.11	54.69	66.37	59.80	72.79	56.15	69.23	57.65	70.41	55.71	68.41
Supervised [16]	63.29	75.32	65.89	77.65	66.70	78.50	67.45	78.56	70.83	81.61	71.72	82.42

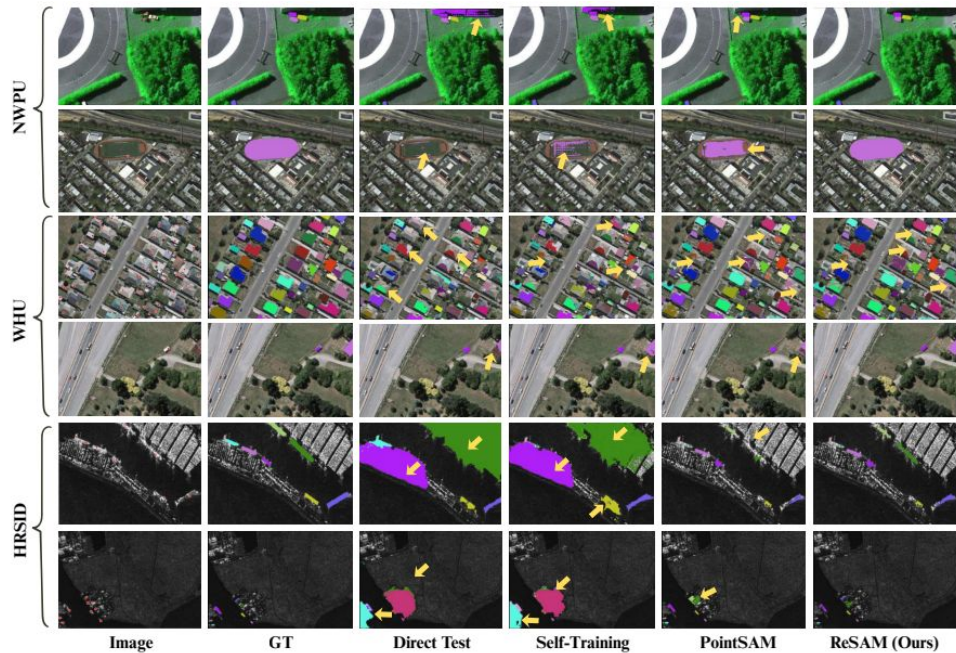
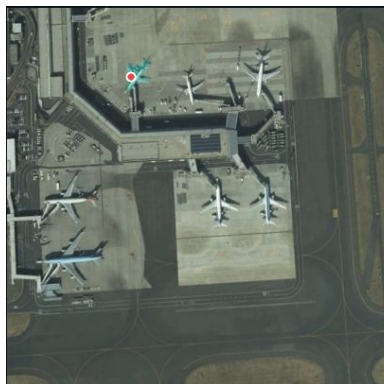
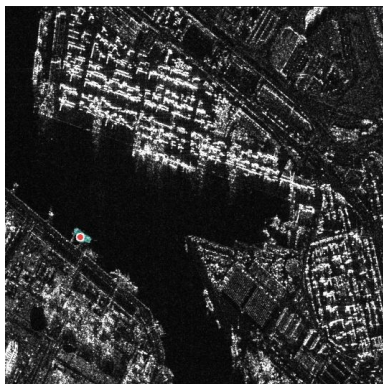
Diff **-4.89**

Qualitative Results

SAM



ReSAM



Thanks

Poster Session 1 #352

Fri, Jun 5, 2026 • 10:45 AM – 12:45 PM MDT

[Reproduce results on Colab](#)



[Hugging Face Demo](#)

