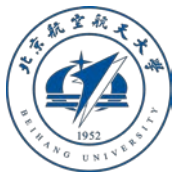


You Impress Me: Dialogue Generation via Mutual Persona Perception

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Outline

- Background
- Motivation
- Method
- Experiment
- Conclusion



Background

- *Personalized Dialogue Generation* states a scenario where two interlocutors meet for the first time and have a conversation to get to know each other.



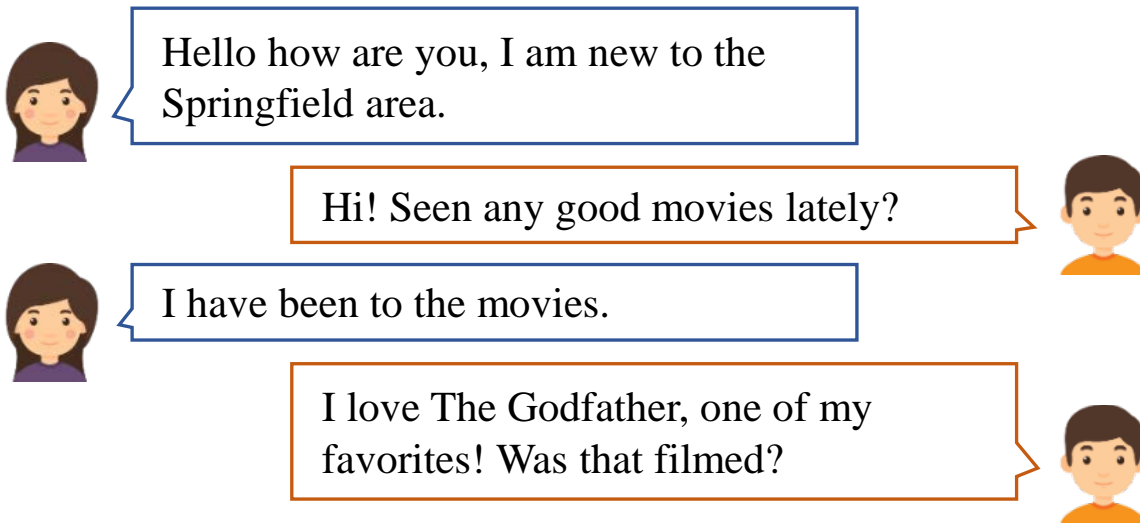
Hello how are you, I am new to the Springfield area.

Hi! Seen any good movies lately?



Background

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Background

- *Personalized Dialogue Generation* states a scenario where two interlocutors meet for the first time and have a conversation to get to know each other.
- Their persona are explicitly described using several profile sentences.



Persona

I bought my first home.
I love to barbecue.
I live in Springfield.
I'm a writer.



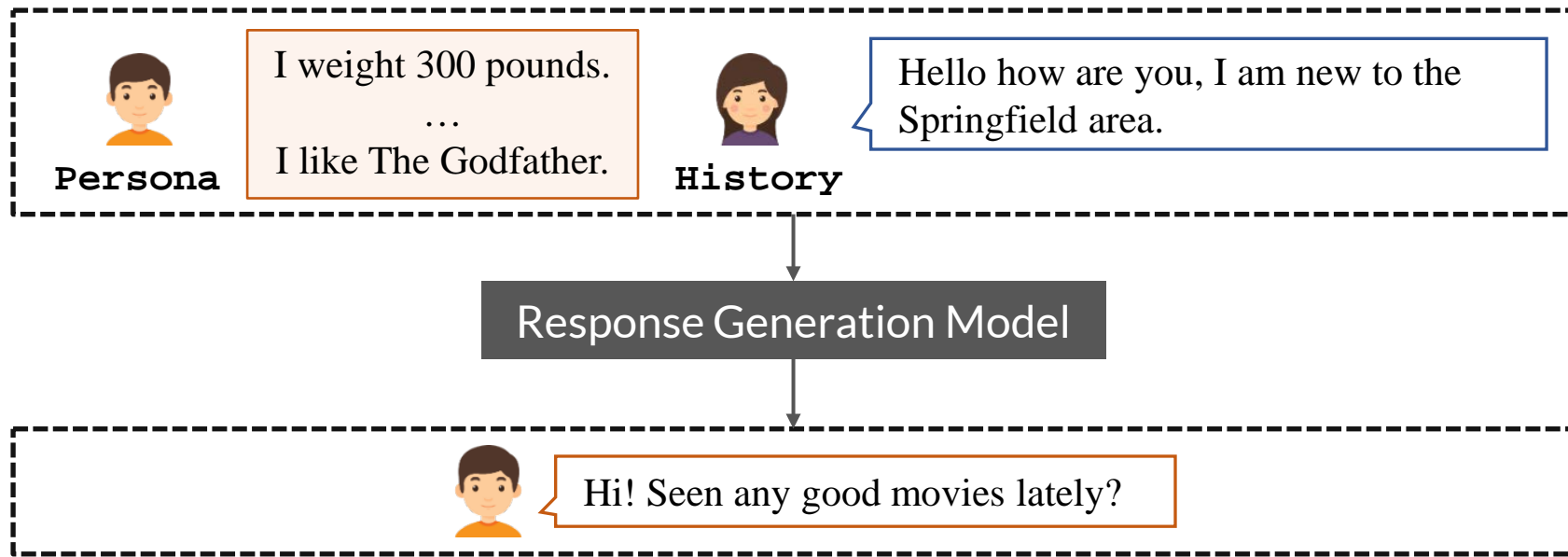
Persona

I weight 300 pounds.
I am not healthy.
I am a man.
I like The Godfather.



Background

- Imposing such an explicit persona facilitates the training of model with configurable and persistent personalities (Zhang et al. 2018).



Motivation

- Existing works (Wolf et al. 2019) on personalized dialogue generation demonstrate promising results, and they usually focus more on mimicking human-like responses, leaving understudied the aspects of modeling understanding between interlocutors.



Motivation

- However, the understanding between interlocutors (i.e. persona perception) is essential for a high-quality conversation.



I don't believe so. I don't watch movies more of a writer.



OK... I know she is a writer

Rellay? He is not very healthy...



What do you write? Any diet books ? I am not very healthy.



- More understanding means more personalized information conveyed by the dialogue 🔥, making a higher quality.



Method


- Based on the above intuition, we propose a *transmitter-receiver* framework to facilitate dialogue generation via the understanding of persona.

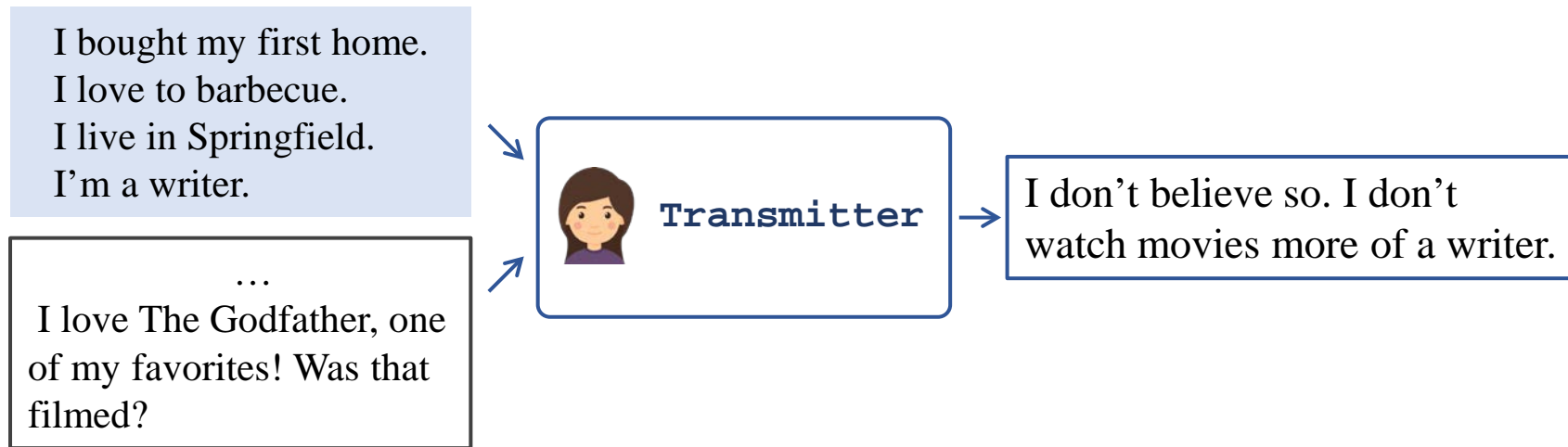


What are Transmitter and Receiver?



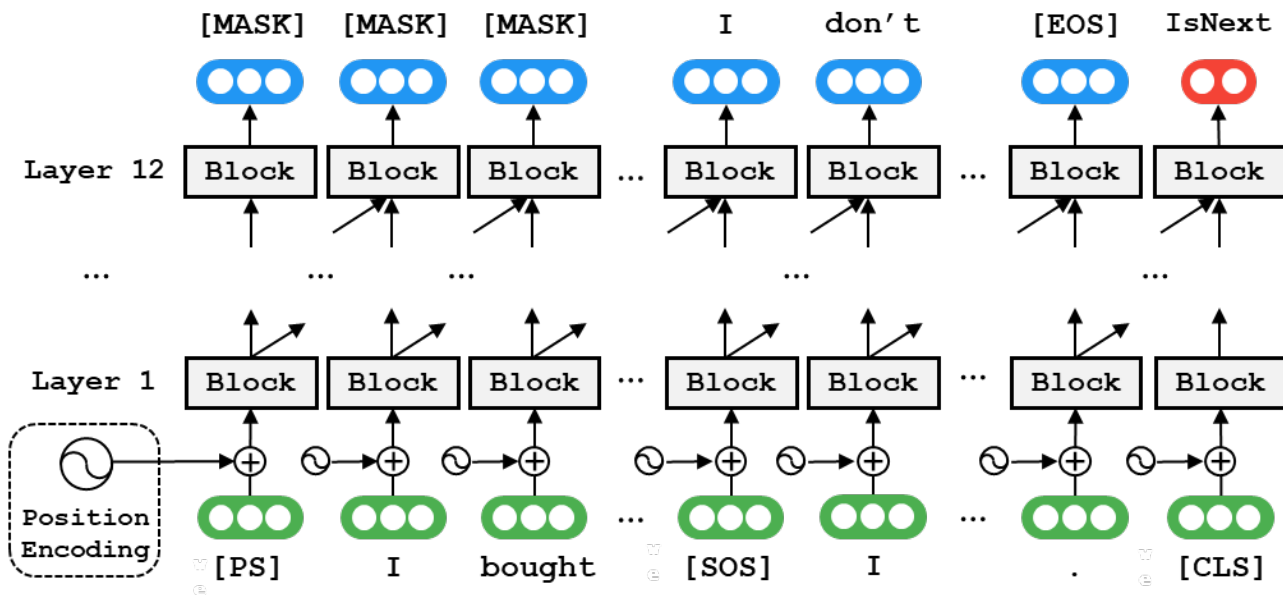
Method

- Based on the above intuition, we propose a *transmitter-receiver* framework to facilitate dialogue generation via the understanding of persona.
-  **Transmitter** is responsible for dialogue generation. It accepts the persona and the dialogue history as input, and aims to generate the response.




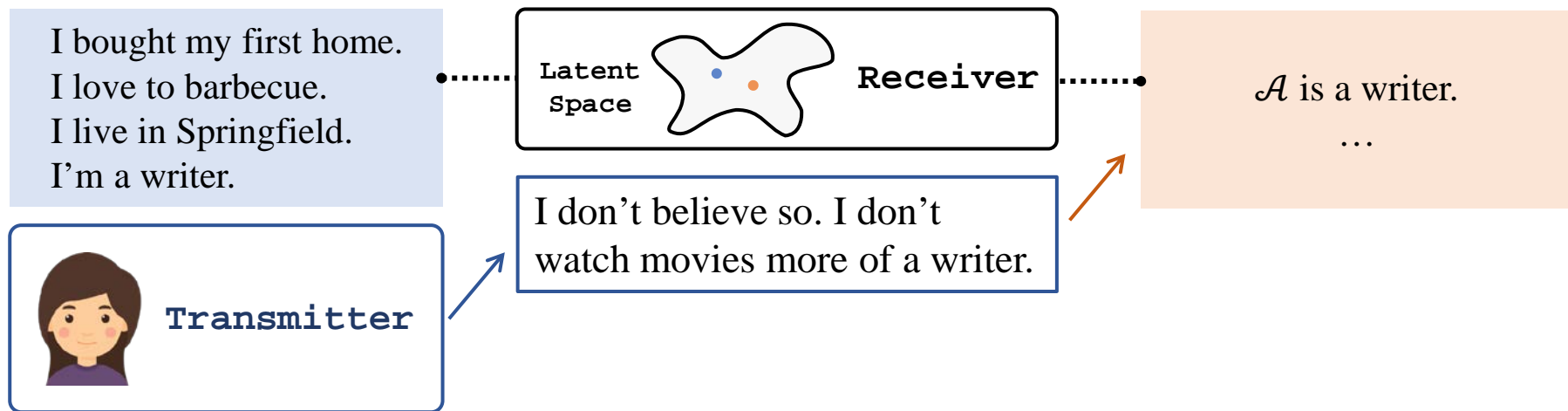
Method

- ✈ Transmitter follows the GPT architecture (Radford et al. 2018).



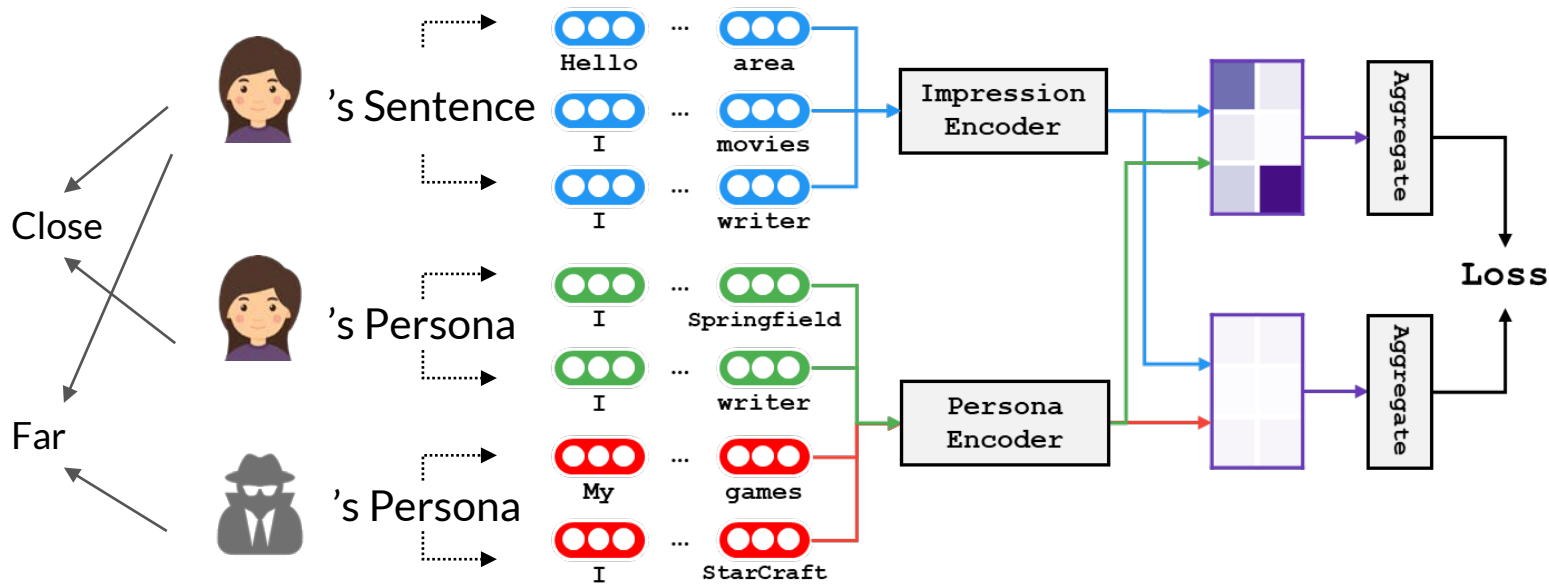
Method

- Based on the above intuition, we propose a *transmitter-receiver* framework to facilitate dialogue generation via the understanding of persona.
-  **Receiver** is responsible for persona perception (i.e. understanding).



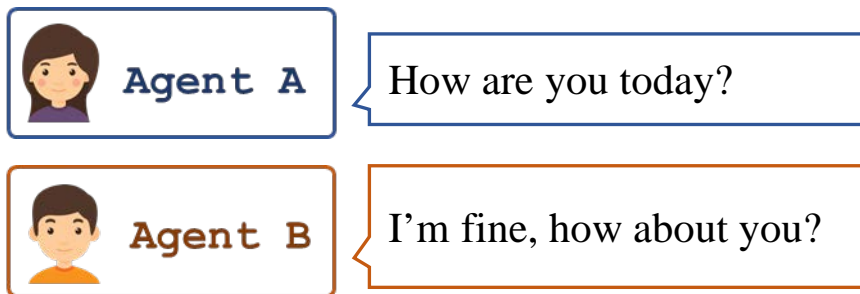
Method

- ↓ **Receiver** is devised to learn the proximity between sentences and persona by a contrastive learning paradigm.



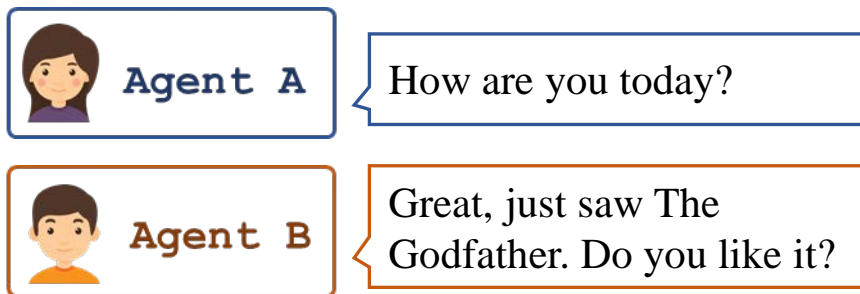
Method

- Transmitter is fine-tuned during a *self-play procedure* (Lewis et al. 2017) with persona perception as a kind of reward.
- We have two Transmitters (Agent A & B) communicate for several turns. Then we collect rewards to give feedback, part of which is provided by Receiver.



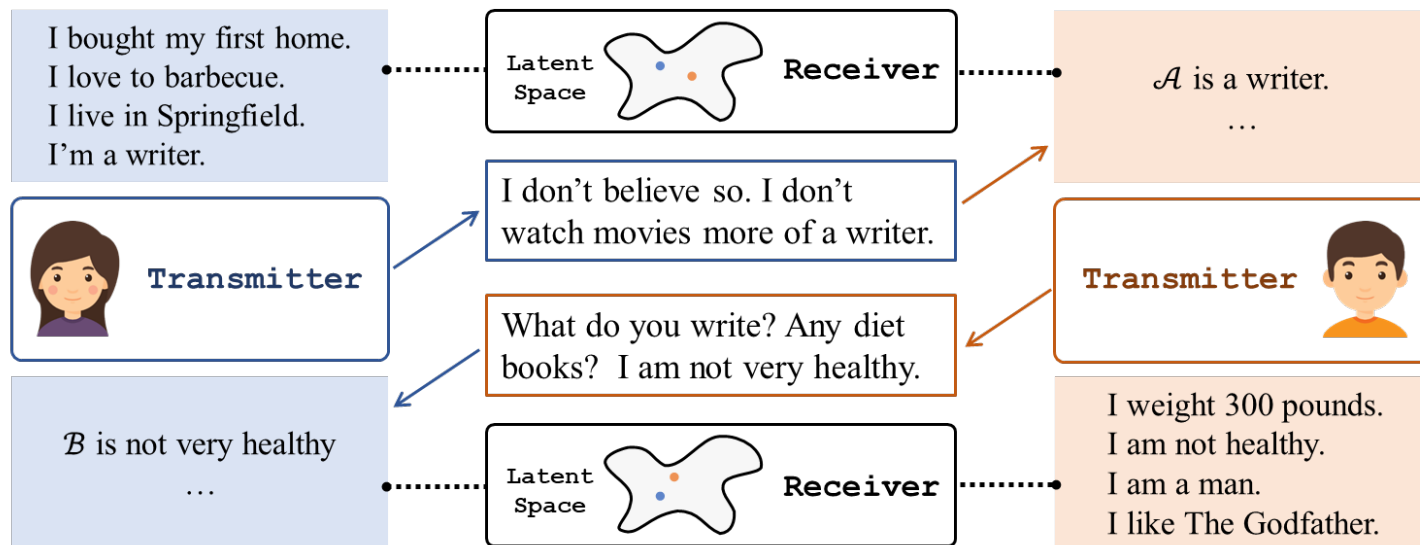
Method

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Method

- Considering both ends of two interlocutors, we enhance dialogue generation via mutual persona perception.



Experiment

- We conduct experiments on the Persona-Chat dataset (*Original & Revised*).

Category	Model	Original			Revised		
		Hits@1(%)↑	ppl↓	F1(%)↑	Hits@1(%)↑	ppl↓	F1(%)↑
Retrieval	KV Profile Memory	54.8	-	14.25	38.1	-	13.65
	Dually Interactive Matching	78.8	-	-	70.7	-	-
Generative	Generative Profile Memory	10.2	35.01	16.29	9.9	34.94	15.71
	Language Model	-	50.67	16.30	-	51.61	13.59
	SEQ2SEQ-ATTN	12.5	35.07	16.82	9.8	39.54	15.52
Pretrain Fintune	Lost In Conversation	17.3	-	17.79	16.2	-	16.83
	Transfertransfo	82.1	17.51	19.09	-	-	-
	\mathcal{P}^2 BOT (Our)	81.9 [0.1]	15.12 [0.16]	19.77 [0.08]	68.6 [0.2]	18.89 [0.11]	19.08 [0.07]



Experiment



Persona



context

I've an allergy to water.
I'm a famous twitch streamer.
I helped design the game StarCraft.
I am working on building a robot to be my body double.

Cool. I did hardcore exercise four hours everyday.

Human

That's a lot of exercising. I hate exercising. I just work on my robot most days.

Lost In Conversation

That sounds like a lot of fun!

Transfertransfo

I work at a computer company. I could make you an Android!



Our

I do not exercise at all. I'm busy with my robot project.



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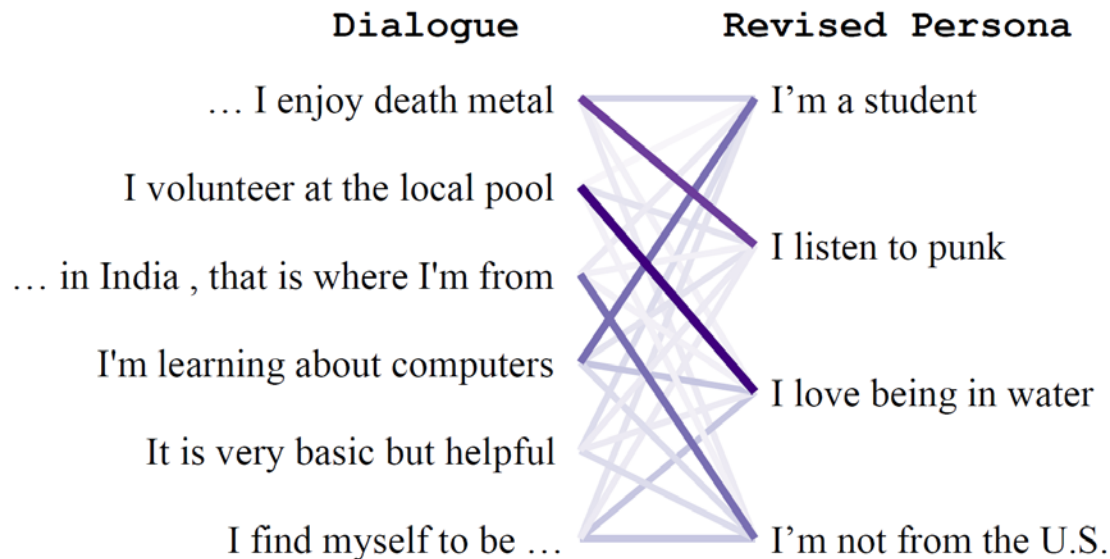
Microsoft

Research
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Experiment

- Visualization of the relevance scores between a sampled dialogue and its corresponding revised persona.



Conclusion

- We propose a transmitter-receiver framework which explicitly models understanding between interlocutors.
- Under this framework, mutual persona perception is incorporated as a reward signal to achieve the personalized dialogue generation.
- For future work, we would like to extend Receiver to conversational recommender systems.



Thanks

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Code: <https://github.com/SivilTaram/Persona-Dialogue-Generation>