CLAIMS

1. A method for event extraction, comprising:

acquiring an inputted text, wherein the inputted text comprises at least one trigger word and at least one event argument;

extracting, through an encoder and a decoder, a first text feature vector set corresponding to the inputted text;

acquiring a target extraction template corresponding to the at least one trigger word;

decoding, through the decoder, the target extraction template and the inputted text to obtain an argument feature vector of each event argument; and

determining, based on the first text feature vector set and the argument feature vector of each event argument, a value range corresponding to each event argument,

wherein the method further comprises:

respectively converting the inputted text and the target extraction template into a text word vector set and a template word vector set, wherein

the extracting, through the encoder and the decoder, the first text feature vector set corresponding to the inputted text comprises:

encoding the text word vector set through the encoder to obtain a second text feature vector set; and

decoding the text word vector set and the second text feature vector set through the decoder to obtain the first text feature vector set corresponding to the inputted text; and

correspondingly, the decoding, through the decoder, the target extraction template and the inputted text to obtain the argument feature vector of each event argument comprises:

decoding, through the decoder, the template word vector set and the second text feature vector set to obtain the argument feature vector of each event argument.

2. The method according to claim 1, wherein the decoding, through the decoder, the template word vector set and the second text feature vector set to obtain the argument feature vector of each event argument comprises:

decoding, by using the decoder, the template word vector set and the second text feature vector set to obtain a template feature vector set merged with information of the inputted text; and

determining, from the template feature vector set, the argument feature vector of each event argument corresponding to each argument role based on position information of each argument role in the template word vector set.

3. The method according to claim 2, wherein the determining, from the template feature vector set, the argument feature vector of each event argument corresponding to each argument role based on position information of each argument role in the template word vector set comprises:

for the position information of each argument role in the template word vector set, extracting, from the template feature vector set, a feature vector of each event argument corresponding to the argument role ; and

performing average pooling on the feature vector of each event argument to obtain the argument feature vector of the event argument.

4. The method according to any one of claims 1 to 3, further comprising:

determining a target event type based on the at least one trigger word; and

determining the target extraction template from a preset template library based on the target event type.

5. The method according to claim 4, further comprising:

determining an event type set corresponding to a text set, wherein the event type set comprises at least one event type;

determining at least two argument roles in each event type and relationship information between the at least two argument roles;

for each event type, splicing the at least two argument roles based on the relationship information between the at least two argument roles to obtain an extraction template of each event type; and

forming the preset template library based on the extraction template of each event type in the event type set.

6. The method according to any one of claims 1 to 3, further comprising:

acquiring the at least one trigger word of the inputted text, and marking the at least one trigger word of the inputted text, wherein

the extracting, through the encoder and the decoder, the first text feature vector set corresponding to the inputted text comprises:

extracting, through the encoder and the decoder, the first text feature vector set corresponding to the marked inputted text .

7. The method according to any one of claims 1 to 3, wherein the determining, based on the first text feature vector set and the argument feature vector of each event argument, the value range corresponding to each event argument comprises:

determining at least one candidate start-to-end range of each event argument based on a quantity of corresponding lemmas in the first text feature vector set; and

determining, for each event argument, the value range corresponding to the event argument based on the at least one candidate start-to-end range of the event argument and the argument feature vector of the event argument.

8. The method according to claim 7, wherein determining, for each event argument, the value range corresponding to the event argument based on the at least one candidate start-to-end range

of the event argument and the argument feature vector of the event argument comprises:

converting the argument feature vector of each event argument into a start search vector representing a start position and an end search vector representing an end position;

determining a first inner product result of a feature vector corresponding to each lemma in the first text feature vector set and each start search vector to obtain a first inner product result set of candidate start positions of each event argument;

determining a second inner product result of the feature vector corresponding to each lemma in the first text feature vector set and each end search vector to obtain a second inner product result set of candidate end positions of each event argument; and

determining the value range corresponding to each event argument based on the first inner product result set of the candidate start positions and the second inner product result set of the candidate end positions of each event argument.

9. A method for training an event extraction model, wherein the event extraction model comprises an encoder, a decoder, and an argument detection module, and the method comprises:

acquiring a training text and a target extraction template corresponding to the training text;

extracting, through the encoder and the decoder, a first text feature vector set corresponding to the training text;

encoding, through the encoder, the target extraction template and the training text to obtain an argument feature vector of each event argument;

determining, through the argument detection module, a prediction range corresponding to each event argument based on the first text feature vector set and the argument feature vector of each event argument;

matching the prediction range of each event argument against a true value range to obtain an optimal prediction range that has a loss function value satisfying a second preset condition and corresponds to each event argument;

determining a loss function value of the event extraction model based on the optimal prediction range of each event argument; and

training the event extraction model based on the loss function value,

wherein the method further comprises:

respectively converting the training text and the target extraction template into a text word vector set and a template word vector set, wherein

the extracting, through the encoder and the decoder, the first text feature vector set corresponding to the training text comprises:

encoding the text word vector set through the encoder to obtain a second text feature vector set; and

decoding the text word vector set and the second text feature vector set through the decoder to obtain the first text feature vector set corresponding to the training text; and

correspondingly, the encoding, through the encoder, the target extraction template and the training text to obtain the argument feature vector of each event argument comprises:

encoding, through the encoder, the template word vector set and the second text feature vector set to obtain the argument feature vector of each event argument.

10. The method according to claim 9, wherein the matching the prediction range of each event argument against the true value range to obtain the optimal prediction range that has the loss function value satisfying the second preset condition and corresponds to each event argument comprises:

matching the prediction range of each event argument against the true value range by using a bipartite graph matching method to obtain a candidate matching group, wherein the candidate matching group comprises at least one matching pair, and one matching pair comprises a prediction range and a true value range of one event argument;

determining a loss function value of each candidate matching group, wherein the loss function value is used for representing a sum of distances in all matching pairs in the candidate

matching group; and

selecting a candidate matching group that has a loss function value satisfying the second preset condition to obtain the optimal prediction range corresponding to each event argument.

11. The method according to claim 9 or 10, wherein the determining the loss function value of the event extraction model based on the optimal prediction range of each event argument comprises:

acquiring a first inner product result corresponding to a start position of the optimal prediction range of each event argument and a second inner product result corresponding to an end position of the optimal prediction range of each event argument;

normalizing the first inner product result and the second inner product result; and

determining, based on the normalized first inner product result and second inner product result, a loss function value of a model which the method is used for.

12. An apparatus for event extraction, comprising:

a first acquisition module, configured to acquire an inputted text of a sentence-level or document-level text, wherein the inputted text comprises at least one trigger word and at least one event argument;

a first extraction module, configured to extract, through an encoder and a decoder, a first text feature vector set corresponding to the inputted text;

a second acquisition module, configured to acquire a target extraction template corresponding to the at least one trigger word;

a first decoding module, configured to decode, through the decoder, the target extraction template and the inputted text to obtain an argument feature vector of each event argument; and

a first determination module, configured to determine, based on the first text feature vector set and the argument feature vector of each event argument, a value range corresponding

to each event argument,

wherein the apparatus further comprises:

a first conversion module, configured to respectively convert the inputted text and the target extraction template into a text word vector set and a template word vector set, wherein

the first extraction module further comprises:

an encoding sub-module, configured to encode the text word vector set through the encoder to obtain a second text feature vector set; and

a first decoding sub-module, configured to decode the text word vector set and the second text feature vector set by using the decoder to obtain the first text feature vector set corresponding to the inputted text; and

correspondingly, the first decoding module further comprises:

a second decoding sub-module, configured to decode, by using the decoder, the template word vector set and the second text feature vector set to obtain the argument feature vector of each event argument.

13. The apparatus according to claim 12, wherein the second decoding sub-module further comprises:

a decoding unit, configured to decode, by using the decoder, the template word vector set and the second text feature vector set to obtain a template feature vector set merged with information of the inputted text; and

a first determination unit, configured to determine, from the template feature vector set, the argument feature vector of each event argument corresponding to each argument role based on position information of each argument role in the template word vector set.

14. The apparatus according to claim 13, wherein the first determination unit further comprises:

an extraction sub-unit, configured to, for the position information of each argument role

in the template word vector set, extract, from the template feature vector set, a feature vector of each event argument corresponding to the argument role ; and

a pooling sub-unit, configured to perform average pooling on the feature vector of each event argument to obtain the argument feature vector of the event argument.

15. An apparatus for training an event extraction model, comprising:

a fourth acquisition module, configured to acquire a training text and a target extraction template corresponding to the training text;

a second extraction module, configured to extract, through the encoder and the decoder, a first text feature vector set corresponding to the training text;

a second encoding module, configured to encode, through the encoder, the target extraction template and the training text to obtain an argument feature vector of each event argument;

a sixth determination module, configured to determine, through the argument detection module, a prediction range corresponding to each event argument based on the first text feature vector set and the argument feature vector of each event argument;

a matching module, configured to match the prediction range of each event argument against a true value range to obtain an optimal prediction range that has a loss function value satisfying a second preset condition and corresponds to each event argument;

a seventh determination module, configured to determine a loss function value of the event extraction model based on the optimal prediction range of each event argument; and

a training module, configured to train the event extraction model based on the loss function value,

wherein the apparatus further comprises:

a second conversion module, configured to respectively convert the training text and the target extraction template into a text word vector set and a template word vector set, wherein

the second extraction module further comprises:

an encoding sub-module, configured to encode the text word vector set through the encoder to obtain a second text feature vector set; and

a first decoding sub-module, configured to decode the text word vector set and the second text feature vector set by using the decoder to obtain the first text feature vector set corresponding to the training text; and

correspondingly, the second encoding module further comprises:

a second encoding sub-module, configured to encode, by using the encoder, the template word vector set and the second text feature vector set to obtain the argument feature vector of each event argument.

16. An electronic device, comprising a memory and a processor, the memory storing computer programs executable on the processor, the processor executing the programs to implement the steps in the method according to any one of claims 1 to 11.

17. A computer-readable storage medium, storing computer programs, wherein a processor is configured to execute the computer programs to implement the steps in the method according to any one of claims 1 to 11.

18. A computer program product, comprising computer readable codes, wherein when the computer readable codes run in a device, a processor in the device executes instructions for implementing the steps in the method according to any one of claims 1 to 11.