Optimized Trigger Generation Strategy for Dialogue Relation Extraction Task

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Abstract. The goal of dialogue relation extraction (DRE) is to identify a relation between two entities in dialogue. A speaker can get clues called "triggers" that relate to entities and relations at identifying relations between specific entities through the triggers during conversations. However, as the trigger data does not always exist in DRE dataset, it is difficult to improve performance by leveraging the trigger. To solve this issue, we propose an approach that describes an effective relation identification method by training a trigger generation model utilizing dialogue, entity, and relation.

Keywords: dialogue relation extraction, entity, trigger, conversation

1 Introduction

Relation extraction is the task for solving natural language understanding in the field of natural language processing (NLP) [1], and it is a task to identify the type of semantic relation between two entities mentioned in dialogue. This research task plays an important role in knowledge construction and information extraction as it can extract features between two entities in a structured form [2].

Dialogue relation extraction (DRE) aims to identify relations from entity information in sentences in a more natural conversation [3]. Research on extracting dialogue relations in the field of information extraction is crucial because the relation between entities in a dialogue can provide potentially useful features to the dialogue system to generate better dialogue information or responses [4]. A trigger composed of short phrases or words can be defined as "the smallest range of continuous text that indicates the existence of a given relation" and provides valuable information for identifying the relationship in the conversation flow. The relation extraction trigger can then be utilized as a potential explainable element.

In this study, we aim to create a trigger optimized for predicting the relation with entities in multiple sentences in the relation extraction task. Our proposed approach consists of two steps: a trigger generation module and a relation extraction module. In this step, we leverage the generation model BART, which consisted of an encoder-

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decoder structure for the trigger generator procedure, and the classification model BERT, which consisted of Transformer encoder structure for the relation extraction module. Our contributions as follows:

1. We generate DRE optimized triggers using an encoder-decoder model structure.
2. With a generated trigger, we finetune the encoder-based language model, BERT, and classify which relation is the optimal value.
3. We experiment for the DRE task with quantitative experimental results.

2. Problem Definition

In our study, we create triggers considering with dialogue context and finally use the triggers as input features with dialogue, and question. In this process, a single query pair can contain multiple relations.

3. Experiment

Model	Test		
	Precision	Recall	F1 score
Baseline model (BERT)	0.5056	0.4947	0.5001
Trigger generated model (BERT)	0.5220	0.5418	0.5317

Table 1. Experimental results for general BERT and trigger generated BERT

Table 1 shows the experimental results for general BERT and trigger generated BERT. When triggers were used for the input sequence of the BERT model to identify the relations, compared to the case where these triggers were not, the performance quantitatively improved in precision, recall, f1 score by 1.64%p, 4.71%p, 3.16%p, respectively.

As can be confirmed by the experimental results, the generated triggers were effective in identifying the relation as meaningful information feature.

4. Conclusion and Future Work

The experimental results in this study show that our approach, which can effectively improve performance by creating a trigger that acts as an important clue in the DRE. By inducing effective responses and useful information provision to the dialogue system, the DRE task is a necessary research field. In future research, we plan to conduct study that can create more effective triggers by modeling the triggers for entity and relation.

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References

1. Y. Hur, S. Son, M. Shim, J. Lim, and H. Lim, "K-epic: Entity-perceived context representation in korean relation extraction," Applied Sciences, Vol. 11, No. 23, 2021. [Online]. Available: https://www.mdpi.com/2076-3417/11/23/11

2. G. Kim, J. Kim, J. Son, and H. Lim, "Kochet: a korean cultural heritage corpus for entity-related tasks," arXiv preprint arXiv:2209.00367, 2

3. K. Kim, Y. Hur, G. Kim, and H. Lim, "Greg: A global level relation extraction with knowledge graph embedding," Applied Sciences, Vol. 10, No. 3, 2020. [Online]. Available: https://www.mdpi.com/2076-3417/10

4. J. Son, J. Kim, J. Lim, and H. Lim, "Grasp: Guiding model with relational semantics using prompt," arXiv preprint arXiv:2208.12494, 202