Diversified evaluation of text simplification through extrinsic tasks

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Summary

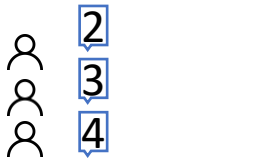
- We propose to evaluate text simplification through the extrinsic tasks
  - use output scores of task models trained with data simplified by the target model
- We evaluate correlation between scores and human judgement

How to evaluate text simplification?

Goal: Simplify text **while keeping the meaning**

Input: Avatar is maddening
Output1: Avatar is bad
Output2: Avatar is very bad

Human judgement:
- Meaning
- Grammar
- Simplicity



All three aspects need annotation

☹ Not reproducible

Automatic evaluation
- BLEU[Papeneli+ 02], SARI[Xu+ 16]

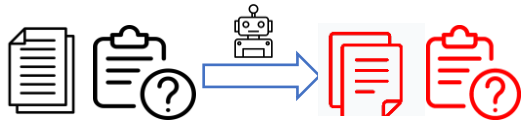
☹ Ignore the importance of individual words/phrases

Evaluate text simplification via tasks

Idea: Examine models for various tasks trained from data simplified by the target model
- Simplified sentences can be easier to process by **computers** as well as human
- **Outputs of simplified model** indicate the effectiveness of text simplification

Sentiment classification as the extrinsic task

Step1. Simplify task datasets w/ target simplification model



Training/test datasets

Simplified training/test datasets

Step2. Train a model from simplified datasets

Step3. obtain scores for each example in simplified dataset

Simplified model

"Avatar is bad" Negative (0.7)	<	"Avatar is very bad" Negative (0.8)

We can expect better simplification increases the probability of gold outputs

Experiments

Evaluate our method in terms of correlation between model outputs and human judgement

Extrinsic Tasks for evaluation
- Sentiment analysis (SST-2)
- Natural language inference (MNLI train+SNLI test)
- Language modeling (Simple-wikipedia)

Text simplification model
- ACCESS[Martin+ 19]

	Meaning	Grammar	Simplicity
Senti. Analysis	-0.04	**0.16**	0.03
Natural language inference	**0.05**	-0.10	0.01
Lang. modeling	-0.16	0.10	**0.11**

Conclusion
- The results of language modeling shows that this task can slightly reflect text simplicity
- Other tasks seems not so useful as expected

Future work

1. Try other simplification models for comparison
2. Leverage the gain of performance of simplified model as metric
3. Try other models for each extrinsic tasks
4. Consider task-oriented text simplification