Technical Appendix for AAAI Submission 8034

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Experiment Setup

We use `bert-base-uncased` as the Pretrained Language Model (PLM) in AGED. We follow Chen, Zheng, and Chang (2021); Zheng et al. (2022) to first train AGED on exemplar sentences then train on the train set continually. We search for hyperparameters (learning rate, batch size, and epoch num) with performance in the development set. Performance in the development set is also used to save the best parameters of the models, and we will evaluate AGED with these parameters in the test set.

Our code is implemented with `Pytorch` and `Huggingface`. AGED is trained on `NVIDIA A40` with 40 GB memory and it will take about 4 GPU hours to train AGED and 0.6 hours when AGED is trained only with the training dataset. More details about hyperparameter settings are listed in the Table 1.

The performance of AGED is evaluated by the micro-F1 score[1]. For an argument span, we consider that the exact match that requires the prediction triple (`FE`, `start`, `end`) should be the same as the ground truth.

Models

We evaluate the performance of AGED with some previous models. For fair comparison, we only consider models that use PLMs. These models will be introduced briefly:

- **semi-CRF (2017)**: A semi-markov CRF based model that treats argument identification as semantic segmentation. Its bert-based version is reimplemented by Lin, Sun, and Zhang (2021).

- **Kalyanpur et al. (2020)**: A T5-based model that models frame semantic role labeling as sequence-to-sequence task.

- **Bastianelli, Vanzo, and Lemon (2020)**: Using constituency to strengthen semantic role labeling. The syntactic paths between the predicate and arguments are injected into the traditional BIO-based sequence labeling framework.

- **Chen, Zheng, and Chang (2021)**: A joint model that uses two decoders to identify arguments and classify roles. Each decoder is a recurrent neural network and

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[1]https://www.cs.cmu.edu/~ark/SEMAFOR/eval/

Hyper-parameter	Value
bert version	bert-base-uncased
batch size	16/**32**
learning rate (train only)	1e-5/**5e-5**
learning rate (pretrain)	5e-5
learning rate (fine-tune)	**1e-5**/5e-5
lr scheduler	Linear decay
warm up ratio	0.1
optimizer	BertAdam
epoch num (train only)	15/**20**/25
epoch num (pretrain)	**5**/10
epoch num (finetune)	**10**/20

Table 1: Hyper-parameter settings of AGED. "train only" means AGED trained only with training dataset. "pretrain" means AGED w/ exemplar trained with exemplar instances. "fine-tune" means AGED w/exemplar then trained with training dataset.

arguments are identified sequentially to capture interactions between them.

- **Lin, Sun, and Zhang (2021)**: A graph-based end-to-end frame semantic parsing model. Targets and arguments are nodes in the graph and role classification is to construct edges between targets and arguments and predict the type of edges.

- **KID (2022)**: A frame knowledge-enhanced double graph-based framework proposed by Zheng et al. (2022). Arguments are identified sequentially via a semantic graph decoder and frame knowledge such as FE definitions are used to capture semantic relations between FEs.

References

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