

GAME PICTURE DISPLAY METHOD AND APPARATUS, DEVICE, AND COMPUTER-READABLE STORAGE MEDIUM

RELATED APPLICATION

[0001] This application claims priority to Chinese Patent Application No. 202310248919.1, entitled "GAME PICTURE DISPLAY METHOD AND APPARATUS, DEVICE, AND COMPUTER-READABLE STORAGE MEDIUM" and filed on March 7, 2023, which is incorporated herein by reference in its entirety.

FIELD OF THE TECHNOLOGY

[0002] Embodiments of this application relate to the field of computer technologies, and in particular, to a game picture display method and apparatus, a device, and a computer-readable storage medium.

BACKGROUND OF THE DISCLOSURE

[0003] With the continuous development of computer technologies, there are more and more types of games running on terminal devices such as smartphones. During running of the games, a game picture display method is needed, so that game pictures are displayed on the terminal devices.

SUMMARY

[0004] Embodiments of this application provide a game picture display method and apparatus, a device, and a computer-readable storage medium. The technical solutions include the following several aspects.

[0005] According to a first aspect, an embodiment of this application provides a game picture display method, the method being performed by a terminal device, and the method including:

displaying a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight;

processing, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture; and

displaying a second game picture, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including the reference scene picture, an external picture of the sight being obtained based on the first scene picture, and a size of an object included in the external picture of the sight being smaller than a size of an object included in the reference scene picture.

[0006] According to a second aspect, an embodiment of this application provides a game picture display method, the method being performed by a terminal device, and the method including:

displaying a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight; and

displaying a second game picture in response to a trigger operation for the conversion control, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including a reference scene picture, a magnification of an object included in an external picture of the sight being less than a magnification of an object included in the reference scene picture, and the magnification of the object included in the reference scene picture being greater than a magnification of an object included in the first scene picture.

[0007] According to a third aspect, an embodiment of this application provides a game picture display apparatus, including:

a display module configured to display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight; and

a processing module configured to process, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture;

the display module being further configured to display a second game picture, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including the reference scene picture, an external picture of the sight being obtained based on the first scene picture, and a size of an object included in the external picture of the sight being smaller than a size of an object included in the reference scene picture.

[0008] According to a fourth aspect, an embodiment of this application provides a game picture display apparatus, including:

a display module configured to display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight;

the display module being further configured to display a second game picture in response to a trigger operation for the conversion control, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including a reference scene picture, a magnification of an object included in an external picture of the sight being less than a magnification of an object included in the reference scene picture, and the magnification of the object included in the reference scene picture being greater than a magnification of an object included in the first scene picture

[0009] According to a fifth aspect, an embodiment of this application provides an electronic device, the electronic device including a processor and a memory, the memory storing at least one program code, and the at least one program code being loaded and executed by the processor, to cause the electronic device to implement any one of the foregoing the game picture display methods.

[0010] According to a sixth aspect, a non-transitory computer-readable storage medium is further provided, the non-transitory computer-readable storage medium including at least one program code, and the at least one program code being loaded and executed by a processor, to cause a computer to implement any one of the foregoing the game picture display methods.

[0011] According to a seventh aspect, a computer program or a computer program product is further provided, the computer program or the computer program product storing at least one computer instruction, and the at least one computer instruction being loaded and executed by a processor, to cause a computer to implement any one of the foregoing the game picture display methods.

[0012] According to the technical solution provided in this embodiment of this application, after the trigger operation for the conversion control is received, the first scene picture is zoomed in, to obtain the reference scene picture, so that the size of the object included in the reference scene picture is larger than the size of the object included in the first scene picture, and the second game picture is displayed, the internal picture of the sight in the second game picture is the reference scene picture, the external picture of the sight is determined based on the first scene picture, and the size of the object included in the internal picture of the sight is larger than the size of the object included in the external picture of the sight, so that zoom magnifications of the internal picture and the external picture of the sight are different, which achieves a difference between the inside and the

outside of the sight and then improves a display effect of a game picture, thereby improving game experience of a game object. Moreover, a calculation amount of a scene picture is smaller, and there is a lower requirement for performance of the terminal device displaying the game picture, which can save resources.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] FIG. 1 is a schematic diagram of an implementation environment of a game picture display method according to an embodiment of this application.

[0014] FIG. 2 is a flowchart of a game picture display method according to an embodiment of this application.

[0015] FIG. 3 is a schematic diagram of display of a first game picture according to an embodiment of this application.

[0016] FIG. 4 is a schematic diagram of display of a third scene picture according to an embodiment of this application.

[0017] FIG. 5 is a schematic diagram of acquisition of a third scene picture according to an embodiment of this application.

[0018] FIG. 6 is a schematic diagram of acquisition of a fourth scene picture according to an embodiment of this application.

[0019] FIG. 7 is a schematic diagram of acquisition of a reference scene picture according to an embodiment of this application.

[0020] FIG. 8 is a schematic diagram of acquisition of a reference scene picture according to an embodiment of this application.

[0021] FIG. 9 is a schematic diagram of display of a second game picture according to an embodiment of this application.

[0022] FIG. 10 is a schematic diagram of display of another second game picture according to an embodiment of this application.

[0023] FIG. 11 is a flowchart of a game picture display method according to an embodiment of this application.

[0024] FIG. 12 is a flowchart of a method for acquiring a reference scene picture according to an embodiment of this application.

[0025] FIG. 13 is a schematic structural diagram of a game picture display apparatus according to an embodiment of this application.

[0026] FIG. 14 is a schematic structural diagram of a game picture display apparatus according to an embodiment of this application.

[0027] FIG. 15 is a schematic structural diagram of a terminal device according to an embodiment of this application.

[0028] FIG. 16 is a schematic structural diagram of a server according to an embodiment of this application.

DESCRIPTION OF EMBODIMENTS

[0029] To make the objectives, technical solutions, and advantages of this application clearer, the following further describes implementations of this application in detail with reference to the accompanying drawings.

[0030] The terms "first", "second", and so on in this application are intended to distinguish similar objects but do not necessarily indicate a specific order or sequence. Such used data is interchangeable where appropriate so that the embodiments of this application described here can be implemented in an order other than those illustrated or described here. Implementations described in the following exemplary embodiments do not represent all implementations that are consistent with this application. Instead, they are merely examples of the apparatus and method consistent with some aspects of this application as recited in the appended claims.

[0031] FIG. 1 is a schematic diagram of an implementation environment of a game picture display method according to an embodiment of this application. As shown in FIG. 1, the implementation environment includes: a terminal device 101 and a server 102.

[0032] An application program that can provide a game picture is installed and run in the terminal device 101. The terminal device 101 is configured to perform the game picture display method according to this embodiment of this application.

[0033] A type of the application program that can provide the game picture is not limited in this embodiment of this application. For example, the application program that can provide the game picture is a game application program, such as a third-person shooting (TPS) game, a first-person shooting (FPS) game, a multiplayer online battle arena (MOBA) game, a multiplayer shooting survival game, and a massive multiplayer online role-playing game (MMO). In an exemplary embodiment, the game application program as referred to in this embodiment of this

application is a game application program based on frame synchronization. That is, the game picture display method according to this embodiment of this application is applicable to the game application program based on frame synchronization.

[0034] Certainly, in addition to the game application program, the application program that can provide the game picture may also be an application program of another type, for example, a virtual reality (VR) application program, an augmented reality (AR) application program, a three-dimensional map program, a map simulation program, a social application program, or an interactive entertainment application program.

[0035] The server 102 is configured to provide a backend service for the application program that can provide the game picture and is installed in the terminal device 101. In a possible implementation, the server 102 takes on primary computing work, and the terminal device 101 takes on secondary computing work. Alternatively, the server 102 takes on the secondary computing work, and the terminal 101 takes on the primary computing work. Alternatively, collaborative computing is performed between the server 102 and the terminal device 101 by using a distributed computing architecture.

[0036] In some embodiments, the terminal device 101 is any electronic product that may perform human-computer interaction with a user in one or more manners such as a keyboard, a touchpad, a touchscreen, a remote control, voice interaction, or a handwriting device, for example, a personal computer (PC), a mobile phone, a smartphone, a personal digital assistant (PDA), a wearable device, a pocket PC (PPC), a tablet computer, a smart on board unit, a smart television, or a smart speaker.

[0037] The server 102 may be one server, a server cluster including a plurality of server units, or a cloud computing service center. The server 102 and the terminal device 101 may be directly or indirectly connected in a wired or wireless communication manner.

[0038] A person skilled in the art can understand that the terminal device 101 and the server 102 are only examples, and other existing or future possible terminal devices or servers that are applicable to this application are also to be included in the scope of protection of this application, and are included herein by reference.

[0039] An embodiment of this application provides a game picture display method applicable to the foregoing implementation environment. By taking a flowchart of a game picture display method according to an embodiment of this application shown in FIG. 2 as an example, the

method may be performed by the terminal device 101 in FIG. 1. As shown in FIG. 2, the method includes the following operation 201 to operation 203.

[0040] Operation 201: Display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control.

[0041] In an exemplary embodiment of this application, a target game that can provide a game picture is installed and run in a terminal device. The target game may be a game of any type, which is not limited in this embodiment of this application. For example, the target game provided in this embodiment of this application is an MOBA game.

[0042] In a possible implementation, related information of multiple application programs is displayed on a display interface of the terminal device. Types of the application programs may be the same or different. The related information of the application programs may be icons of the application programs or names of the application programs, which is not limited in this embodiment of this application. In response to related information of a target game in multiple application programs that is selected by the user and displayed, the terminal device receives a selection instruction for the related information of the target game, runs the target game, and then displays a page of the target game. A game start control is displayed on the page, and the game start control is configured to enter the target game.

[0043] When the user wants to enter the target game, the user selects the game start control. In this case, the terminal device receives the selection instruction for the game start control, and displays a first game picture. The first game picture includes a first scene picture, a sight, and a conversion control. The sight is in an off state. The conversion control is configured to perform state conversion on the sight, or the conversion control is configured to convert a state of the sight. The state of the sight includes, but is not limited to, an off state and an on state. The conversion control is configured to convert between the off state and the on state. For example, the conversion control is configured to convert the state of the sight into the on state when the sight is in the off state. The conversion control is further configured to convert the state of the sight into the off state when the sight is in the on state. For example, the conversion control may be an independent control. Alternatively, the conversion control may include a sight on control and a sight off control. The sight on control is configured to convert the state of the sight into the on state when the sight is in the off state, or the sight on control is configured to turn on the sight. The sight off control is configured to convert the state of the sight into the off state when the sight is in the on state. For example, the first game picture may include the sight on control. The sight may be an independent item, or may be a sight included in a virtual item, which is not limited in this embodiment of this

application. In some embodiments, the virtual item may be a tool of any type. The virtual item may be used by a target object, and the target object is an object controlled by the user. In some embodiments, the conversion control is displayed in a second form. The second form is configured for indicating that the sight included in the first game picture is in an off state. For example, "the conversion control is displayed in a second form" means that the conversion control is displayed in white.

[0044] FIG. 3 is a schematic diagram of display of a first game picture according to an embodiment of this application. A first scene picture 301, a sight 302, and a conversion control 303 are displayed. The sight is a sight included in a virtual item 304, and the sight is in an off state.

[0045] In some embodiments, the first game picture further includes a transmit control 305, a jump control 306, a lay-down control 307, a squat control 308, and a direction control 309. The transmit control 305 is configured to transmit a virtual resource by using a virtual item, the jump control 306 is configured to instruct the target object to jump, the lay-down control 307 is configured to instruct the target object to lay down, the squat control 308 is configured to instruct the target object to squat, and the direction control 309 is configured to determine a direction of travel of the target object. Certainly, other content may also be displayed in the first game picture, which is not limited in this embodiment of this application.

[0046] Operation 202: Process, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture.

[0047] For example, a size of an object included in the reference scene picture is larger than a size of an object included in the first scene picture. In an exemplary embodiment, in this embodiment of this application, a second scene picture that is in the first scene picture and corresponds to the sight may be processed. The second scene picture may belong to part of a first scene. A size of an object included in the second scene picture is the same as the size of the object included in the first scene picture, so that the size of the object included in the reference scene picture is also larger than the size of the object included in the second scene picture. Since only the second scene picture that is in the first scene picture and corresponds to the sight needs to be processed, a calculation amount of a scene picture is smaller, and there is a lower requirement for performance of the terminal device displaying the game picture, which can save resources.

[0048] For example, a zoom magnification of the reference scene picture relative to the first scene picture is determined based on the zoom magnification of the sight. In some implementations, the zoom magnification of the sight is the zoom magnification of the reference scene picture

relative to the first scene picture, or the zoom magnification of the sight is the same as the zoom magnification of the reference scene picture relative to the first scene picture. In some other implementations, the zoom magnification of the sight is corrected according to an actual requirement, to obtain a corrected zoom magnification. The corrected zoom magnification is the zoom magnification of the reference scene picture relative to the first scene picture. For example, the zoom magnification is corrected according to a screen size of the terminal device, so that the reference scene picture has a good display effect on the terminal device having the screen size.

[0049] When the user wants to turn on the sight, the user selects the conversion control, and the terminal device receives a trigger operation for the conversion control. A manner in which the user selects the conversion control is not limited in this embodiment of this application. In some embodiments, the manner in which the user selects the conversion control may be that the user clicks the conversion control, or may be that the conversion control is selected by voice.

[0050] In a possible implementation, a process of processing, according to the zoom magnification of the sight, a second scene picture that is in the first scene picture and corresponds to the sight, to obtain the reference scene picture includes, but is not limited to, the following three processes.

[0051] In the first manner, the reference scene picture is acquired by: adjusting the first scene picture to obtain a third scene picture; and processing, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture.

[0052] A size of an object included in the third scene picture is larger than the size of the object included in the first scene picture, and a field of view range of the third scene picture is smaller than a field of view range of the first scene picture. The size of the object included in the reference scene picture is larger than a size of an object included in the fourth scene picture. A size of the reference scene picture is the same as a size of the sight. For example, "a size of the reference scene picture is the same as a size of the sight" includes: the size of the reference scene picture being the same as a size of the internal picture of the sight that is turned on (or the sight in the on state).

[0053] A manner of adjusting the first scene picture to obtain the third scene picture is not limited in this embodiment of this application. In some embodiments, at least two following implementation manners of adjusting the first scene picture to obtain the third scene picture are provided in this embodiment of this application.

[0054] In the first implementation manner, a first field of view corresponding to the first scene picture and a zoom magnification of the sight are acquired, and the first scene picture is adjusted according to the first field of view and the zoom magnification of the sight, to obtain the third scene picture.

[0055] The first field of view corresponding to the first scene picture is a field of view set by a developer of the target game when the target game is developed. In some embodiments, the first field of view corresponding to the first scene picture is stored in a storage space of the terminal device, and the terminal device acquires the first field of view corresponding to the first scene picture from the storage space of the terminal device. Alternatively, a corresponding relationship between game identifiers and game field of views is stored in the server, and the terminal device and the server perform communication connection through a wired network or a wireless network. The terminal device transmits a first acquisition request to the server. The first acquisition request includes a game identifier of a target game. The server receives the first acquisition request and parses the first acquisition request, to obtain the game identifier of the target game; and determine a field of view corresponding to the target game according to the game identifier of the target game and the corresponding relationship between the game identifiers and game the field of views, wherein the field of view corresponding to the target game is a first field of view. The server transmits the first field of view to the terminal device, so that the terminal device acquires the first field of view.

[0056] When the sight is a sight included in a virtual item, the zoom magnification of the sight corresponds to the virtual item. In some embodiments, a first corresponding relationship between item identifiers and zoom magnifications is stored in the terminal device. In the first corresponding relationship, the item identifiers are item identifiers of virtual items, and the zoom magnifications are zoom magnifications of sights included in the virtual items. The terminal device queries the first corresponding relationship according to an item identifier of a virtual item (e.g., a virtual item used by a target user), to obtain a zoom magnification of a sight included in the virtual item. Alternatively, the first corresponding relationship is stored in the server. The terminal device transmits a second acquisition request to the server. The second acquisition request includes an item identifier of a virtual item. The server receives the second acquisition request and parses the second acquisition request, to obtain the item identifier of the virtual item. The server queries the first corresponding relationship according to the item identifier of the virtual item, to obtain a zoom magnification of a sight included in the virtual item. The server transmits the zoom magnification of the sight to the terminal device, so that the terminal device acquires the zoom magnification of the sight.

[0057] When the sight is an independent item, the sight and the zoom magnification of the sight are in one-to-one correspondence. That is, there is a second corresponding relationship between identifiers of sights and zoom magnifications of the sights. The terminal device queries the second corresponding relationship according to an identifier of a sight (e.g., a sight used by a target object), to obtain a zoom magnification of the sight. Certainly, alternatively, the server may determine the zoom magnification of the sight and transmit the zoom magnification of the sight to the terminal device, so that the terminal device acquires the zoom magnification of the sight. The process is similar to the foregoing process of acquiring the zoom magnification of the sight when the sight is attached to the virtual item, that is, when the virtual item includes the sight. Details are not described herein again.

[0058] In a possible implementation, a process of adjusting the first scene picture according to the first field of view and the zoom magnification of the sight, to obtain the third scene picture includes: determining a second field of view according to the first field of view and the zoom magnification of the sight; and adjusting the first scene picture according to the second field of view, to obtain the third scene picture. For example, the second field of view is a field of view corresponding to a target zoom magnification corresponding to the zoom magnification of the sight.

[0059] A process of determining the second field of view according to the first field of view and the zoom magnification of the sight includes: determining the target zoom magnification corresponding to the zoom magnification of the sight; and determining the second field of view according to the first field of view and the target zoom magnification. The target zoom magnification is a zoom magnification of the third scene picture relative to the first scene picture.

[0060] In some embodiments, a third corresponding relationship between zoom magnifications of sights and target zoom magnifications is stored in the terminal device. The terminal device queries the third corresponding relationship according to the zoom magnification of the sight, to obtain a target zoom magnification corresponding to the zoom magnification of the sight. Table 1 below is an exemplary table of the third corresponding relationship provided in an embodiment of this application. The table is merely an example, and a form of the third corresponding relationship is not limited to the table.

Table 1

Zoom magnifications of sights	Target zoom magnifications corresponding to the zoom magnifications of the sights
3X	2.7X

4X	3.6X
6X	5.2X
7X	5.8X
16X	12.9X
20X	16X

[0061] As can be seen from Table 1 above, when the zoom magnification of the sight is 3X, the target zoom magnification corresponding to the zoom magnification of the sight is 2.7X. When the zoom magnification of the sight is 4X, the target zoom magnification corresponding to the zoom magnification of the sight is 3.6X. When the zoom magnifications of the sights are other magnifications other than 3X and 4X, the target zoom magnifications corresponding to the zoom magnifications of the sights are as shown in Table 1 above, and details are not described herein again.

[0062] Alternatively, the third corresponding relationship is stored in the server. The terminal device transmits a third acquisition request to the server. The third acquisition request includes a zoom magnification of a sight. The server receives the third acquisition request and parses the third acquisition request, to obtain the zoom magnification of the sight. The server queries the third corresponding relationship according to the zoom magnification of the sight, to obtain a target zoom magnification corresponding to the zoom magnification of the sight. The server transmits the determined target zoom magnification to the terminal device, so that the terminal device acquires the target zoom magnification corresponding to the zoom magnification of the sight.

[0063] In some embodiments, after the target zoom magnification corresponding to the zoom magnification of the sight is determined, a process of determining the second field of view according to the first field of view and the target zoom magnification includes: determining a reference value according to the first field of view; determining a target value according to the reference value and the target zoom magnification; and determining the second field of view according to the target value. For example, a tangent value of one-half of the first field of view is taken as the reference value, and a quotient between the target zoom magnification and the reference value (e.g., a quotient obtained by dividing the reference value by the target zoom magnification) is taken as the target value. Twice an arctangent value of the target value is taken as the second field of view.

[0064] In some embodiments, the second field of view is determined according to the first field of view and the target zoom magnification based on the following Formula (1).

$$\tan \frac{FOV2}{2} = \frac{\tan \frac{FOV1}{2}}{A} \quad \text{Formula (1)}$$

[0065] In the foregoing Formula (1), FOV2 denotes the second field of view, FOV1 denotes the first field of view, and A denotes the target zoom magnification.

[0066] For example, the first field of view is 75 degrees, the target zoom magnification is 3.6, and it is determined according to the foregoing Formula (1) that the second field of view is 23.966 degrees.

[0067] In a possible implementation, after the second field of view is determined, content included in the first scene picture is rendered according to the second field of view, to obtain the third scene picture. FIG. 4 is a schematic diagram of display of a third scene picture according to an embodiment of this application. As can be seen from FIG. 4 and FIG. 3, a size of an object included in FIG. 4 is larger than a size of an object included in FIG. 3, and a field of view in FIG. 4 is smaller than a field of view in FIG. 3.

[0068] In the second implementation manner, the target zoom magnification corresponding to the zoom magnification of the sight is determined; the first scene picture is stretched according to the target zoom magnification, to obtain a second target scene picture; and the second target scene picture is clipped, to obtain the third scene picture. The target zoom magnification is a zoom magnification of the third scene picture relative to the first scene picture.

[0069] The process of determining the target zoom magnification corresponding to the zoom magnification of the sight has been described in the first implementation manner above, and details are not described herein again. A size of the second target scene picture is target zoom magnification times a size of the first scene picture. For example, if the target zoom magnification is 3.6, the size of the second target scene picture is 3.6 times the size of the first scene picture. Clipping is performed by taking a center point of the second target scene picture as a center, to obtain the third scene picture. A center point of the third scene picture is the center point of the second target scene picture. For example, a size of the third scene picture is the same as or different from the size of the first scene picture, which is not limited in this embodiment of this application. However, a size of an object included in the third scene picture is larger than the size of the object included in the first scene picture. For example, the object included in the third scene picture is of a first size, the object included in the first scene picture is of a second size, and the first size is target zoom magnification times the second size.

[0070] In a possible implementation, a process of clipping the second target scene picture, to obtain the third scene picture includes: determining a candidate region by taking the center point of the second target scene picture as a center, where a length of the candidate region is a length of the first scene picture, a width of the candidate region is a width of the first scene picture, and a center point of the candidate region is the center point of the second target scene picture, and taking a scene picture covered by the candidate region in the second target scene picture as the third scene picture.

[0071] FIG. 5 is a schematic diagram of acquisition of a third scene picture according to an embodiment of this application. (1) in FIG. 5 is the first scene picture, (2) in FIG. 5 is the second target scene picture, a region included by a dotted line in (2) is the candidate region, and (3) in FIG. 5 is the third scene picture.

[0072] The third scene picture may be acquired in the first implementation manner above, or the third scene picture may be acquired in the second implementation manner above, which is not limited in this embodiment of this application.

[0073] In some embodiments, after the third scene picture is acquired, a fourth scene picture that is in the third scene picture and corresponds to the sight is processed according to the zoom magnification of the sight, to obtain the reference scene picture. Before the fourth scene picture is processed, the fourth scene picture needs to be acquired first. For example, when the fourth scene picture needing to be acquired is in the shape of a circle, a process of acquiring the fourth scene picture includes: determining a reference region by taking the center point of the third scene picture as a center and a target length as a radius; and taking a scene picture covered by the reference region in the third scene picture as the fourth scene picture. The target length is a radius of the sight. Alternatively, when the fourth scene picture needing to be acquired is in another shape other than the circle, the process of acquiring the fourth scene picture includes: taking the center point of the third scene picture as a center, determining a region with a reference size, and taking a scene picture covered by the region with the reference size in the third scene picture as the fourth scene picture. The reference size is a size of the internal picture of the sight.

[0074] FIG. 6 is a schematic diagram of acquisition of a fourth scene picture according to an embodiment of this application. For example, the fourth scene picture is in the shape of a circle. (1) in FIG. 6 is the third scene picture, a region included by a dotted line in (2) in FIG. 6 is the reference region, and (3) in FIG. 6 is the fourth scene picture.

[0075] In a possible implementation, after the fourth scene picture is acquired, the fourth scene picture is processed according to the zoom magnification of the sight, to obtain the reference

scene picture. Two processing manners of processing the fourth scene picture according to the zoom magnification of the sight, to obtain the reference scene picture are provided in this embodiment of this application.

[0076] In the first processing manner, a reference zoom magnification is determined according to the zoom magnification of the sight; first image coordinates of a center point of the sight and second image coordinates of pixels in the fourth scene picture are acquired; and pixel information of the pixels is adjusted according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, to obtain the reference scene picture.

[0077] The reference zoom magnification is a zoom magnification of the reference scene picture relative to the fourth scene picture. A process of determining the zoom magnification of the sight has been described in the first implementation manner above, and details are not described herein again.

[0078] In some embodiments, a process of determining the reference zoom magnification according to the zoom magnification of the sight includes: determining a target zoom magnification corresponding to the zoom magnification of the sight; and determining the reference zoom magnification according to the zoom magnification of the sight and the target zoom magnification. For example, a quotient between the zoom magnification of the sight and the target zoom magnification (e.g., a quotient obtained by dividing the zoom magnification of the sight by the target zoom magnification) is taken as the reference zoom magnification. The process of determining the target zoom magnification has also been described in operation 202 above, and details are not described herein again.

[0079] For example, when the zoom magnification of the sight is 4X and the target zoom magnification corresponding to the zoom magnification of the sight is 3.6X, the reference zoom magnification is $4/3.6$.

[0080] In a possible implementation, a process of acquiring the first image coordinates of the center point of the sight includes: acquiring coordinates of the center point of the sight in a world coordinate system; and converting the coordinates of the center point of the sight in the world coordinate system according to a transformation matrix, to obtain the first image coordinates of the center point of the sight.

[0081] In some embodiments, a process of adjusting the pixel information of the pixels according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, to obtain the reference scene picture includes: determining, according to

the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, third image coordinates after the pixels are offset; and for any pixel in the pixels, adjusting, based on existence of a reference pixel that is in the pixels and whose third image coordinates are the same as those after the any pixel is offset, pixel information of the reference pixel to pixel information of the any pixel, and traversing the pixels, to obtain the reference scene picture. The pixel information includes, but is not limited to, at least one of color information and transparency information of the pixel. The color information of the pixel includes a red value, a green value, and a blue value of the pixel.

[0082] A process of determining, according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, third image coordinates after the pixels are offset includes: determining, for any pixel in the pixels, a target offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel, the target offset vector of the any pixel being configured for indicating an offset between the second image coordinates of the any pixel and image coordinates of the any pixel that are zoomed in according to the reference zoom magnification, and the target offset vector of the any pixel including a first offset value of the any pixel in a first direction and a second offset value of the any pixel in a second direction; and determining, according to the second image coordinate of the any pixel, the first offset value of the any pixel in the first direction, and the second offset value of the any pixel in the second direction, the third image coordinates after the any pixel is offset.

[0083] In some embodiments, a process of determining the target offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel includes: determining a reference offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel; and taking the reference offset vector of the any pixel as the target offset vector of the any pixel, or determining the target offset vector of the any pixel according to the reference offset vector of the any pixel.

[0084] In a possible implementation, the reference offset vector of the any pixel is determined according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel based on the following Formula (2).

$$P = \left(1 - \frac{1}{B}\right) * (U - V) \quad \text{Formula (2)}$$

[0085] In the foregoing Formula (2), P denotes the reference offset vector of the any pixel, B denotes the reference zoom magnification, U denotes the first image coordinates, and V denotes the second image coordinates of the any pixel.

[0086] For example, the reference zoom magnification is $\frac{4}{3.6}$, the first image coordinates are (10, 10), the second image coordinates of any pixel are (6, 4), and it is determined according to the foregoing Formula (2) that the reference offset vector of the any pixel is (0.4, 0.6).

[0087] The target offset vector of the any pixel may be determined according to the reference offset vector of the any pixel in the following two manners.

[0088] In the first manner, an encoded intermediate vector of the any pixel is determined according to the reference offset vector of the any pixel; and a target offset vector of the any pixel is determined according to the encoded intermediate vector of the any pixel.

[0089] The encoded intermediate vector is a vector obtained after normalization of the reference offset vector. In some embodiments, the encoded intermediate vector of the any pixel is determined according to the reference offset vector of the any pixel based on the following Formula (3).

$$Q = (P + \text{float2}(1.0, 1.0)) * 0.5 \quad \text{Formula (3)}$$

[0090] In the foregoing formula (3), Q denotes the encoded intermediate vector of the any pixel, P denotes the reference offset vector of the any pixel, and float denotes a floating-point function.

[0091] The encoded intermediate vector of the any pixel includes a third offset value of the any pixel in the first direction and a fourth offset value of the any pixel in the second direction, and a process of determining the target offset vector of the any pixel according to the encoded intermediate vector of the any pixel includes: determining the target offset vector of the any pixel according to the third offset value and the fourth offset value.

[0092] In some embodiments, a process of determining the target offset vector of the any pixel according to the third offset value and the fourth offset value includes: encoding the third offset value to obtain a first binary value, and encoding the fourth offset value to obtain a second binary value; acquiring a third binary value and a fourth binary value according to the first binary value, and acquiring a fifth binary value and a sixth binary value according to the second binary value; and determining the target offset vector of the any pixel according to the third binary value, the fourth binary value, the fifth binary value, and the sixth binary value.

[0093] The first binary value and the second binary value have a same quantity of bits. For example, both the first binary value and the second binary value have 16 bits. The third binary value and the fourth binary value may have the same quantity of or different quantities of bits, and the fifth binary value and the sixth binary value may have the same quantity of or different quantities of bits, which are not limited in this embodiment of this application.

[0094] In some embodiments, a process of acquiring the third binary value and the fourth binary value according to the first binary value includes: splitting the first binary value, to obtain the third binary value and the fourth binary value. For example, the first binary value has 16 bits, the first eight bits of the first binary value are taken as the third binary value, and the last eight bits of the first binary value are taken as the fourth binary value.

[0095] For example, according to the first binary value, the third binary value is acquired according to the following Formula (4), and the fourth binary value is acquired according to the following Formula (5).

$$L = \text{frac}(M) - \text{frac}(M * 255.0f)/255.0f \quad \text{Formula (4)}$$

$$K = \text{frac}(N * 255.0f) \quad \text{Formula (5)}$$

[0096] In the foregoing formula (4), L denotes the third binary value, M denotes the first S digits of the first binary value, frac denotes a function, and S is set based on experience or adjusted according to an implementation environment, which are not limited in this embodiment of this application. S is greater than zero and is less than the quantity of bits included in the first binary value, and 255.0f denotes a maximum value that can be expressed by an eight-bit binary value. In the foregoing formula (5), K denotes the fourth binary value, and N denotes a digit other than the first S digits in the first binary value.

[0097] A process of acquiring the fifth binary value and the sixth binary value according to the second binary value includes: splitting the second binary value, to obtain the fifth binary value and the sixth binary value. For example, the second binary value has 16 bits, the first eight bits of the second binary value are taken as the fifth binary value, and the last eight bits of the second binary value are taken as the sixth binary value. In some embodiments, according to the second binary value, the fifth binary value is acquired according to the foregoing Formula (4), and the sixth binary value is acquired according to the foregoing Formula (5).

[0098] In a possible implementation, a process of determining the target offset vector of the any pixel according to the third binary value, the fourth binary value, the fifth binary value, and the sixth binary value includes: decoding the third binary value to obtain a first value, decoding the

fourth binary value to obtain a second value, decoding the fifth binary value to obtain a third value, and decoding the sixth binary value to obtain a fourth value; and determining the target offset vector of the any pixel according to the first value, the second value, the third value, and the fourth value.

[0099] For example, a decimal value corresponding to the third binary value is taken as the first value. A decimal value corresponding to the fourth binary value is taken as the second value. A decimal value corresponding to the fifth binary value is taken as the third value. A decimal value corresponding to the sixth binary value is taken as the fourth value.

[00100] In a possible implementation, a process of determining the target offset vector of the any pixel according to the first value, the second value, the third value, and the fourth value includes: determining first coordinates according to the first value and the second value, a value of the first coordinates in the first direction being the first value, and a value of the first coordinates in the second direction being the second value; determining second coordinates according to the third value and the fourth value, a value of the second coordinates in the first direction being the third value, and a value of the second coordinates in the second direction being the fourth value; and determining the target offset vector of the any pixel according to the first coordinates and the second coordinates.

[00101] For example, the target offset vector of the any pixel is determined according to the first value, the second value, the third value, and the fourth value based on the following Formula (6).

$$W = \left(M - \frac{N}{255.0f} \right) + 2.0 - 1 \quad \text{Formula (6)}$$

[00102] In the foregoing formula (6), W denotes the target offset vector of the any pixel, M denotes the first coordinates, and N denotes the second coordinates.

[00103] In the second manner, the reference offset vector of the any pixel includes a fifth offset value of the any pixel in the first direction and a sixth offset value in the second direction, and the target offset vector of the any pixel is determined according to the fifth offset value and the sixth offset value.

[00104] A process of determining the target offset vector of the any pixel according to the fifth offset value and the sixth offset value is similar to the process of determining the target offset vector of the any pixel according to the third offset value and the fourth offset value in the first manner above, and details are not described herein again.

[00105] The target offset vector of the any pixel may be determined by selecting the first manner, or the target offset vector of the any pixel may be determined by selecting the second manner, which is not limited in this embodiment of this application.

[00106] After the reference offset vector of the pixel is acquired, the reference offset vector of the pixel needs to be stored in a render target (RT). Due to a limited storage capacity of the RT, a two-channel reference offset vector needs to be adjusted to a four-channel value, the four-channel value is stored in the RT, the four-channel value is acquired from the RT, the four-channel value is processed to obtain a two-channel target offset vector, and the second image coordinates of the pixel are adjusted according to the target offset vector, to obtain the third image coordinates after the pixel is offset.

[00107] In the second processing manner, a reference zoom magnification is determined according to the zoom magnification of the sight; the fourth scene picture is stretched according to the reference zoom magnification, to obtain a first target scene picture; and the first target scene picture is clipped, to obtain the reference scene picture.

[00108] The reference zoom magnification is a zoom magnification of the reference scene picture relative to the fourth scene picture. A size of the first target scene picture is reference zoom magnification times a size of the fourth scene picture. A center point of the reference scene picture is a center point of the first target scene picture, and a size of the reference scene picture is the same as a size of the sight. For example, "a size of the reference scene picture is the same as a size of the sight" includes: The size of the reference scene picture is the same as a size of the internal picture of the sight. The internal picture of the sight is a picture displayed after the sight is turned on (or the sight in the on state).

[00109] The process of acquiring the zoom magnification of the sight and the process of determining the reference zoom magnification according to the zoom magnification of the sight have been described in the first processing manner above, and details are not described herein again.

[00110] In a possible implementation, for example, a process of clipping, when the reference scene picture is in the shape of a circle, the first target scene picture, to obtain the reference scene picture includes: determining a target region by taking the center point of the first target scene picture as a center and a target length as a radius, and taking a scene picture covered by the target region in the first target scene picture as the reference scene picture. The target length is a radius of the sight. Alternatively, when the reference scene picture is in another shape other than the circle, the process of acquiring the reference scene picture includes: taking the center point of the first

target scene picture as a center, determining a region with a reference size, and taking a scene picture covered by the region with the reference size in the first target scene picture as the reference scene picture. The reference size is a size of the internal picture of the sight.

[00111] FIG. 7 is a schematic diagram of acquisition of a reference scene picture according to an embodiment of this application. For example, the reference scene picture is in the shape of a circle. (1) in FIG. 7 is the fourth scene picture, (2) in FIG. 7 is the first target scene picture, a region included by a dotted line in (2) is the target region, and (3) in FIG. 7 is the reference scene picture.

[00112] The reference scene picture may be acquired in the first manner of acquiring the reference scene picture. There is a smaller difference between a size of an object included in the reference scene picture and a size of an object included in the third scene picture. When the reference scene picture is subsequently displayed inside the sight and a scene picture other than the fourth scene picture in the third scene picture is displayed outside the sight, there is a difference between the size of the internal picture of the sight and the size of the external picture of the sight, thereby achieving a difference between the inside and the outside of the sight. The size of the object included in the external picture of the sight is larger than the size of the object included in the first scene picture. Therefore, a difference between the internal picture and the external picture of the sight is not large, and a blind region of the game picture is smaller after the sight is turned on. The blind region refers to a region that cannot be seen by the game object in the displayed game picture. The first scene picture is zoomed in to obtain the third scene picture, and then the fourth scene picture that is in the third scene picture and corresponds to the sight is zoomed in, to obtain the reference scene picture, so that a transitional zoom magnification (that is, a zoom magnification of the third scene picture relative to the first scene picture) is introduced into the process of acquiring the reference scene picture, and there is a smaller difference between definitions of the internal picture and the external picture. Compared with the manner of displaying a scene picture other than the second scene picture in the first scene picture outside the sight, the manner of displaying the scene picture other than the fourth scene picture in the third scene picture outside the sight has a smaller magnification difference between the internal picture and the external picture of the sight, so that the internal picture of the sight is displayed more clearly.

[00113] In addition, after the first scene picture is processed to obtain the third scene picture, the first scene picture may not be further processed, but a fourth scene picture that is in the third scene picture and corresponds to the sight is processed. The fourth scene picture is, for example, part of the third scene picture. Consequently, fewer scene pictures need to be processed. For example, the first scene picture does not need to be processed twice or more, thereby saving

hardware and computing resources of the terminal device displaying the game picture, and increasing a display speed of the game picture.

[00114] For example, when the internal picture (the reference scene picture) of the sight is 20 times the first scene picture, and the external picture (the scene picture other than the second scene picture in the first scene picture) of the sight is 1 time the first scene picture, due to a larger magnification difference between the internal picture and the external picture, a difference between definitions of the internal picture and the external picture is larger, and the displayed internal picture is more blurry. When the internal picture (the reference scene picture) of the sight is 20 times the first scene picture, and the external picture of the sight (the scene picture other than the fourth scene picture in the third scene picture) is 16 times the first scene picture, due to a smaller magnification difference between the internal picture and the external picture, the difference between definitions of the internal picture and the external picture is smaller, and the displayed internal picture is clearer.

[00115] In the second manner, the reference scene picture is acquired by: adjusting pixel information of pixels in the second scene picture according to the zoom magnification of the sight, first image coordinates of a center point of the sight, and fourth image coordinates of the pixels in the second scene picture, to obtain the reference scene picture, where the second scene picture is a picture that is in the first scene picture and corresponds to the sight.

[00116] An implementation process of the second manner of acquiring the reference scene picture is similar to the implementation process of the first processing manner above, and details are not described herein again.

[00117] In the third manner, the reference scene picture is acquired by: stretching the second scene picture according to the zoom magnification of the sight, to obtain a third target scene picture, and clipping the third target scene picture to obtain the reference scene picture, where the second scene picture is a picture that is in the first scene picture and corresponds to the sight.

[00118] A size of the third target scene picture is zoom magnification times a size of the second scene picture, a center point of the reference scene picture is a center point of the third target scene picture, and a size of the reference scene picture is the same as a size of the sight.

[00119] An implementation process of the third manner of acquiring the reference scene picture is similar to the implementation process of the second processing manner above, and details are not described herein again.

[00120] FIG. 8 is a schematic diagram of acquisition of a reference scene picture according to an embodiment of this application. (1) in FIG. 8 is the first scene picture, (2) in FIG. 8 is the third target scene picture, and (3) in FIG. 8 is the reference scene picture.

[00121] When the reference scene picture is acquired in the second manner of acquiring the reference scene picture and the third manner of acquiring the reference scene picture, the second scene picture needs to be acquired first. The process of acquiring the second scene picture is similar to the process of acquiring the fourth scene picture in the above process, and details are not described herein again.

[00122] There is a difference between a size of an object included in the reference scene picture acquired in the second manner of acquiring the reference scene picture or the third manner of acquiring the reference scene picture and a size of an object included in the first scene picture, so that when the reference scene picture is subsequently displayed inside the sight and a scene picture other than the second scene picture in the first scene picture is displayed outside the sight, a difference between the inside and the outside of the sight is achieved. In addition, only the second scene picture that is in the first scene picture and corresponds to the sight is processed (or the complete first scene picture does not need to be processed), which saves hardware and computing resources of the terminal device displaying the game picture, and increases a display speed of the game picture.

[00123] Operation 203: Display a second game picture, the second game picture including the sight, the sight being in an on state, an internal picture of the sight being the reference scene picture, and an external picture of the sight being obtained based on the first scene picture.

[00124] A size of an object included in the external picture of the sight is smaller than a size of an object included in the reference scene picture, that is, the size of the object included in the external picture of the sight is smaller than a size of an object included in the internal picture of the sight.

[00125] In a possible implementation, when the reference scene picture is acquired in the second manner of acquiring the reference scene picture or the third manner of acquiring the reference scene picture, the external picture of the sight is a picture other than the second scene picture in the first scene picture. FIG. 9 is a schematic diagram of display of a second game picture according to an embodiment of this application. A sight 901 is displayed in the second game picture, the sight 901 is in an on state, an internal picture of the sight is a reference scene picture 902, and an external picture of the sight is a picture other than the second scene picture in the first scene picture.

[00126] Alternatively, when the reference scene picture is acquired in the first manner of acquiring the reference scene picture in operation 202 above, the external picture of the sight is a picture other than the fourth scene picture in the third scene picture. The third scene picture is obtained by adjusting the first scene picture. The process of acquiring the third scene picture has been described in operation 202, and details are not described herein again. FIG. 10 is a schematic diagram of display of another second game picture according to an embodiment of this application. A sight 1001 is displayed in the second game picture, the sight 1001 is in an on state, an internal picture of the sight is a reference scene picture 1002, and an external picture of the sight is a picture other than a fourth scene picture in a third scene picture.

[00127] In some embodiments, the second game picture further includes a conversion control, the conversion control is displayed in a first form, and the first form is configured for indicating that the sight displayed in the second game picture is in an on state. For example, "the conversion control is displayed in a first form" means that the conversion control is displayed in gray. Certainly, the second game picture may further include another control, which is not limited in this embodiment of this application.

[00128] In the foregoing method, after the trigger operation for the conversion control is received, the second scene picture that is in the first scene picture and corresponds to the sight is zoomed in, to obtain the reference scene picture, so that the size of the object included in the reference scene picture is larger than the size of the object included in the first scene picture, and the second game picture is displayed, the internal picture of the sight in the second game picture is the reference scene picture, the external picture of the sight is determined based on the first scene picture, and the size of the object included in the internal picture of the sight is larger than the size of the object included in the external picture of the sight, so that zoom magnifications of the internal picture and the external picture of the sight are different, which achieves a difference between the inside and the outside of the sight and then improves a display effect of a game picture, thereby improving game experience of a game object. Moreover, in some implementations, since only the second scene picture that is in the first scene picture and corresponds to the sight needs to be processed, a calculation amount of a scene picture is smaller, and there is a lower requirement for performance of the terminal device displaying the game picture, which can save resources.

[00129] An embodiment of this application provides a game picture display method applicable to the foregoing implementation environment. by taking a flowchart of a game picture display method according to an embodiment of this application shown in FIG. 11 as an example, the

method may be performed by the terminal device 101 in FIG. 1. As shown in FIG. 11, the method includes the following operation 1101 to operation 1102.

[00130] Operation 1101: Display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight.

[00131] In a possible implementation, a process of displaying the first game picture is similar to the process in operation 201 above, and details are not described herein again.

[00132] Operation 1102: Display a second game picture in response to a trigger operation for the conversion control, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including a reference scene picture, a magnification of an object included in an external picture of the sight being less than a magnification of an object included in the reference scene picture, and the magnification of the object included in the reference scene picture being greater than a magnification of an object included in the first scene picture.

[00133] In a possible implementation, a process of displaying the second game picture is similar to the process in operation 203 above, and details are not described herein again. A magnification of an object included in the external picture of the sight is obtained based on a size of the object included in the external picture of the sight and a size of an object included in the first scene picture. For example, the magnification of the object included in the external picture of the sight is a quotient between the size of the object included in the external picture of the sight and the size of the object included in the first scene picture. The magnification of the object included in the reference scene picture is obtained based on a size of the object included in the reference scene picture and the size of the object included in the first scene picture. For example, the magnification of the object included in the reference scene picture is a quotient between the size of the object included in the reference scene picture and the size of the object included in the first scene picture. For example, the magnification of the object included in the first scene picture is 1. The size of the object included in the external picture of the sight is smaller than the size of the object included in the reference scene picture, and the size of the object included in the reference scene picture is larger than the size of the object included in the first scene picture.

[00134] In some embodiments, the magnification of the object included in the external picture of the sight in the second game picture is greater than the magnification of the object included in the first scene picture, or the magnification of the object included in the external picture of the sight in the second game picture is equal to the magnification of the object included in the first scene picture. A size of the object included in the external picture of the sight in the second

game picture is larger than the size of the object included in the first scene picture, or the size of the object included in the external picture of the sight in the second game picture is equal to the size of the object included in the first scene picture.

[00135] In a possible implementation, the second game picture further includes a direction control, and the direction control is configured to adjust a displayed game picture. After the second game picture is displayed, a third game picture is displayed in response to a trigger operation for the direction control. The third game picture includes the sight, the sight is in an on state, an internal picture of the sight includes a fifth scene picture, a magnification of an object included in an external picture of the sight in the third game picture is less than a magnification of an object included in the fifth scene picture, and the magnification of the object included in the fifth scene picture is the same as the magnification of the object included in the reference scene picture. The magnification of the object included in the external picture of the sight included in the third game picture is the same as the magnification of the object included in the external picture of the sight included in the second game picture.

[00136] For example, the fifth scene picture is a scene picture on a side of a direction indicated by the direction control of the reference scene picture, or the fifth scene picture is a scene picture in the direction indicated by the direction control. For example, if a direction indicated by the direction control included in the second game picture is a left side, the internal picture of the sight (that is, the fifth scene picture) in the third game picture is a scene picture on the left side of the reference scene picture.

[00137] In some embodiments, the second game picture further includes a conversion control, and the conversion control is displayed in a first form. Alternatively, the second game picture further includes a conversion control in a first form, and the first form is configured for indicating that the sight displayed in the second game picture is in an on state. After the second game picture is displayed, the first game picture is displayed in response to a trigger operation for the conversion control, and the conversion control displayed in the first game picture is displayed in a second form. Alternatively, the first game picture includes a conversion control in a second form, and the second form is configured for indicating that the sight displayed in the first game picture is in an off state. The first form and the second form are not limited in this embodiment of this application. For example, "the conversion control is displayed in a first form" means that the conversion control is displayed in gray, and "the conversion control is displayed in a second form" means that the conversion control is displayed in white.

[00138] In the foregoing method, after the trigger operation for the conversion control is received, the magnification of the object included in the internal picture of the sight in the displayed second game picture is greater than the magnification of the object included in the external picture of the sight, so that zoom magnifications of the internal picture and the external picture of the sight are different, which achieves a difference between the inside and the outside of the sight and then improves a display effect of a game picture, thereby improving game experience of a game object.

[00139] FIG. 12 is a flowchart of a method for acquiring a reference scene picture according to an embodiment of this application. As shown in FIG. 12, the method includes the following operations:

[00140] Operation 1201: Adjust a first scene picture to obtain a third scene picture.

[00141] In a possible implementation, a size of an object included in the third scene picture is larger than a size of an object included in the first scene picture, a size of the third scene picture is reference zoom magnification times a size of the first scene picture, and the reference zoom magnification is determined based on a zoom magnification of a sight.

[00142] Operation 1202: Determine a fourth scene picture corresponding to the sight in the third scene picture.

[00143] In a possible implementation, the fourth scene picture is part of the third scene picture.

[00144] Operation 1203: Determine a reference zoom magnification according to the zoom magnification of the sight.

[00145] Operation 1204: Acquire first image coordinates of a center point of the sight and second image coordinates of pixels in the fourth scene picture.

[00146] Operation 1205: Determine a target offset vector of the pixels according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels.

[00147] Operation 1206: Determine, according to the target offset vector and the second image coordinates of the pixels, third image coordinates after the pixels are offset.

[00148] Operation 1207: Adjust, based on existence of a reference pixel that is in the pixels and whose third image coordinates are the same as those after the any pixel is offset, pixel information of the reference pixel to pixel information of the any pixel, and traverse the pixels, to obtain a reference scene picture.

[00149] Implementations of operation 1201 to operation 1207 above have been described in operation 202 above, and details are not described herein again.

[00150] FIG. 13 is a schematic structural diagram of a game picture display apparatus according to an embodiment of this application. As shown in FIG. 13, the apparatus includes:

[00151] a display module 1301 configured to display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight; and

[00152] a processing module 1302 configured to process, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture;

[00153] the display module 1301 being further configured to display a second game picture, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including the reference scene picture, an external picture of the sight being obtained based on the first scene picture, and a size of an object included in the external picture of the sight being smaller than a size of an object included in the reference scene picture.

[00154] In a possible implementation, the processing module 1302 is configured to adjust the first scene picture in response to the trigger operation for the conversion control, to obtain a third scene picture, a size of an object included in the third scene picture being larger than a size of an object included in the first scene picture; and process, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture, the size of the object included in the reference scene picture being larger than a size of an object included in the fourth scene picture, and the external picture of the sight being a picture other than the fourth scene picture in the third scene picture.

[00155] In a possible implementation, the processing module 1302 is configured to determine a reference zoom magnification according to a zoom magnification of the sight, the reference zoom magnification being a zoom magnification of the reference scene picture relative to the fourth scene picture; acquire first image coordinates of a center point of the sight and second image coordinates of pixels in the fourth scene picture; and adjust pixel information of the pixels according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, to obtain the reference scene picture.

[00156] In a possible implementation, the processing module 1302 is configured to determine, according to the reference zoom magnification, the first image coordinates, and the

second image coordinates of the pixels, third image coordinates after the pixels are offset; and for any pixel in the pixels, adjust, based on existence of a reference pixel that is in the pixels and whose third image coordinates are the same as those after the any pixel is offset, pixel information of the reference pixel to pixel information of the any pixel, and traverse the pixels, to obtain the reference scene picture.

[00157] In a possible implementation, the processing module 1302 is configured to determine, for any pixel in the pixels, a target offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel, the target offset vector of the any pixel being configured for indicating an offset between the second image coordinates of the any pixel and image coordinates of the any pixel that are zoomed in according to the reference zoom magnification, and the target offset vector of the any pixel including a first offset value of the any pixel in a first direction and a second offset value of the any pixel in a second direction; and determine, according to the second image coordinate of the any pixel, the first offset value of the any pixel in the first direction, and the second offset value of the any pixel in the second direction, the third image coordinates after the any pixel is offset.

[00158] In a possible implementation, the processing module 1302 is configured to determine a reference offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel; and determine the target offset vector of the any pixel according to the reference offset vector of the any pixel in either of the following manners: taking the reference offset vector of the any pixel as the target offset vector of the any pixel; and determining the target offset vector of the any pixel according to the reference offset vector of the any pixel.

[00159] In a possible implementation, the processing module 1302 is configured to determine an encoded intermediate vector of the any pixel according to the reference offset vector of the any pixel, and determine the target offset vector of the any pixel according to the encoded intermediate vector of the any pixel, the encoded intermediate vector being a vector obtained after normalization of the reference offset vector; or determine the target offset vector of the any pixel according to a fifth offset value and a sixth offset value included in the reference offset vector of the any pixel, the fifth offset value being an offset value of the any pixel in the first direction, and the sixth offset value being an offset value of the any pixel in the second direction.

[00160] In a possible implementation, the encoded intermediate vector of the any pixel includes a third offset value of the any pixel in the first direction and a fourth offset value of the any pixel in the second direction.

[00161] The processing module 1302 is configured to encode the third offset value to obtain a first binary value, and encode the fourth offset value to obtain a second binary value, the first binary value and the second binary value having a same quantity of bits; acquire a third binary value and a fourth binary value according to the first binary value, and acquire a fifth binary value and a sixth binary value according to the second binary value; and determine the target offset vector of the any pixel according to the third binary value, the fourth binary value, the fifth binary value, and the sixth binary value.

[00162] In a possible implementation, the processing module 1302 is configured to decode the third binary value to obtain a first value, decode the fourth binary value to obtain a second value, decode the fifth binary value to obtain a third value, and decode the sixth binary value to obtain a fourth value; and determine the target offset vector of the any pixel according to the first value, the second value, the third value, and the fourth value.

[00163] In a possible implementation, the processing module 1302 is configured to determine a reference zoom magnification according to a zoom magnification of the sight, the reference zoom magnification being a zoom magnification of the reference scene picture relative to the fourth scene picture; stretch the fourth scene picture according to the reference zoom magnification, to obtain a first target scene picture, a size of the first target scene picture being reference zoom magnification times a size of the fourth scene picture; and clip the first target scene picture to obtain the reference scene picture, a center point of the reference scene picture being a center point of the first target scene picture, and a size of the reference scene picture being the same as a size of the internal picture of the sight.

[00164] In a possible implementation, the processing module 1302 is configured to determine a target region by taking the center point of the first target scene picture as a center and a target length as a radius, the target length being a radius of the sight; and take a scene picture covered by the target region in the first target scene picture as the reference scene picture.

[00165] In a possible implementation, the processing module 1302 is configured to determine a reference region by taking a center point of the third scene picture as a center and a target length as a radius, the target length being a radius of the sight; and take a scene picture covered by the reference region in the third scene picture as the fourth scene picture.

[00166] In a possible implementation, the processing module 1302 is configured to acquire a first field of view corresponding to the first scene picture and a zoom magnification of the sight; determine a second field of view according to the first field of view and the zoom magnification of the sight (for example, the second field of view is a field of view corresponding to a target zoom

magnification corresponding to the zoom magnification of the sight); and adjust the first scene picture according to the second field of view, to obtain the third scene picture.

[00167] In a possible implementation, the processing module 1302 is configured to determine a target zoom magnification corresponding to the zoom magnification of the sight, the target zoom magnification being a zoom magnification of the third scene picture relative to the first scene picture; determine a reference value according to the first field of view; determine a target value according to the reference value and the target zoom magnification; and determine the second field of view according to the target value.

[00168] In a possible implementation, the processing module 1302 is configured to determine a target zoom magnification corresponding to the zoom magnification of the sight, the target zoom magnification being a zoom magnification of the third scene picture relative to the first scene picture; stretch the first scene picture according to the target zoom magnification, to obtain a second target scene picture, a size of the second target scene picture being target zoom magnification times a size of the first scene picture; and clip the second target scene picture to obtain the third scene picture, the center point of the third scene picture being a center point of the second target scene picture (for example, a size of the third scene picture is the same as the size of the first scene picture).

[00169] In a possible implementation, the processing module 1302 is configured to adjust, in response to the trigger operation for the conversion control, pixel information of pixels in the second scene picture according to the zoom magnification of the sight, first image coordinates of a center point of the sight, and fourth image coordinates of the pixels in the second scene picture, to obtain the reference scene picture; or stretch, in response to the trigger operation for the conversion control, the second scene picture according to the zoom magnification of the sight, to obtain a third target scene picture, and clip the third target scene picture to obtain the reference scene picture; The second scene picture is a scene picture that is in the first scene picture and corresponds to the sight, and the external picture of the sight is a picture other than the second scene picture in the first scene picture.

[00170] According to the foregoing apparatus, after a trigger operation for the sight on control is received, the first scene picture is zoomed in, to obtain the reference scene picture, the second game picture is displayed, the internal picture of the sight in the second game picture is the reference scene picture, the external picture of the sight is determined based on the first scene picture, and the size of the object included in the internal picture of the sight is larger than the size of the object included in the external picture of the sight, so that zoom magnifications of the internal

picture and the external picture of the sight are different, which achieves a difference between the inside and the outside of the sight and then improves a display effect of a game picture, thereby improving game experience of a game object. For example, in some implementations, since only the second scene picture that is in the first scene picture and corresponds to the sight needs to be processed, a calculation amount of a scene picture is smaller, and there is a lower requirement for performance of the terminal device displaying the game picture, which can save resources.

[00171] FIG. 14 is a schematic structural diagram of a game picture display apparatus according to an embodiment of this application. As shown in FIG. 14, the apparatus includes:

[00172] a display module 1401 configured to display a first game picture, the first game picture including a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight;

[00173] the display module 1401 being further configured to display a second game picture in response to a trigger operation for the conversion control, the second game picture including the sight, the sight being in an on state, an internal picture of the sight including a reference scene picture, a magnification of an object included in an external picture of the sight being less than a magnification of an object included in the reference scene picture, and the magnification of the object included in the reference scene picture being greater than a magnification of an object included in the first scene picture.

[00174] In a possible implementation, the magnification of the object included in the external picture of the sight in the second game picture is greater than the magnification of the object included in the first scene picture, or the magnification of the object included in the external picture of the sight in the second game picture is equal to the magnification of the object included in the first scene picture.

[00175] In a possible implementation, the second game picture further includes a direction control, and the direction control is configured to adjust a displayed game picture.

[00176] The display module 1401 is further configured to display a third game picture in response to a trigger operation for the direction control. The third game picture includes the sight, the sight is in an on state, an internal picture of the sight includes a fifth scene picture, a magnification of an object included in an external picture of the sight in the third game picture is less than a magnification of an object included in the fifth scene picture, the magnification of the object included in the fifth scene picture is the same as a magnification of an object included in the reference scene picture, and the fifth scene picture is a scene picture on a side of a direction

indicated by the direction control of the reference scene picture, or the fifth scene picture is the scene picture in the direction indicated by the direction control.

[00177] In a possible implementation, the second game picture further includes a sight on control, and the sight on control is displayed in a first form. Alternatively, the second game picture further includes a conversion control in a first form, and the first form is configured for indicating that the sight displayed in the second game picture is in an on state.

[00178] The display module 1401 is further configured to display the first game picture in response to a trigger operation for the conversion control. The sight on control displayed in the first game picture is displayed in a second form. Alternatively, the first game picture includes a conversion control in a second form, and the second form is configured for indicating that the sight displayed in the first game picture is in an off state.

[00179] In the foregoing apparatus, after the trigger operation for the sight on control is received, the magnification of the object included in the internal picture of the sight in the displayed second game picture is greater than the magnification of the object included in the external picture of the sight, so that zoom magnifications of the internal picture and the external picture of the sight are different, which achieves a difference between the inside and the outside of the sight and then improves a display effect of a game picture, thereby improving game experience of a game object.

[00180] When the apparatus provided above implements the functions of the apparatus, only division into the foregoing function modules is used as an example for description. In the practical application, the functions may be allocated to and completed by different function modules according to requirements. That is, an internal structure of the device is divided into different function modules, to complete all or some of the functions described above. In addition, the apparatus provided in the foregoing embodiments and the method embodiments belong to the same concept. For details of a specific implementation process, reference may be made to the method embodiments. Details are not described herein again.

[00181] FIG. 15 shows a structural block diagram of a terminal device 1500 according to an exemplary embodiment of this application. The terminal device 1500 may be a portable mobile terminal, such as a smartphone, a tablet computer, a moving picture experts group audio layer III (MP3) player, a moving picture experts group audio layer IV (MP4) player, a notebook computer, or a desktop computer. The terminal device 1500 may also be referred to as another name such as user equipment, a portable terminal, a laptop terminal, or a desktop terminal.

[00182] Generally, the terminal device 1500 includes: a processor 1501 and a memory 1502.

[00183] The processor 1501 may include one or more processing cores, for example, a 4-core processor or an 8-core processor. The processor 1501 may be implemented in at least one hardware form of a digital signal processor (DSP), a field-programmable gate array (FPGA), and a programmable logic array (PLA). The processor 1501 may alternatively include a main processor and a coprocessor. The main processor is a processor configured to process data in an awakened state, which is also referred to as a central processing unit (CPU). The coprocessor is a low-power processor configured to process data in a standby state. In some embodiments, the processor 1501 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 screen. In some embodiments, the processor 1501 may further include an artificial intelligence (AI) processor. The AI processor is configured to process computing operations related to machine learning.

[00184] The memory 1502 may include one or more non-transitory computer-readable storage media. The computer-readable storage medium may be non-transient (or non-transitory). The memory 1502 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 1502 is configured to store at least one instruction, and the at least one instruction is configured for being executed by the processor 1501 to implement the game picture display method provided in the method embodiments of this application.

[00185] In some embodiments, the terminal device 1500 may further include: a peripheral interface 1503 and at least one peripheral. The processor 1501, the memory 1502, and the peripheral interface 1503 may be connected through a bus or a signal cable. Each peripheral may be connected to the peripheral interface 1503 through a bus, a signal cable, or a circuit board. For example, the peripheral includes a display screen 1505.

[00186] The peripheral interface 1503 may be configured to connect the at least one peripheral related to input/output (I/O) to the processor 1501 and the memory 1502. In some embodiments, the processor 1501, the memory 1502, and the peripheral interface 1503 are integrated on the same chip or circuit board. In some other embodiments, any one or two of the processor 1501, the memory 1502, and the peripheral interface 1503 may be implemented on an independent chip or circuit board, which is not limited in this embodiment.

[00187] The display screen 1505 is configured to display a user interface (UI). The UI may include a graph, text, an icon, a video, and any combination thereof. When the display screen 1505 is a touch display screen, the display screen 1505 further has a capability of acquiring a touch signal

on or above a surface of the display screen 1505. The touch signal may be inputted to the processor 1501 as a control signal for processing. In this case, the display screen 1505 may be further configured to provide a virtual button and/or a virtual keyboard that are/is also referred to as a soft button and/or a soft keyboard. In some embodiments, one display screen 1505 may be disposed on a front panel of the terminal device 1500. In some other embodiments, at least two display screens 1505 may be respectively disposed on different surfaces of the terminal device 1500 or folded. In some other embodiments, the display screen 1505 may be a flexible display screen disposed on a curved surface or a folded surface of the terminal device 1500. Even, the display screen 1505 may be further set in a non-rectangular irregular pattern, namely, a special-shaped screen. The display screen 1505 may be manufactured by using a material such as a liquid crystal display (LCD) or an organic light-emitting diode (OLED).

[00188] A person skilled in the art may understand that the structure shown in FIG. 15 constitutes no limitation on the terminal device 1500, and the terminal device may include more or fewer components than those shown in the figure, or some components may be combined, or a different component deployment may be used.

[00189] FIG. 16 is a schematic structural diagram of a server according to an embodiment of the present disclosure. The server 1600 may vary a lot due to different configurations or performance, and may include one or more CPUs 1601 and one or more memories 1602. The one or more memories 1602 store at least one instruction, and the at least one instruction is loaded and executed by the one or more CPUs 1601 to implement the game picture display method provided in the foregoing method embodiments. Certainly, the server 1600 may further have components such as a wired or wireless network interface, a keyboard, an input/output interface for input and output. The server 1600 may further include other components configured to implement device functions. Details are not described herein.

[00190] In an exemplary embodiment, a non-transitory computer-readable storage medium is further provided, the non-transitory computer-readable storage medium stores at least one program code, and the at least one program code is loaded and executed by a processor, to cause a computer to implement any one of the foregoing the game picture display methods.

[00191] In some embodiments, the non-transitory computer-readable storage medium may be a read-only memory (ROM), a random access memory (RAM), a compact disc read-only memory (CD-ROM), a magnetic tape, a floppy disk, an optical data storage device, or the like.

[00192] In an exemplary embodiment, a computer program or a computer program product is further provided, the computer program or the computer program product stores at least one

computer instruction, and the at least one computer instruction is loaded and executed by a processor, to cause a computer to implement any one of the foregoing the game picture display methods.

[00193] Information (including, but not limited to, user device information, user personal information, or the like), data (including, but not limited to, data configured for analysis, stored data, presented data, or the like), and signals as referred to in this application are all authorized by a user or fully authorized by various parties, and collection, use, and processing of related data need to comply with relevant laws, regulations, and standards of relevant regions. For example, the first game picture as referred to in this application is acquired under full authorization.

[00194] "Plurality of" as referred to herein means two or more. "And/or" describes an association relationship that describes 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 "/" generally indicates an "or" relationship between the associated objects.

[00195] The sequence numbers of the foregoing embodiments of this application are merely for description purpose but do not imply the preference among the embodiments.

[00196] The foregoing descriptions are merely exemplary embodiments of this application, but are not intended to limit this application. Any modification, equivalent replacement, or improvement made within the principle of this application shall fall within the protection scope of this application.

CLAIMS

What is claimed is:

1. A game picture display method, the method being performed by a terminal device, and the method comprising:

displaying a first game picture, the first game picture comprising a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight;

processing, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture; and

displaying a second game picture, the second game picture comprising the sight, the sight being in an on state, an internal picture of the sight comprising the reference scene picture, an external picture of the sight being obtained based on the first scene picture, and a size of an object comprised in the external picture of the sight being smaller than a size of an object comprised in the reference scene picture.

2. The method according to claim 1, wherein the processing, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture comprises:

adjusting the first scene picture in response to the trigger operation for the conversion control, to obtain a third scene picture, a size of an object comprised in the third scene picture being larger than a size of an object comprised in the first scene picture; and

processing, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture, the size of the object comprised in the reference scene picture being larger than a size of an object comprised in the fourth scene picture, and the external picture of the sight being a picture other than the fourth scene picture in the third scene picture.

3. The method according to claim 2, wherein the processing, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture comprises:

determining a reference zoom magnification according to the zoom magnification of the sight, the reference zoom magnification being a zoom magnification of the reference scene picture relative to the fourth scene picture;

acquiring first image coordinates of a center point of the sight and second image coordinates of pixels in the fourth scene picture; and

adjusting pixel information of the pixels according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, to obtain the reference scene picture.

4. The method according to claim 3, wherein the adjusting pixel information of the pixels according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, to obtain the reference scene picture comprises:

determining, according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, third image coordinates after the pixels are offset; and

for any pixel in the pixels, adjusting, based on existence of a reference pixel that is in the pixels and whose third image coordinates are the same as those after the any pixel is offset, pixel information of the reference pixel to pixel information of the any pixel, and traversing the pixels, to obtain the reference scene picture.

5. The method according to claim 4, wherein the adjusting, according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the pixels, third image coordinates after the pixels are offset comprises:

determining, for any pixel in the pixels, a target offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel, the target offset vector of the any pixel being configured for indicating an offset between the second image coordinates of the any pixel and image coordinates of the any pixel that are zoomed in according to the reference zoom magnification, and the target offset vector of the any pixel comprising a first offset value of the any pixel in a first direction and a second offset value of the any pixel in a second direction; and

determining, according to the second image coordinate of the any pixel, the first offset value of the any pixel in the first direction, and the second offset value of the any pixel in the second direction, the third image coordinates after the any pixel is offset.

6. The method according to claim 5, wherein the determining a target offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel comprises:

determining a reference offset vector of the any pixel according to the reference zoom magnification, the first image coordinates, and the second image coordinates of the any pixel; and

determining the target offset vector of the any pixel according to the reference offset vector of the any pixel in either of the following manners:

taking the reference offset vector of the any pixel as the target offset vector of the any pixel;

and determining the target offset vector of the any pixel according to the reference offset vector of the any pixel.

7. The method according to claim 6, wherein the determining the target offset vector of the any pixel according to the reference offset vector of the any pixel comprises:

determining an encoded intermediate vector of the any pixel according to the reference offset vector of the any pixel, and determining the target offset vector of the any pixel according to the encoded intermediate vector of the any pixel, the encoded intermediate vector being a vector obtained after normalization of the reference offset vector;

or determining the target offset vector of the any pixel according to a fifth offset value and a sixth offset value comprised in the reference offset vector of the any pixel, the fifth offset value being an offset value of the any pixel in the first direction, and the sixth offset value being an offset value of the any pixel in the second direction.

8. The method according to claim 7, wherein the encoded intermediate vector of the any pixel comprises a third offset value of the any pixel in the first direction and a fourth offset value of the any pixel in the second direction; and

the determining the target offset vector of the any pixel according to the encoded intermediate vector of the any pixel comprises:

encoding the third offset value to obtain a first binary value, and encoding the fourth offset value to obtain a second binary value, the first binary value and the second binary value having a same quantity of bits;

acquiring a third binary value and a fourth binary value according to the first binary value, and acquiring a fifth binary value and a sixth binary value according to the second binary value; and

determining the target offset vector of the any pixel according to the third binary value, the fourth binary value, the fifth binary value, and the sixth binary value.

9. The method according to claim 8, wherein the determining the target offset vector of the any pixel according to the third binary value, the fourth binary value, the fifth binary value, and the sixth binary value comprises:

decoding the third binary value to obtain a first value, decoding the fourth binary value to

obtain a second value, decoding the fifth binary value to obtain a third value, and decoding the sixth binary value to obtain a fourth value; and

determining the target offset vector of the any pixel according to the first value, the second value, the third value, and the fourth value.

10. The method according to claim 2, wherein the processing, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture comprises:

determining a reference zoom magnification according to the zoom magnification of the sight, the reference zoom magnification being a zoom magnification of the reference scene picture relative to the fourth scene picture;

stretching the fourth scene picture according to the reference zoom magnification, to obtain a first target scene picture, a size of the first target scene picture being reference zoom magnification times a size of the fourth scene picture; and

clipping the first target scene picture to obtain the reference scene picture, a center point of the reference scene picture being a center point of the first target scene picture, and a size of the reference scene picture being the same as a size of the internal picture of the sight.

11. The method according to claim 10, wherein the clipping the first target scene picture to obtain the reference scene picture comprises:

determining a target region by taking the center point of the first target scene picture as a center and a target length as a radius, the target length being a radius of the sight; and

taking a scene picture covered by the target region in the first target scene picture as the reference scene picture.

12. The method according to any one of claims 2 to 11, wherein before the processing, according to the zoom magnification of the sight, a fourth scene picture that is in the third scene picture and corresponds to the sight, to obtain the reference scene picture, the method further comprises:

determining a reference region by taking a center point of the third scene picture as a center and a target length as a radius, the target length being a radius of the sight; and

taking a scene picture covered by the reference region in the third scene picture as the fourth scene picture.

13. The method according to any one of claims 2 to 11, wherein the adjusting the first scene

picture to obtain a third scene picture comprises:

- acquiring a first field of view corresponding to the first scene picture and a zoom magnification of the sight;

- determining a second field of view according to the first field of view and the zoom magnification of the sight; and

- adjusting the first scene picture according to the second field of view, to obtain the third scene picture.

14. The method according to claim 13, wherein the determining a second field of view according to the first field of view and the zoom magnification of the sight comprises:

- determining a target zoom magnification corresponding to the zoom magnification of the sight, the target zoom magnification being a zoom magnification of the third scene picture relative to the first scene picture;

- determining a reference value according to the first field of view;

- determining a target value according to the reference value and the target zoom magnification;
- and

- determining the second field of view according to the target value.

15. The method according to any one of claims 2 to 11, wherein the adjusting the first scene picture to obtain a third scene picture comprises:

- determining a target zoom magnification corresponding to the zoom magnification of the sight, the target zoom magnification being a zoom magnification of the third scene picture relative to the first scene picture;

- stretching the first scene picture according to the target zoom magnification, to obtain a second target scene picture, a size of the second target scene picture being target zoom magnification times a size of the first scene picture; and

- clipping the second target scene picture to obtain the third scene picture, a center point of the third scene picture being a center point of the second target scene picture.

16. The method according to claim 1, the processing, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture comprises:

- adjusting, in response to the trigger operation for the conversion control, pixel information of

pixels in the second scene picture according to the zoom magnification of the sight, first image coordinates of a center point of the sight, and fourth image coordinates of the pixels in the second scene picture, to obtain the reference scene picture;

or stretching, in response to the trigger operation for the conversion control, the second scene picture according to the zoom magnification of the sight, to obtain a third target scene picture, and clipping the third target scene picture to obtain the reference scene picture;

wherein the second scene picture is a scene picture that is in the first scene picture and corresponds to the sight, and the external picture of the sight is a picture other than the second scene picture in the first scene picture.

17. A game picture display method, the method being performed by a terminal device, and the method comprising:

displaying a first game picture, the first game picture comprising a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight; and

displaying a second game picture in response to a trigger operation for the conversion control, the second game picture comprising the sight, the sight being in an on state, an internal picture of the sight comprising a reference scene picture, a magnification of an object comprised in an external picture of the sight being less than a magnification of an object comprised in the reference scene picture, and the magnification of the object comprised in the reference scene picture being greater than a magnification of an object comprised in the first scene picture.

18. The method according to claim 17, the magnification of the object comprised in the external picture of the sight in the second game picture is greater than the magnification of the object comprised in the first scene picture, or the magnification of the object comprised in the external picture of the sight in the second game picture is equal to the magnification of the object comprised in the first scene picture.

19. The method according to claim 17 or 18, wherein the second game picture further comprises a direction control, the direction control being configured to adjust a displayed game picture; and

after the displaying a second game picture, the method further comprises:

displaying a third game picture in response to a trigger operation for the direction control, the third game picture comprising the sight, the sight being in an on state, the internal picture of the sight comprising a fifth scene picture, the magnification of the object comprised in the external

picture of the sight in the third game picture being less than a magnification of an object comprised in the fifth scene picture, the magnification of the object comprised in the fifth scene picture being equal to the magnification of the object comprised in the reference scene picture, and the fifth scene picture being a scene picture in a direction indicated by the direction control.

20. The method according to claim 17 or 18, wherein the second game picture further comprises the conversion control in a first form, the first form being configured for indicating that the sight comprised in the second game picture is in an on state; and

after the displaying a second game picture, the method further comprises:

displaying the first game picture in response to the trigger operation for the conversion control, the first game picture comprising the conversion control in a second form, the second form being configured for indicating that the sight comprised in the first game picture is in an off state.

21. A game picture display apparatus, comprising:

a display module configured to display a first game picture, the first game picture comprising a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight; and

a processing module configured to process, in response to a trigger operation for the conversion control, the first scene picture according to a zoom magnification of the sight, to obtain a reference scene picture, a size of an object comprised in the reference scene picture being larger than a size of an object comprised in the first scene picture;

the display module being further configured to display a second game picture, the second game picture comprising the sight, the sight being in an on state, an internal picture of the sight comprising the reference scene picture, an external picture of the sight being obtained based on the first scene picture, and a size of an object comprised in the external picture of the sight being smaller than a size of an object comprised in the reference scene picture.

22. A game picture display apparatus, comprising:

a display module configured to display a first game picture, the first game picture comprising a first scene picture, a sight, and a conversion control, the sight being in an off state, and the conversion control being configured to perform state conversion on the sight;

the display module being further configured to display a second game picture in response to a trigger operation for the conversion control, the second game picture comprising the sight, the sight being in an on state, an internal picture of the sight comprising a reference scene picture, a

magnification of an object comprised in an external picture of the sight being less than a magnification of an object comprised in the reference scene picture, and the magnification of the object comprised in the reference scene picture being greater than a magnification of an object comprised in the first scene picture.

23. An electronic device, the electronic device comprising a processor and a memory, the memory storing at least one program code, and the at least one program code being loaded and executed by the processor, to cause the electronic device to implement the game picture display method according to any one of claims 1 to 20.

24. A non-transitory computer-readable storage medium, the non-transitory computer-readable storage medium storing at least one program code, and the at least one program code being loaded and executed by a processor, to cause a computer to implement the game picture display method according to any one of claims 1 to 20.

25. A computer program product, the computer program product storing at least one computer instruction, and the at least one computer instruction being loaded and executed by a processor, to cause a computer to implement the game picture display method according to any one of claims 1 to 20.