Modifying the Writing Style in Goal-Oriented Dialog Generation

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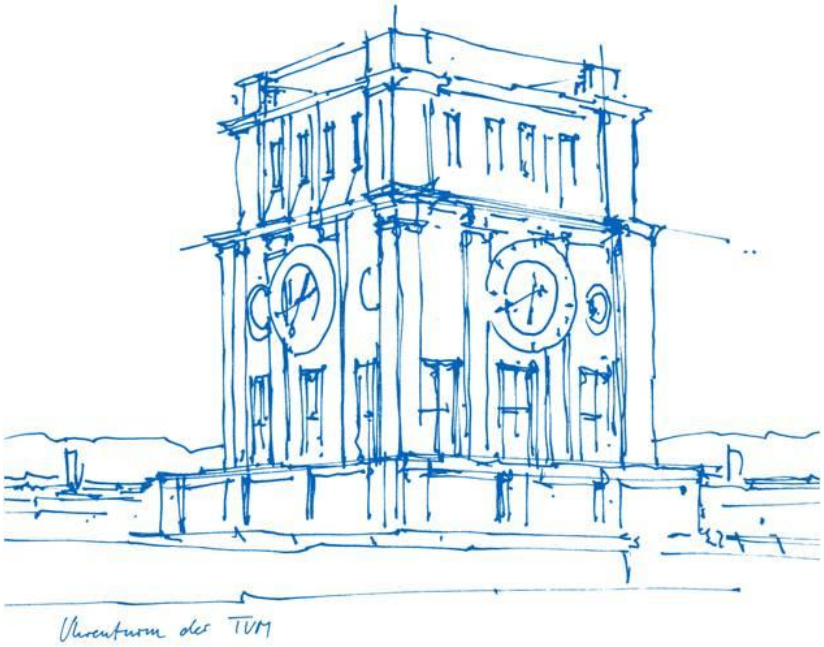


Content

- Motivations and Goals
- Approaches
- Datasets
- Training
- Evaluation and Results
- Conclusion

Motivation

- Fixed writing style
  - cannot react on changes in writing style of the used
  - writing style cannot be changed after training

- when aiming at a certain style → find task data with task data

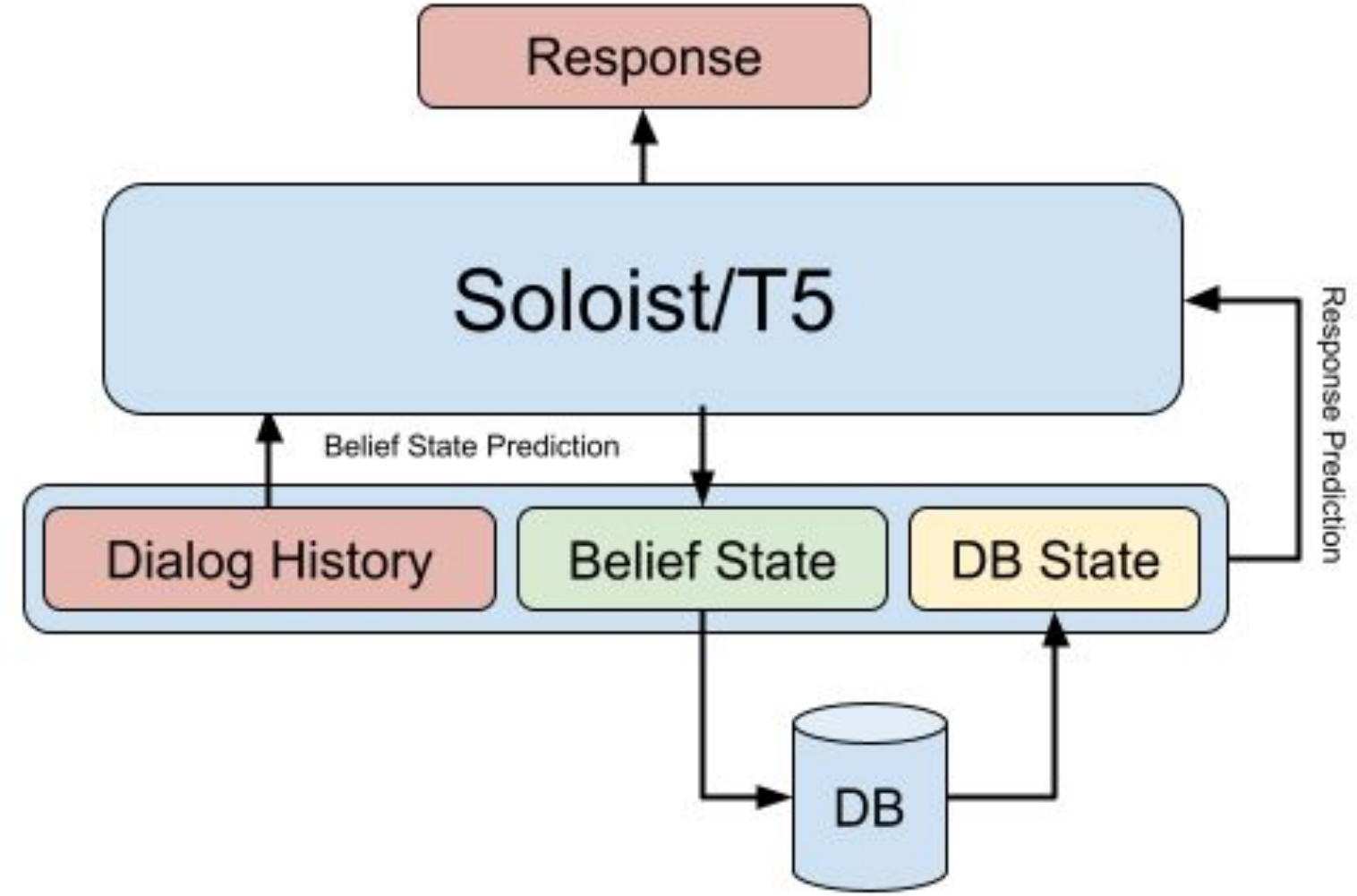
Goals

1. develop a dialogue agent

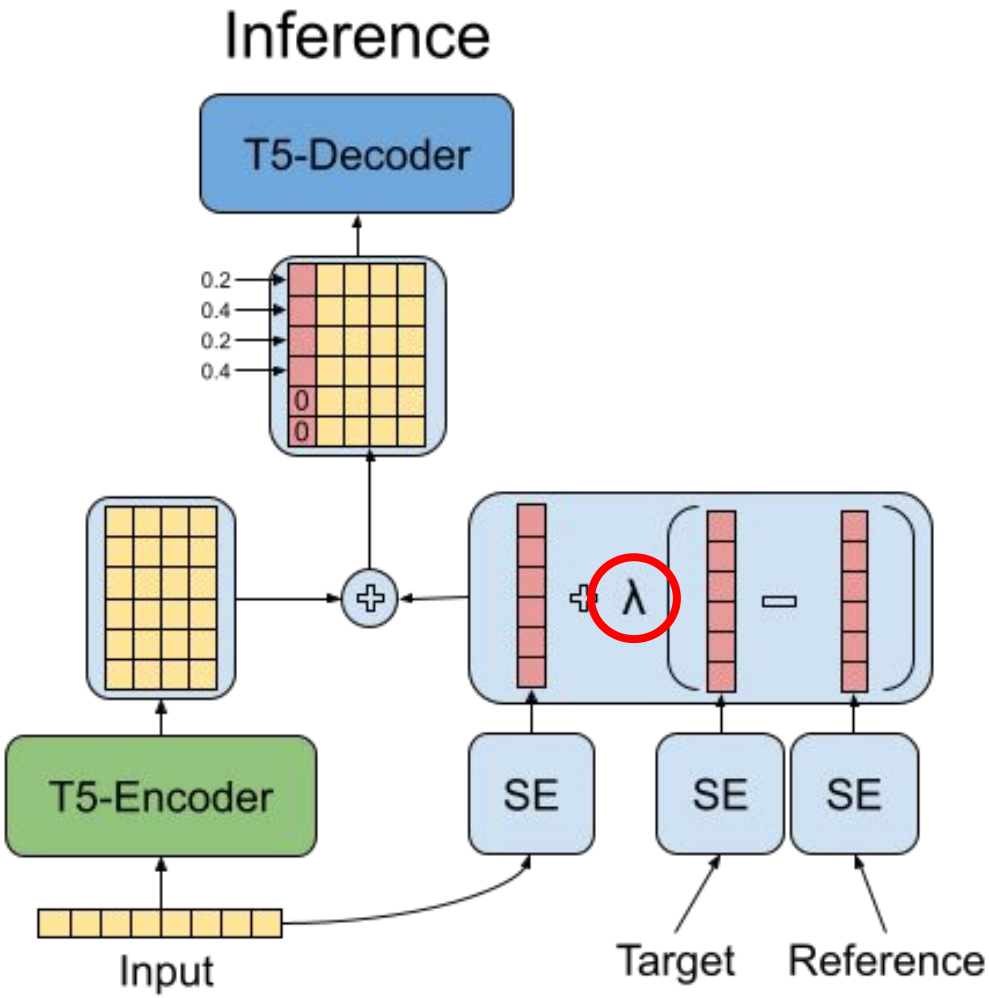
2. develop a model that modifies the writing style with a given style

3. or combine the agent and modification model

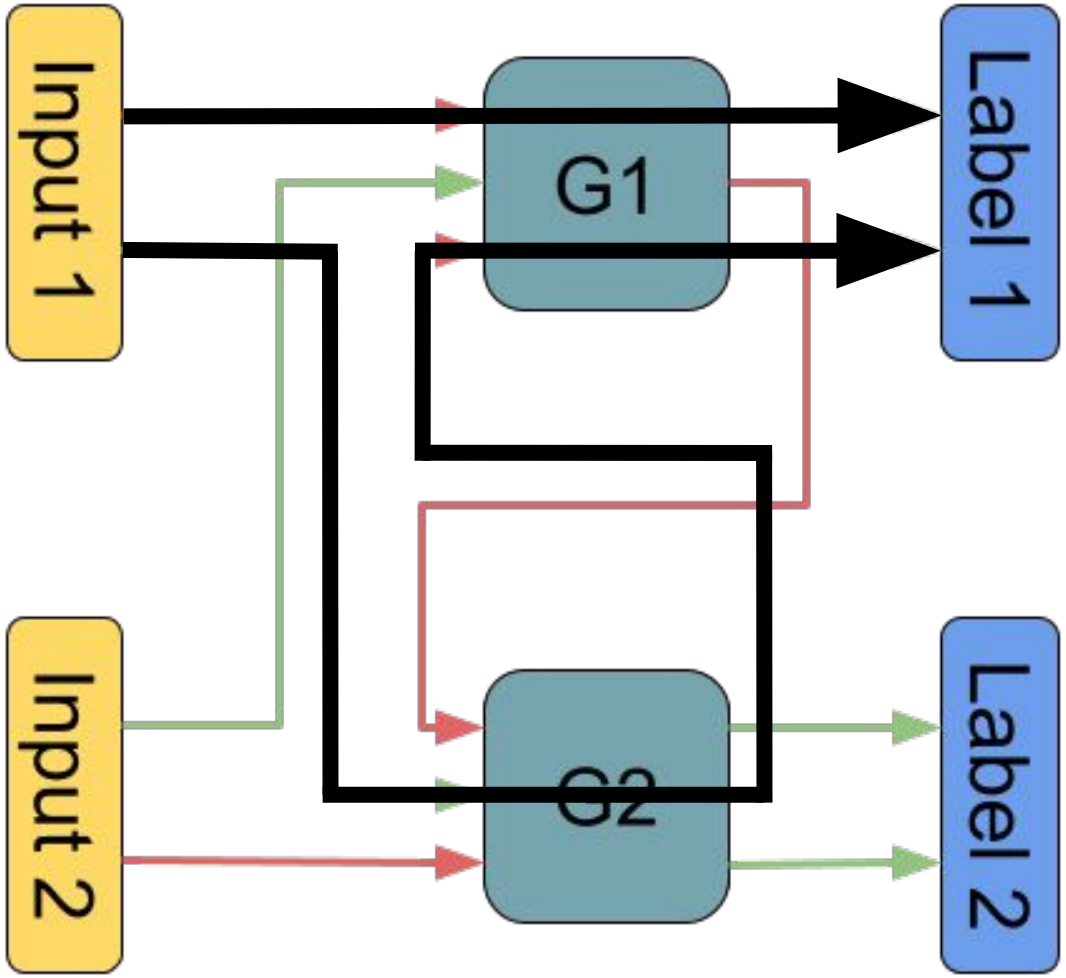
Approaches - Soloist



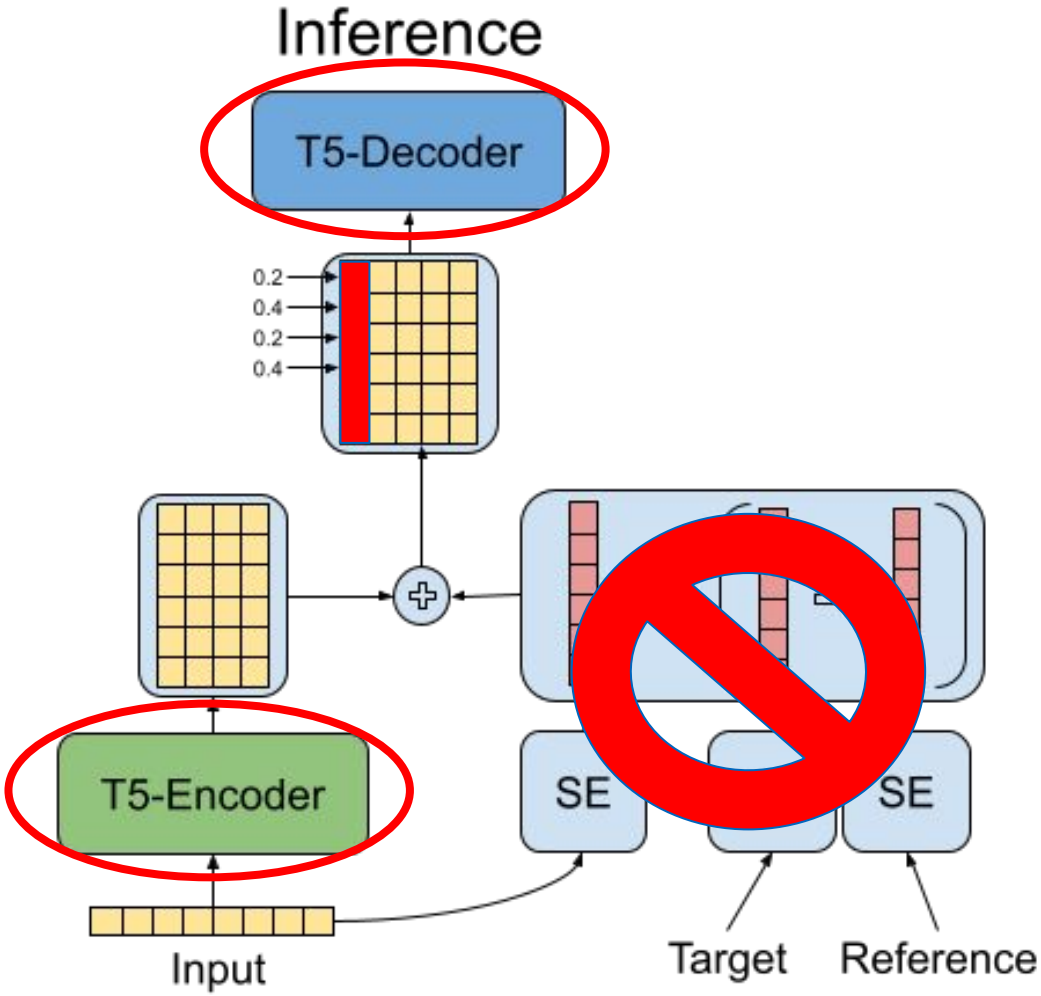
Approaches - TextSETTR



Approaches - DGST



Merged TextSETTR



Parameters

Original Model	**Parameters**	**Modified Model**	**Parameters**
Soloist (GPT-2)	117M	Small Soloist	60M
TextSETTR	1B	Small TextSETTR	96M
TextSETTR + Soloist	1.1B	Merged TExtSETTR	96M

Datasets

Taskmaster Dataset (~46k entries):

user: Hello, I am looking for movie theaters near Hudson, Wyoming.

=> Belief State : Movie Tickets { location = near Hudson, Wyoming } query { find_theaters } <EOB>

DB: find_theaters { name.theater_1 = Gem Theater; … } <EOKB>

Hello, I have two nearby examples. One is Gem Theater, which is 15.2 miles away …

Trump Twitter Dataset (~34k entries):

To all of those who have asked, I will not be going to the Inauguration on January 20th.

I WON THIS ELECTION, BY A LOT!

Fine Food Dataset (~500k entries):

I mix this with nonfat plain yogurt and it's the best dip around -- I can eat veggies all day with this stuff. Hard to find in grocery stores so I'm THRILLED it's on Amazon!

Training

- DGST, Soloist, Small TextSETTR and Merged TextSETTR:
  - Modified seq2seq task
  - on one Tesla T4 GPU

- Full sized TextSETTR:
  - Modified seq2seq task
  - model parallelism on 4 Tesla K80

Evaluation - Soloist

- BLEU Score
- Inform → {location : Munich, … }
- Success →The theater is located in *Munich*
- Combined → (Inform + Success) * 0.5 + BLEU Score

Results - Soloist

Model	Dataset	Inform	Success	BLEU	Combined
Soloist (large)	MultiWOZ (6 Domains)	85.50	72.90	16.54	102.49
Soloist (small)	Taskmaster (Movie Tickets)	84.24	67.30	60.79	136.56

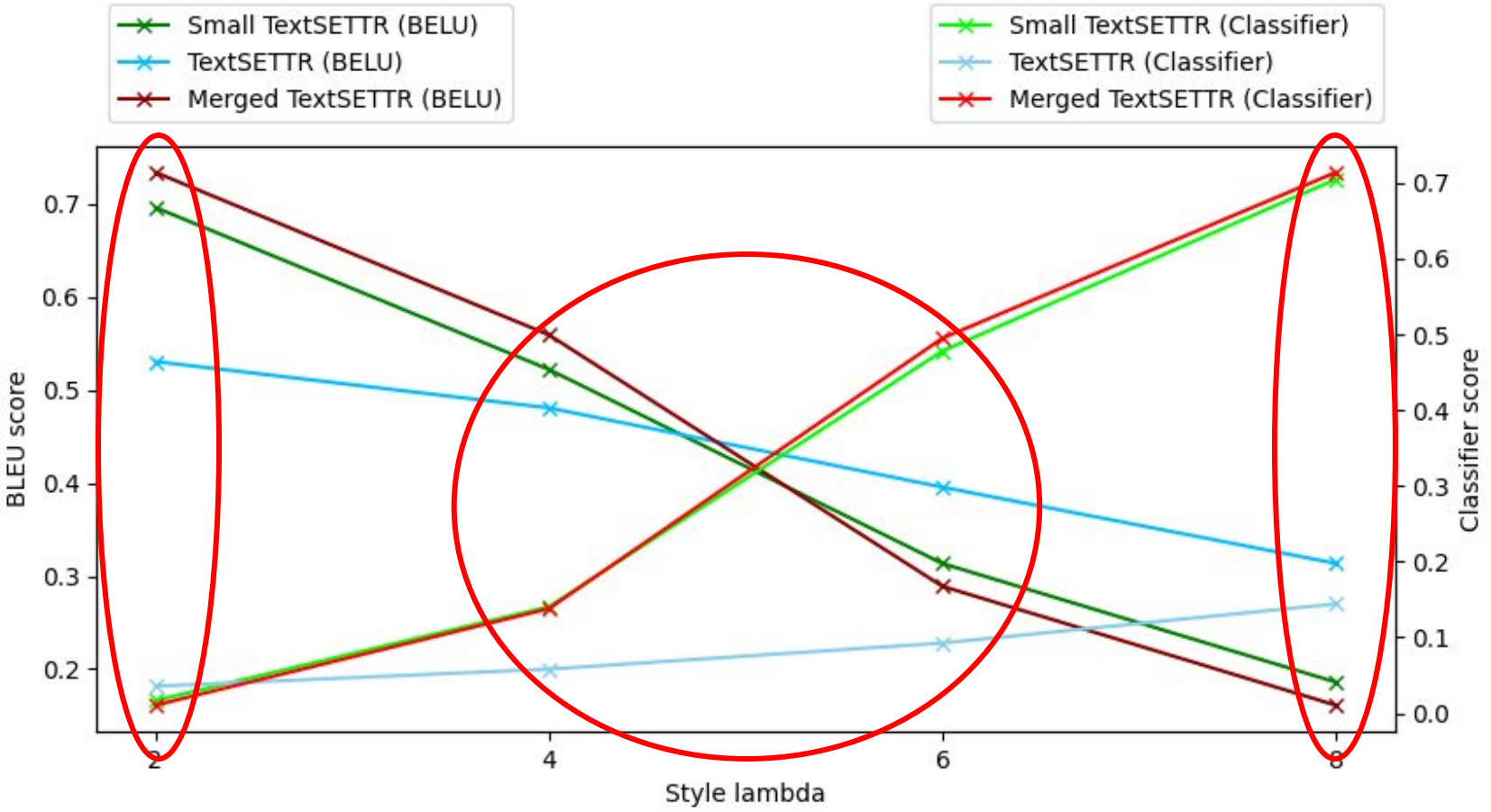
Evaluation - DGST and TextSETTR models

- BLEU Score

- Classifier Score:
  - Distilbert + classifier head
  - Taskmaster response vs. Donald Trump response
  - 99.6% accuracy after one epoch

Only heuristics !!!

Results - TextSETTR



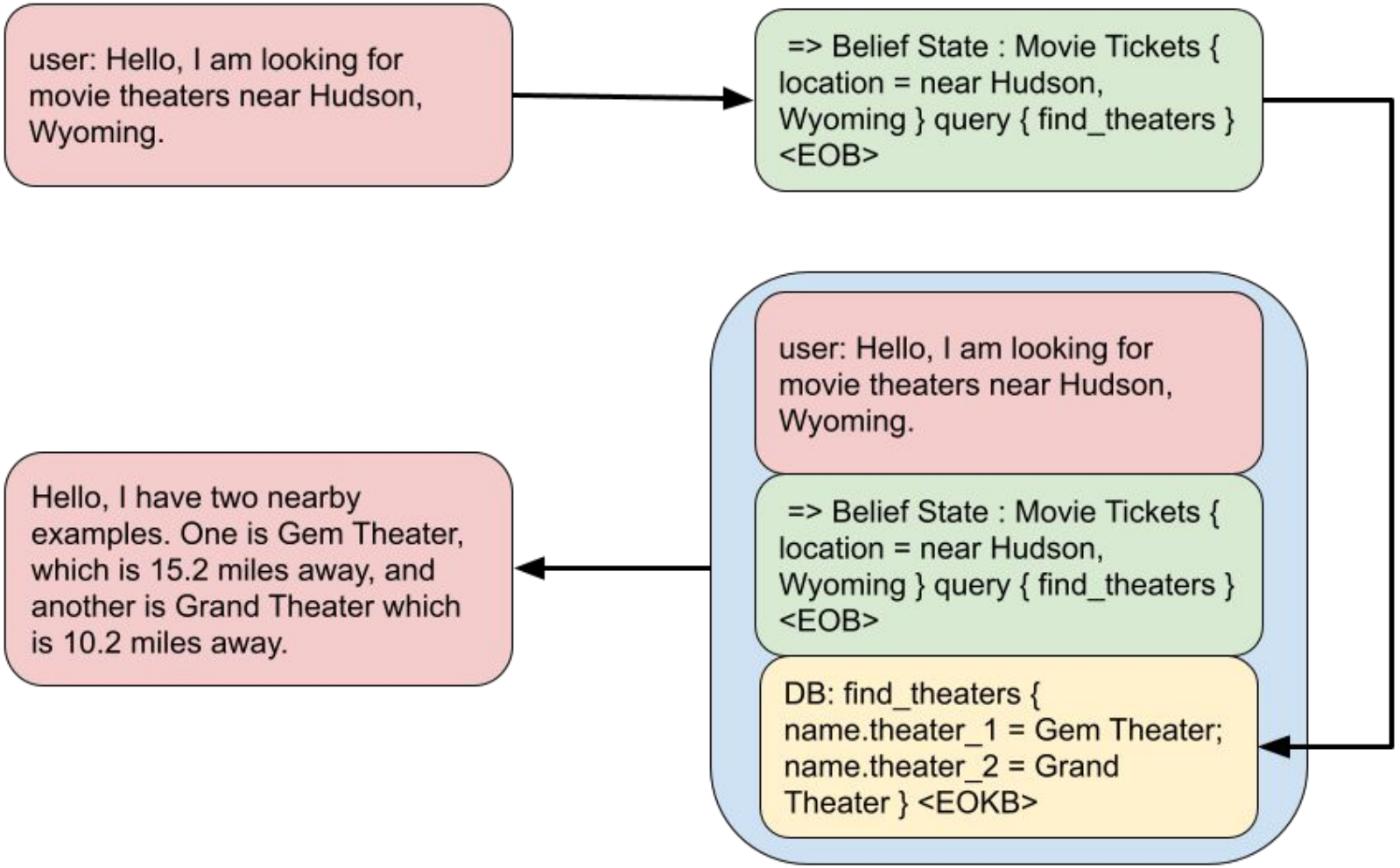
Results - DGST

- BLEU score: 82.3
- Classifier score: 0.037
- non modified dataset score: 0.033

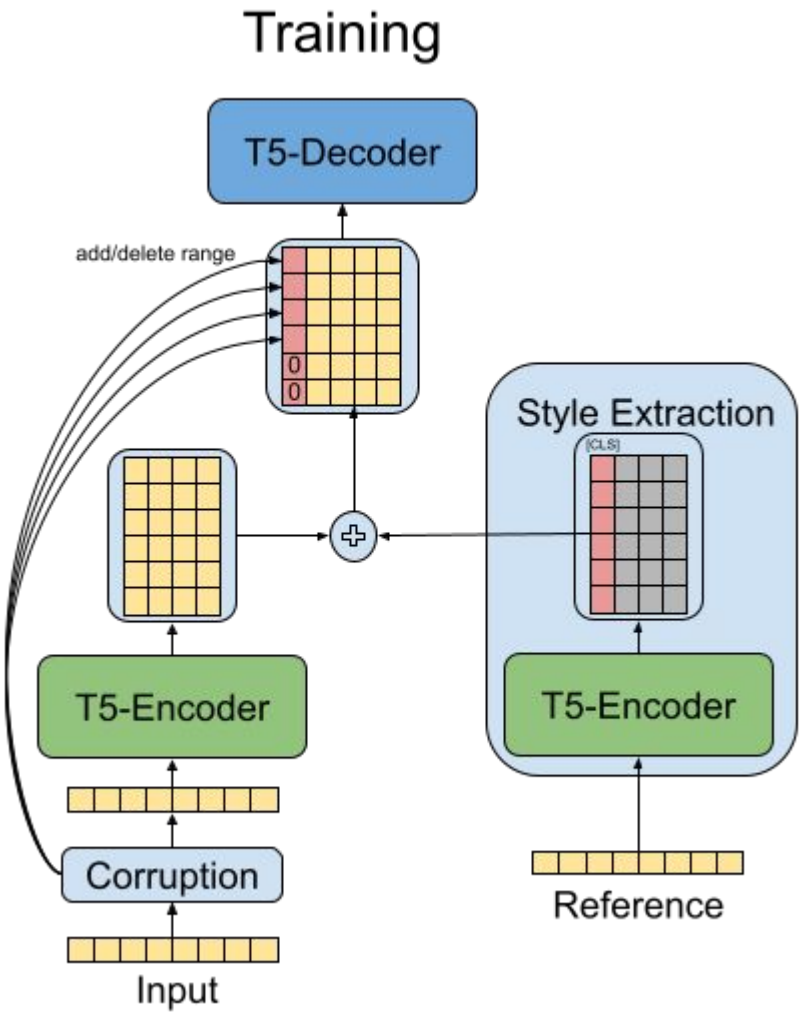
Conclusion

- Good performance of the small Soloist on a reduced domain
- TextSETTR and DGST does not perform sufficiently
- TextSETTR is style adaptive

Approaches - Soloist Data



Approaches - TextSETTR Training



Prediction Examples

TextSETTR lambda 4:

- "Family Jewels" is currently available
- i am a "Family Jewels" currently

Large TextSETTR lambda 4:

- Okay let me check. Yes there is one available in the Filmore district. Is that okay with you?
- We have a dog named Mr. Weimaraner.. Yes there is one available in the Filmore district.. Is that okay with you?