DESCRIPTION

TITLE OF THE INVENTION: LIVE BROADCAST INTERACTION METHOD, DEVICE, ELECTRONIC DEVICE AND COMPUTER-READABLE STORAGE MEDIUM

CROSS REFERENCE TO RELATED APPLICATION

[0001] The present disclosure claims priority to Chinese patent application with the filing No. 2025102364299, filed with the Chinese Patent Office on February 28, 2025, and entitled "LIVE BROADCAST INTERACTION METHOD, DEVICE, ELECTRONIC DEVICE AND COMPUTER-READABLE STORAGE MEDIUM", the entire contents of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of computer technology, and in particular to a live broadcast interaction method, a device, an electronic device and a computer-readable storage medium.

BACKGROUND ART

[0003] With the development of the live broadcast industry, functional live broadcast rooms and live broadcast with goods have mature applications in various industries. This type of live broadcast can often enable some users to achieve conversions through the interaction between the anchor and the users watching the live broadcast, such as following the anchor, purchasing goods, etc.

[0004] In the relevant technology, the conversion intention of the user itself can be analyzed and the users can be sorted according to the conversion intention, but this method can only realize the classification of users and cannot guide the live broadcast interaction process to promote user conversion, so there is a problem of poor live broadcast effect.

SUMMARY

[0005] In view of this, the objective of the present disclosure is to provide a live broadcast interaction method, device, electronic device and computer-readable storage medium to promote user conversion and improve the live broadcast effect.

[0006] In order to achieve the above objective, the technical solution adopted by the embodiment of the present disclosure is as follows.

[0007] In the first aspect, the present disclosure provides a live broadcast interaction method, the method comprising:

[0008] obtaining first interactive parameters corresponding to each of viewing users in a current live broadcast;

[0009] inputting the first interactive parameters corresponding to each of viewing user into a pre-trained user value model for processing to obtain conversion values corresponding to each of the viewing users; the conversion values represent a promotion effect of an interactive behavior between an anchor and the viewing user on a conversion of the viewing user;

[0010] determining first target users whose conversion values reach a preset value from multiple viewing users according to the conversion values corresponding to each of viewing user; and

[0011] determining interactive strategies corresponding to the first target users through a pre-trained reply model for each of the first target users respectively, and sending the interactive strategies to the anchor so that the anchor interacts with the first target users according to the interactive strategies.

[0012] In an optional embodiment, the step of obtaining the first interactive parameters corresponding to each of viewing users in a current live broadcast comprises:

[0013] obtaining live broadcast parameters in the current live broadcast; the live broadcast parameters include user messages of multiple viewing users and multiple live broadcast contents of the anchor; and

[0014] determining first interactive parameters corresponding to each of viewing user according to each user message and a timestamp corresponding to the user message, each anchor live broadcast content and a timestamp corresponding to the anchor live broadcast content.

[0015] In an optional embodiment, the step of inputting the first interactive parameters corresponding to each of viewing user into a pre-trained user value model for processing to obtain conversion values corresponding to each of the viewing users comprises:

[0016] for each of the viewing users respectively, inputting the first interaction parameter corresponding to the viewing user into the user value model for processing to obtain the first conversion probability and the second conversion probability corresponding to the viewing user, wherein

[0017] the first conversion probability represents a conversion probability of the viewing user when there is an interactive behavior between the anchor and the viewing user, and the second conversion probability represents the conversion probability of the viewing user when there is no interactive behavior between the user and the viewing user;

[0018] determining a difference between the first conversion probability and the second conversion probability as the conversion value of the viewing user.

[0019] In an optional embodiment, the step of determining the interaction strategies corresponding to each of the first target users through the pre-trained reply model comprises:

[0020] determining a reply order corresponding to each of the first target users according to the conversion value corresponding to each of the first target users; and

[0021] determining the users to be replied in sequence according to the reply order corresponding to each of the first target users, and inputting the first interaction parameters corresponding to the users to be replied into the reply model for processing to obtain the interaction strategies corresponding to the users to be replied.

[0022] In an optional embodiment, the method further includes:

[0023] determining at least one second target user from the plurality of viewing users according to the conversion value of each viewing user when the first target user does not exist, and inputting a first interaction parameter corresponding to the second target user into the reply model for processing to obtain the interaction strategy corresponding to the second target user.

[0024] In an optional implementation, the reply model is trained by the following steps:

[0025] acquiring second interaction parameters and industry knowledge data between the plurality of converted users and the anchor;

[0026] randomly determining interaction parameters to be processed from the plurality of the second interaction parameters according to a preset ratio, truncating the interaction parameters to be processed, and obtaining the truncated interaction parameters to be processed; and

[0027] inputting the second interaction parameters, the truncated interaction parameters to be processed, and the industry knowledge data into the preset initial reply model for training to obtain the trained reply model.

[0028] In an optional implementation, the user value model is trained by the following steps:

[0029] acquiring third interaction parameters corresponding to multiple viewing users;

[0030] adding training labels to the third interaction parameters corresponding to each of the viewing user according to conversion and interaction status of each of the viewing user; and

[0031] inputting the third interaction parameters with the training labels added into the preset initial user value model for training to obtain a trained user value model.

[0032] In the second aspect, the present disclosure provides a live broadcast interaction device, the device comprising:

[0033] an acquisition module, configured to acquire first interactive parameters corresponding to each of viewing users in a current live broadcast;

[0034] a processing module, configured to input the first interactive parameters corresponding to each of the viewing users into a pre-trained user value model for processing, and obtain a conversion value corresponding to each of the viewing users, where the conversion value represents a promotion effect of the interactive behavior between an anchor and the viewing user on a conversion of the viewing user; and

[0035] a determination module, configured to determine the first target users whose conversion values reach a preset value from a plurality of viewing users according to the conversion value corresponding to each of the viewing users; and

[0036] the determination module is further configured to determine the interactive strategies corresponding to the first target users through a pre-trained reply model for each of the first target users, and send the interactive strategies to the anchor, so that the anchor interacts with the first target users according to the interactive strategies.

[0037] In the third aspect, the present disclosure provides an electronic device, comprising a processor and a memory, wherein the memory stores a computer program executable by the processor, and the processor executes the computer program to implement the method described in any one of the aforementioned implementations.

[0038] In a fourth aspect, the present disclosure provides a computer-readable storage medium having a computer program stored thereon, and when the computer program is executed by a processor, the method described in any of the aforementioned embodiments is implemented.

[0039] The live broadcast interaction method, device, electronic device, and computer-readable storage medium provided in the embodiments of the present disclosure can determine the conversion value corresponding to each viewing user through the first interactive parameter corresponding to each viewing user and the pre-trained user value model. Since the conversion value can characterize the promotion effect of the interactive behavior between the anchor and the viewing user on the conversion of the viewing user, the first target user who should be

interacted with first can be determined according to the conversion value, and the interactive strategy corresponding to each first target user can be determined through the pre-trained reply model and sent to the anchor. In this way, the anchor can interact with each first target user preferentially according to the interactive strategy corresponding to each first target user, thereby promoting user conversion and improving the live broadcast effect.

BRIEF DESCRIPTION OF DRAWINGS

[0040] In order to more clearly illustrate the technical solution of the embodiment of the present disclosure, the following will briefly introduce the drawings required for use in the embodiment. It should be understood that the following drawings only show certain embodiments of the present disclosure, and therefore should not be regarded as limiting the scope. For those ordinary skilled in this field, other relevant drawings can also be obtained based on these drawings without creative work.

[0041] Figure 1 shows a block diagram of an electronic device provided by the embodiment of the present disclosure;

[0042] Figure 2 shows a flow diagram of a live broadcast interaction method provided by the embodiment of the present disclosure;

[0043] Figure 3 shows a schematic diagram of a user value model;

[0044] Figure 4 shows a schematic diagram of conversion value calculation; and

[0045] Figure 5 shows a functional module diagram of a live broadcast interaction device provided by the embodiment of the present disclosure.

[0046] Reference signs: 100-memory; 110-processor; 120-communication module; 200-acquisition module; 210-processing module; 220-determination module.

DETAILED DESCRIPTION OF EMBODIMENTS

[0047] The technical solutions in the embodiments of the present disclosure will be clearly and completely described in combination with the drawings in the embodiments of the present disclosure below. Obviously, the described embodiments are only part of the embodiments of the present disclosure, not all of the embodiments. The components of the embodiments of the present disclosure described and shown in the drawings here can be arranged and designed in various different configurations.

[0048] Therefore, the following detailed description of the embodiments of the present disclosure provided in the drawings is not intended to limit the scope of protection claimed the present disclosure, but only represents the selected embodiments of the present disclosure.

Based on the embodiments of the present disclosure, all other embodiments obtained by those skilled in the art without creative work are within the scope of protection of the present disclosure.

[0049] It should be noted that relational terms such as the terms “first” and “second” are only used to distinguish one entity or operation from another entity or operation, and do not necessarily require or imply any such actual relationship or order between these entities or operations. Moreover, the terms “include”, “comprise” or any other variant thereof are intended to cover non-exclusive inclusion, so that a process, method, article or device including a series of elements includes not only those elements, but also other elements not explicitly listed, or also includes elements inherent to such a process, method, article or device. In the absence of further restrictions, the elements defined by the sentence “including a ...” do not exclude the existence of other identical elements in the process, method, article or device including the elements.

[0050] At present, with the development of the live broadcast industry, functional live broadcast rooms, live broadcast with goods, etc. have mature applications in various industries. This type of live broadcast can often interact with users watching the live broadcast through the anchor to enable some users to achieve conversions, such as following the anchor, purchasing goods, etc.

[0051] Current live broadcast assistants and other software are often only configured to optimize the live broadcast process to improve the content quality of the live broadcast, but when facing a large number of users, the anchor or the live broadcast team still needs to select some users to reply.

[0052] In the related art, although some algorithms can analyze the conversion intention of the user itself and sort the users according to the conversion intention, this method can only realize the classification of users, and cannot determine the causal effect of the interactive behavior of the anchor on the user conversion. Therefore, it is often impossible to guide the live broadcast interaction workflow, and therefore it is impossible to promote user conversion, resulting in poor live broadcast effect.

[0053] Based on this, the embodiment of the present disclosure provides a live broadcast interaction method, device, electronic device and computer-readable storage medium to solve the above problems. Next, the live broadcast interaction method, device, electronic device and computer-readable storage medium provided by the embodiment of the present disclosure are introduced in combination with the drawings.

[0054] Figure 1 is a block diagram of an electronic device provided by the embodiment of the present disclosure. Referring to Figure 1, the electronic device includes a memory 100, a processor 110 and a communication module 120. The memory 100, the processor 110 and the communication module 120 are electrically connected to each other directly or indirectly to realize data transmission or interaction. For example, these elements can be electrically connected to each other through one or more communication buses or signal lines.

[0055] The memory 100 is configured to store computer programs or data that can be executed by the processor. The memory 100 can be, but is not limited to, a random access memory (RAM), a read only memory (ROM), a programmable read-only memory (PROM), an erasable programmable read-only memory (EPROM), an electric erasable programmable read-only memory (EEPROM), etc.

[0056] The processor 110 is configured to read/write data or computer programs stored in the memory and perform corresponding functions.

[0057] The communication module 120 is configured to establish a communication connection between the electronic device and other communication terminals through the network, and is configured to send and receive data through the network.

[0058] It should be understood that the structure shown in Figure 1 is only a structural schematic diagram of the electronic device, and the electronic device can also include more or fewer components than those shown in Figure 1, or have a different configuration from that shown in Figure 1. Each component shown in Figure 1 can be implemented by hardware, software or a combination thereof.

[0059] Next, the live broadcast interaction method provided by the embodiment of the present disclosure is exemplarily introduced in combination with the flowchart diagram, taking the electronic device in Figure 1 as the execution subject. Specifically, Figure 2 is a flowchart of the live broadcast interaction method provided by the embodiment of the present disclosure, referring to Figure 2, the method includes:

[0060] Step S20, obtaining the first interaction parameter corresponding to each viewing user in the current live broadcast.

[0061] Optionally, the first interaction parameter can be a conversation combination corresponding to the viewing user, including the question content of the viewing user starting from entering the live broadcast room and the corresponding reply content from the anchor.

[0062] Optionally, the electronic device can start to obtain the first interaction parameter corresponding to each viewing user in the current live broadcast in real time after the preset duration of the live broadcast starts for processing.

[0063] Step S21, inputting the first interaction parameter corresponding to each viewing user into a pre-trained user value model for processing, and obtaining the conversion value corresponding to each viewing user.

[0064] The conversion value represents the promotion effect of the interactive behavior between the anchor and the viewing user on the conversion of the viewing user.

[0065] In this embodiment, the conversion value can reflect the causal effect of the interactive behavior of anchor on the conversion of the user, that is, the conversion value can be used to determine whether the anchor can promote the conversion of the user after taking interactive measures against the viewing user, such as purchasing goods, following the anchor, etc.

[0066] Optionally, different live broadcast rooms can have different conversion goals, for example, some live broadcast rooms can hope to achieve user's following, some live broadcast rooms can hope to achieve user purchases, and some live broadcast rooms can hope that users leave some sales leads, etc. Therefore, the user value model can be set according to the specific conversion goals of the live broadcast room, so as to obtain the conversion value corresponding to the relevant conversion goal.

[0067] Step S22, determining first target users whose conversion values reach the preset values from multiple viewing users according to the conversion value corresponding to each viewing user.

[0068] Optionally, viewing users can generally be divided into four categories, including user groups that are disgusted by the speech, non-target user groups, high-value user groups, and interactive conversion groups.

[0069] The user group that is disgusted by the speech refers to users who are resistant to the active interactive guidance behavior of the anchor, which will lead to a decrease in the professionalism and trust in the live broadcast, and can complete natural conversion if the anchor and the audience do not actively interact. The non-target user group refers to users who only watch in the live broadcast room and cannot complete the conversion regardless of whether the live broadcast interacts with them. The high-value user group refers to users who will complete the conversion regardless of whether the anchor gives priority to replying to their questions or actively initiates interaction. The interactive conversion group refers to users who need to give priority to replying or interacting to complete the conversion, otherwise they will jump out of the live broadcast room.

[0070] Optionally, the first target user refers to the viewing user whose conversion is greatly promoted by the interactive behavior of the anchor, that is, the above-mentioned interactive conversion group.

[0071] It is understandable that for such users, if the anchor does not give priority to replying to their questions or actively guiding them, the conversion probability of these users is small. On the contrary, if the anchor gives priority to replying to their questions or actively guiding them, these users are likely to complete the conversion. Therefore, it is necessary to determine these first target users from multiple viewing users for priority interaction.

[0072] Optionally, the preset value can be set according to the actual application situation, and the present disclosure does not make too much limitation on this. For example, if the number of people in the live broadcast room is small, only 500 people, a smaller preset value can be set to ensure that 50% of the viewing users are the first target users; if the number of people in the live broadcast room is large, such as 100,000 people, a higher preset value can be set to ensure that 0.5% of the viewing users are the first target users.

[0073] Step S23, determining, for each first target user, the interaction strategy corresponding to the first target use through the pre-trained reply model, and sending the interaction strategy to the anchor so that the anchor interacts with the first target user according to the interaction strategy.

[0074] Optionally, the reply model can be a large language model.

[0075] Optionally, the interactive strategy can be the reply content for the question with no reply raised by the first target user (i.e., predicting the reply content from the anchor), or it can be the topic guidance for the first target user (i.e., predicting the next question from the user), such as raising the guiding question that the first target user is interested in, introducing the content that the first target user is interested in, etc.

[0076] For example, if a first target user actively asks a question, the electronic device can generate at least one reply corresponding to the question through the reply model and send it to the anchor, and the anchor selects a reply to interact with the first target user in the live broadcast room; if a first target user has not actively asked a question, a guiding question for the content that the first target user is interested in (i.e., the user's next question) can be generated.

[0077] For the reply content from the anchor, the anchor can reply the reply content of the anchor to the first target user to interact with the first target user, and for the next question of the user, the anchor can actively ask the first target user whether he wants to ask this question based on the next question to interact with the first target user.

[0078] The live broadcast interaction method provided in the embodiment of the present disclosure can determine the conversion value corresponding to each viewing user through the first interactive parameter corresponding to each viewing user and the pre-trained user value model. Since the conversion value can represent the promotion effect of the interactive behavior between the anchor and the viewing user on the conversion of the viewing user, the first target user who should be interacted with preferentially can be determined according to the conversion value, and the interactive strategy corresponding to each first target user can be determined through the pre-trained reply model and sent to the anchor. In this way, the anchor can interact with each first target user preferentially according to the interactive strategy corresponding to each first target user, thereby promoting user conversion and improving the live broadcast effect.

[0079] Optionally, for the convenience of application, the reply model and the user value model can be trained first.

[0080] In this embodiment, the corresponding reply model and user value model can be trained for each live broadcast room respectively, or the general reply model and user value model can be trained for multiple live broadcast rooms. The specific setting can be made according to the actual application situation, and the present disclosure does not impose too much limitation on this.

[0081] Next, a possible embodiment for how to train the reply model is provided.

[0082] Specifically, the electronic device can obtain the second interaction parameters and industry knowledge data between multiple converted users and the anchor, randomly determine the interaction parameters to be processed from the multiple second interaction parameters according to a preset ratio, truncate the interaction parameters to be processed, obtain the truncated interaction parameters to be processed, and then input the second interaction parameters, the truncated interaction parameters to be processed and the industry knowledge data into the preset initial reply model for training to obtain a trained reply model.

[0083] Optionally, the converted user refers to a user who has achieved the relevant conversion goal, such as having purchased relevant products, having followed the anchor, etc.

[0084] Optionally, the second interaction parameter can include all interaction parameters from the time the converted user enters the live broadcast room to the time of conversion, that is, the user comments or questions of the converted user and the reply from the anchor, and the industry knowledge data can include the conversation records between industry experts and users, and can also include industry-related documents, etc.

[0085] For example, for a car live broadcast room, industry knowledge data can be a conversation between an automotive industry expert and a user. This part of data can improve the performance of the reply model in industry logic reasoning ability. If the user asks “I am in the Northeast, recommend a car”, the reply can be “The winter in the Northeast is relatively cold. If it is only used in the city and there are charging piles, an electric car can be taken into consider, otherwise it is recommended to buy a large-displacement oil car”.

[0086] Optionally, in order to ensure that the reply model can predict the questions that the user can be interested in so as to actively ask questions to the corresponding user, such as predicting the next question of the user and predicting the effective reply content of the anchor, the electronic device can also truncate the second interaction parameter. In this embodiment, the electronic device can randomly select some of the multiple second interaction parameters as the interaction parameters to be processed, and divide the interaction parameters to be processed into the first interaction parameters to be processed and the second interaction parameters to be processed, wherein the first interaction parameters to be processed are truncated according to the reply of the anchor, and the second interaction parameters to be processed are randomly truncated, so as to obtain the truncated interaction parameters to be processed.

[0087] In one example, if the reply of the anchor is characterized as A, and the question of the user or comment is characterized as Q, then the second interaction parameter can be characterized as Q->A->Q->…->Q->(A) (i.e., the user completes the conversion after the anchor replies (A)), the first interaction parameter to be processed can be characterized as Q->A->Q->…->A->(Q) (used to be configured to predict the next question of the user (Q)), and the second interaction parameter to be processed can be characterized as Q->A->Q->…->Q->(A) (the second interaction parameter is randomly truncated and configured to predict the reply content of the anchor (A)).

[0088] Optionally, the preset ratio can be set according to the actual application situation. In one possible embodiment, the second interaction parameter, the first interaction parameter to be processed, the second interaction parameter to be processed, and the industry knowledge data can be mixed in a ratio of 2:1:2:1.

[0089] In one possible embodiment, the initial reply model can be Qianwen 2.5 14B. In addition, the electronic device can also perform Lora fine-tuning on the reply model in a supervised fine-tuning manner. The fine-tuning hardware can use Nvidia A800*12, 500GB RAM training cluster, and the training rounds can be preset rounds, such as 3 rounds.

[0090] Optionally, after the reply model training is completed, it can be deployed according to actual application requirements.

[0091] It should be noted that the reply information generated by the large model in the related technology is often not natural enough, and it is often impossible to combine the interactive context of the user and live broadcast context information to generate personalized replies, so it is impossible to solve user problems while interacting with users in a targeted manner and guide users to complete conversion.

[0092] The live broadcast interaction method provided by the embodiment of the present disclosure can input the second interaction parameters and industry knowledge data of the converted users into the initial reply model for training. Therefore, the trained reply model can combine product expertise and conversation history under the corresponding style and tone to generate a suitable interaction strategy. At the same time, by intercepting part of the second interaction parameters and inputting them into the initial reply model for training, the trained reply model can also have the ability to actively ask questions, guide and high-quality reply capabilities. In this way, personalized replies can be generated in the current live broadcast, and user problems can be solved while interacting with users in a targeted manner, and users can be guided to complete conversion.

[0093] Next, a possible embodiment for how to train the user value model is provided.

[0094] Specifically, the electronic device can obtain the third interaction parameters corresponding to multiple viewing users, add training tags to the third interaction parameters corresponding to each viewing user according to the conversion and interaction status of each viewing user, and then input the third interaction parameters with the training tags added into the preset initial user value model for training to obtain the trained user value model.

[0095] Optionally, due to the characteristics of live broadcast, electronic devices cannot collect information about whether the same viewing user has completed conversion when interacting or not interacting at the same time. Therefore, the interaction parameters between the anchor and the user during the live broadcast can be collected. For the converted users, all the interaction parameters from the time of entering the live broadcast room to the conversion time point can be retained, and for the unconverted users, all the interaction parameters during the entire live broadcast can be retained.

[0096] It can be understood that the third interaction parameter can include all the interaction parameters of the converted users from entering the live broadcast room to the conversion time point, and all the interaction parameters of the unconverted users during the entire live broadcast.

[0097] Optionally, the conversion situation refers to whether the viewing user has converted, and the interaction situation refers to whether there is interactive behavior between the viewing user and the anchor.

[0098] In a possible implementation, the interaction situation can be characterized as T, and the conversion situation can be characterized as Y. Then, according to the conversion situation and interaction situation of each viewing user, training labels can be added to the third interaction parameters corresponding to each viewing user, including (T=1, Y=1), (T=1, Y=0), (T=0, Y=1), (T=0, Y=0).

[0099] The (T=1, Y=1) represents that there is interactive behavior between the viewing user and the anchor and the user is converted, (T=1, Y=0) represents that there is interactive behavior between the viewing user and the anchor and the user is not converted, (T=0, Y=1) represents that there is no interactive behavior between the viewing user and the anchor and the user is converted, and (T=0, Y=0) represents that there is no interactive behavior between the viewing user and the anchor and the user is not converted.

[0100] It can be understood that the situation where there is no interactive behavior refers to the situation where the viewing user actively asks questions or actively comments, thereby leaving interaction parameters, but the anchor does not reply to them.

[0101] In a possible implementation, considering that in the actual live broadcast scene, most of the viewing users are users who do not have interactive behavior and are not converted, the data volume of the third interaction parameter of (T=0, Y=0) can be large. In order to ensure the model training effect, the electronic device can randomly sample the third interaction parameter of (T=0, Y=0), and select part of the third interaction parameters of (T=0, Y=0) to input into the initial user value model for training.

[0102] Optionally, the initial user value model can be an Uplift+Transformer structure.

[0103] Optionally, considering that there can be multiple conversion targets, such as following, purchase, and transaction leads, multi-task training can be adopted, that is, multiple training labels are set for the third interaction parameter, such as Y1 represents purchase, Y2 represents following, etc. On this basis, the user value model can output values corresponding to multiple conversion targets.

[0104] Optionally, after the user value model is trained, it needs to be deployed. At this time, one or more different conversion targets can be selected for different live broadcast rooms.

[0105] In an example, Figure 3 is a schematic diagram of the user value model. Referring to Figure 3, the electronic device can input multiple third interaction parameters with training labels added to the embedding layer to generate a sentence embedding vector, input the

sentence embedding vector to the Transformer layer for processing, contextually encode the sentence embedding vector, output a word vector containing context information, and then splice the vectors from different sources through the splicing layer to output a high-dimensional vector of comprehensive information. Finally, the spliced vector is nonlinearly transformed through the fully connected layer to output the final prediction result.

[0106] Optionally, considering that there are many live broadcast parameters in the actual live broadcast process, the electronic device first obtains the live broadcast parameters in the current live broadcast, performs data cleaning on them, and obtains the first interaction parameter.

[0107] In this embodiment, the live broadcast parameter can include user messages of multiple viewing users and multiple live broadcast contents of anchors.

[0108] Optionally, the live broadcast contents of anchors can include the oral broadcast contents of anchors and the comment information of anchors on the messages of viewing users.

[0109] Optionally, the electronic device can determine the first interaction parameters corresponding to each viewing user according to the timestamps corresponding to the messages of each user and the user messages, the live broadcast contents of each anchor and the timestamps corresponding to the live broadcast contents of the anchor.

[0110] In this embodiment, the electronic device can clean and integrate the live broadcast parameters to obtain the session combination corresponding to each viewing user, that is, the first interaction parameter.

[0111] Next, a possible embodiment is provided for how to input the first interaction parameters corresponding to each viewing user into the pre-trained user value model for processing to obtain the conversion value corresponding to each viewing user.

[0112] Specifically, the electronic device can input the first interaction parameters corresponding to each viewing user into the user value model for processing for each viewing user, obtain the first conversion probability and the second conversion probability corresponding to the viewing user, and determine the difference between the first conversion probability and the second conversion probability as the conversion value of the viewing user.

[0113] The first conversion probability represents the conversion probability of the viewing user when there is an interactive behavior between the anchor and the viewing user, and the second conversion probability represents the conversion probability of the viewing user when there is no interactive behavior between the user and the viewing user.

[0114] Optionally, the user value model can process the first interactive parameter to output the corresponding conversion probability of the viewing user.

[0115] In this embodiment, in order to determine the promoting effect of the interactive behavior of the anchor on the conversion of the viewing user, two prediction processes can be performed through the user value model, and different interactive variables are set for the two prediction processes respectively, so as to output the first conversion probability and the second conversion probability respectively.

[0116] It can be understood that the interactive variable is a binary variable, which refers to whether the anchor has an interactive behavior with the viewing user.

[0117] In an example, referring to Figure 4 showing a schematic diagram of conversion value calculation, the electronic device can input the first interactive parameter of the viewing user into the user value model, and set the interactive variable T to 1, so as to obtain the first conversion probability of the conversion variable Y=1 when the viewing user obtains the T=1. In addition, the electronic device also needs to set the interactive variable T to 0, so as to obtain the second conversion probability of the conversion variable Y=1 when the viewing user obtains the T=0, and then determine the difference between the two as the conversion value corresponding to the viewing user.

[0118] Optionally, in order to further improve the conversion probability of viewing users, the anchor needs to interact with the first target users with high conversion values first. Therefore, when determining the interaction strategy corresponding to the first target users, the electronic device can first sort the first target users.

[0119] Next, a possible embodiment is provided for how to determine the interaction strategy corresponding to the first target users through the pre-trained reply model for each first target user respectively.

[0120] Specifically, the electronic device can determine the reply order corresponding to each first target user according to the conversion value corresponding to each first target user, determine the users to be replied in turn according to the reply order corresponding to each first target user, input the first interaction parameters corresponding to the users to be replied into the reply model for processing, and obtain the interaction strategy corresponding to the users to be replied.

[0121] Optionally, the electronic device can sort each first target user from high to low according to the conversion value, so as to determine the reply order corresponding to each first target user.

[0122] In this embodiment, if the user value model is provided with only one conversion target, it can be sorted directly according to the conversion value corresponding to the conversion target, but if the user value model is provided with multiple conversion targets, such

as both purchase and following, the electronic device can perform mixed sorting of the first target users according to the preset recommendation algorithm and the conversion value corresponding to each conversion target.

[0123] The conversion goals can include following, purchase, interest, etc., and the mixed sorting refers to the weighted average value obtained by weighted averaging based on the weight of each conversion goal set, and sorting in reverse order from large to small.

[0124] In one possible implementation, the preset recommendation algorithm can be a click-through rate algorithm (CTR).

[0125] Optionally, in order to ensure the generation effect of the interactive strategy, the electronic device can also input the output result of the user value model, the interactive goal, the time from the last record of the first interactive parameter of the first target user to the current moment, the time the first target user enters the live broadcast room, etc. in the reply model.

[0126] The output result of the user value model refers to the conversion probability of the first target user, and the interactive goal can be to guide the user to follow, guide the user to purchase, guide the user to leave sales leads, etc.

[0127] It can be understood that the interactive strategy needs to be related to the interactive goal, for example, prompting the user shopping information, guiding the user to follow, analyzing the products that the user pays attention to, etc.

[0128] Optionally, in order to ensure the processing accuracy of the reply model, it is also necessary to iteratively train the reply model according to the interactive parameters generated in the actual application process.

[0129] In this embodiment, in order to improve the richness and diversity of interactive strategies, the electronic device can not only generate interactive strategies through the reply model and send them to the anchor, but also encourage the anchor to reply to the user by himself/herself, so as to explore more and better reply ways.

[0130] In a possible implementation, the model interaction ratio and the anchor interaction ratio can be set according to the actual application situation. In an example, the model interaction ratio can be 80%, and the anchor interaction ratio can be 20%, that is, the electronic device can input 80% of the first interaction parameters of the first target user into the reply model for processing, and send 20% of the first interaction parameters of the first target user to the anchor, and the anchor can reply to the questions of the first target user by himself/herself, or initiate topic guidance for him.

[0131] Optionally, considering that there can be a situation where the first target user does not exist, the electronic device can determine at least one second target user from multiple viewing users according to the conversion value of each viewing user, input the first interaction parameter corresponding to the second target user into the reply model for processing, and obtain the interaction strategy corresponding to the second target user.

[0132] In this embodiment, if there is no conversion value greater than the preset value, the electronic device can find at least one second target user with a larger conversion value among multiple viewing users, and generate an interaction strategy corresponding to the second target user.

[0133] In one possible implementation, the electronic device can reduce the preset value, and select the second target user from multiple viewing users according to the reduced preset value.

[0134] In order to perform the corresponding steps in the above embodiments and each possible method, a method for implementing a live broadcast interaction device is given below. Optionally, referring to Figure 5, Figure 5 is a functional module diagram of a live broadcast interaction device provided in the embodiment of the present disclosure. It should be noted that the basic principle and technical effect of the live broadcast interaction device provided in this embodiment are the same as those in the above embodiments. For the sake of brief description, the parts not mentioned in this embodiment can refer to the corresponding contents in the above embodiments. The live broadcast interaction device includes: an acquisition module 200, a processing module 210 and a determination module 220.

[0135] The acquisition module 200 is configured to obtain the first interaction parameter corresponding to each viewing user in the current live broadcast.

[0136] It can be understood that the acquisition module can be configured to perform the above step S20.

[0137] The processing module 210 is configured to input the first interaction parameter corresponding to each viewing user into the pre-trained user value model for processing, and obtain the conversion value corresponding to each viewing user. The conversion value represents the promotion effect of the interactive behavior between the anchor and the viewing user on the conversion of the viewing user.

[0138] It is understandable that the processing module 210 can be configured to perform the above step S21.

[0139] The determination module 220 is configured to determine the first target user whose conversion value reaches the preset value from multiple viewing users according to the conversion value corresponding to each viewing user.

[0140] It is understandable that the determination module 220 can be configured to perform the above step S22.

[0141] The determination module 220 is also configured to determine the interaction strategy corresponding to the first target user through the pre-trained reply model for each first target user, and send the interaction strategy to the anchor so that the anchor interacts with the first target user according to the interaction strategy.

[0142] It is understandable that the determination module 220 can be configured to perform the above step S23.

[0143] Optionally, the acquisition module 200 is also configured to acquire the live broadcast parameters in the current live broadcast, wherein the live broadcast parameters include user messages of multiple viewing users and multiple anchor live broadcast contents; and determine the first interaction parameter corresponding to each viewing user according to each user message and the timestamp corresponding to the user message, each anchor live broadcast content and the timestamp corresponding to the anchor live broadcast content.

[0144] Optionally, the processing module 210 is further configured to, for each viewing user respectively, input the first interaction parameter corresponding to each viewing user into the user value model for processing; obtain the first conversion probability and the second conversion probability corresponding to the viewing user, wherein the first conversion probability represents the conversion probability of the viewing user when there is an interactive behavior between the anchor and the viewing user, the second conversion probability represents the conversion probability of the viewing user when there is no interactive behavior between the user and the viewing user; and determine the difference between the first conversion probability and the second conversion probability as the conversion value of the viewing user.

[0145] Optionally, the determination module 220 is further configured to determine the reply order corresponding to each first target user according to the conversion value corresponding to each first target user; determine the users to be replied in turn according to the reply order corresponding to each first target user; input the first interaction parameter corresponding to the users to be replied into the reply model for processing; and obtain the interaction strategy corresponding to the users to be replied.

[0146] Optionally, the determination module 220 is further configured to determine at least one second target user from multiple viewing users according to the conversion value of each viewing user when there is no first target user, input the first interaction parameter

corresponding to the second target user into the reply model for processing, and obtain the interaction strategy corresponding to the second target user.

[0147] Optionally, the live interactive model also includes a model training module, the model training module is configured to obtain the second interactive parameters and industry knowledge data between multiple converted users and the anchor; randomly determine the interaction parameters to be processed from the multiple second interactive parameters according to a preset ratio; truncate the interaction parameters to be processed; obtain the truncated interaction parameters to be processed; and input the second interaction parameters, the truncated interaction parameters to be processed and the industry knowledge data into a preset initial reply model for training to obtain a trained reply model.

[0148] Optionally, the model training module is also configured to obtain the third interactive parameters corresponding to multiple viewing users; add training labels to the third interactive parameters corresponding to each viewing user according to the conversion and interaction status of each viewing user; and input the third interactive parameters with the training labels added into a preset initial user value model for training to obtain a trained user value model.

[0149] Optionally, the above module can be stored in the memory shown in Figure 1 in the form of software or firmware or solidified in the operating system (OS) of the electronic device, and can be executed by the processor in Figure 1. At the same time, the data and program codes required to execute the above module can be stored in the memory.

[0150] The present disclosure also provides a computer-readable storage medium on which a computer program is stored. When the computer program is executed by a processor, the live broadcast interaction method provided by the present disclosure can be implemented.

[0151] In the several embodiments provided in the present disclosure, it should be understood that the disclosed devices and methods can also be implemented in other ways. The device embodiments described above are merely schematic. For example, the flowcharts and block diagrams in the drawings show the possible architecture, functions and operations of the devices, methods and computer program products according to the multiple embodiments of the present disclosure. At this point, each box in the flowcharts and block diagrams represents a module, a program segment or a portion of a code, and the module, the program segment or the portion of a code contains one or more executable instructions configured to implement a specified logical function. It should also be noted that in some alternative implementations, the functions marked in the box can also occur in a different order than that marked in the drawings. For example, two consecutive boxes can actually be executed substantially in parallel, and they can sometimes be executed in the opposite order, depending on the functions involved. It

should also be noted that each box in the block diagram and/or flow chart, and the combination of boxes in the block diagram and/or flow chart, can be implemented by a dedicated hardware-based system that performs the specified function or action, or can be implemented by a combination of dedicated hardware and computer instructions.

[0152] In addition, the functional modules in various embodiments of the present disclosure can be integrated together to form an independent part, or each module can exist separately, or two or more modules can be integrated to form an independent part.

[0153] If the function is implemented in the form of a software functional module and sold or used as an independent product, it can be stored in a computer-readable storage medium. Based on this understanding, the technical solution of the present disclosure, or the part that contributes to the relevant technology, or the part of the technical solution, can be embodied in the form of a software product. The computer software product is stored in a storage medium, including several instructions to enable a computer device (which can be a personal computer, server, or network device, etc.) to perform all or part of the steps of the method described in each embodiment of the present disclosure. The aforementioned storage medium includes: U disk, mobile hard disk, read-only memory (ROM), random access memory (RAM), disk or optical disk, etc., which can store program code.

[0154] The above is only an optional embodiment of the present disclosure, and is not configured to limit the present disclosure. For those skilled in the art, the present disclosure can have various changes and variations. Any modification, equivalent replacement, improvement, etc. made within the spirit and principle of the present disclosure shall be included in the protection scope of the present disclosure.

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[0155] The above scheme is adopted to determine the conversion value corresponding to each viewing user through the first interaction parameter corresponding to each viewing user and the pre-trained user value model. The conversion value represents the promotion effect of the interactive behavior between the anchor and the viewing user on the conversion of the viewing user. According to the conversion value corresponding to each viewing user, the first target user whose conversion value reaches the preset value is determined from multiple viewing users, and the interaction strategy corresponding to each first target user is determined through the pre-trained reply model and sent to the anchor. In this way, the anchor can preferentially interact with each first target user according to the interaction strategy corresponding to each first target user, thereby promoting user conversion and improving the live broadcast effect.

CLAIMS

Claim 1: A live broadcast interaction method, wherein the method comprises:

obtaining first interactive parameters corresponding to each of viewing users in a current live broadcast;

inputting the first interactive parameters corresponding to each of viewing user into a pre-trained user value model for processing to obtain conversion values corresponding to each of the viewing users, wherein the conversion values represent a promotion effect of an interactive behavior between an anchor and the viewing user on a conversion of the viewing user;

determining first target users whose conversion values reach a preset value from multiple viewing users according to the conversion values corresponding to each of viewing user; and

determining interactive strategies corresponding to the first target users through a pre-trained reply model for each of the first target users respectively, and sending the interactive strategies to the anchor so that the anchor interacts with the first target users according to the interactive strategies.

Claim 2: The method according to claim 1, wherein the step of obtaining the first interactive parameters corresponding to each of viewing users in a current live broadcast comprises:

obtaining live broadcast parameters in the current live broadcast, wherein the live broadcast parameters comprise user messages of multiple viewing users and multiple live broadcast contents of the anchor; and

determining first interactive parameters corresponding to each of viewing user according to each user message and a timestamp corresponding to the user message, each anchor live broadcast content and a timestamp corresponding to the anchor live broadcast content.

Claim 3: The method according to claim 1 or 2, wherein the step of inputting the first interactive parameters corresponding to each of viewing user into a pre-trained user value model for processing to obtain conversion values corresponding to each of the viewing users comprises:

inputting, for each of the viewing users respectively, the first interaction parameter corresponding to the viewing user into the user value model for processing to obtain a first conversion probability and a second conversion probability corresponding to the viewing user, wherein

the first conversion probability represents a conversion probability of the viewing user when an interactive behavior exists between the anchor and the viewing user, and the second conversion probability represents the conversion probability of the viewing user when no interactive behavior exists between the user and the viewing user; and

determining a difference between the first conversion probability and the second conversion probability as the conversion value of the viewing user.

Claim 4: The method according to any one of claims 1 to 3, wherein the step of determining interactive strategies corresponding to the first target users through the pre-trained reply model for each of the first target users respectively comprises:

determining a reply order corresponding to each of the first target users according to the conversion value corresponding to each of the first target users; and

determining the users to be replied in sequence according to the reply order corresponding to each of the first target users, and inputting the first interaction parameters corresponding to the users to be replied into the reply model for processing to obtain the interaction strategies corresponding to the users to be replied.

Claim 5: The method according to any one of claims 1to 4, wherein the method further comprises:

determining at least one second target user from the plurality of viewing users according to the conversion value of each viewing user when the first target user does not exist, and inputting a first interaction parameter corresponding to the second target user into the reply model for processing to obtain the interaction strategy corresponding to the second target user

Claim 6: The method according to any one of claims 1 to 5, wherein the reply model is trained by following steps:

acquiring second interaction parameters and industry knowledge data between the plurality of converted users and the anchor;

randomly determining interaction parameters to be processed from the plurality of the second interaction parameters according to a preset ratio, truncating the interaction parameters to be processed, and obtaining the truncated interaction parameters to be processed; and

inputting the second interaction parameters, the truncated interaction parameters to be processed, and the industry knowledge data into a preset initial reply model for training to obtain the trained reply model.

Claim 7: The method according to any one of claims 1 to 6, wherein the user value model is trained by following steps:

acquiring third interaction parameters corresponding to multiple viewing users;

adding training labels to the third interaction parameters corresponding to each of the viewing user according to conversion and interaction status of each of the viewing user; and

inputting the third interaction parameters with the training labels added into the preset initial user value model for training to obtain a trained user value model.

Claim 8: The method according to any one of claims 1 to 7, wherein the user value module is provided with at least one conversion target; and the step of inputting the first interaction parameters corresponding to each of the viewing users into the pre-trained user value model for processing to obtain the conversion value corresponding to each of the viewing users comprises:

inputting the first interaction parameters corresponding to each of viewing user into the pre-trained user value model for processing to obtain the conversion values corresponding to each of viewing user under the at least one conversion target.

Claim 9: The method according to claim 8, wherein one conversion target is set; and the step of determining the interactive strategies corresponding to the first target

users through a pre-trained reply model for each of the first target users respectively comprises:

sorting each of the first target users to determine the reply order corresponding to each of first target users according to the conversion values corresponding to each of first target users under the one conversion target;

determining the users to be replied in sequence according to the reply order corresponding to each of first target user; and

inputting the first interaction parameters corresponding to the users to be replied into the reply model to obtain the interaction strategies corresponding to the users to be replied.

Claim 10: The method according to claim 8 or 9, wherein multiple conversion targets are set; and the step of determining the interactive strategies corresponding to the first target users through a pre-trained reply model for each of the first target users respectively comprises:

obtaining a weighted average value corresponding to each of first target user according to a weighted average of the conversion values corresponding to each of first target users under the multiple conversion targets;

performing a mixed sorting of each of first target users to determine the reply order corresponding to each of first target user according to the weighted average value corresponding to each of the first target users;

determining the users to be replied in sequence according to the reply order corresponding to each of first target users; and

inputting the first interaction parameters corresponding to the user to be replied into the reply model to obtain the interaction strategies corresponding to the users to be replied.

Claim 11: The method according to any one of claims 1 to 10, wherein the interaction strategies comprise a reply content of a question with no reply raised by the first target user, or a topic guidance which the first target users are interest in.

Claim 12: The method according to any one of claims 2 to 11, wherein the live broadcast content of the anchor comprises: an oral broadcast content of the anchor and a comment information of the anchor on the user message.

Claim 13: A live broadcast interaction device, wherein the device comprises:
an acquisition module, configured to acquire first interactive parameters corresponding to each of viewing users in a current live broadcast;
a processing module, configured to input the first interactive parameters corresponding to each of the viewing users into a pre-trained user value model for processing, and obtain a conversion value corresponding to each of the viewing users, wherein the conversion value represents a promotion effect of the interactive behavior between the anchor and the viewing user on a conversion of the viewing user; and
a determination module, configured to determine the first target users whose conversion values reach a preset value from a plurality of viewing users according to the conversion value corresponding to each of the viewing users, wherein
the determination module is further configured to determine the interactive strategies corresponding to the first target users through a pre-trained reply model for each of the first target users, and send the interactive strategies to the anchor, so that the anchor interacts with the first target users according to the interactive strategies.

Claim 14: An electronic device, wherein the electronic device comprises a processor and a memory, the memory stores a computer program that can be executed by the processor, and the processor can execute the computer program to implement the method according to any one of claims 1 to 12.

Claim 15: A computer-readable storage medium having a computer program stored thereon, wherein when the computer program is executed by a processor, the method according to any one of claims 1 to 12 is implemented.