Dialogue Discourse-Aware Graph Model and Data Augmentation for Meeting Summarization

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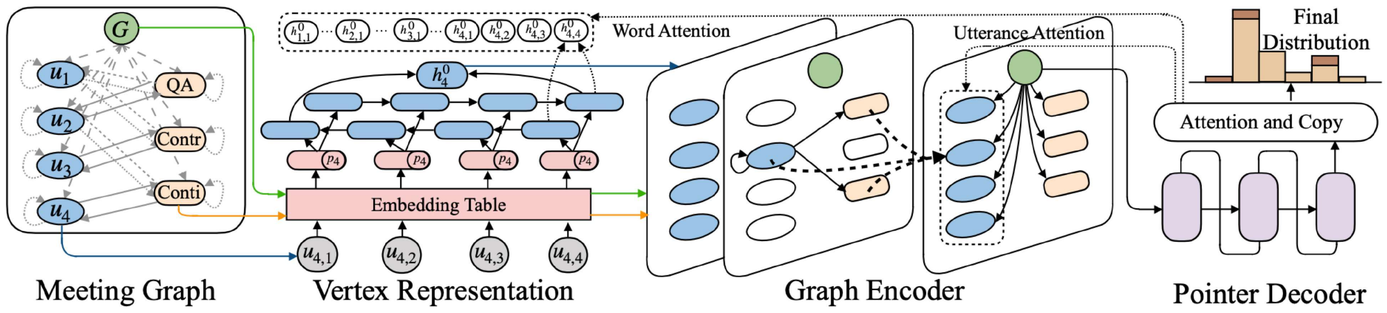
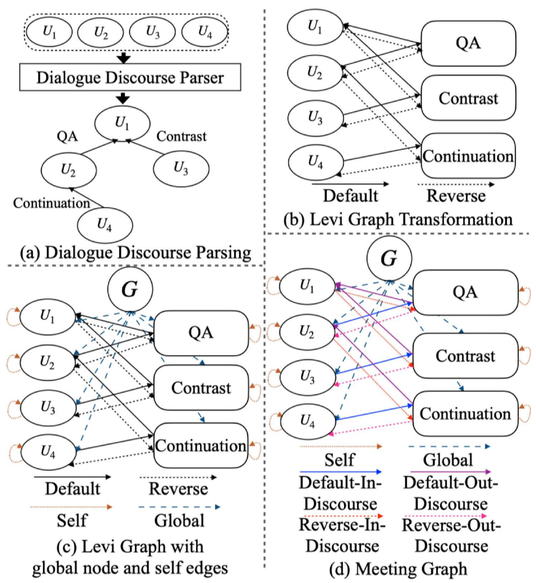
Introduction

- **Meeting Summarization**
  - Distill the most important information from a recorded meeting into a short textual passage.
- **Problems**
  - Sequential text modeling: hinder the exploration of rich interactive relations between utterances.
  - Lack of sufficient training data: hinder the ability of data-hungry neural models.
- **Solution: dialogue discourse**
  - Dialogue Discourse-Aware Meeting Summarizer: model utterances and discourse in a graph interaction manner.
  - Dialogue Discourse-Aware Data Augmentation: construct a pseudo-summarization corpus based on QA discourse.

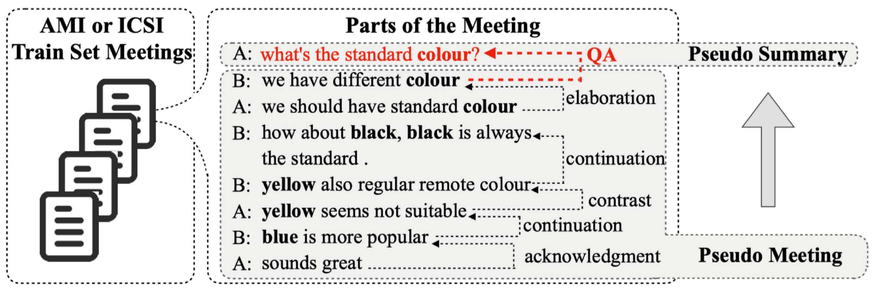
Dialogue Discourse-Aware Meeting Summarizer



Meeting Graph



Dialogue Discourse-Aware Data Augmentation



Conclusion

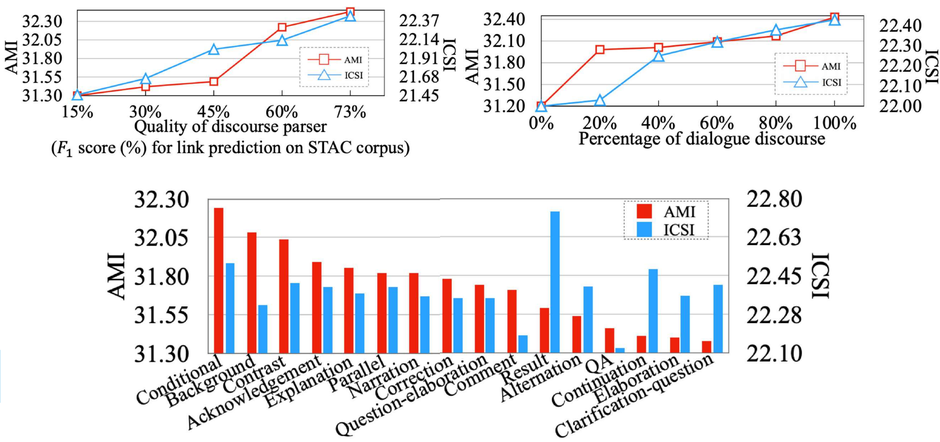
- We make the first attempt to successfully explore dialogue discourse to model the utterances interactions for meeting summarization;
- We devise a dialogue discourse-aware data augmentation strategy to alleviate the data insufficiency problem;
- Extensive experiments show that our model achieves SOTA performance.

Experiments

Automatic Evaluation

	Model	AMI R-1	AMI R-2	AMI R-L	ICSI R-1	ICSI R-2	ICSI R-L
Extractive	TextRank [Mihalcea and Tarau, 2004]	35.19	6.13	15.70	30.72	4.69	12.97
	SummaRunner [Nallapati *et al.*, 2017]	30.98	5.54	13.91	27.60	3.70	12.52
Abstractive	UNS [Shang *et al.*, 2018]	37.86	7.84	13.72	31.73	5.14	14.50
	Pointer-Generator [See *et al.*, 2017]	42.60	14.01	22.62	35.89	6.92	15.67
	HRED [Serban *et al.*, 2016]	49.75	18.36	23.90	39.15	7.86	16.25
	Sentence-Gated [Goo and Chen, 2018]	49.29	19.31	24.82	39.37	9.57	17.17
	TopicSeg [Li *et al.*, 2019]	51.53	12.23	25.47	-	-	-
	HMNet [Zhu *et al.*, 2020]	52.36	18.63	24.00	**45.97**	10.14	18.54
Ours	DDAMS	51.42	20.99	24.89	39.66	10.09	17.53
	DDAMS + DDADA	**53.15**	**22.32**	**25.67**	40.41	**11.02**	**19.18**
	DDAMS + DDADA (w/o fine-tune)	28.35	4.67	14.92	25.94	4.18	13.92

Analyses



Effect of Meeting Graph

	Model	R-1	R-2	R-L
AMI	DDAMS	51.42	**20.99**	**24.89**
	DDAMS (w/ Levi graph)	**51.46**	20.75	24.31
ICSI	DDAMS	**39.66**	**10.09**	**17.53**
	DDAMS (w/ Levi graph)	39.20	9.54	17.48

Effect of Pseudo Data

	Model	R-1	R-2	R-L
AMI	DDAMS	51.42	20.99	24.89
	+ RBDA	52.94	21.96	25.05
	+ DDADA	**53.15**	**22.32**	**25.67**
ICSI	DDAMS	39.66	10.09	17.53
	+ RBDA	39.42	10.60	18.19
	+ DDADA	**40.41**	**11.02**	**19.18**

Paper

Code

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