Learning Temporal Sentence Grounding in Narrated EgoVideos

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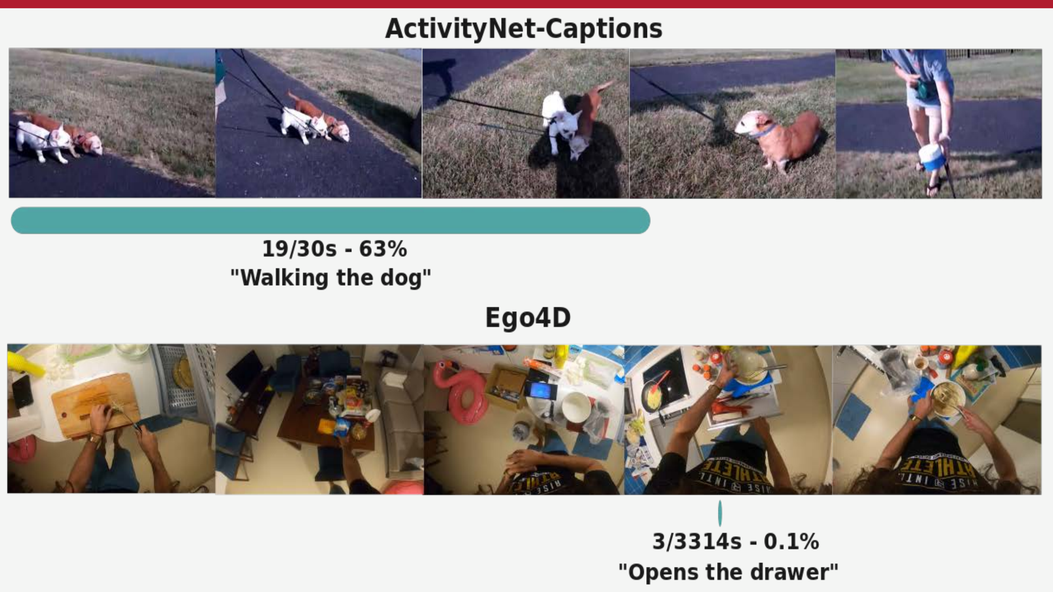
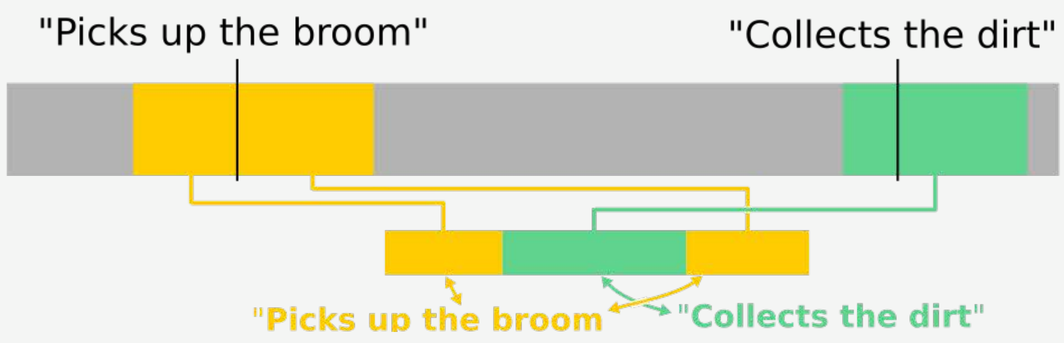
Motivation



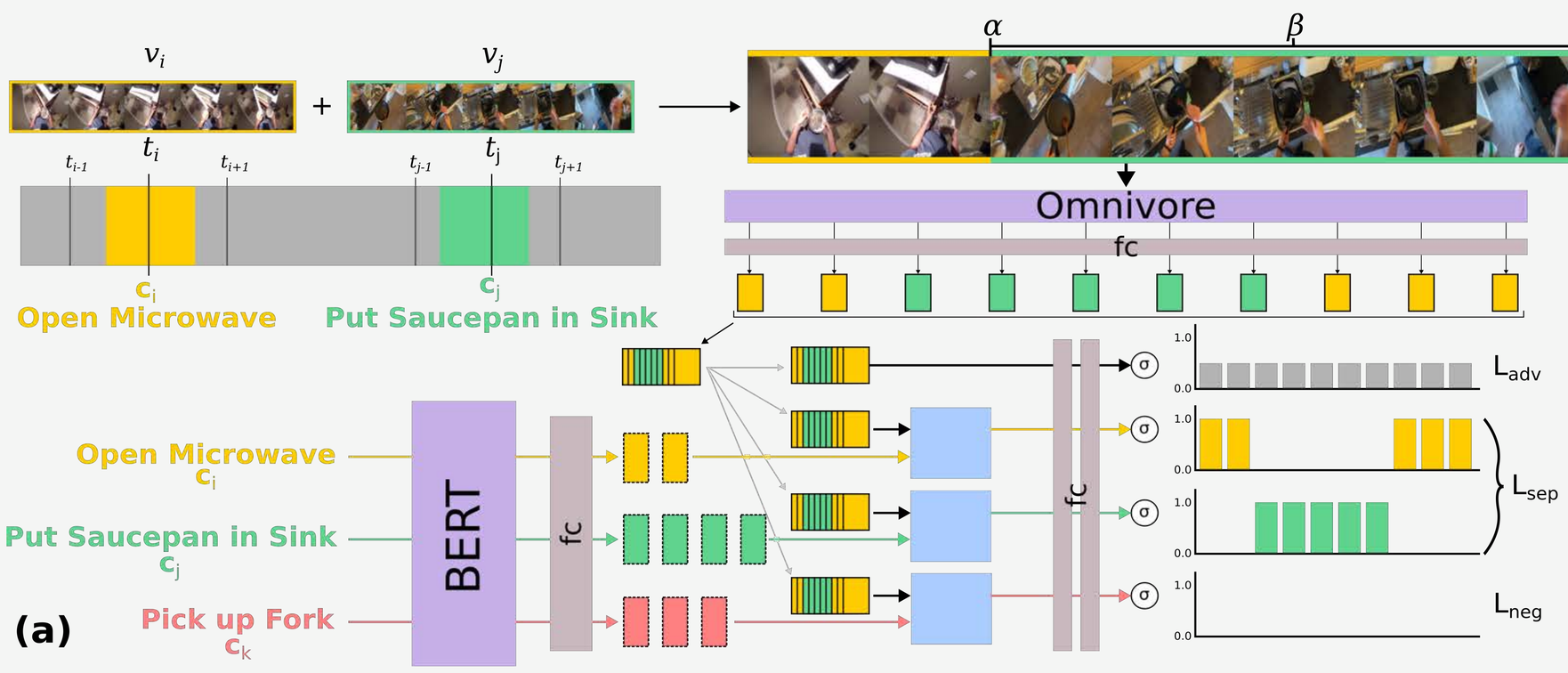
Comparison of Temporal Sentence Grounding Datasets

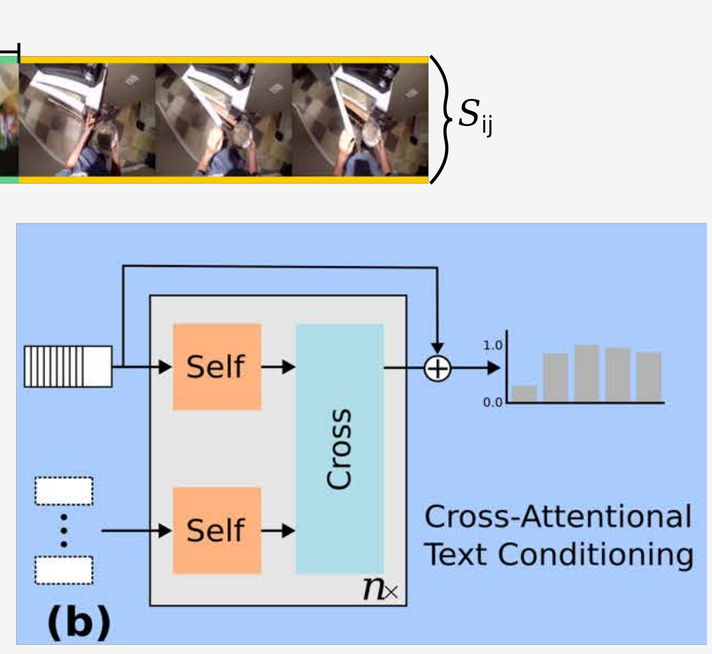
	Total Vid Duration	Avg. Vid Duration	Avg. Mom. Duration	Annotations / Video	Total Annotations	Avg. Coverage ↓
ANet-Captions [21]	487.6h	2.0min	37.1s	4.9	72k	30.90%
Charades-STA [14]	57.1h	0.5min	8.1s	2.3	16k	27.00%
DiDeMo [1]	88.7h	0.5min	6.5s	3.9	41k	21.70%
TACoS [40]	10.1h	4.8min	27.9s	143.6	18k	9.70%
Ego4D [17]	234.9h	17.3min	2.0s	214.1	223k	**0.19%**
EPIC-Kitchens [12]	73.4h	8.9min	3.1s	134.1	67k	0.58%

Clip Merging & Rough Timestamps

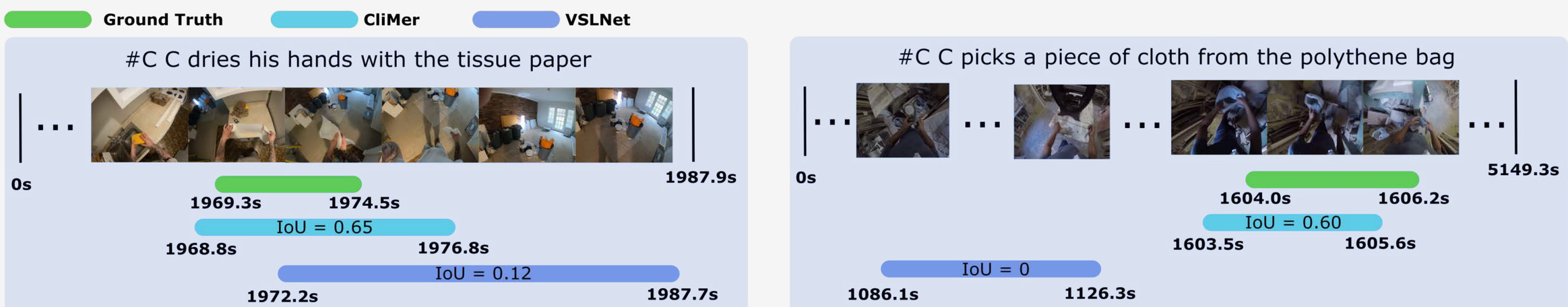


CliMer





Results - Qualitative



Results - Quantitative

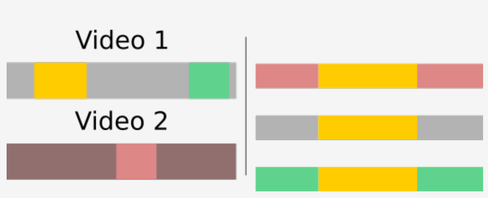
Ego4d

	IoU=0.1	IoU=0.3	IoU=0.5	mR
Random Baseline	0.47	0.09	0.02	0.19
VSLNet [50]	7.32	3.16	1.35	3.94
CliMer	**9.68**	**5.03**	**2.24**	**5.65**

EPIC-Kitchens

	IoU=0.1	IoU=0.3	IoU=0.5	mR
Random Baseline	0.78	0.13	0.03	0.31
VSLNet [50]	19.32	8.76	3.90	10.66
CliMer	**22.20**	**11.57**	**5.25**	**13.01**

Ablation - Clip Merging & Hard Negatives



Merged Segment	Hard Negatives	IoU=0.1	IoU=0.3	IoU=0.5	mR
✓	-	7.28	3.09	1.08	3.82
-	✓	7.23	4.42	2.20	4.62
✓	✓	**9.68**	**5.03**	**2.24**	**5.65**

Conclusion

- Clip merging proves to be an effective method of training using clips segmented from rough timestamps.

- We explore Ego4D and EPIC-Kitchens for Temporal Sentence Grounding showcasing their difficulty.

- Qualitatively CliMer shows a better ability to pick out precise moments for given sentence queries.