【CLAIMS】

【Claim 1】

A method for determining transfer information in a message through natural language processing based on deep learning, the method comprising:

preprocessing an acquired message in a user terminal based on a reference word;

extracting an embedding vector corresponding to each segmented text from the preprocessed message;

determining whether the transfer information is included in the acquired message using a local model operated on the user terminal by installing the master model distributed from the server through weighted calculation of the extracted embedding vector; and

classifying the transfer information in the preprocessed message determined to include the transfer information,

wherein the determining whether the transfer information is included in the acquired message comprises using the local model by installing the master model redistributed from the server after the federated training with the collected as training information the weight update value of the layer performing internal weighted calculation

generated according to a determination result of the local model.

【Claim 2】

The method of claim 1, wherein the preprocessing an acquired message comprises segmenting the acquired message by adding spaces before and after a position of the number or specific word, for the number or specific word included in the message.

【Claim 3】

The method of claim 1, wherein the local model configured to update using a master model distributed through federated training with the training information generated from the plurality of user terminals.

【Claim 4】

The method of claim 3, wherein the determining whether the transfer information is included in the message comprises determining the transfer information is included in the message by using a first expected inclusion probability of the transfer information in the acquired message that is calculated by the local model, and a second expected inclusion probability of the transfer information in the

acquired message that is calculated by the master model.

【Claim 5】

The method of claim 1, wherein the classifying of the transfer information comprises classifying the transfer information in the message by using a regular expression that defines a text pattern for each category as grammar.

【Claim 6】

The method of claim 1, wherein the classifying of the transfer information comprises classifying the transfer information in the message by inputting the preprocessed message into a neural network model trained to classify the transfer information.

【Claim 7】

A computing device for determining transfer information in a message, the application comprising:

a preprocessing unit configured to preprocess an acquired message in the user terminal based on a reference word;

an extracting unit configured to extract an embedding vector corresponding to each segmented text from the preprocessed message;

a transfer information determination unit configured to determine whether the transfer information is included in the acquired message using a local model operated on the user terminal by installing the master model distributed from the server through weighted calculation of the extracted embedding vector; and

a transfer information classification unit configured to classify the transfer information in the preprocessed message determined to include the transfer information,

where in the transfer information determination unit is further configured to use the local model by installing the master model redistributed from the server after the federated training with the collected as training information the weight update value of the layer performing internal weighted calculation generated according to a determination result of the local model.

【Claim 8】

The computing device of claim 7, wherein the preprocessing unit is further configured to segment the message by adding spaces before and after a position of the number or specific word, for the number or specific word included in the message.

【Claim 9】

The computing device of claim 7, wherein the local model configured to update using a master model distributed through federated training with the training information generated from the plurality of user terminals.

【Claim 10】

The computing device of claim 9, wherein the transfer information determination unit is further configured to determine whether the transfer information is included in the message by using a first expected inclusion probability of the transfer information in the acquired message that is calculated by the local model, and a second expected inclusion probability of the transfer information in the acquired message that is calculated by the master model.

【Claim 11】

The computing device of claim 7, wherein the transfer information classification unit is further configured to classify the transfer information in the message by using a regular expression that defines a text pattern for each category as grammar.

【Claim 12】

The computing device of claim 7, wherein the transfer information classification unit is further configured to classify the transfer information in the message by inputting the preprocessed message into a neural network model trained to classify the transfer information.

【Claim 13】

A computer-readable recording medium storing a program for executing the method for determining transfer information according to any one of claims 1 to 2 and 3 to 6.