Hierarchical Modular Event Detection Based on Dependency Graph

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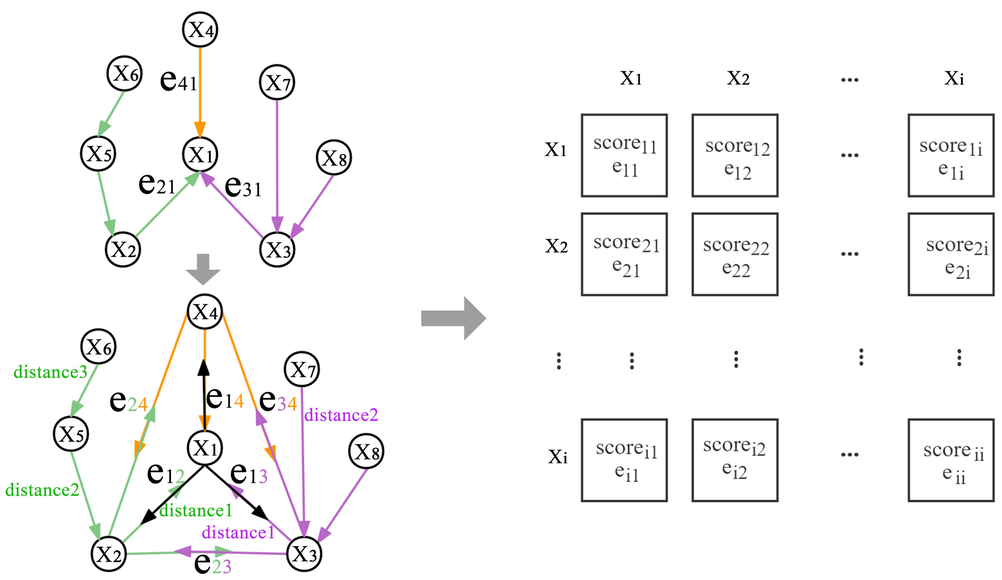
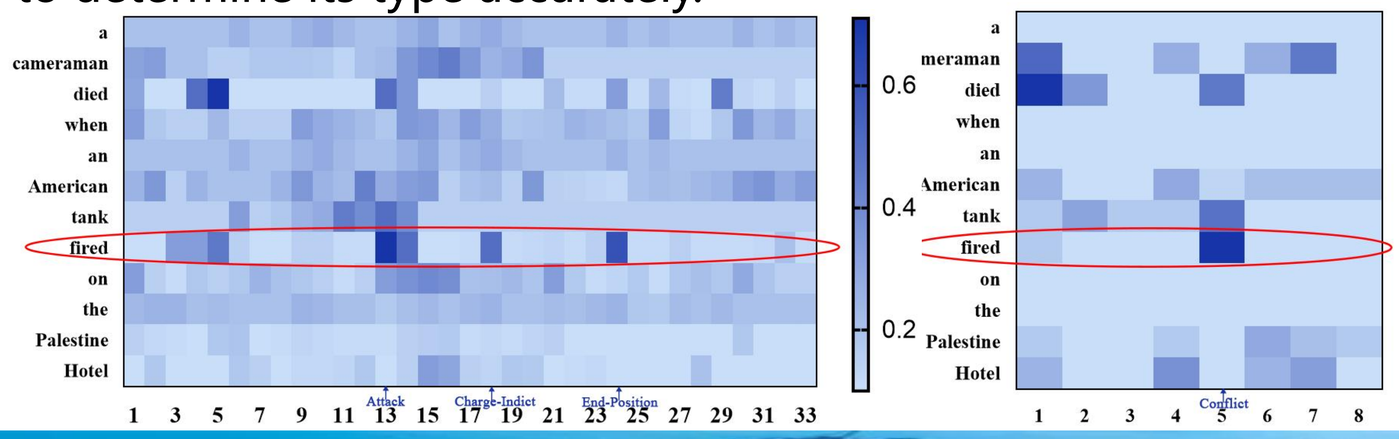
Introduction

Event detection aims to correctly identify trigger words that trigger event generation from unstructured text containing event information, previous work has been performed for fine-grained event types, which leads to the loss of hierarchical conceptual semantic information of event classes. We design in this paper a dynamic modeling of multi-order dependency labeling information between word pairs and perform more accurate classification by fusing fine-grained and coarse-grained event conceptual semantic information.



Heat maps

By considering both coarse-grained information and fine-grained information, it can help to determine its type accurately.



Experiments

Dataset: ACE 2005 corpora
test:40; dev:30; train:529

Model	P	R	F1
DMCNN	75.6	63.6	69.1
JRNN	66.0	73.0	69.3
GCN-ED	77.9	68.8	73.1
HBTNGAM	77.9	69.1	73.3
JMEE	76.3	71.3	73.7
MOGANED	79.5	72.3	75.7
EE-GCN	76.7	78.6	77.6
MLBiNet	80.6	77.4	78.6
HMED(ours)	78.3	**83.7**	**80.9**

Methods

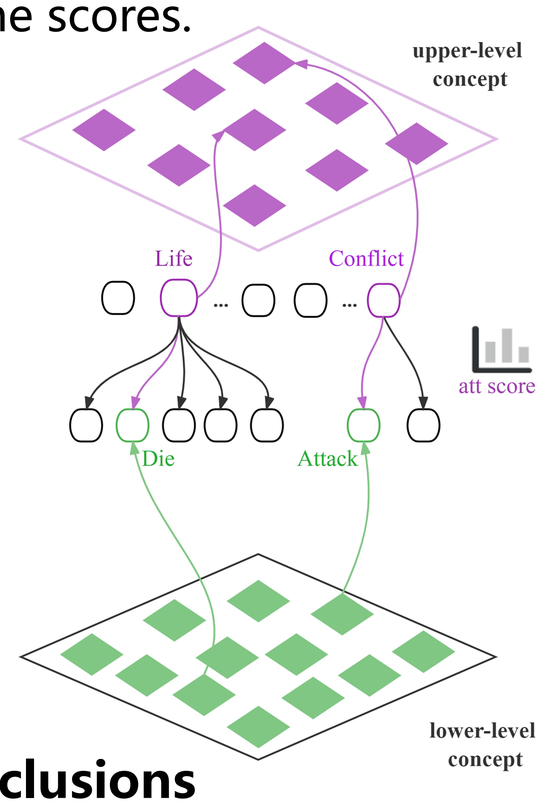
We improved the dynamic update method of EE-GCN. An adjacency matrix is first designed to describe the graph structure, and if there is a relationship between words, the corresponding representation vector is filled into the matrix. Multi-order label information is filled in the remaining positions and attention is used to score them to distinguish the weights, and the dependency labels are also updated after generating a new representation for each word.

Ablation Study

Componet	F1
HMED	80.9
-Multi-order	80.5
-DUM	78.3
-HM	79.5
-BiLSTM	75.2
-DUM&HM	77.8

Hierarchical Modular

We calculate the score of the lower layer corresponding to the upper layer by using a multi-layer perceptron and map the correlation between the two by the scores.



Conclusions

- The inclusion of multi-order label information for dynamic updating of GCN is helpful for ED tasks.
- By fusing coarse-grained and fine-grained event types has a significant impact on the event classification results.

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