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# **METHOD AND APPARATUS FOR INTERACTION INFORMATION PROCESSING, TERMINAL, STORAGE MEDIUM, AND PROGRAM PRODUCT**

## **RELATED APPLICATION**

**[0001]** This application claims priority to Chinese Patent Application No. 202011459769.1, entitled "INTERACTION INFORMATION DISPLAY METHOD AND APPARATUS, TERMINAL, AND STORAGE MEDIUM" filed on December 11, 2020, which is incorporated by reference in its entirety.

## **FIELD OF THE TECHNOLOGY**

**[0002]** Embodiments of this disclosure relate to the field of application development technologies, and in particular, to a method and an apparatus for interaction information processing, a terminal, a storage medium, and a program product.

## **BACKGROUND OF THE DISCLOSURE**

**[0003]** In some multiplayer game battles, sometimes there is need to display some interaction information in a battle interface to increase fun of the game.

**[0004]** In the related art, a battle interface includes a chat control. A chat interface is displayed by clicking the chat control. Interaction icons are displayed by clicking an expression control in the chat interface. By clicking one of the interaction icons is clicked, interaction information corresponding to the interaction icon is displayed in the battle interface.

**[0005]** In the foregoing related art, to display the interaction information, it is necessary to set the chat control in the battle interface, and sequentially click the chat control, the expression control, and the interaction icon. The operation steps are cumbersome.

## **SUMMARY**

**[0006]** Embodiments of this disclosure provide a method and apparatus for interaction information processing, a terminal, a storage medium, and a program product, which can simplify operation of displaying interaction information. The technical solutions are as follows.

**[0007]** According to an aspect of this disclosure, a method for interaction information processing is provided. The method is executable by a terminal and includes:

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- [0008]** displaying a battle interface of a multiplayer online battle, the battle interface including a target virtual object;
- [0009]** displaying an interaction icon presentation region in response to an icon presentation operation for the target virtual object, the interaction icon presentation region including at least one candidate interaction icon;
- [0010]** receiving a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon; and
- [0011]** displaying interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object.
- [0012]** According to an aspect of this disclosure, an apparatus for interaction information processing is provided. The apparatus includes:
- [0013]** an interface display module, configured to display a battle interface of a multiplayer online battle, the battle interface including a target virtual object;
- [0014]** an icon presentation module, configured to display an interaction icon presentation region in response to an icon presentation operation for the target virtual object, the interaction icon presentation region including at least one candidate interaction icon;
- [0015]** an operation receiving module, configured to receive a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon; and
- [0016]** an information display module, configured to display interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object.
- [0017]** According to an aspect of this disclosure, a terminal is provided. The terminal includes a processor and a memory. The memory stores at least one instruction, at least one program, a code set, or an instruction set. The processor loads and executes the at least one instruction, the at least one program, the code set, or the instruction set to implement the method for interaction information processing.
- [0018]** According to an aspect of this disclosure, a computer-readable storage medium is provided. The computer-readable storage medium stores at least one instruction, at least one program, a code set, or an instruction set. The at least one instruction, the at least one program, the code set, or the instruction set, when being loaded and executed by a processor, implements the method for interaction information processing.

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**[0019]** According to an aspect of this disclosure, a computer program product or a computer program is provided. The computer program product or the computer program includes computer instructions stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium and executes the computer instructions, to cause the computer device to execute the method for interaction information processing.

**[0020]** The technical solutions provided in the embodiments of this disclosure may have the following beneficial effects.

**[0021]** Through the icon presentation operation for the battle interface of the multiplayer online battle, the display of the candidate interaction icons can be triggered efficiently. Through the selection confirmation operation for the target interaction icon, the target interaction icon can then be quickly selected and the corresponding interaction information can be displayed. Compared with a solution of finding and clicking a chat control, then finding and clicking an expression control, and then finding and clicking a target interaction icon to display corresponding interaction information, the embodiments in this disclosure can simplify the operation of displaying the interaction information and improve the operation convenience.

**[0022]** It is to be understood that, the foregoing general descriptions and the following detailed descriptions are merely for illustration and explanation purposes and are not intended to limit this disclosure.

## BRIEF DESCRIPTION OF THE DRAWINGS

**[0023]** To describe the technical solutions of the embodiments of this disclosure more clearly, the drawings used for describing the embodiments are briefly described below. Apparently, the drawings in the following description show only some embodiments of this disclosure, and a person of ordinary skill in the art may still derive other drawings from these drawings without creative efforts.

**[0024]** FIG. 1 is a schematic diagram of an implementation environment according to an embodiment of this disclosure.

**[0025]** FIG. 2 is a flowchart of a method for interaction information processing according to an embodiment of this disclosure.

**[0026]** FIG. 3 is a schematic diagram of an interaction icon presentation region according to an embodiment of this disclosure.

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**[0027]** FIG. 4 is a schematic diagram of an interaction icon presentation region according to another embodiment of this disclosure.

**[0028]** FIG. 5 is a schematic diagram of an interaction icon presentation region according to another embodiment of this disclosure.

**[0029]** FIG. 6 is a schematic diagram of a battle interface according to an embodiment of this disclosure.

**[0030]** FIG. 7 is a schematic diagram of a battle interface according to another embodiment of this disclosure.

**[0031]** FIG. 8 is a flowchart of a method for interaction information processing according to another embodiment of this disclosure.

**[0032]** FIG. 9 is a schematic diagram of a battle interface according to another embodiment of this disclosure.

**[0033]** FIG. 10 is a schematic diagram of a method for interaction information processing according to an embodiment of this disclosure.

**[0034]** FIG. 11 is a flowchart of a method for interaction information processing according to another embodiment of this disclosure.

**[0035]** FIG. 12 is a block diagram of an apparatus for interaction information processing according to an embodiment of this disclosure.

**[0036]** FIG. 13 is a block diagram of an apparatus for interaction information processing according to another embodiment of this disclosure.

**[0037]** FIG. 14 is a block diagram of a terminal according to an embodiment of this disclosure.

## DESCRIPTION OF EMBODIMENTS

**[0038]** Exemplary embodiments are described in detail herein and are shown in the accompanying drawings. In the following description involving the accompanying drawings, unless otherwise indicated, the same numerals in different accompanying drawings represent the same or similar elements. The implementations described in the following exemplary embodiments do not constitute all implementations that are consistent with this disclosure. On the contrary, the implementations are merely examples of methods that are described in detail in the appended claims and that are consistent with some aspects of this disclosure.

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**[0039]** FIG. 1 is a schematic diagram of an implementation environment according to an embodiment of this disclosure. The implementation environment may be implemented as a system for interaction information processing. The system 10 may include a first terminal 11.

**[0040]** A target application (app), for example, a first client of the target application, is installed and run on the first terminal 11, and a first user account is logged in the first client. The target application may be a game application such as a shooting game application, a multiplayer gunfight survival game application, an escape survival game application, a location based service (LBS) game application, or a multiplayer online battle arena (MOBA) game application, which is not limited in the embodiments of this disclosure. The target application may be alternatively any application with interaction information processing capabilities, such as social applications, payment applications, video applications, music applications, shopping applications, and news applications. In the method provided in the embodiments of this disclosure, each step may be executed by the first terminal 11, for example, the first client running in the first terminal 11.

**[0041]** Optionally, the first user account corresponds to a target virtual object, and the user of the first client can control the target virtual object and display information in a battle interface through a functionality provided by the target application. The virtual object is a virtual character controlled by the user through the target application. Using an example in which the target application is a game application, the virtual object is a game character controlled by the user through the game application. The virtual object may be in a form of a human being, an animal, a cartoon character, or the like, which is not limited in the embodiments of this disclosure. The virtual object may be presented in a three-dimensional form or a two-dimensional form, which is not limited in the embodiments of this disclosure. Optionally, the virtual object is in a virtual environment. In a case that the virtual environment is a three-dimensional virtual environment, a first virtual object may be a three-dimensional model created based on the skeleton animation technology. The virtual object has its own shape and size in the three-dimensional virtual environment, and occupies a space in the three-dimensional virtual environment.

**[0042]** In some embodiments, the system 10 further includes a server 12. The server 12 establishes a communication connection (for example, a network connection) with the first terminal 11, and is configured to provide backend services for the target application. The server may be an independent physical server, or may be a server cluster including a plurality of physical servers or a distributed system, or may be a cloud server providing a cloud computing service.

**[0043]** In some embodiments, the system 10 further includes a second terminal 13, and the server 12 establishes a communication connection (for example, a network connection) with the

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second terminal 13. The target application, for example, a second client of the target application, is installed and run on the second terminal 13. A second user account is logged in the second client. In a case that a virtual object corresponding to the second user account and the target virtual object are in the same game battle and interaction information is displayed in the first client, corresponding interaction information is also displayed in the second client.

**[0044]** The terminal is an electronic device with capabilities of data computing, processing, and storage. The terminal may be a smartphone, a tablet computer, a personal computer (PC), a wearable device, or the like, which is not limited in the embodiments of this disclosure. Optionally, the terminal is a mobile terminal device with a touch display screen, and the user can achieve human-computer interaction through the touch display screen. In some embodiments, the terminal is associated with a control handle, and a communication connection is established between the control handle and the terminal. The user may perform human-computer interaction with the client of the target application through the control handle.

**[0045]** The technical solutions of this disclosure are described by referring to several embodiments below.

**[0046]** FIG. 2 is a flowchart of a method for interaction information processing according to an embodiment of this disclosure. In this embodiment, descriptions are made by using an example in which the method is applied to the first client described above. As shown in FIG. 2, the method may include the following steps (201 to 204).

**[0047]** In step 201, a battle interface of a multiplayer online battle is displayed, the battle interface including a target virtual object.

**[0048]** Optionally, the multiplayer online battle is a game battle. The multiplayer game battle in the target application includes a plurality of virtual objects (for example, the target virtual object). In some embodiments, the multiplayer online battle may be alternatively a battle scenario of another type, such as a multiplayer competition battle or a multiplayer debate, which is not specifically limited in the embodiments of this disclosure. Optionally, the virtual objects are controlled by different users through corresponding user accounts. The target virtual object is controlled by the user through the first user account, and the target virtual object is displayed in the battle interface of the first client.

**[0049]** In step 202, an interaction icon presentation region is displayed in response to an icon presentation operation performed for the target virtual object.

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**[0050]** In some embodiments, after the first client detects the icon presentation operation performed for the target virtual object, the interaction icon presentation region is presented in the battle interface. The interaction icon presentation region is used for presenting candidate interaction icons. The interaction icon presentation region includes at least one candidate interaction icon. Optionally, the icon presentation operation is a touch operation directly acting on the target virtual object. Alternatively, the icon presentation operation may be regarded as a touch operation directly acting on a position where the target virtual object is displayed.

**[0051]** In some embodiments, as shown in FIG. 3, the interaction icon presentation region is a hollow region centered at the target virtual object 31. Optionally, the hollow region is an annular hollow region 32, an elliptic hollow region 33, a square-shaped hollow region 34, or the like. Apparently, the hollow region may have other shapes, which is not specifically limited in the embodiments of this disclosure.

**[0052]** As shown in FIG. 4, in some embodiments, the interaction icon presentation region is a strip-shaped region located above the target virtual object 31. In an example, the interaction icon presentation region is a transverse strip-shaped region 41 located above the target virtual object 31; and in another example, the interaction icon presentation region is a vertical strip-shaped region 42 located above the target virtual object 31. In some other embodiments, the interaction icon presentation region is a strip-shaped region located below the target virtual object 31. In an example, the interaction icon presentation region is a transverse strip-shaped region 43 located below the target virtual object 31; and in another example, the interaction icon presentation region is a vertical strip-shaped region 44 located below the target virtual object 31.

**[0053]** In some other embodiments, as shown in FIG. 5, the interaction icon presentation region is a fan-shaped region centered at the target virtual object 31. The interaction icon presentation region may be a fan-shaped region 51 located above the target virtual object 31, a fan-shaped region 52 located below the target virtual object 31, a fan-shaped region 53 located on a left side of the target virtual object 31, or a fan-shaped region 54 located on a right side of the target virtual object 31, which is not specifically limited in the embodiments of this disclosure.

**[0054]** In some possible embodiments, the icon presentation operation is an operation in which a finger of a user acts directly on the target virtual object (that is, acts on the position where the target virtual object is displayed). The first client can obtain fingerprint(s) of finger(s) pre-stored by the user in the first terminal, and store fingerprint-related information(s). The fingerprint-related information may indicate whether each fingerprint corresponds to a left-hand finger or a right-hand finger. By comparing a fingerprint of the finger acting on the target virtual object with the

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pre-stored fingerprint(s) of the at least one finger, it is determined whether the finger acting on the target virtual object is a left-hand finger or right-hand finger of the user, and the interaction icon presentation region is displayed at a position corresponding to the left/right hand.

**[0055]** In some embodiments, the position corresponding to the left/right hand is a position that is convenient for the user to observe the candidate interaction icons, which reduces or avoids occlusion of the interaction icon presentation region by the hand. That is, if the finger acting on the target virtual object is a left-hand finger of the user, the interaction icon presentation region is displayed at a position not occluded by the left-hand finger (that is, on the right side of the target virtual object); and if the finger acting on the target virtual object is a right-hand finger of the user, the interaction icon presentation region is displayed at a position not occluded by the right-hand finger (that is, on the left side of the target virtual object). In an example, based on the example of FIG. 5, when it is detected that the icon presentation operation acting on the target virtual object is performed by the left-hand finger of the user, the interaction icon presentation region is the fan-shaped region 54 located on the right side of the target virtual object 31 since the region on the left side of the target virtual object may be occluded by the left hand; and in another example, when it is detected that the icon presentation operation acting on the target virtual object is performed by the right-hand finger of the user, the interaction icon presentation region is the fan-shaped region 53 located on the left side of the target virtual object 31 since the region on the right side of the target virtual object may be occluded by the right hand. Therefore, the probability that the finger or palm of the user occludes the interaction icon presentation region is reduced, which is convenient for the user to quickly select the interaction icon.

**[0056]** In some embodiments, hand occlusion has little impact on the interaction icon selection by the user (for example, the interaction icon occupies a large display region). Optionally, the position corresponding to the left/right hand is a position that is convenient for the user to confirm a selection on a target interaction icon. That is, if the finger acting on the target virtual object is the left-hand finger of the user, the interaction icon presentation region is displayed on the left side of the target virtual object; and if the finger acting on the target virtual object is the right-hand finger of the user, the interaction icon presentation region is displayed on the right side of the target virtual object. In an example, based on the example of FIG. 5, when it is detected that the icon presentation operation acting on the target virtual object is performed by the left-hand finger of the user, the interaction icon presentation region is the fan-shaped region 53 located on the left side of the target virtual object 31; and in another example, when it is detected that the icon presentation operation acting on the target virtual object is performed by the right-hand finger of the user, the interaction icon presentation region is the fan-shaped region 54 located on the right side of

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the target virtual object 31. Therefore, it is convenient for the user to confirm the selection on the target interaction icon, and the operation convenience is improved.

**[0057]** Optionally, the foregoing fingerprint collection and fingerprint comparison process is performed using an under-screen fingerprint recognition technology.

**[0058]** It is noted that the interaction icon presentation region may be alternatively a region that is located at other positions (for example, at upper left, upper right, lower left, or lower right of the target virtual object) or a region that is displayed in other shapes. The shape and display position of the interaction icon presentation region may depend on actual situation, which is not specifically limited in the embodiments of this disclosure. The interaction icon presentation region is displayed close to the target virtual object according to the position of the target virtual object, thereby reducing a movement distance of the operating object (for example, a finger of the user), making it convenient to perform subsequent operation for confirming selection on the target interaction icon, and further improving the convenience of the user operation.

**[0059]** In step 203, a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon is received.

**[0060]** In a case that interaction information to be displayed is the interaction information corresponding to the target interaction icon, the user may perform the selection confirmation operation for the target interaction icon through the first client. Optionally, the selection confirmation operation includes a selection operation and a confirmation operation. The selection operation is used for selecting the target interaction icon, and the confirmation operation is used for making a final confirmation on the selection operation (that is, the target interaction icon selected by the selection operation).

**[0061]** In step 204, interaction information corresponding to the target interaction icon is displayed at an interaction presentation position corresponding to the target virtual object.

**[0062]** Optionally, after the selection confirmation operation for the target interaction icon is received, the interaction information corresponding to the target interaction icon is displayed around the target virtual object. The interaction information is used for interaction with another virtual object (or a user corresponding to the virtual object). In some embodiments, the interaction presentation position corresponding to the target virtual object is preset by personnel (that is, the developer of the target application), or may be set by the user. For example, a dynamic expression corresponding to the target interaction icon is displayed above the target virtual object, to enhance the fun of the interaction information. In some embodiments, the interaction presentation position

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corresponding to the target virtual object is located above the target virtual object. The interaction information corresponding to the target interaction icon may include: the target interaction icon, an animation or a cinemagraph corresponding to the target interaction icon, an action corresponding to the target interaction icon made by the target virtual object, text interaction information corresponding to the target interaction icon, audio interaction information corresponding to the target interaction icon, video interaction information corresponding to the target interaction icon, and the like.

**[0063]** In some embodiments, as shown in FIG. 6, interaction information 63 corresponding to the target interaction icon is also displayed in clients corresponding to other virtual objects 62 in the same battle as the target virtual object 61 (regardless of whether the virtual objects 62 are ally virtual objects or enemy virtual objects). In some embodiments, as shown in FIG. 7, the target virtual object is not displayed in the battle interface of the client corresponding to another virtual object 71, and in this case the interaction information 73 corresponding to the target interaction icon is displayed in a chat region 72 in the battle interface in a form of chatting.

**[0064]** Based on the above, in the technical solutions provided in the embodiments of this disclosure, through the icon presentation operation acting on the battle interface of the multiplayer online battle, the display of the candidate interaction icons can be triggered efficiently. Through the selection confirmation operation for the target interaction icon, the target interaction icon can then be quickly selected and the corresponding interaction information can be displayed. Compared with a case of finding and clicking a chat control, then finding and clicking an expression control, and then finding and clicking a target interaction icon to display corresponding interaction information, the solution in this disclosure can simplify the operation steps of displaying the interaction information and improve the operation convenience.

**[0065]** In addition, in the embodiments of this disclosure, the interaction icon can be selected and confirmed through the operation on the target virtual object without setting additional interaction controls in the battle interface, which reduces the quantity of controls in the battle interface, and reduces the probability of accidental operations of the user on the controls, thereby improving the operation convenience.

**[0066]** FIG. 8 is a flowchart of a method for interaction information processing according to another embodiment of this disclosure. In this embodiment, descriptions are made by using an example in which the method is applied to the first client described above. As shown in FIG. 8, the method may include the following steps (801 to 808).

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**[0067]** In step 801, a battle interface of a multiplayer online battle is displayed, the battle interface including a target virtual object.

**[0068]** The step 801 is the same as or similar to step 201 in the foregoing embodiment shown in FIG. 2, and details are not repeated herein.

**[0069]** In step 802, a trigger operation for the target virtual object is received.

**[0070]** In some embodiments, the icon presentation operation is a trigger operation acting on the target virtual object. Optionally, the trigger operation is a click operation, i.e., clicking on the target virtual object. Optionally, the trigger operation is performed by a human body or an object such as a finger or a stylus pen that can perform a touch operation.

**[0071]** In step 803, an interaction icon presentation region is displayed in a case that a continuously-triggering duration of the trigger operation is longer than a first preset duration.

**[0072]** Optionally, the continuously-triggering duration of the trigger operation is detected after the user clicks the target virtual object. In some embodiments, if the trigger operation is a click operation, the continuously-triggering duration is a continuous-clicking duration. In some embodiments, continuous clicking may be regarded as a long-press, and the continuous clicking duration may be considered as a duration of the long-press. In a case that the continuous-click duration of the click operation is longer than the first preset duration, the icon presentation operation is completed, and the interaction icon presentation region is displayed. If the continuous-click duration is too short (shorter than the first preset duration), the interaction icon presentation region is not displayed, thereby reducing the probability of accidental touch. The first preset duration may be 0.5 seconds, 0.8 seconds, 1 second, 1.5 seconds, 2 seconds, or the like. Optionally, the first preset duration may be set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure.

**[0073]** In some other optional embodiments, the icon presentation operation may be alternatively a double-click operation, a triple-click operation, a hovering operation, a heavy pressure operation, a slide operation, or the like acting on the target virtual object. Optionally, the continuous-click duration of each click of the double-click operation and the triple-click operation is not limited in the embodiments of this disclosure, and when it is detected that the user has clicked the target virtual object, it means that one click operation is completed.

**[0074]** In some embodiments, the hovering operation refers to a case that an operating object (for example, a finger of the user or a stylus pen) retains within a preset distance above the target virtual object for a second preset duration. The preset distance may be 1 mm, 1.5 mm, 2 mm,

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2.5 mm, 3 mm, 4 mm, 5 mm, 8 mm, 1 cm, 2 cm, or the like. The second preset duration may be 0.5 seconds, 0.8 seconds, 1 second, 1.5 seconds, 2 seconds, or the like. Optionally, the second preset duration may be set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure. In some embodiments, the hovering operation may alternatively be an operation in which a mouse stays at the position where the target virtual object is displayed but does not click the target virtual object for a duration reaching the second preset duration.

**[0075]** In some embodiments, the battle interface is displayed on a touch display screen, which is a pressure-activated display screen. The first client may respond to different instructions by detecting different pressures acting on the display screen. In some optional embodiments, the heavy pressure operation means that a pressure acting on the target virtual object by the operating object controlled by the user is greater than or equal to a times of an average pressure (which is a pressure threshold) acting on the display screen by the operating object, where  $a$  is greater than 1, and may be 1.5, 2, 2.5, 3, 4, or the like. The specific value of  $a$  is set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure. In some other optional embodiments, the heavy pressure operation means that a pressure acting on the target virtual object by the operating object controlled by the user is greater than or equal to a preset pressure. The specific value of the preset pressure is set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure.

**[0076]** In step 804, a slide operation starting from an acting position of an icon presentation operation to a position where a target interaction icon is displayed, is received.

**[0077]** As shown in FIG. 9, after an interaction icon presentation region 91 is located around the target virtual object 31, a selection operation for the target interaction icon is a slide operation 92 starting from the acting position of the icon presentation operation to the position where the target interaction icon is displayed. In some embodiments, the position where the target interaction icon is displayed is a display region 93 for displaying the target interaction icon; and in some other embodiments, the position where the target interaction icon is displayed is a box 94 where the target interaction icon is located.

**[0078]** In step 805, the target interaction icon is displayed differently from other interaction icons in the interaction icon presentation region.

**[0079]** In some embodiments, after the slide operation starting from the acting position of the icon presentation operation to the position where the target interaction icon is displayed is received, the target interaction icon is displayed differently from other interaction icons in the

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interaction icon presentation region, so that the target interaction icon is highlighted, which is convenient for the user to confirm that the target interaction icon is selected. Optionally, the displaying the target interaction icon differently from other interaction icons in the interaction icon presentation region to make the target interaction icon be displayed in a style different from other interaction icons in the interaction icon presentation region includes: increasing display brightness of the target interaction icon, decreasing display brightness of other interaction icons, changing a display color of the target interaction icon from gray to colorful, changing a display color of other interaction icons from colorful to gray, enlarging the target interaction icon, minifying other interaction icons, dynamically displaying the target interaction icon, and the like. Optionally, in a case that the target interaction icon is displayed dynamically, other interaction icons are displayed statically.

**[0080]** In step 806, it is determined that the selection confirmation operation for the target interaction icon is received in response to detecting that the slide operation stops at the position where the target interaction icon is displayed.

**[0081]** In some embodiments, a case in which the slide operation stops at the position where the target interaction icon is displayed and the slide operation does not move to another position (that is, the operating object (for example, a finger) controlled by the user releases the target interaction icon) indicates that the user completes the selection confirmation operation for the target interaction icon.

**[0082]** In step 807, display of the interaction icon presentation region is cancelled.

**[0083]** In some embodiments, after it is determined that the selection confirmation operation for the target interaction icon is received, it indicates that the interaction icon finally selected by the user is the target interaction icon, and there is no need to display the interaction icon presentation region. Therefore, the display of the interaction icon presentation region is canceled, to prevent the interaction icon presentation region from occluding other elements in the battle interface.

**[0084]** In step 808, interaction information corresponding to the target interaction icon is displayed at an interaction presentation position corresponding to the target virtual object.

**[0085]** The step 808 is the same as or similar to step 204 in the foregoing embodiment in FIG. 2, and details are not described herein again.

**[0086]** Based on the above, in the technical solutions provided in the embodiments of this disclosure, through user operation of continuous clicking on the target virtual object, sliding from the acting position of the icon presentation operation to the position where the target interaction

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icon is displayed, and releasing at the position of the target interaction icon, the interaction information corresponding to the target interaction icon is displayed. In the operation, the operating object (for example, a finger of the user) is always on the touch screen on which the battle interface is displayed, and can implement the operation in one step without leaving the display screen. Compared with touching the touch screen for a plurality of times, the operation time is reduced, and the operation efficiency and the operation convenience are improved.

**[0087]** A summarization of the method for interaction information processing provided in the embodiments of this disclosure is made below with reference to FIG. 10. The method may be applied to the first client described above. As shown in FIG. 10, the method may include the following steps (1001 to 1005).

**[0088]** In step 1001, a battle interface of a multiplayer online battle is displayed, the battle interface including a target virtual object 31.

**[0089]** In step 1002, an interaction icon presentation region 102 is displayed in response to a long-press 101 on the target virtual object 31.

**[0090]** In step 1003, a slide operation 92, starting from an acting position of the icon presentation operation to a position where the target interaction icon 103 is displayed, is received.

**[0091]** In step 1004, the target interaction icon 103 is displayed differently from other interaction icons in the interaction icon presentation region 102.

**[0092]** In step 1005, interaction information 104 corresponding to the target interaction icon 103 is displayed in response to detecting that the operating object controlled by the user releases the target interaction icon 103.

**[0093]** In some embodiments, after the displaying the interaction icon presentation region, the method further includes the following steps:

**[0094]** 1: displaying a default selected icon in the interaction icon presentation region differently from other interaction icons, the default selected icon being an interaction icon in a default selected state; and

**[0095]** 2: displaying, in response to a selection confirmation operation for the default selected icon, interaction information corresponding to the default selected icon at the interaction presentation position corresponding to the target virtual object.

**[0096]** In some embodiments, the default selected icon is displayed differently from other interaction icons, which is convenient for the user to quickly find the default selected icon and

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perform the selection confirmation operation on the default selected icon, so that the operation time required in displaying the interaction information is reduced, and the operation efficiency is improved. Optionally, regarding the operation of displaying the default selected icon differently from other interaction icons, reference may be made to the operation of displaying the target interaction icon differently from other interaction icons in the interaction icon presentation region in step 805 in the foregoing embodiment of FIG. 8, and details are not described herein again.

**[0097]** In some embodiments, after the interaction icon presentation region is displayed, if there is a default selected icon displayed differently from other interaction icons, and what the user wants to select is the default selected icon, interaction information corresponding to the default selected icon may be displayed directly at the interaction presentation position corresponding to the target virtual object by performing the selection confirmation operation on the default selected icon, without performing a selection operation on the default selected icon, thereby further simplifying the operation of displaying the interaction information and improving the operation convenience.

**[0098]** In some embodiments, the selection confirmation operation for the default selected icon includes: keeping on the continuous-clicking on the target virtual object to reach a third preset duration, a slide operation starting from the acting position of the icon presentation operation to a position other than the interaction icon presentation region, and the like. The third preset duration may be 0.5 seconds, 0.8 seconds, 1 second, 1.5 seconds, or the like, and the third preset duration may be set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure.

**[0099]** In some embodiments, the default selected icon is an interaction icon at a default position in the interaction icon presentation region. The interaction icon at the default position may be an interaction icon farthest from or closest to the target virtual object, or a leftmost or topmost interaction icon in an elongated interaction icon presentation region.

**[0100]** In some other embodiments, the default selected icon is preset by the user corresponding to the first user account or set by personnel (for example, the developer of the target application).

**[0101]** In some other embodiments, the default selected icon is an interaction icon corresponding to the last displayed interaction information.

**[0102]** In some other embodiments, the default selected icon is an interaction icon used most times by the user corresponding to the first user account in this multiplayer online battle. Alternatively, the default selected icon is an interaction icon used most times by the user

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corresponding to the first user account in last  $n$  multiplayer online battles, where  $n$  may be a positive integer such as 5, 10, 15, 20, 30, or 40. The specific value of  $n$  may be set by personnel according to the actual situation, which is not specifically limited in the embodiments of this disclosure.

**[0103]** In some embodiments, after displaying the battle interface of the multiplayer online battle, the method further includes: displaying, in response to a shortcut send operation for the target virtual object, interaction information corresponding to a default selected icon at the interaction presentation position corresponding to the target virtual object, the default selected icon being an interaction icon in a default selected state. In this implementation, the shortcut operation is different from the icon presentation operation. Through the shortcut operation, the interaction information corresponding to the default selected icon is displayed directly without displaying the interaction icon presentation region, which further simplifies the operation of displaying the interaction information and improves the operation convenience. Optionally, the shortcut send operation is a slide operation (for example, sliding to left, sliding to right, sliding upward, or sliding downward) on the target virtual object, a double-click operation on the target virtual object, a triple-click operation on the target virtual object, a heavy pressure operation on the target virtual object, a quick-click operation on the target virtual object, or the like, which is not specifically limited in the embodiments of this disclosure.

**[0104]** In some embodiments, after displaying a battle interface of a multiplayer online battle, the method further includes the following steps:

**[0105]** 1: displaying a recommended interaction icon in a case that the multiplayer online battle is in a preset battle state; and

**[0106]** 2: displaying interaction information corresponding to the recommended interaction icon in response to a selection confirmation operation for the recommended interaction icon.

**[0107]** The preset battle state includes: obtaining a large advantage in the battle, defeating another virtual object in this battle for the first time, cumulatively defeating  $b$  other virtual objects once in this battle, winning the battle, failing the battle, and the like, which is not specifically limited in the embodiments of this disclosure, where  $b$  is a positive integer. For example, if the battle state is winning the battle, the corresponding interaction information is information indicating celebration or joy; and if the battle state is failing the battle, the corresponding interaction information is information indicating frustration, comfort, or encouragement. In this embodiment, the recommended interaction icon matching the battle state is displayed to help the use select the

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interaction icon, thereby reducing the selection time of the user and improving the display efficiency of the interaction information.

**[0108]** FIG. 11 is a flowchart of a method for interaction information processing according to another embodiment of this disclosure. As shown in FIG. 11, the method may include the following steps (1101 to 1109).

**[0109]** In step 1101, an icon presentation operation for a target virtual object is detected.

**[0110]** In step 1102, an interaction icon presentation region is displayed.

**[0111]** In step 1103, it is detected whether a finger of a user slides to a position where a target interaction icon is displayed, and if so, step 1108 is performed; otherwise, step 1104 is performed.

**[0112]** In step 1104, the target interaction icon is displayed differently from other interaction icons in the interaction icon presentation region.

**[0113]** In step 1105, it is detected whether the finger of the user releases the target interaction icon, and if so, step 1106 is performed; otherwise, step 1104 is performed.

**[0114]** In step 1106, display of the interaction icon presentation region is cancelled.

**[0115]** In step 1107, interaction information corresponding to the target interaction icon is displayed, and the process is ended.

**[0116]** In step 1108: it is detected whether the finger of the user leaves a touch screen, and if so, step 1109 is performed; otherwise, step 1103 is performed.

**[0117]** In step 1109, display of the interaction icon presentation region is displayed, and the process is ended.

**[0118]** The following describes apparatus embodiments of this disclosure, which can be used for executing the method embodiments of this disclosure. For details not disclosed in the apparatus embodiments of this disclosure, reference may be made to the method embodiments of this disclosure.

**[0119]** FIG. 12 is a block diagram of an apparatus for interaction information processing according to an embodiment of this disclosure. The apparatus has functions of implementing the foregoing examples of the method for interaction information processing. The functions may be implemented by hardware, or may be implemented by hardware executing corresponding software. The apparatus may be the first terminal described above, or may be disposed on the first terminal.

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The apparatus 1200 may include: an interface display module 1210, an icon presentation module 1220, an operation receiving module 1230, and an information display module 1240.

**[0120]** The interface display module 1210 is configured to display a battle interface of a multiplayer online battle, the battle interface including a target virtual object.

**[0121]** The icon presentation module 1220 is configured to display an interaction icon presentation region in response to an icon presentation operation for the target virtual object, the interaction icon presentation region including at least one candidate interaction icon.

**[0122]** The operation receiving module 1230 is configured to receive a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon.

**[0123]** The information display module 1240 is configured to display interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object.

**[0124]** Based on the above, in the technical solutions provided in the embodiments of this disclosure, through the icon presentation operation in the battle interface, the display of the candidate interaction icons can be triggered efficiently. Through the selection confirmation operation for the target interaction icon, the target interaction icon can be quickly selected and the corresponding interaction information can be displayed. Compared with a solution of finding and clicking a chat control, then finding and clicking an expression control, and then finding and clicking a target interaction icon to display corresponding interaction information, the embodiment of this disclosure can simplify the operation of displaying the interaction information and improve the operation convenience.

**[0125]** In some embodiments, the icon presentation module 1220 is configured to:

**[0126]** receive a trigger operation for the target virtual object; and

**[0127]** display the interaction icon presentation region in a case that a continuously-triggering duration of the trigger operation is longer than a first preset duration.

**[0128]** In some embodiments, as shown in FIG. 13, the operation receiving module 1230 includes: an operation receiving sub-module 1231 and an operation determination sub-module 1232.

**[0129]** The operation receiving sub-module 1231 is configured to receive a slide operation starting from an acting position of the icon presentation operation to a position where the target interaction icon is displayed.

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**[0130]** The operation determination sub-module 1232 is configured to determine that the selection confirmation operation for the target interaction icon is received in response to detecting that the slide operation stops at the position where the target interaction icon is displayed.

**[0131]** In some embodiments, as shown in FIG. 13, the operation receiving module 1230 further includes an icon display sub-module 1233.

**[0132]** The icon display sub-module 1233 is configured to display the target interaction icon differently from other interaction icons in the interaction icon presentation region.

**[0133]** In some embodiments, the interaction icon presentation region is a hollow region centered on the target virtual object; or, the interaction icon presentation region is a strip-shaped region located above the target virtual object; or, the interaction icon presentation region is a fan-shaped region centered on the target virtual object.

**[0134]** In some embodiments, the information display module 1240 is configured to display a dynamic expression corresponding to the target interaction icon above the target virtual object.

**[0135]** In some embodiments, as shown in FIG. 13, the apparatus 1200 further includes a display canceling module 1250.

**[0136]** The display canceling module 1250 is configured to cancel display of the interaction icon presentation region.

**[0137]** In some embodiments, as shown in FIG. 13, the apparatus 1200 further includes an icon display module 1260.

**[0138]** The icon display module 1260 is configured to display a default selected icon in the interaction icon presentation region differently from other interaction icons, the default selected icon being an interaction icon in a default selected state.

**[0139]** The information display module 1240 is further configured to display, in response to a selection confirmation operation for the default selected icon, interaction information corresponding to the default selected icon at the interaction presentation position corresponding to the target virtual object.

**[0140]** In some embodiments, the information display module 1240 is further configured to display, in response to a shortcut send operation for the target virtual object, interaction information corresponding to the default selected icon at the interaction presentation position corresponding to the target virtual object, the default selected icon being an interaction icon in a default selected state.

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**[0141]** In some embodiments, as shown in FIG. 13, the icon display module 1260 is further configured to display a recommended interaction icon in a case that the multiplayer online battle is in a preset battle state.

**[0142]** The information display module 1240 is further configured to display interaction information corresponding to the recommended interaction icon in response to a selection confirmation operation for the recommended interaction icon.

**[0143]** It is noted that in the description of the apparatus provided in the foregoing embodiments for implementing the functions, the foregoing division of the functional modules is exemplary. In practice, the functions may be implemented by different functional modules as required. That is to say, the inner structure of the device is divided into different functional modules to implement all or part of the described functions. In addition, the apparatus according to the embodiments of the disclosure is based on the same conception as the method embodiments, and for the specific implementation of the apparatus, reference may be made to the method embodiments, for which no detail is given here.

**[0144]** FIG. 14 is a structural block diagram of a terminal 1400 according to an embodiment of this disclosure. The terminal 1400 may be an electronic device such as a mobile phone, a tablet computer, a game console, an ebook reader, a multimedia player, a wearable device, or a PC. The terminal is configured to implement the method for interaction information processing provided in the foregoing embodiments. The terminal may be the first terminal 11 in the implementation environment shown in FIG. 1.

**[0145]** Generally, the terminal 1400 includes a processor 1401 and a memory 1402.

**[0146]** The processor 1401 may include one or more processing cores, for example, a 4-core processor or an 8-core processor. The processor 1401 may be implemented by hardware selected from a digital signal processor (DSP), a field programmable gate array (FPGA), and a programmable logic array (PLA). The processor 1401 may further include a main processor and a coprocessor. The main processor is a processor configured to process data in an awake state, and is also referred to as a central processing unit (CPU). The coprocessor is a low power consumption processor configured to process the data in a standby state. In some embodiments, the processor 1401 may be integrated with a graphics processing unit (GPU). The GPU is configured to render and draw content that needs to be displayed on a display. In some embodiments, the processor 1401 may further include an artificial intelligence (AI) processor. The AI processor is configured to process computing operations related to machine learning.

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**[0147]** The memory 1402 may include one or more computer-readable storage media. The computer-readable storage medium may be non-transient. The memory 1402 may further include a high-speed random access memory and a nonvolatile memory, for example, one or more disk storage devices or flash storage devices. In some embodiments, the non-transient computer-readable storage medium in the memory 1402 is configured to store at least one instruction, at least one program, a code set, or an instruction set, and is configured to be executed by one or more processors, to implement the method for interaction information processing.

**[0148]** In some embodiments, the terminal 1400 may optionally include a peripheral interface 1403 and at least one peripheral device. The processor 1401, the memory 1402, and the peripheral interface 1403 may be connected by a bus or a signal line. Each peripheral device may be connected to the peripheral interface 1403 by using a bus, a signal cable, or a circuit board. Specifically, the peripheral device includes: at least one of a radio frequency circuit 1404, a display screen 1405, a camera component 1406, an audio circuit 1407, a positioning component 1408, and a power supply 1409.

**[0149]** A person skilled in the art may understand that the structure shown in FIG. 14 does not constitute the limitation to the terminal 1400, and more or fewer components than those shown in the figure may be included, some components may be combined, or the components may be in different arrangements.

**[0150]** In an exemplary embodiment, a computer-readable storage medium is further provided. The storage medium stores at least one instruction, at least one program, a code set, or an instruction set. The at least one instruction, the at least one program, the code set, or the instruction set, when being executed by a processor, implements the foregoing method for interaction information processing.

**[0151]** Optionally, the computer-readable storage medium may include: a read-only memory (ROM), a random access memory (RAM), solid state drives (SSD), an optical disc, or the like. The RAM may include a resistance random access memory (ReRAM) and a dynamic random access memory (DRAM).

**[0152]** In an exemplary embodiment, a computer program product or a computer program is further provided. The computer program product or the computer program includes computer instructions stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium, and executes the computer instructions, to cause the computer device to execute the method for interaction information processing.

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**[0153]** The expression "a plurality of" used in this specification means two or more. The expression "and/or" describes an association relationship between associated objects and represents that three relationships may exist. For example, A and/or B may represent the following three cases: Only A exists, both A and B exist, and only B exists. The character "/" in this specification generally indicates an "or" relationship between the associated objects.

**[0154]** The foregoing descriptions are merely exemplary embodiments of this disclosure, but are not intended to limit this disclosure. Any modification, equivalent replacement, or improvement made within the spirit and principle of this disclosure shall fall within the protection scope of this disclosure.

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## CLAIMS

### What is claimed is:

1. A method for interaction information processing, executable by a terminal, the method comprising:

displaying a battle interface of a multiplayer online battle, the battle interface comprising a target virtual object;

displaying an interaction icon presentation region in response to an icon presentation operation for the target virtual object, the interaction icon presentation region comprising at least one candidate interaction icon;

receiving a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon; and

displaying interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object.

2. The method according to claim 1, wherein the displaying an interaction icon presentation region in response to an icon presentation operation for the target virtual object comprises:

receiving a trigger operation for the target virtual object; and

displaying the interaction icon presentation region in a case that a duration of the trigger operation is longer than a first preset duration.

3. The method according to claim 1, wherein the receiving a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon comprises:

receiving a slide operation starting from an acting position of the icon presentation operation to a position where the target interaction icon is displayed; and

determining that the selection confirmation operation for the target interaction icon is received in response to detecting that the slide operation stops at the position where the target interaction icon is displayed.

4. The method according to claim 3, wherein after receiving the slide operation starting from the acting position of the icon presentation operation to the position where the target interaction icon is displayed, the method further comprises:

displaying the target interaction icon differently from other interaction icons in the interaction icon presentation region.

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5. The method according to claim 1, wherein the interaction icon presentation region is a hollow region centered at the target virtual object, a strip-shaped region located above the target virtual object, or a fan-shaped region centered at the target virtual object.

6. The method according to claim 1, wherein the displaying interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object comprises:

displaying a dynamic expression corresponding to the target interaction icon at a position above the target virtual object.

7. The method according to claim 1, wherein after receiving the selection confirmation operation for the target interaction icon in the at least one candidate interaction icon, the method further comprises:

canceling display of the interaction icon presentation region.

8. The method according to claim 1, wherein after displaying the interaction icon presentation region, the method further comprises:

displaying a default selected icon in the interaction icon presentation region differently from other interaction icons, the default selected icon being an interaction icon in a default selected state; and

displaying, in response to a selection confirmation operation for the default selected icon, interaction information corresponding to the default selected icon at the interaction presentation position corresponding to the target virtual object.

9. The method according to claim 1, wherein after displaying the battle interface of the multiplayer online battle, the method further comprises:

displaying, in response to a shortcut send operation for the target virtual object, interaction information corresponding to a default selected icon at the interaction presentation position corresponding to the target virtual object,

the default selected icon being an interaction icon in a default selected state.

10. The method according to claim 1, wherein after displaying the battle interface of the multiplayer online battle, the method further comprises:

displaying a recommended interaction icon in a case that the multiplayer online battle is in a preset battle state; and

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displaying interaction information corresponding to the recommended interaction icon in response to a selection confirmation operation for the recommended interaction icon.

11. An apparatus for interaction information processing, comprising:

an interface display module, configured to display a battle interface of a multiplayer online battle, the battle interface comprising a target virtual object;

an icon presentation module, configured to display an interaction icon presentation region in response to an icon presentation operation for the target virtual object, the interaction icon presentation region comprising at least one candidate interaction icon;

an operation receiving module, configured to receive a selection confirmation operation for a target interaction icon in the at least one candidate interaction icon; and

an information display module, configured to display interaction information corresponding to the target interaction icon at an interaction presentation position corresponding to the target virtual object.

12. The apparatus according to claim 11, wherein the icon presentation module is configured to:

receive a trigger operation for the target virtual object; and

display the interaction icon presentation region in a case that a duration of the trigger operation is longer than a first preset duration.

13. The apparatus according to claim 11, wherein the operation receiving module comprises:

an operation receiving sub-module, configured to receive a slide operation starting from an acting position of the icon presentation operation to a position where the target interaction icon is displayed; and

an operation determination sub-module, configured to determine that the selection confirmation operation for the target interaction icon is received in response to detecting that the slide operation stops at the position where the target interaction icon is displayed.

14. The apparatus according to claim 13, wherein the operation receiving module further comprises:

an icon display sub-module, configured to display the target interaction icon differently from other interaction icons in the interaction icon presentation region.

15. The apparatus according to claim 11, wherein the interaction icon presentation region is a

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hollow region centered at the target virtual object, a strip-shaped region located above the target virtual object, or a fan-shaped region centered at the target virtual object.

16. The apparatus according to claim 11, further comprising:

an icon display module, configured to display a default selected icon in the interaction icon presentation region differently from other interaction icons, the default selected icon being an interaction icon in a default selected state; and

the information display module, further configured to display, in response to a selection confirmation operation for the default selected icon, interaction information corresponding to the default selected icon at the interaction presentation position corresponding to the target virtual object.

17. The apparatus according to claim 11, wherein the information display module is further configured to:

display, in response to a shortcut send operation for the target virtual object, interaction information corresponding to a default selected icon at the interaction presentation position corresponding to the target virtual object,

the default selected icon being an interaction icon in a default selected state.

18. A terminal comprising a processor and a memory, the memory storing at least one instruction, at least one program, a code set, or an instruction set, wherein the processor loads and executes the at least one instruction, the at least one program, the code set, or the instruction set, to implement the method for interaction information processing according to any one of claims 1 to 10.

19. A computer-readable storage medium storing at least one instruction, at least one program, a code set, or an instruction set, wherein the at least one instruction, the at least one program, the code set, or the instruction set, when being loaded and executed by a processor, implements the method for interaction information processing according to any one of claims 1 to 10.

20. A computer program product or a computer program, comprising computer instructions, causing a processor executing the computer instructions to implement the method for interaction information processing according to any one of claims 1 to 10.