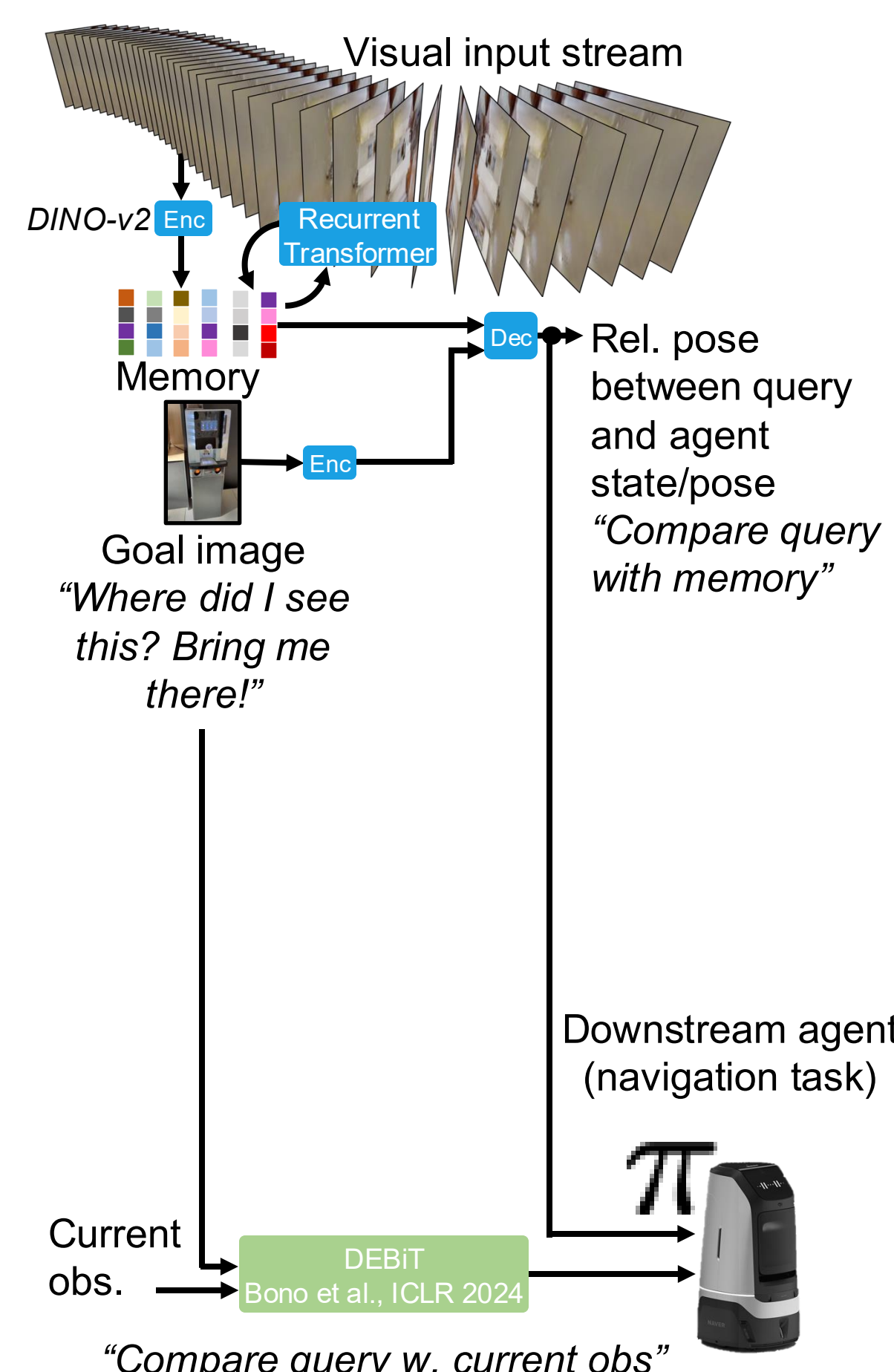


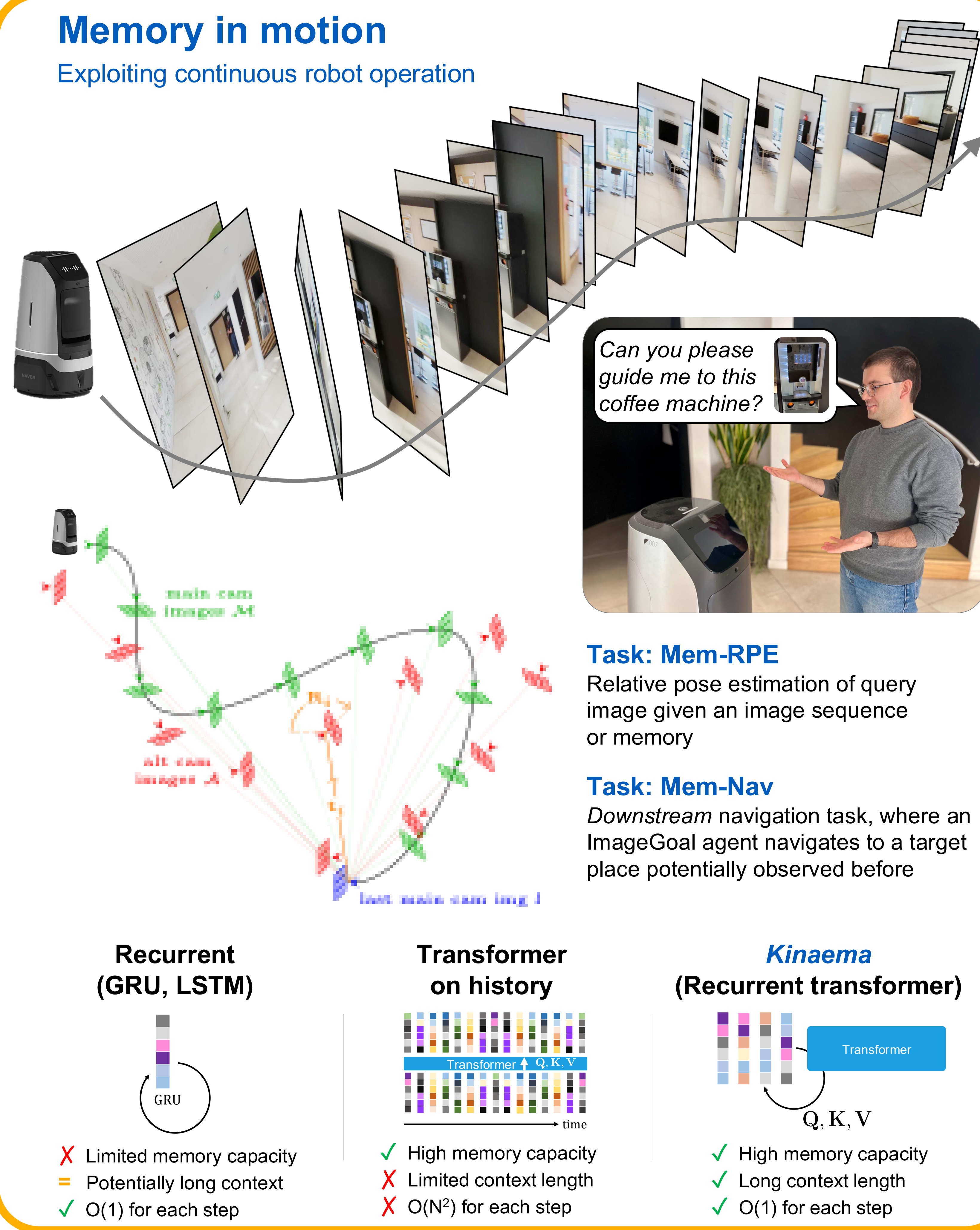
→ predict relative pose of query images with respect to any memory location.

Goal 3: Stability – integrate gating functions into recurrent transformer updates

Recurrent transformer model maintaining a latent memory of an observed scene

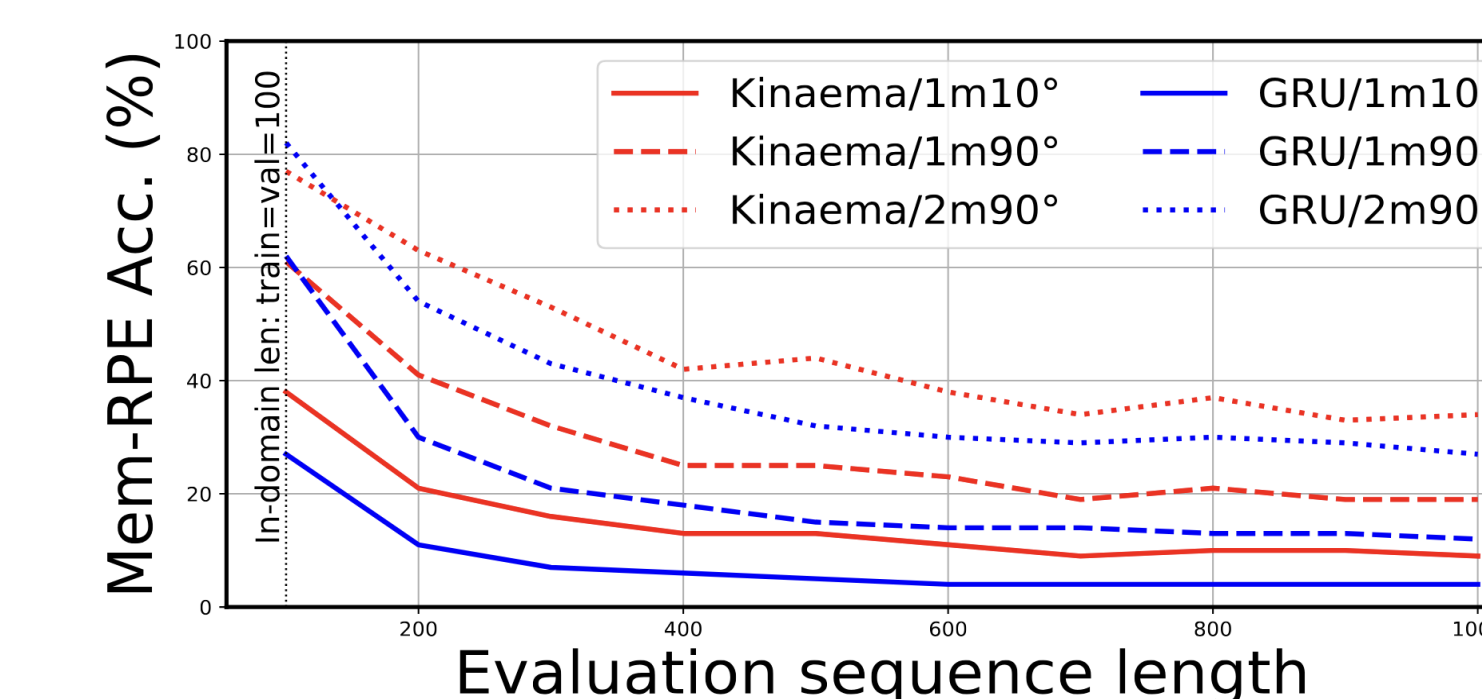


Exploiting continuous robot operation

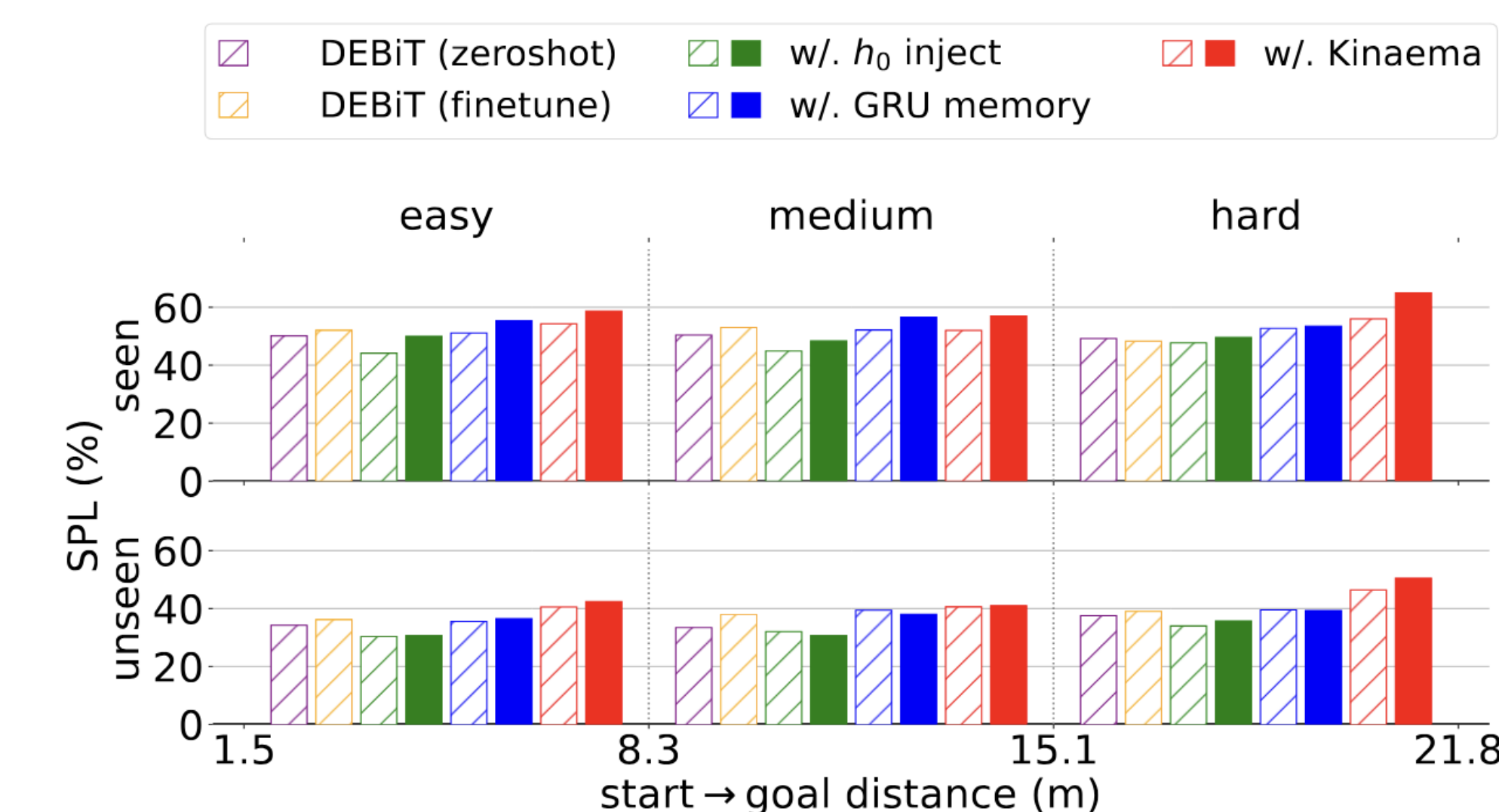


Mem-RPE – Pose estimation accuracy

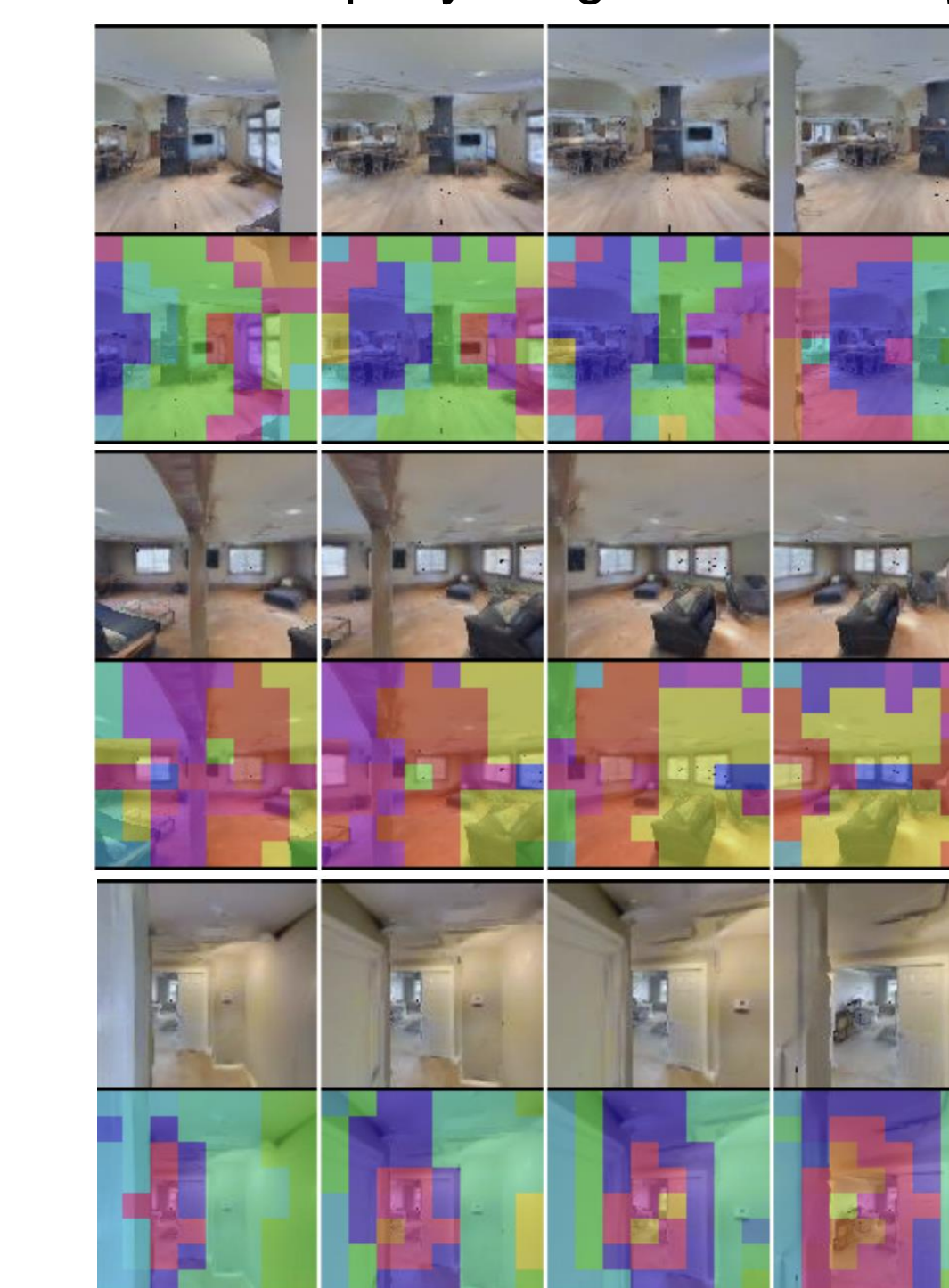
Model	Mem size	Obs ✓	Seq len 200			Seq len 800		
			1m 10%	1m 90%	2m 90%	1m 10%	1m 90%	2m 90%
<i>Trunc.Hist.</i>	41.6k	✓	2	11	28	1	6	16
MooG [36]	524.3k	✗	0	5	14	0	3	9
LRU [25]	3.1k	✗	4	18	34	2	9	20
EMA [34]	153.6k	✗	6	18	34	3	11	24
xLSTM [5]	2,359.3k	✗	8	23	47	5	13	29
GRU [16]	3.1k	✗	12	32	56	4	14	31
<i>Kinaema</i>	61.4k	✗	21	41	63	10	21	37



GRU and Kinaema are integrated into the baseline DEBiT agent, with (■) and without (□) priming sequence.
Kinaema is particularly useful to solve **hard nav episodes**, where start → goal distance > 15m



Between query image and memory

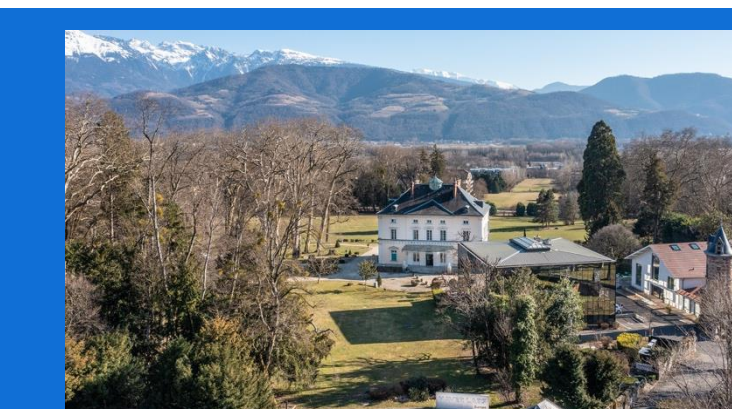


Probing network can infer scene structures from Mem-RPE pre-training

Avg IoU	Avg SR*	GT	
0.46	61.3		
0.46	56.8		

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