

Initiative-Aware Self-Supervised Learning for Knowledge-Grounded Conversations

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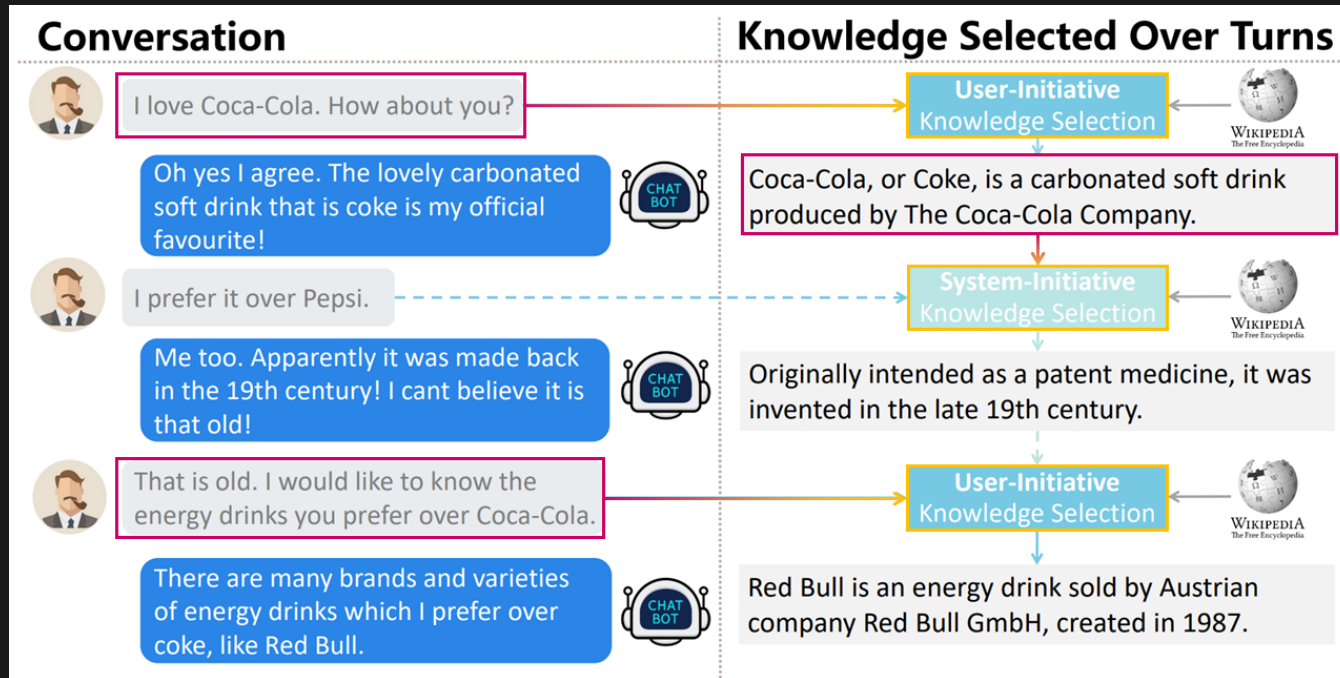
Introduction

In Knowledge-Grounded Conversations (KGC) tasks, external knowledge is used to generate more informative responses.

The method of selecting the required knowledge is an important part of KGC.

The conversation may be driven by the user or the system.

Introduction(cont.)

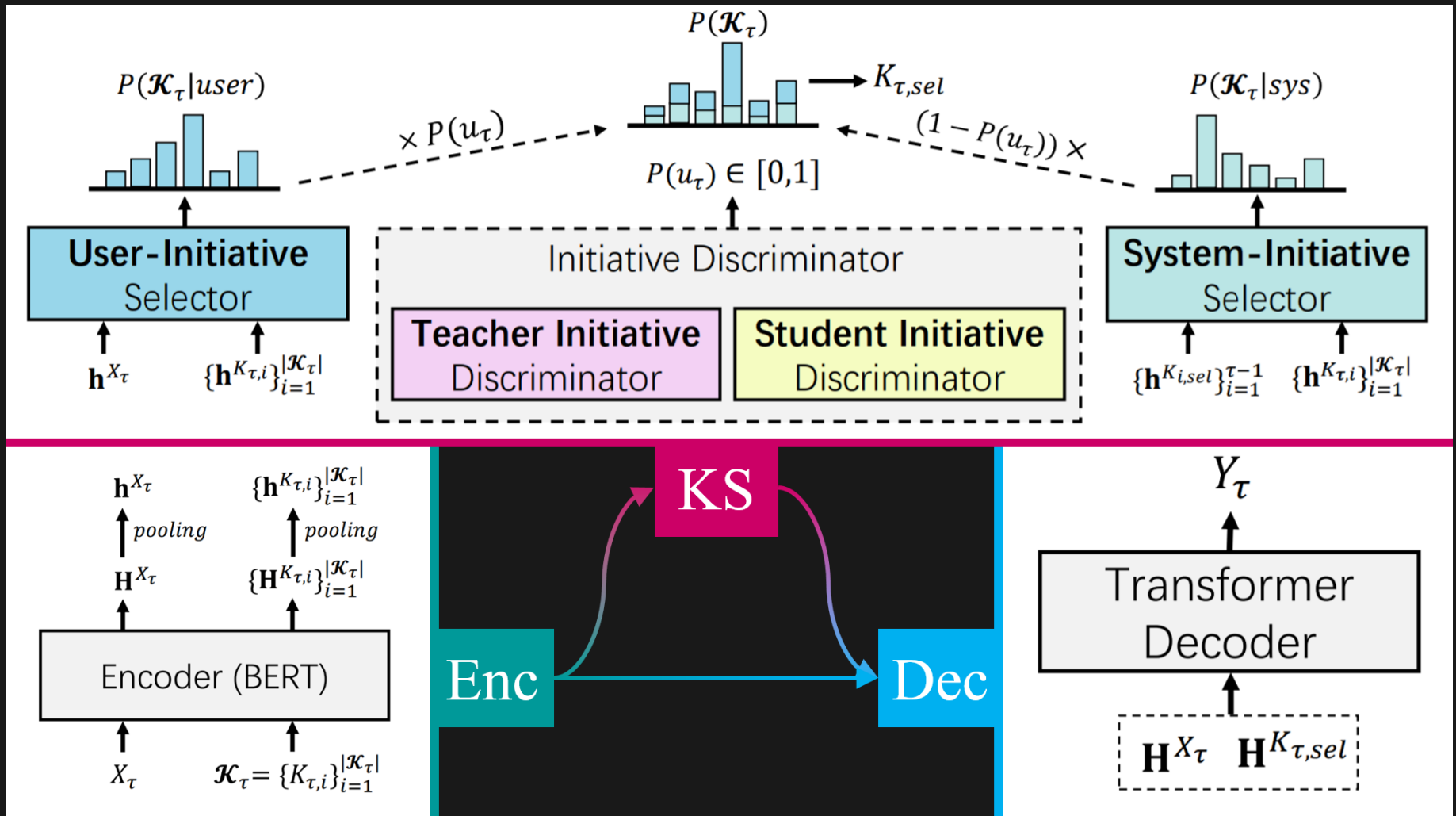


Explicitly distinguishes between user-initiative and system-initiative knowledge selection.

Introduction(cont.)

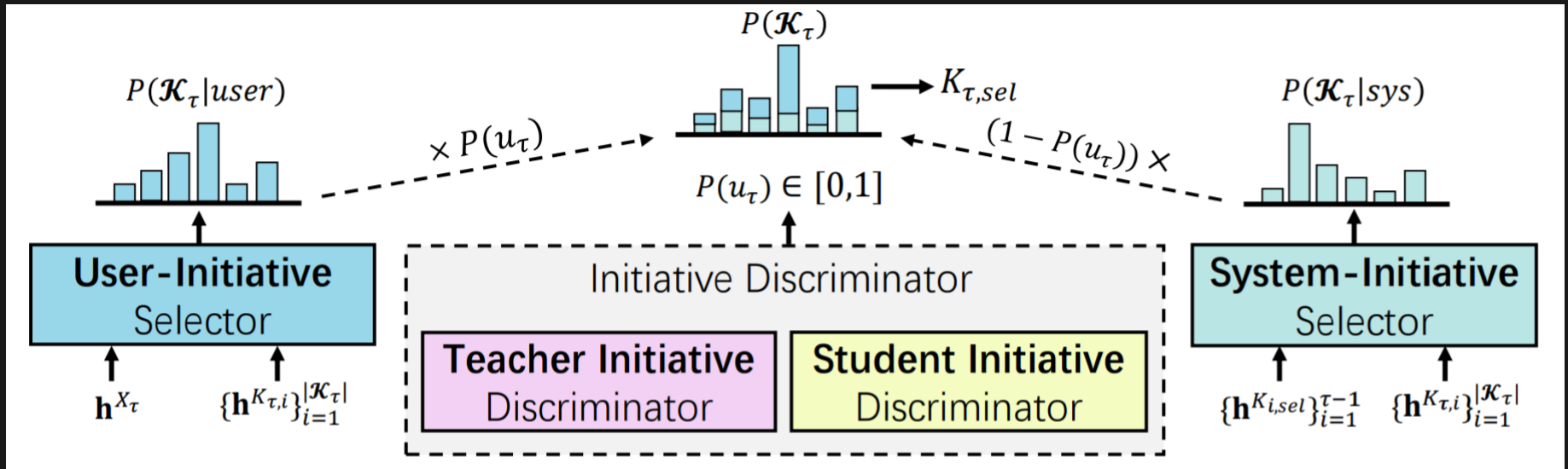
- User's Initiative
Based on **New Topics** or **Questions** posed by the user
- System's Initiative
Based on **The Previously Selected Knowledge**

Architecture

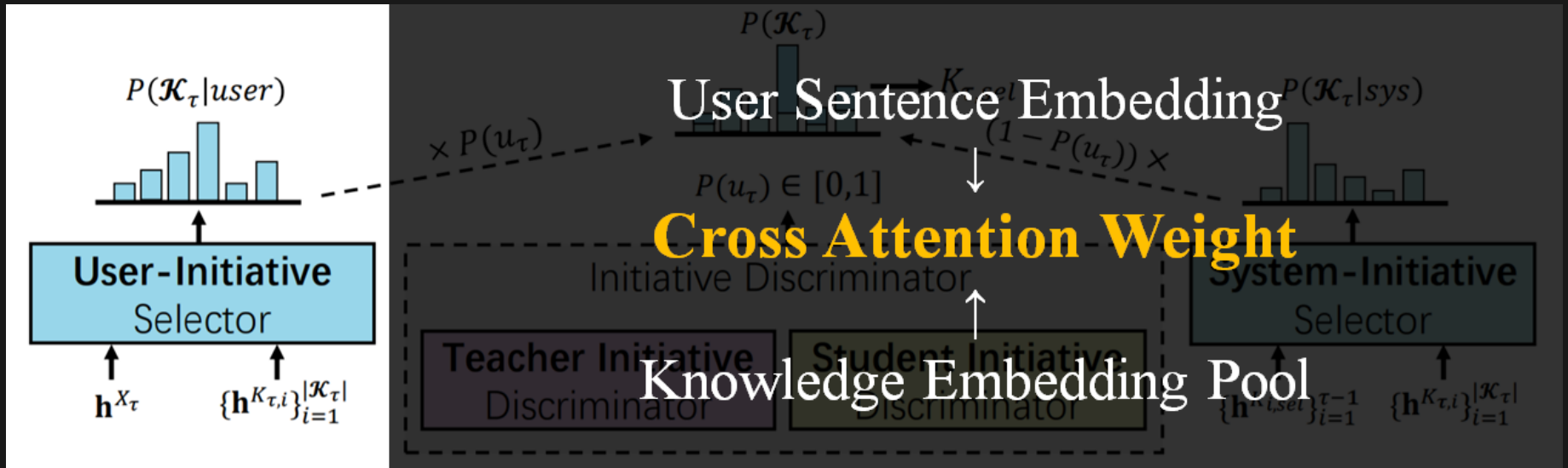


MIKe

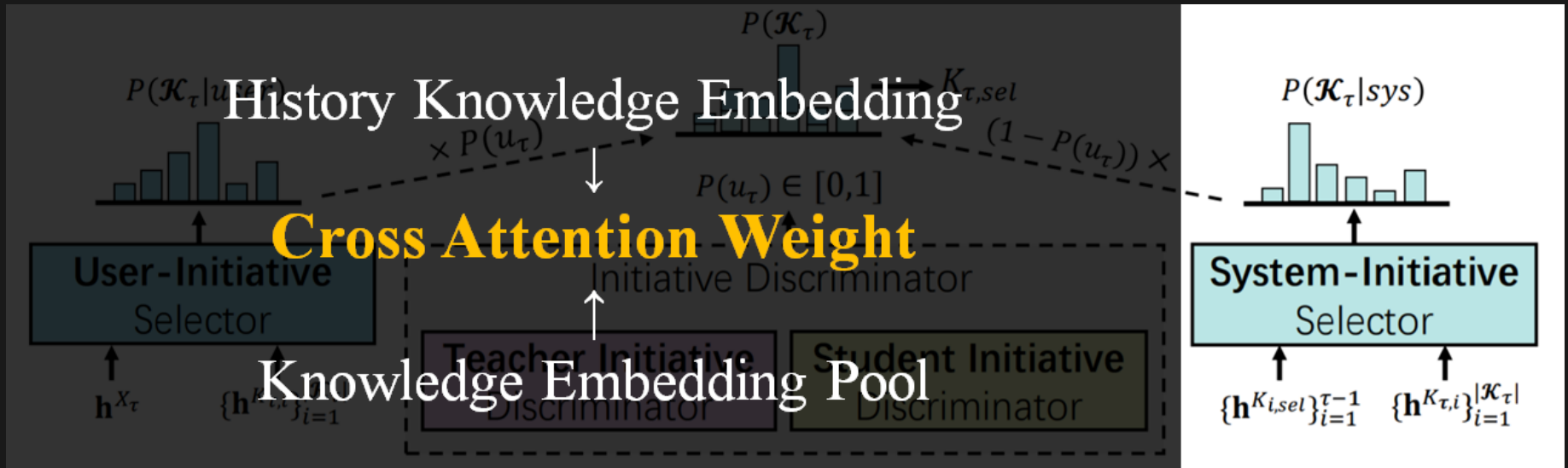
Mixed-Initiative Knowledge Selection Method



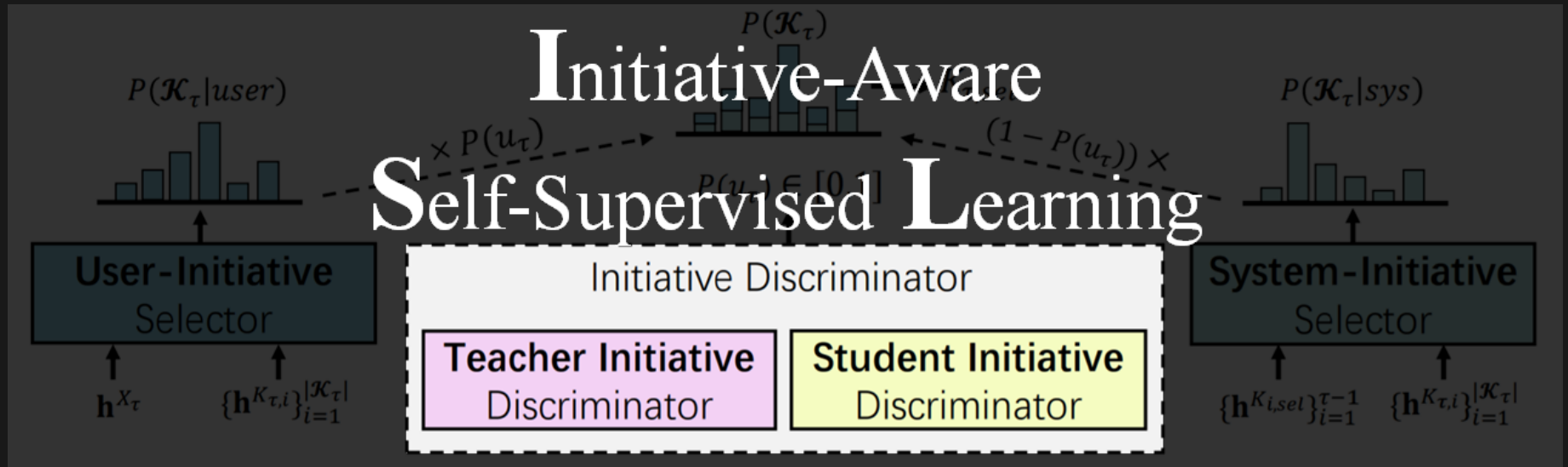
MIKe(cont.)



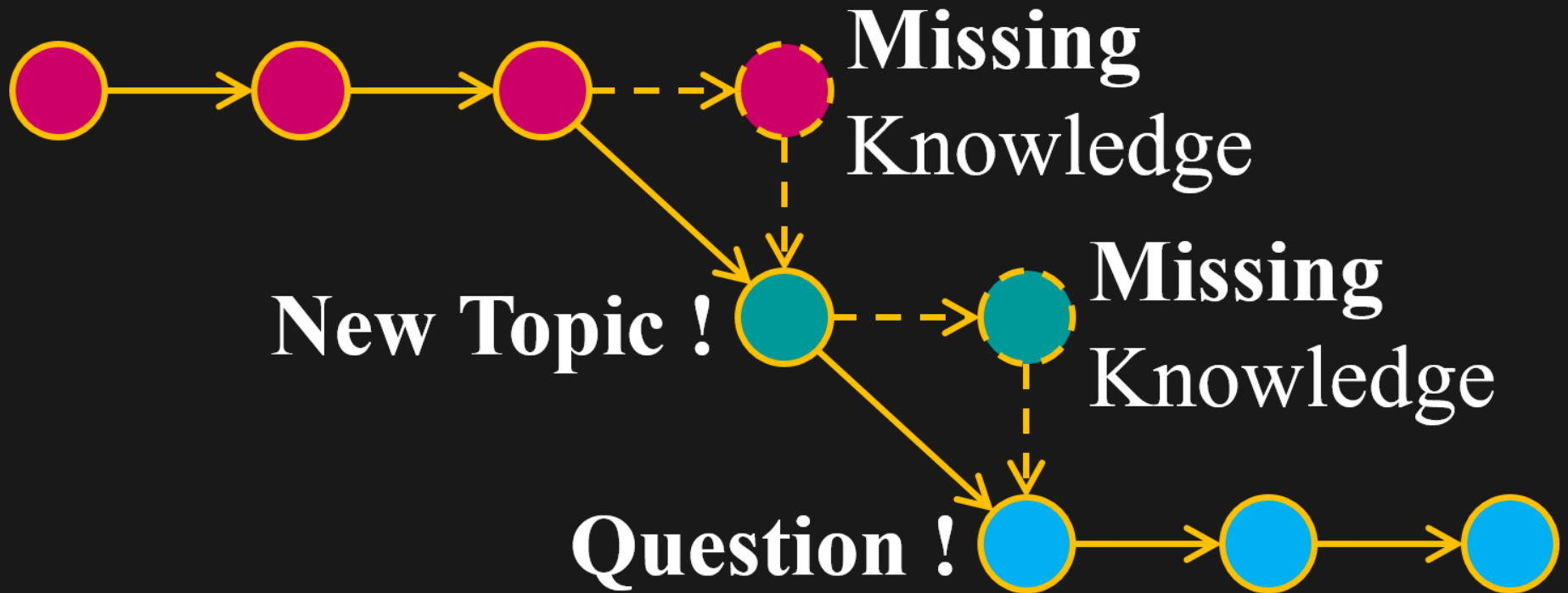
MIKe(cont.)



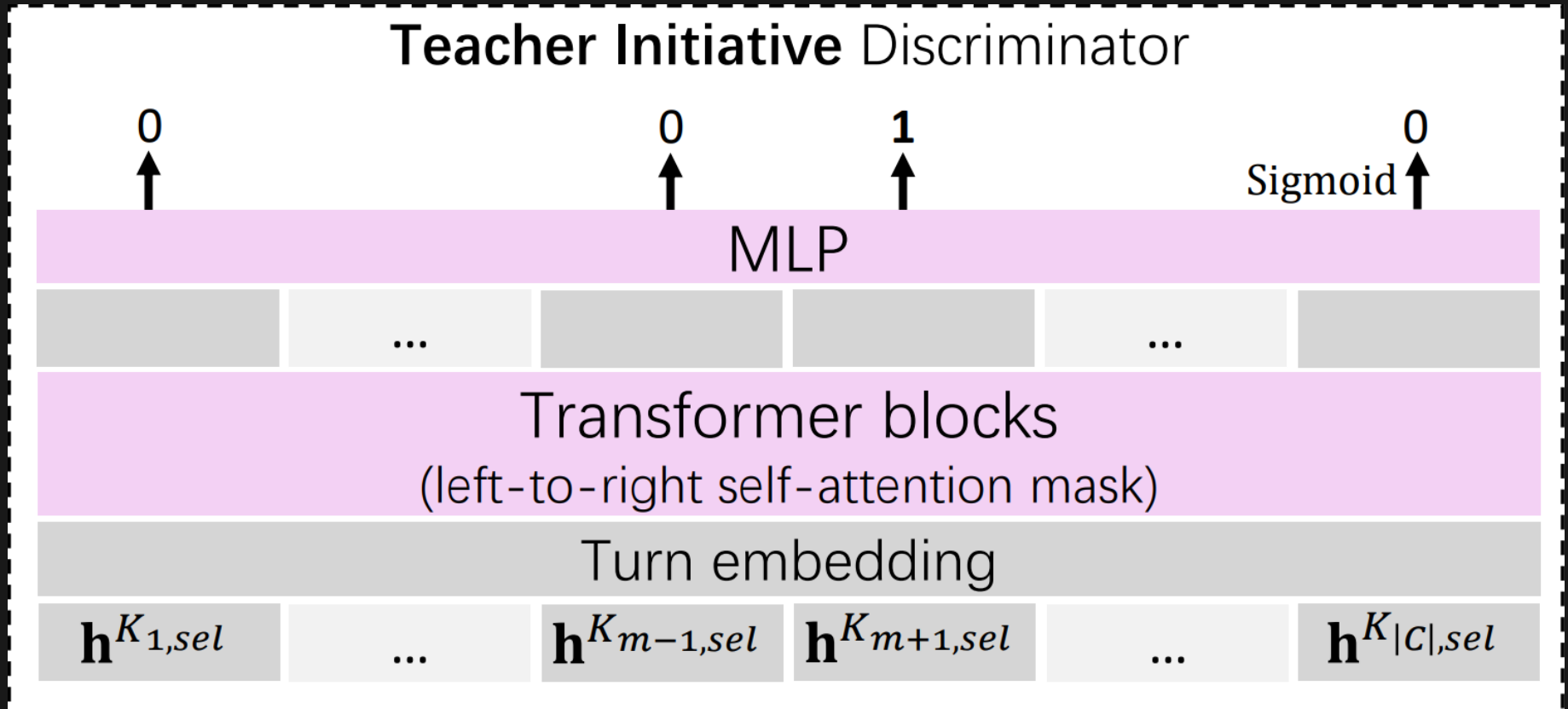
ISLe



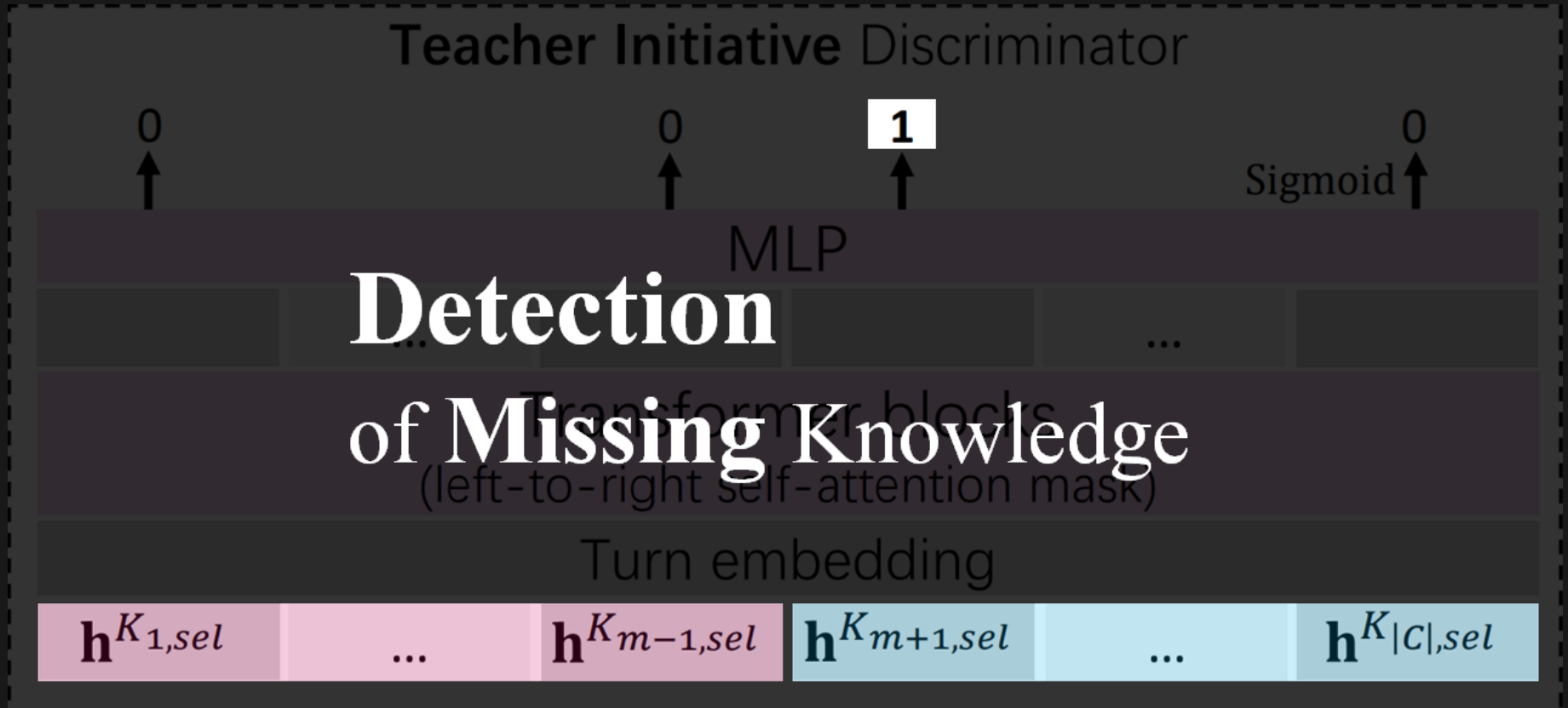
ISLe(cont.)



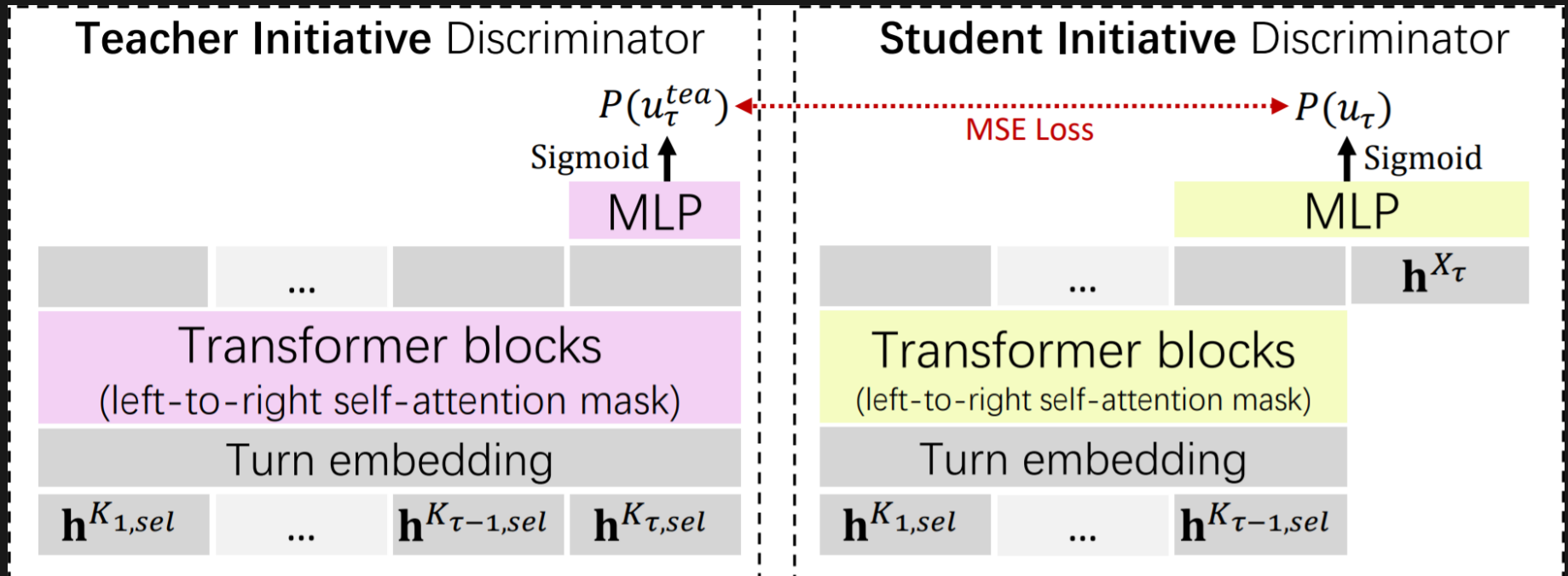
ISLe(cont.)



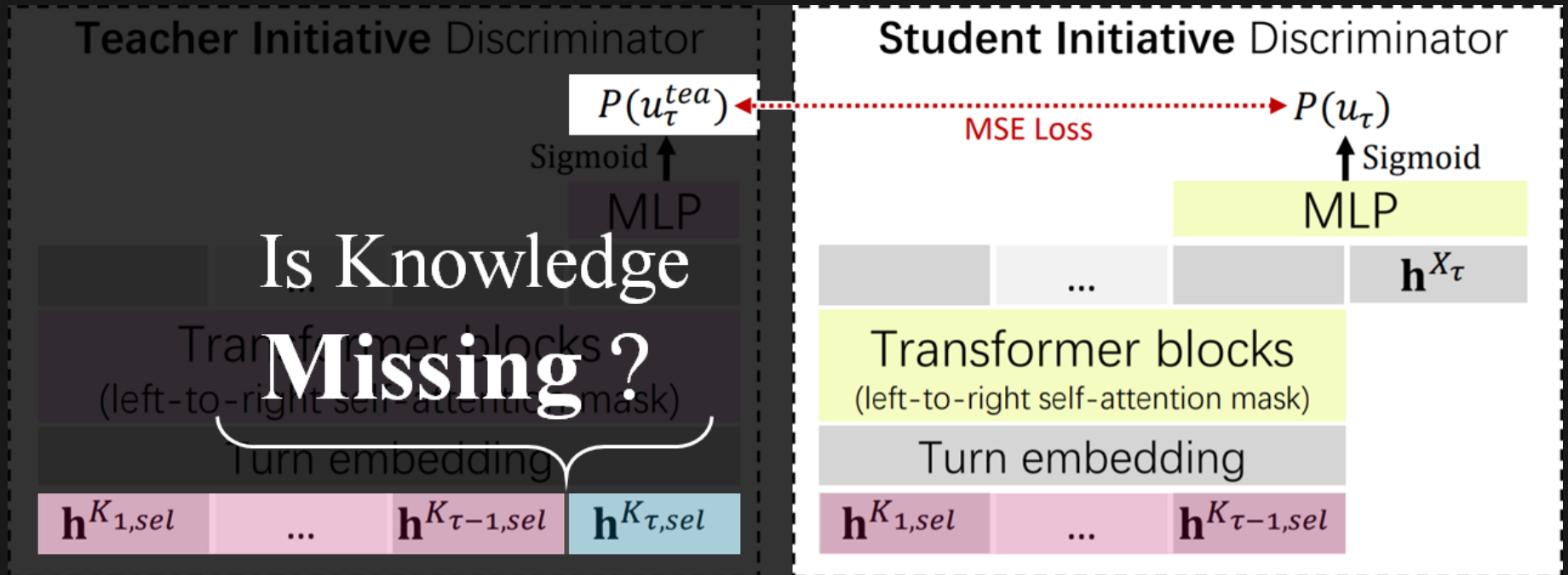
ISLe(cont.)



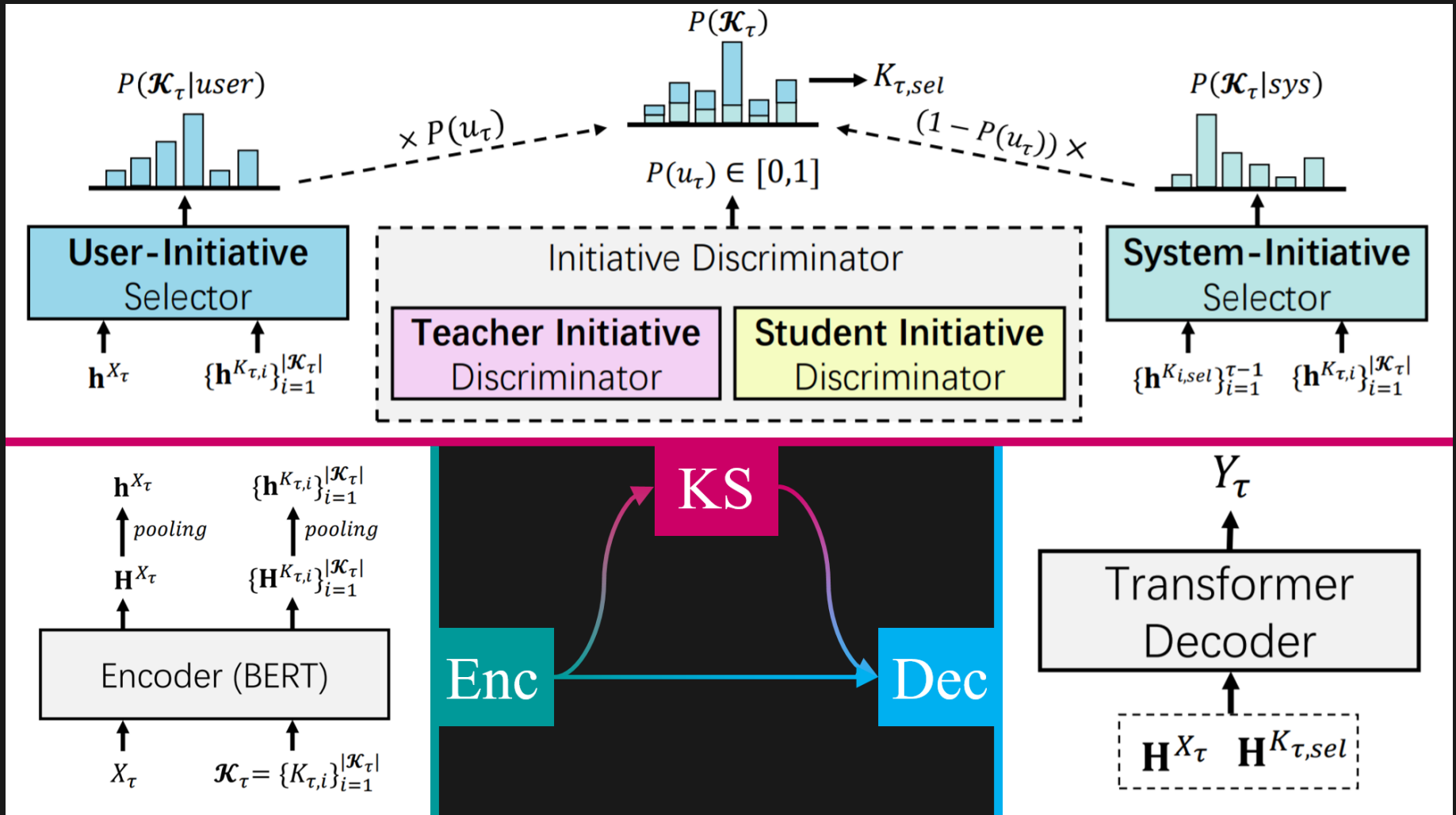
ISLe(cont.)



ISLe(cont.)



Architecture(review)



Evaluation

on the WoW dataset

Methods	Test Seen (%)					
	BLEU-4	METEOR	ROUGE-1	ROUGE-2	ROUGE-L	R@1
PostKS + BERT	0.77	14.16	22.68	4.27	16.59	4.83
TMemNet + BERT	1.61	15.47	24.12	4.98	17.00	23.86
SKT	1.76	16.04	24.61	5.24	17.61	25.36
DiffKS + BERT	2.22	16.82	24.75	6.27	17.90	25.62
DukeNet	2.43	17.09	25.17	6.81	18.52	26.38
SKT+PIPM+KDBTS	2.47	17.14	25.19	7.01	18.47	27.40
MIKe (ours)	2.78	17.76	25.40	7.11	18.78	28.41
MIKe-ISLe	2.63	17.22	25.15	6.97	18.67	27.52
MIKe-ISLe-ID	2.48	17.28	24.90	6.64	18.24	26.58
MIKe-ISLe-ID-UIS	1.70	15.88	24.37	5.17	17.33	23.95
MIKe-ISLe-ID-SIS	1.68	15.76	24.33	5.08	17.21	23.88

Evaluation(cont.)

on the WoW dataset

Methods	Test Unseen (%)					
	BLEU-4	METEOR	ROUGE-1	ROUGE-2	ROUGE-L	R@1
PostKS + BERT	0.39	12.59	20.82	2.73	15.25	4.39
TMemNet + BERT	0.60	13.05	21.74	3.63	15.60	16.33
SKT	1.05	13.74	22.84	4.40	16.05	18.19
DiffKS + BERT	1.69	14.69	23.62	5.05	16.82	20.11
DukeNet	1.68	15.06	23.34	5.29	17.06	19.57
SKT+PIPM+KDBTS	1.71	14.83	23.56	5.46	17.14	20.20
MIKe (ours)	2.00	15.64	23.78	5.61	17.41	21.47
MIKe-ISLe	1.67	15.38	23.42	5.28	17.04	20.44
MIKe-ISLe-ID	1.46	14.70	22.87	5.16	16.36	19.35
MIKe-ISLe-ID-UIS	0.89	13.68	22.17	4.09	15.98	16.67
MIKe-ISLe-ID-SIS	0.87	13.44	22.01	3.88	15.79	15.99

Initiative Discrimination Evaluation

Methods	Test Seen (%)			Test Unseen (%)		
	M-F1	U-F1	S-F1	M-F1	U-F1	S-F1
MIKe	62.87	61.79	63.95	61.79	61.10	62.48
MIKe-ISLe	51.04	60.59	41.49	47.29	60.89	33.69
Heuristic	51.74	48.16	55.31	52.69	49.52	55.86

Initiative Discrimination Evaluation(cont.)

Heuristic Method

- **User Initiative**

The current user utterance contains a question mark or begins with a question word.

- **System Initiative**

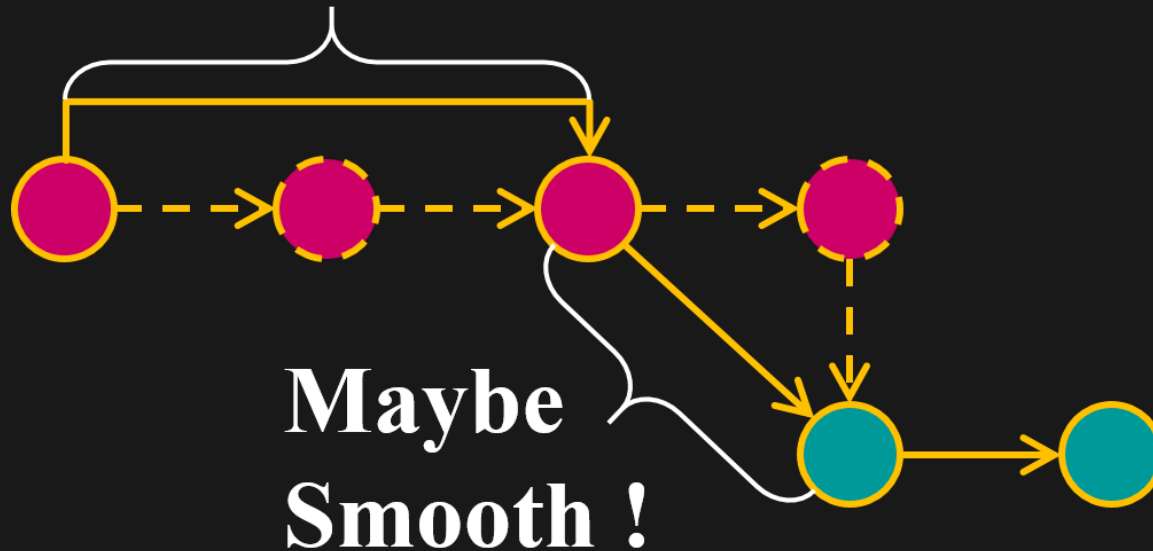
Other

Conclusion

- With the help of ISLe, the accuracy of KS has been significantly improved.
- There is still a large room for improvement in distinguishing initiative types.

Conclusion(cont.)

**Maybe
Smooth !**



Unable to determine switching point.

Thanks for your attention.