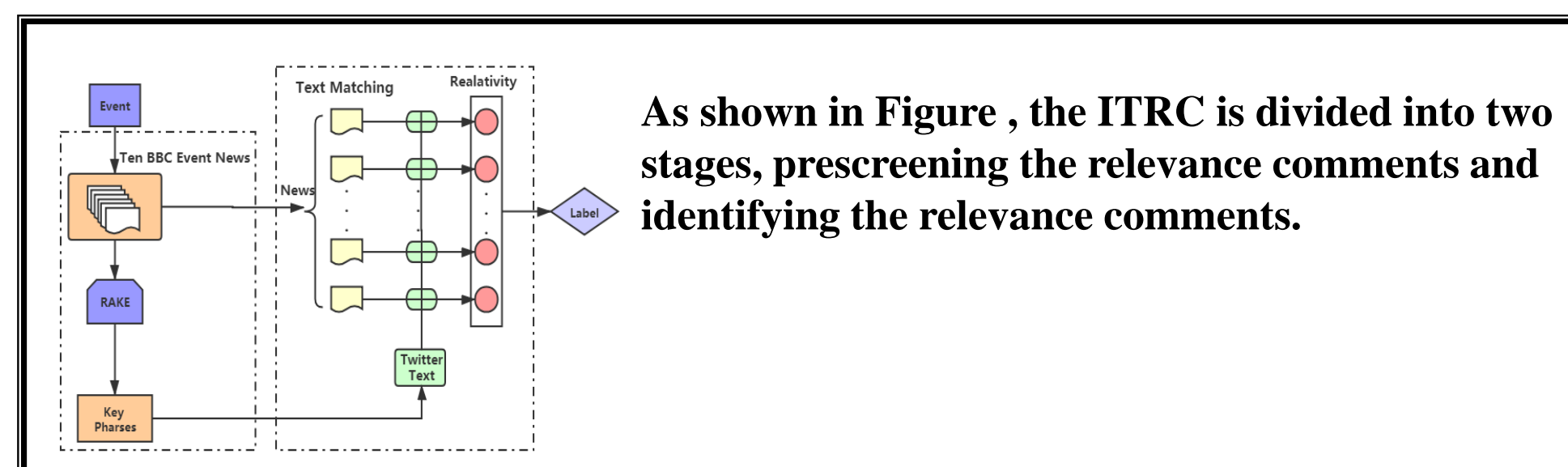


Paper Abstract

• Nowadays, with the continuous development of the Internet, public opinion analysis has become an indispensable means for governments and companies to grasp public opinion trends and respond promptly to emergencies. Finding out a topic's relevant comments is more conducive to providing analysis foundation. Twitter, a popular social media website, permits users to post their viewpoints about an event. An event's relevant comments could be obtained through twitter search using the event's key phrases. However, twitter search utilizes the full-match mode, which the search results contain a large number of irrelevant comments for it doesn't use a correlation filter. In this paper, we proposed a framework for identifying twitter relevance comments (ITRC). The framework treats ITRC as a text matching task and matches one comment with all news of an event to distinguish whether the comment is a relevance comment in twitter. Before the matching module, we adopted the Rake algorithm to extract key phrases from the event's news and then the key phrases were used for twitter search to construct twitter relevant comments dataset. Based on this dataset, the effectiveness of different text matching methods was examined. Through the in-event and cross-event experiments, we used the MVLSTM with the best overall performance as our matching module. Moreover, we also mixed data from different events to conduct the experiments. The experimental results demonstrated the effectiveness of the mixed data strategy.

System Model

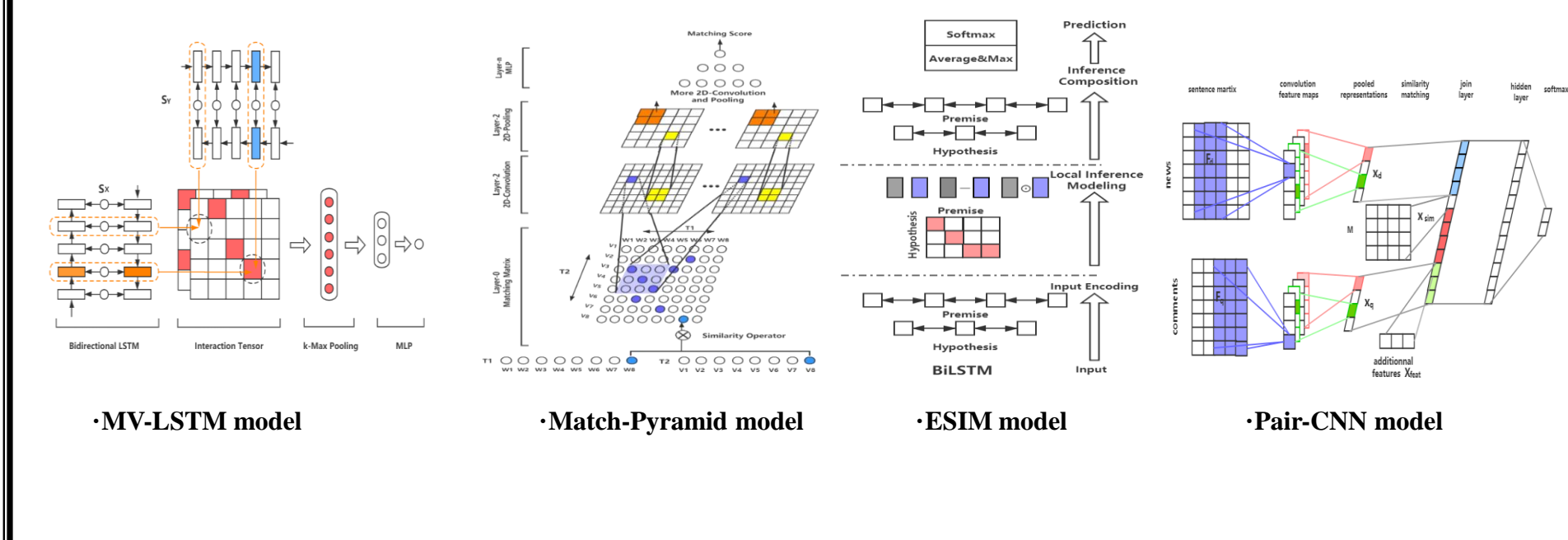


Brief Introduction of the Paper

In this paper, we constructed a twitter relevant comments dataset which contains three events' relevant comments. Moreover, we proposed a framework for identifying twitter relevance comments (ITRC). The framework treats ITRC as a text matching task and matches one comment with all news of an event to distinguish whether the comment is a relevance comment in twitter. The ITRC is divided into two stages, prescreening the relevance comments and identifying the relevance comments. The MV-LSTM, Match-Pyramid, ESIM, and Pair-CNN algorithms were used as the matching module in the framework. We respectively used the single event data and the mixed data to conduct experiments, and compared the performance of our model on in-event experiment and cross-event experiment.

Algorithm Principle

While prescreening the relevance comments, firstly, our framework crawls the news about events on the BBC News as the text representation of the event, and afterwards uses the Rake algorithm to extract key phrases from the news event titles. In this paper, we obtain ten news for each event to conduct experiments. Based on the threshold of the key phrase we set, we filtered out the set containing key phrases for searching. Then the key phrases were used for twitter search to prescreen the relevance comments. In the relevance comments identification module, we treat ITRC as a text matching task and match one comment with all news of an event to distinguish whether the comment is a relevance comment in twitter. In this paper, the MV-LSTM, Match-Pyramid, ESIM, and Pair-CNN algorithms were used to match the news text with the tweet comments, and identify the twitter text whether related to the event. In the text matching phase, we calculated the correlation between the tweet text and the ten news texts. If there is news related to the tweet comment, the twitter comment is considered to be related to the event.



Experimental Simulation

• In this experiment, we use the correlation classification performance of a single event in this event and the classification performance of two other events to conduct experiments, and mix two events to conduct training tests to test the classification performance of this model in the third category of events. In the experiment, the accuracy and F_1 value are used as the evaluation criteria.

• 1.Unmixed data experiments

• The experiment that uses training data of Event 1 :

Model	Event 1 Accuracy	Event 1 F ₁	Event 2 Accuracy	Event 2 F ₁	Event 3 Accuracy	Event 3 F ₁
MV-LSTM	0.9504	0.9502	0.5326	0.5201	0.5880	0.5313
Match-Pyramid	0.8020	0.7932	0.6580	0.5222	0.7233	0.6833
ESIM	0.9021	0.8938	0.4932	0.4870	0.5462	0.5210
Pair-CNN	0.7620	0.7724	0.3346	0.3182	0.5016	0.5134

• The experiment that uses training data of Event 2 :

Model	Event 2 Accuracy	Event 2 F ₁	Event 1 Accuracy	Event 1 F ₁	Event 3 Accuracy	Event 3 F ₁
MV-LSTM	0.9651	0.9652	0.5546	0.5190	0.6151	0.5347
Match-Pyramid	0.7324	0.7900	0.4413	0.3002	0.6282	0.4847
ESIM	0.8634	0.8402	0.5214	0.4607	0.5847	0.5743
Pair-CNN	0.8127	0.7833	0.4031	0.4021	0.4857	0.4472

• The experiment that uses training data of Event 3 :

Model	Event 3 Accuracy	Event 3 F ₁	Event 1 Accuracy	Event 1 F ₁	Event 2 Accuracy	Event 2 F ₁
MV-LSTM	0.8566	0.8569	0.4181	0.4001	0.5622	0.5720
Match-Pyramid	0.6364	0.4949	0.4413	0.2802	0.6580	0.5222
ESIM	0.6978	0.6324	0.4673	0.4345	0.5279	0.5190
Pair-CNN	0.7014	0.6745	0.3987	0.3591	0.4671	0.4670

2. Mixed data experiments

The experiment that uses training data of Event 1 and Event 2 :

Model	Event 1 and Event 2 Accuracy	Event 1 and Event 2 F ₁	Event 3 Accuracy	Event 3 F ₁
MV-LSTM	0.9685	0.9685	0.5825	0.5712
Match-Pyramid	0.8279	0.8148	0.6282	0.4847
ESIM	0.8358	0.8032	0.5982	0.5345
Pair-CNN	0.8562	0.8204	0.6002	0.5927

The results of different experiments in Event 3:

Model	Event 3 Accuracy	Event 3 F ₁
MV-LSTM with unmixed data	0.5880	0.5313
MV-LSTM with mixed data	0.5825	0.5712

Conclusion of the Paper

• In this paper, we proposed a framework for identifying twitter relevance comments. We respectively used the single event data and the mixed data to conduct experiments, and compared the performance of our model on in-event experiment and cross-event experiment. The framework we construct performs relatively well on in event experiment while on cross-event data its performance still needs enhancement. At the same time, using the data mixed with different events as the training set to train our framework could improve the performance of the model on cross-event data. In the future, we will augment the scale of the dataset making it contain more events so as to further explore how to preferably improve the model's performance on cross event.