

SOCIAL METHOD AND APPARATUS BASED ON THREE-DIMENSIONAL VIRTUAL ENVIRONMENT, DEVICE, AND MEDIUM

[0001] This application claims priority to Chinese Patent Application No. 202211440883.9, entitled "SOCIAL METHOD AND APPARATUS BASED ON THREE-DIMENSIONAL VIRTUAL ENVIRONMENT, DEVICE, AND MEDIUM" filed with the China National Intellectual Property Administration on November 17, 2022, which is incorporated herein by reference in its entirety.

FIELD OF THE TECHNOLOGY

[0002] Embodiments of this application relate to the field of human-computer interaction, and in particular, to a social method and apparatus based on a three-dimensional virtual environment, a device, and a medium.

BACKGROUND OF THE DISCLOSURE

[0003] In a battle arena shooting game, a plurality of game sharing modes are provided, so that a player can share game insights to another player.

[0004] In a related art, the player may take a screenshot in a game battle to capture a game picture. Through a social program, a game forum, or the like, the player may display the screenshot and describe relevant insights, to share the game insights with another player.

[0005] In a method in the related art, the game insights can only be shared to another player outside of the game battle.

SUMMARY

[0006] This application provides a social method and apparatus based on a three-dimensional virtual environment, a device, and a medium. A check-in marker may be placed in the three-dimensional virtual environment to share social information with another virtual character in the three-dimensional virtual environment. The technical solutions are as follows:

[0007] According to an aspect of this application, a social method based on a three-dimensional virtual environment is provided. The method is performed by a computer device, and the method includes:

[0008] displaying a first virtual character located at a first position in a three-dimensional virtual environment;

[0009] receiving a check-in operation, the check-in operation including an operation of editing first social information for a first event; and

[0010] displaying a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

[0011] According to another aspect of this application, a social apparatus based on a three-dimensional virtual environment is provided. The apparatus includes:

[0012] a display module, configured to display a first virtual character located at a first position in a three-dimensional virtual environment; and

[0013] an interaction module, configured to receive a check-in operation, the check-in operation including an operation of editing first social information for a first event; and

[0014] the display module being configured to display a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, and the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

[0015] According to an aspect of this application, a computer device is provided. The computer device includes: a processor and a memory, the memory having a computer program stored therein, and the computer program being loaded and executed by the processor to implement the social method based on the three-dimensional virtual environment as described above.

[0016] According to another aspect of this application, a computer-readable storage medium is provided, the storage medium having a computer program stored therein, and the computer program being loaded and executed by a processor to implement the social method based on the three-dimensional virtual environment as described above.

[0017] According to another aspect of this application, a computer program product is provided, the computer program product including computer instructions, and the computer

instructions being stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium, and the processor executes the computer instructions, to enable the computer device to perform the social method based on the three-dimensional virtual environment according to the foregoing aspects.

[0018] When a check-in operation is received, a check-in marker is placed in a three-dimensional virtual environment based on a current position of a main virtual character, the check-in marker recording social information posted by the main virtual character for a first event. When another virtual character in the three-dimensional virtual environment approaches the check-in marker, the check-in marker may display, to the another virtual character, the social information posted by the main virtual character, so that the social information is shared with the another virtual character in a battle. In this way, when the main control virtual character triggers an event at a position in the three-dimensional virtual environment, or when the main control virtual character discovers a colored egg at a position in the three-dimensional virtual environment, the main control virtual character may set a check-in marker at the position, and share an achievement or a discovery to another virtual character arriving at the position. The another virtual character may view social information on the check-in marker, and at the same time, the another virtual character may also view a surrounding environment of the check-in marker and personally experience the event described in the social information.

[0019] In addition, each virtual character arriving at the position can view the social information, and there is no need for the main virtual character to send the social information to each virtual character one by one. This helps simplify a social information sharing procedure and reduces processing resource consumption in a social information sharing process.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. 1 is a block diagram of a structure of a computer system according to an exemplary embodiment.

[0021] FIG. 2 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0022] FIG. 3 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0023] FIG. 4 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0024] FIG. 5 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0025] FIG. 6 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0026] FIG. 7 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0027] FIG. 8 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0028] FIG. 9 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0029] FIG. 10 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0030] FIG. 11 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0031] FIG. 12 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0032] FIG. 13 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0033] FIG. 14 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0034] FIG. 15 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0035] FIG. 16 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0036] FIG. 17 is a schematic diagram of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0037] FIG. 18 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment.

[0038] FIG. 19 is a block diagram of a structure of a social apparatus based on a three-dimensional virtual environment according to an exemplary embodiment.

[0039] FIG. 20 is a block diagram of a structure of a computer device according to an exemplary embodiment.

DESCRIPTION OF EMBODIMENTS

[0040] Exemplary embodiments are described in detail herein, and examples of the exemplary embodiments are shown in the accompanying drawings. When the following description involves the accompanying drawings, unless otherwise indicated, the same numerals in different accompanying drawings represent the same or similar elements. The implementations described in the following exemplary embodiments do not represent all implementations consistent with this application. On the contrary, the implementations are merely examples of apparatuses and methods that are described in detail in the appended claims and that are consistent with some aspects of this application.

[0041] "Several" mentioned in the specification means one or more, and "plurality of" means two or more. "And/or" describes an association relationship for describing 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.

[0042] First, terms involved in embodiments of this application are briefly introduced.

[0043] Three-dimensional virtual environment (or referred to as "virtual environment"): The three-dimensional virtual environment is a virtual environment displayed (or provided) when a client is run on a terminal. The virtual environment may be a simulated environment of the real world, or may be a semi-simulated and semi-fictional environment, or may be an entirely fictional environment.

[0044] In some embodiments, the virtual environment is a battle environment of a virtual character. For example, in a survival-type game, at least one virtual character performs a single battle in the virtual environment. The virtual character achieves an objective of surviving in the virtual environment by avoiding an attack initiated by an enemy unit and a danger (for example, a poison gas zone and a swamp) present in the virtual environment. When a health point of the virtual character in the virtual environment is zero, a life of the virtual character in the virtual environment ends, and the last surviving virtual character is a winner.

[0045] FIG. 1 is a block diagram of a structure of a computer system according to an exemplary embodiment of this application. The computer system includes: a first terminal 110, a second terminal 120, and a server 140.

[0046] A client supporting a virtual environment is installed and run on the first terminal 110. A control account of a main virtual character logs in to the client, and the client may be any one of a three-dimensional map program, a first-person shooting (FPS) game, a third-person shooting (TPS) game, a multiplayer online battle arena (MOBA) game, a role-playing game (RPG), a virtual reality (VR) application program, or an augmented reality (AR) program. The first terminal 110 is a terminal used by a first user. The first user uses the first terminal 110 to control a first virtual character located in the virtual environment to perform an activity. The activity includes but is not limited to at least one of adjusting a body posture, walking, running, jumping, riding, driving, aiming, picking, or using a throwing item. For example, the first virtual character is a virtual person, such as a simulated person object or a cartoon person object. For example, the first user controls the first virtual character to perform the activity through a UI control on a virtual environment picture.

[0047] A client supporting a virtual environment is installed and run on the second terminal 120. A control account of a main virtual character logs in to the client, and the client may be any one of a three-dimensional map program, a first-person shooting game, a third-person shooting game, a MOBA game, a role-playing game, a virtual reality application program, and an augmented reality program. The second terminal 120 is a terminal used by a second user. The second user uses the second terminal 120 to control a second virtual character located in the three-dimensional virtual environment to perform an activity. The activity includes but is not limited to at least one of adjusting a body posture, walking, running, jumping, riding, driving, aiming, picking, or using a throwing item. For example, the second virtual character is a virtual person, such as a simulated person object or a cartoon person object. For example, the second user controls the second virtual character to perform the activity through a UI control on a virtual environment picture.

[0048] The first terminal 110 and the second terminal 120 are connected to the server 140 through a wireless network or a wired network.

[0049] The server 140 includes at least one of one server, a plurality of servers, a cloud computing platform, or a virtualization center. For example, the server 140 includes a processor and a memory, and the memory includes a receiving module, a control module, and a sending module. The receiving module is configured to receive a request sent by the client, for example, a request for controlling movement of the virtual character. The control module is configured to control rendering of the virtual environment picture. The sending module is configured to send a response to the client, for example, send, to the client, information indicating that a position of the virtual character has changed. The server 140 is configured to provide a backend service for the client supporting the virtual environment. In some embodiments, the server 140 is responsible for primary

computing work, and the first terminal 110 is responsible for secondary computing work. Alternatively, the server 140 is responsible for secondary computing work, and the first terminal 110 is responsible for primary computing work. Alternatively, the server 140 and the first terminal 110 are responsible for computing work in a coordinated manner.

[0050] An example in which a game client that supports the virtual environment and that is run on the first terminal and the second terminal is a shooting game client is used for description. The second user may control the second virtual character through the second terminal to create a second check-in marker in the three-dimensional virtual environment. For example, the second user triggers a check-in control 301 to open a "chicken dinner check-in" interface, edits second social information, and performs "check-in confirmation" on the "chicken dinner check-in" interface, so that the second check-in marker is displayed in the three-dimensional virtual environment.

[0051] The first user may control the first virtual character through the first terminal to approach the second check-in marker in the three-dimensional virtual environment, and tap/click a reply control 402 of the second check-in marker to display a "reply check-in" interface. The second social information edited by the second user is displayed on the "reply check-in" interface. The first user may edit and send reply information by triggering a text box on the "reply check-in" interface.

[0052] In some embodiments, the client may be run on different operating system platforms (Android or IOS). In some embodiments, a device type of the terminal includes: at least one of a smartphone, a smart watch, a vehicle-mounted terminal, a wearable device, a smart television, a tablet computer, an e-book reader, an MP3 player, an MP4 player, a laptop portable computer, or a desktop computer. An example in which the terminal includes the smartphone is used for description in the following embodiments.

[0053] A person skilled in the art may learn that there may be more or fewer terminals. For example, there may be only one terminal, or there may be dozens or hundreds of terminals, or more terminals. The quantity and the device type of the terminals are not limited in embodiments of this application.

[0054] FIG. 2 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. An example in which the method is applied to the terminal (or the client that supports the three-dimensional virtual environment and that is installed on the terminal) shown in FIG. 1 is used for description. The method includes the following operations.

[0055] Operation 210: Display a first virtual character located at a first position in a three-dimensional virtual environment.

[0056] The first virtual character is a virtual character controlled by the terminal (the client on the terminal) that performs the method, namely, a main virtual character.

[0057] Virtual character: The virtual character refers to a movable object controlled by the client in a virtual environment. The movable object may be a virtual person, a virtual animal, a cartoon person, or the like, for example, a person or an animal displayed in the three-dimensional virtual environment. In some embodiments, the virtual character is a three-dimensional model created based on an animated skeletal technology. Each virtual character has a shape and a volume in the three-dimensional virtual environment, and occupies a part of space in the three-dimensional virtual environment. In some embodiments, in this embodiment of this application, a virtual character (for example, a second virtual character) other than the first virtual character may be a virtual character controlled by another client, or may be a virtual character controlled by a server/computer program/artificial intelligence, for example, a human-computer virtual character.

[0058] In some embodiments, the three-dimensional virtual environment is a three-dimensional virtual environment of a game battle. For example, the three-dimensional virtual environment is a three-dimensional virtual environment of a first map of the game battle, and the first virtual character engages in the game battle in the first map. The three-dimensional virtual environment is a three-dimensional virtual environment of a game battle supporting the three-dimensional virtual environment. For example, the three-dimensional virtual environment is a three-dimensional virtual environment of a game battle of a battle arena shooting game/a first-person shooting game/a third-person shooting game/a MOBA game.

[0059] The three-dimensional virtual environment may alternatively be a three-dimensional virtual environment outside of the game battle. For example, the three-dimensional virtual environment is a three-dimensional virtual environment of a main scene of a game. For example, the three-dimensional virtual environment is a three-dimensional virtual environment of a role-playing game (RPG).

[0060] The first position is a position point in the three-dimensional virtual environment. In some embodiments, the first position is located on a ground in the three-dimensional virtual environment. The ground refers to any model surface on which the first virtual character can stand, including a building surface, a terrain surface, a virtual vehicle surface, and the like. In some embodiments, the first position includes three-dimensional coordinates, or the first position includes two-dimensional coordinates on a horizontal plane in the three-dimensional virtual environment.

[0061] The first position is a position at which the first virtual character is currently located. Alternatively, the first position is a position at which the first virtual character triggers a first event. Alternatively, the first position is a position at which the first virtual character is located when a check-in operation is triggered.

[0062] In some embodiments, a battle picture in which the first virtual character engages in the game battle in the first map is displayed, and the battle picture includes the first virtual character located at the first position in the three-dimensional virtual environment of the first map. In some embodiments, the battle picture is a picture of the three-dimensional virtual environment obtained with the first virtual character as an observation target. That is, the first virtual character is located at a center position of the battle picture.

[0063] Operation 220: Receive the check-in operation, the check-in operation including an operation of editing first social information for the first event.

[0064] The check-in operation may be an operation triggered by a user. For example, the check-in operation may be: at least one of an operation of triggering a check-in control displayed on an interface, an operation of controlling the first virtual character to perform a check-in action, an operation of triggering a keyboard key corresponding to the check-in operation, a voice control instruction configured for triggering the check-in action, or an action control instruction configured for triggering the check-in action.

[0065] The first event is a topic event for the first virtual character to check in. In other words, when social sharing needs to be performed for the first event, the check-in operation is triggered.

[0066] The first event may be an event triggered by the first virtual character, and the check-in control is displayed on the interface after the first event is triggered, so that the first virtual character may check in for the first event. For example, the first event may be winning a game battle by the first virtual character, defeating another virtual character by the first virtual character, triggering a hidden storyline by the first virtual character, achieving an achievement by the first virtual character, or obtaining a virtual item first by the first virtual character.

[0067] Alternatively, the first event may be an event selected when the first virtual character checks in. For example, an event selection area is provided on a check-in editing interface, and the user may select the first event in the event selection area as a topic event for checking in. For example, the first event may be a social topic event such as daily sharing, battle experience sharing, skin display, or friending.

[0068] In some embodiments, a check-in marker provided in this embodiment of this application may also be configured for triggering a special interaction between virtual characters, and the first event may alternatively be a special interaction event. For example, the user may select the special interaction event in the event selection area. For example, the special interaction event includes: prize quizzes, snatching red packets, selling a virtual item of the first virtual character, exchanging a target item with a virtual item of the first virtual character, summoning the first virtual character, and the like.

[0069] In some embodiments, different first events may correspond to social information of different types.

[0070] The social information includes at least one type of information posted by the first virtual character through checking in. The social information includes: at least one of the first event, a text, a picture, a video, audio, a link, a check-in marker style, a three-dimensional model display, a question, an answer, a reward, related information of a red packet, a sold virtual item, a virtual item for exchange, or a virtual item intended to be obtained.

[0071] The text may be a text input by the user or a text automatically generated by a system. The picture may be a picture automatically taken by the system for the first event, a picture taken by the user in a game, or a picture uploaded from a local album. The video may be a video automatically recorded by the system for the first event, a video recorded by the user in the game, or a video uploaded from the local album. The audio may be audio recorded by the system for the first event, audio recorded by the user in the game, or audio uploaded locally. The link may be a jump link automatically generated by the system based on the first event or a jump link input by the user.

[0072] The three-dimensional model display may be configured for displaying a virtual model, such as the first virtual character, a user-selected skin, a virtual item, or a virtual vehicle. The three-dimensional model display may be further configured for reproducing a scene model (the first event is continuously and cyclically played in the scene model) in which the first event occurs. By observing the three-dimensional model display, the user can view, from any angle, a complete process in which the first virtual character triggers the first event in the scene model. For example, a scene in which the first virtual character kills another virtual character is reproduced. The three-dimensional model display may enable the user to observe the virtual model in the three-dimensional model display from a plurality of angles. For example, the user may rotate the virtual model in the three-dimensional model display and view the model from any angle. Alternatively, when the three-dimensional model display is configured for reproducing the first event, the user may select different perspectives to view, for example, select a perspective of the first virtual

character, or a perspective of another virtual character, or a spectator perspective, and view, from different perspectives, the first event cyclically displayed in the same scene model.

[0073] In an embodiment, when the first event is a battle winning event, the three-dimensional model display is configured for displaying a process in which the last virtual character is defeated.

[0074] Operation 230: Display a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

[0075] After receiving the check-in operation, a terminal device displays the first check-in marker at the second position in the three-dimensional virtual environment based on the first social information in the check-in operation.

[0076] In a possible implementation, the second position is determined based on the first position. The first position may be the same as the second position. Alternatively, the second position is located in a perspective direction of the first virtual character and is at a fixed distance from the first position. Alternatively, the second position is a position to which an aiming sight of the first virtual character points. Alternatively, the second position is a position associated with the first position.

[0077] In some embodiments, the first check-in marker is fixed at the second position, and cannot be moved and cannot be picked up.

[0078] In some embodiments, the second position of the first check-in marker is permanently bound to the three-dimensional virtual environment for storage. The server permanently stores the first check-in marker located at the second position in the three-dimensional virtual environment. Stored data is not cleared as a current battle ends. In addition, in a subsequent battle performed in the three-dimensional virtual environment, the data is also loaded, and the first check-in marker is displayed at the second position in the three-dimensional virtual environment. That is, after the first virtual character creates the first check-in marker, the first check-in marker always exists in the three-dimensional virtual environment. Always existing includes: After the current battle ends, in a second battle performed in the three-dimensional virtual environment, the first check-in marker may also be seen at the second position, and the second battle may be a battle in which the first virtual character participates or a battle in which the first virtual character does not

participate. Correspondingly, the first check-in marker becomes a fixed scene model in the three-dimensional virtual environment.

[0079] Certainly, considering that an excessive quantity of check-in markers in the three-dimensional virtual environment affects movement of a virtual character in the three-dimensional virtual environment, data related to the check-in marker in the three-dimensional virtual environment may alternatively be periodically cleared. Alternatively, a total quantity of check-in markers in the three-dimensional virtual environment is limited, and data of an earliest created check-in marker is cleared in chronological order. Alternatively, check-in markers are classified, and some classified check-in markers are displayed according to the main control virtual character. Alternatively, when a check-in marker is configured for performing the special interaction event, data of the check-in marker is deleted after the special interaction event is completed. Alternatively, when a duration for which the check-in marker exists reaches a first time threshold and interaction hotness of a check-in marker is less than a hotness threshold, data of the check-in marker is deleted. The interaction hotness may be determined based on a reply quantity/like quantity of the check-in marker. Therefore, a quantity of check-in markers in the three-dimensional virtual environment is limited.

[0080] In some embodiments, the first check-in marker may alternatively exist at the second position only in the current battle, and is cleared after the battle ends. The first check-in marker does not appear at the second position in other battles.

[0081] In some embodiments, the first check-in marker is a three-dimensional virtual model displayed in the three-dimensional virtual environment. The first check-in marker may be displayed as a light beam, a statue, a treasure chest, a building, a plant, or the like.

[0082] In an optional embodiment, the first check-in marker may be a transparent model (a transparent model through which a virtual character can pass, or a transparent model through which a virtual character cannot pass). To be specific, the user cannot see the first check-in marker in the three-dimensional virtual environment, but when the virtual character approaches the first check-in marker, a viewing control of the first check-in marker may be displayed, and by triggering the viewing control, the user may view the first social information on the first check-in marker. In this way, another virtual character may search for the first check-in marker in the three-dimensional virtual environment in a treasure hunt manner.

[0083] A display style of the first check-in marker may be default. In other words, different events all correspond to a check-in marker with a same style. Alternatively, a display style of the first check-in marker depends on the first event, and different events correspond to check-in

markers with different styles. Alternatively, a display style of the first check-in marker is selected by the user.

[0084] The first check-in marker is configured for displaying the first social information to another virtual character nearby. For example, the virtual character arriving at the second position includes: a virtual character whose distance from the second position is less than a threshold.

[0085] When the another virtual character approaches the first check-in marker, the first social information corresponding to the first check-in marker is automatically displayed. Alternatively, when the another virtual character approaches the first check-in marker, the viewing control is displayed on an interface. In response to receiving a triggering operation on the viewing control, a display interface is displayed, and the first social information is displayed on the display interface. Alternatively, when the first social information includes the three-dimensional model display, a picture of the three-dimensional model display is displayed when the another virtual character approaches the first check-in marker. Alternatively, the another virtual character is controlled to enter, from the three-dimensional virtual environment, the scene model in the three-dimensional model display, and the first event played in the scene model is viewed from a perspective of the another virtual character.

[0086] In some embodiments, a virtual character other than the first virtual character is allowed to view the first social information on the first check-in marker, and the first virtual character is not allowed to view the first social information. In other words, the first virtual character cannot view the first social information when approaching the first check-in marker. In other words, a publisher cannot view social information posted by the publisher, but can only view social information posted by others.

[0087] In some embodiments, a virtual character belonging to a same camp as the first virtual character is allowed to view the first social information on the first check-in marker, and a virtual character belonging to a camp different from a camp to which the first virtual character belongs cannot view the first social information.

[0088] In some embodiments, the another virtual character may interact with the first check-in marker. The interaction includes: viewing, replying, liking, friend adding, obtaining rewards, exchanging items, purchasing items, and the like. In some embodiments, an interaction manner may be determined based on an event type of the first event, or may be manually set by the user. For example, when the first event is the battle winning event, a default interaction manner may include viewing, replying, liking, and friend adding. The user may alternatively customize the interaction

manner as obtaining the rewards. To be specific, the second virtual character arriving at the first check-in marker may obtain a specific reward.

[0089] Based on the above, according to the method provided in this embodiment of this application, when a check-in operation is received, a check-in marker is placed in a three-dimensional virtual environment based on a current position of a main virtual character. The check-in marker records social information posted by the main virtual character for a first event. When another virtual character in the three-dimensional virtual environment approaches the check-in marker, the check-in marker may display, to the another virtual character, the social information posted by the main virtual character, so that the social information is shared with the another virtual character in a game battle. In this way, when the main control virtual character triggers an event at a position in the three-dimensional virtual environment, or when the main control virtual character discovers a colored egg at a position in the three-dimensional virtual environment, the main control virtual character may set a check-in marker at the position, and share an achievement or a discovery to another virtual character arriving at the position. The another virtual character may view social information on the check-in marker, and at the same time, the another virtual character may also view a surrounding environment of the check-in marker and personally experience the event described in the social information.

[0090] FIG. 3 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. Based on the embodiment shown in FIG. 2, operation 220 may include operation 221 and operation 225.

[0091] Operation 210: Display a first virtual character located at a first position in a three-dimensional virtual environment.

[0092] For example, as shown in FIG. 4, a user interface is displayed. The user interface includes a battle picture and a check-in control 301. The battle picture includes a first virtual character 302 located at the first position in the three-dimensional virtual environment.

[0093] For example, when the first virtual character triggers a first event, a first to-be-checked-in marker may be displayed at a second position in the three-dimensional virtual environment. In response to the first virtual character approaching the first to-be-checked-in marker, a terminal displays a check-in control. In response to triggering the check-in control, operation 221 is performed to display a check-in editing interface. In response to completing checking in, the terminal replaces the first to-be-checked-in marker with a first check-in marker and displays the first check-in marker. Display states of the first to-be-checked-in marker and the first check-in marker are different.

[0094] Operation 221: Display the check-in editing interface, the check-in editing interface including at least one of a text editing area, a picture editing area, a video editing area, a check-in marker style selection area, or an event selection area.

[0095] For example, in response to receiving an operation of triggering the check-in control, the terminal displays the check-in editing interface. Alternatively, in response to the first virtual character performing a check-in action, the terminal displays the check-in editing interface. Alternatively, in response to an operation of aiming at a second position to fire a check-in item, the terminal displays the check-in editing interface.

[0096] The check-in editing interface is configured for editing social information, and first social information includes social information displayed on the check-in editing interface when checking in is confirmed.

[0097] The check-in editing interface includes at least one of the text editing area, the picture editing area, the video editing area, the check-in marker style selection area, or the event selection area.

[0098] The text editing area is configured for editing a text, and the picture editing area is configured for taking a screenshot, uploading a picture, and editing a picture. The video editing area is configured for recording a video, uploading a video, and editing a video. The check-in marker style selection area is configured for selecting a check-in marker style. The event selection area is configured for selecting an event or editing an event.

[0099] In some embodiments, different events correspond to different check-in editing interfaces. Correspondingly, the terminal displays a corresponding check-in editing interface based on the first event.

[00100] For example, when the first event is that the first virtual character wins a battle, the check-in editing interface may include at least one of a text editing area, a picture editing area, a video editing area, or an audio editing area.

[00101] When the first event is skin display, the check-in editing interface may include at least one of a text editing area or a skin selection area.

[00102] When the first event is a prize quiz, the check-in editing interface may include at least one of a question editing area, an answer editing area, a reward selection area, a respondent constraint editing area, a text editing area, a picture editing area, a video editing area, or an audio editing area.

[00103] When the first event is sending a red packet, the check-in editing interface may include at least one of a red packet quantity editing area, a red packet amount editing area, a red packet sending rule selection area, a red packet collector limit condition editing area, a text editing area, a picture editing area, a video editing area, or an audio editing area.

[00104] When the first event is selling a virtual item, the check-in editing interface may include at least one of a virtual item selection area, a selling amount editing area, a text editing area, a picture editing area, a video editing area, an audio editing area, a starting price editing area, or an auction start time and end time editing area.

[00105] When the first event is exchanging virtual items, the check-in editing interface may include at least one of a virtual item selection area for exchange, a desired virtual item selection area, a text editing area, a picture editing area, a video editing area, or an audio editing area.

[00106] When the first event is summoning the first virtual character, the check-in editing interface may include at least one of a summon condition editing area, a first virtual character introduction editing area, a text editing area, a picture editing area, a video editing area, or an audio editing area.

[00107] For example, as shown in (1) in FIG. 5, in response to receiving an operation of triggering the check-in control 301, a check-in editing interface shown in (2) in FIG. 5 is displayed. The check-in editing interface includes a text editing area 303, a picture editing area 304, and a check-in confirmation control 305.

[00108] In some embodiments, when the check-in editing interface includes the picture editing area, at least one picture automatically obtained for the first event is displayed by default in the picture editing area.

[00109] In a possible implementation, when the first event is triggered, a terminal device/server can automatically obtain pictures related to the first event, and when a user opens the check-in editing interface, the pictures are automatically displayed in the picture editing area, for the user to select or store.

[00110] In some embodiments, in response to an operation of viewing one of the at least one picture, the terminal enlarges and displays the picture, and displays a save-to-album control and a cancel control. In response to triggering the save-to-album control, the terminal saves the picture to a local album. In response to triggering the cancel control, the terminal returns to the check-in editing interface.

[00111] When the first event includes that the first virtual character wins a first battle, when a third virtual character is defeated causing the first virtual character to win the first battle, the at least one picture includes a picture, obtained from a perspective of the third virtual character, that the third virtual character is defeated; and when a fourth virtual character defeats the third virtual character causing the first virtual character to win the first battle, the at least one picture includes a picture, obtained from the perspective of the third virtual character, that the third virtual character is defeated, and a picture, obtained from a perspective of the fourth virtual character, that the fourth virtual character defeats the third virtual character. The first virtual character and the fourth virtual character are a same virtual character, or the first virtual character and the fourth virtual character are virtual characters of a same camp.

[00112] That is, when a battle ends, the terminal device/server automatically obtains pictures from perspectives of both sides in a final defeat. For example, if the first virtual character defeats the third virtual character, a defeat picture from a perspective of the first virtual character and a kill picture from the perspective of the third virtual character are obtained respectively, and the two pictures are displayed in the picture editing area of the check-in editing interface. Alternatively, if the fourth virtual character defeats the third virtual character, and the first virtual character is a teammate of the fourth virtual character, a team to which the first virtual character belongs wins the battle, and the terminal device/server automatically obtains a defeat picture from the perspective of the fourth virtual character and a defeat picture from the perspective of the third virtual character, and displays the two pictures in the picture editing area of the check-in editing interface. Alternatively, if the third virtual character is automatically eliminated for another external reason, the terminal device/server automatically obtains an elimination picture from the perspective of the third virtual character, and displays the elimination picture in the picture editing area of the check-in editing interface.

[00113] For example, the user may delete a picture displayed by default in the picture editing area. The user may also upload a picture selected by the user in the picture editing area.

[00114] Operation 225: Receive an editing operation on the first social information on the check-in editing interface, the first social information including at least one of a text, a picture, a video, a check-in marker style, or the first event.

[00115] For example, as shown in FIG. 6, an operation of editing a text "I'm so happy to have won the chicken dinner, hahahahaha, check out the picture below, my position was just perfect" in the text editing area 303 of the check-in editing interface is received. Two defeat pictures automatically obtained by a system are further displayed in the picture editing area 304 of the

check-in editing interface. In response to tapping/clicking a first defeat picture 306, an interface shown in FIG. 7 is displayed. The first defeat picture 306 is enlarged and displayed, and a save-to-album control 307 and a cancel control 308 are displayed. In response to triggering the save-to-album control 307, the terminal saves the first defeat picture 306 to a local album of the terminal device. In response to triggering the cancel control 308, the terminal cancels enlarging and displaying of the first defeat picture 306, and returns to display the check-in editing interface shown in FIG. 6.

[00116] A check-in operation includes an operation of editing the first social information received on the check-in editing interface, and a check-in confirmation operation. After editing social information, the user performs the check-in confirmation operation, so that the social information is posted and a check-in marker is placed.

[00117] For example, a text editing operation triggered in the text editing area of the check-in editing interface is received; picture selection, editing, and deletion operations triggered in the picture editing area are received; video selection, editing, and deletion operations triggered in the video editing area are received; audio recording, editing, deletion, and selection operations triggered in the audio editing area are received; an operation of selecting the check-in marker style triggered in the check-in marker style selection area is received; and an event selection operation triggered in the event selection area is received.

[00118] When the first event is that the first virtual character wins the battle, at least one of a text editing operation, a picture editing operation, a video editing operation, or an audio editing operation on the check-in editing interface is received, and the first social information is generated based on the foregoing operations.

[00119] When the first event is a prize quiz, an operation of inputting a first question in the question editing area, an operation of inputting a first answer in the answer editing area, and an operation of selecting a reward in the reward selection area are received. The first social information includes the first question, the first answer, and the reward.

[00120] When the first event is sending a red packet, an operation of editing a quantity of red packets in the red packet quantity editing area, an operation of editing a red packet amount in the red packet amount editing area, an operation of selecting a red packet sending rule in the red packet sending rule selection area, an operation of editing a red packet collector limit condition in the red packet collector limit condition editing area, and the like are received. The first social information may include at least one piece of information of the quantity of red packets, the red packet amount, the red packet sending rule, or the red packet collector limit condition.

[00121] When the first event is selling a virtual item, an operation of selecting a first virtual item in the virtual item selection area and an operation of editing a first selling amount in the selling amount editing area are received. The first social information may include at least one of the first virtual item or the first selling amount.

[00122] When the first event is exchanging virtual items, an operation of selecting a first virtual item as a virtual item for exchange and an operation of selecting a second virtual item as a desired virtual item are received. The first social information may include item information of the first virtual item and the second virtual item.

[00123] When the first event is summoning the first virtual character, an operation of selecting a summon condition and an operation of editing a first virtual character introduction are received. The first social information may include the summon condition and the first virtual character introduction.

[00124] For example, the check-in editing interface includes a check-in confirmation control. In response to triggering the check-in confirmation control, the check-in editing interface is exited, and operation 230 is performed to create the first check-in marker in the three-dimensional virtual environment.

[00125] In some embodiments, in response to triggering the check-in confirmation control, the terminal device sends the first social information to the server. The server associatively stores the first social information, the second position, the first check-in marker, and the three-dimensional virtual environment (or a first map/map label corresponding to the three-dimensional virtual environment). In some embodiments, the server permanently stores the foregoing information. In response to receiving a check-in success message sent by the server, the terminal performs operation 230 of displaying the first check-in marker at the second position in the three-dimensional virtual environment.

[00126] Operation 230: Display the first check-in marker created by the first virtual character at the second position in the three-dimensional virtual environment, the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

[00127] For example, as shown in FIG. 8, after the check-in operation is completed, the terminal displays a first check-in marker 309 at the second position in the three-dimensional virtual environment.

[00128] For example, in the three-dimensional virtual environment, there is not only a check-in marker created by the first virtual character, but also a check-in marker created by another virtual character. In some embodiments, a display style of the check-in marker created by the another virtual character is different from a display style of the check-in marker created by the first virtual character. For example, the check-in marker created by the another virtual character is displayed as a cyan light beam, and the check-in marker created by the first virtual character is displayed as a red light beam.

[00129] Based on the above, according to the method provided in this embodiment of this application, the check-in editing interface is displayed, so that the user can edit and post at least one type of social information of a text, a picture, a video, audio, or an event. The user creates a check-in marker in the three-dimensional virtual environment after completing checking in and posting the social information, so that another virtual character approaching the check-in marker can see the social information posted by the first virtual character.

[00130] According to the method provided in this embodiment of this application, a picture that is automatically obtained by the system and that is related to the first event is displayed in the picture editing area of the check-in editing interface. This simplifies a user operation, and the user can quickly edit the social information for the first event, to improve human-computer interaction efficiency.

[00131] According to the method provided in this embodiment of this application, when the first virtual character wins the first battle, defeat pictures from perspectives of both sides in a final defeat are automatically obtained, and the defeat pictures are displayed in the picture editing area, so that a highlight moment when the first virtual character wins the battle is presented in a plurality of perspectives. This is convenient for the user to edit the social information to share a win, and improves the human-computer interaction efficiency.

[00132] FIG. 9 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. Based on the embodiment shown in FIG. 2, operation 240 is further included after operation 230.

[00133] Operation 240: Display a display interface of a second check-in marker in response to a distance between the first virtual character and a third position being less than a first threshold, the display interface displaying second social information edited by a second virtual character for a second event.

[00134] In some embodiments, the three-dimensional virtual environment further includes a check-in marker created by another virtual character, for example, the second check-in marker created by the second virtual character and located at the third position.

[00135] A method in which a virtual character approaches and interacts with a check-in marker is described below by using the second check-in marker as an example.

[00136] The second check-in marker created by the second virtual character is displayed at the third position in the three-dimensional virtual environment.

[00137] The second virtual character and the first virtual character are virtual characters controlled by different user accounts. In other words, the virtual character is not allowed to view a check-in marker created by the virtual character. Alternatively, the second virtual character and the first virtual character may be a same virtual character. In other words, the virtual character can approach and view a check-in marker created by the virtual character.

[00138] The second virtual character and the first virtual character may be virtual characters that jointly participate in a current battle (the first battle), that is, both the first check-in marker and the second check-in marker are created in the first battle.

[00139] Alternatively, the second virtual character and the first virtual character may be virtual characters respectively participating in different battles. For example, the first virtual character creates the first check-in marker in the first battle, and the second virtual character creates the second check-in marker in a second battle. Battle start time of the second battle is later than creation time of the first check-in marker. The first battle and the second battle are two battles performed in the same three-dimensional virtual environment. For example, the first battle and the second battle are both game battles performed in a three-dimensional virtual environment of the first map.

[00140] When the first virtual character approaches the second check-in marker, a reply control may be displayed on a battle interface. In response to receiving a triggering operation on the reply control, the terminal displays the display interface corresponding to the second check-in marker.

[00141] For example, as shown in FIG. 10, a second check-in marker 401 created by the second virtual character is displayed at the third position in the three-dimensional virtual environment. When the first virtual character 302 approaches the second check-in marker 401, the terminal displays a reply control 402. In response to triggering the reply control 402, a display interface 403 of the second check-in marker shown in FIG. 11 is displayed.

[00142] The display interface includes the second social information posted by the second virtual character for the second event. In some embodiments, the display interface may further include character information of the second virtual character. For example, the character information includes at least one of an avatar, a nickname, an organization to which the character belongs, a rank name, a rank icon, a personal signature, or last online time. In some embodiments, the display interface may further include at least one piece of information of a second event name, second event occurrence time, second social information posting time, at least one piece of reply information, or character information of a replier.

[00143] In addition to displaying the second social information, the display interface is further configured for interacting with a virtual character viewing the second social information. For example, the virtual character viewing the second social information may reply to the second social information, add the second virtual character as a friend, save a picture/a video/audio in the second social information, collect a reward in the second social information, obtain a virtual item in the second social information, and the like.

[00144] In some embodiments, the display interface may further include at least one interaction control. For example, the display interface includes a reply editing control. The reply editing control is configured for editing reply information and posting the reply information. For another example, the display interface includes a social relationship establishment control. The social relationship establishment control is configured for triggering establishment of a social relationship (for example, establishment of a friend relationship) with the second virtual character. For another example, the display interface includes a three-dimensional model display entrance. The three-dimensional model display entrance is configured for opening a three-dimensional model display interface to display a related picture of a three-dimensional model display in the second social information.

[00145] Several interaction manners are described below.

[00146] 1. Reply.

[00147] The display interface further includes the reply editing control. The terminal device receives a reply operation on the reply editing control, the reply operation including an operation of editing the reply information; and the terminal device replies to the second social information based on the reply information.

[00148] The reply information includes at least one piece of information of a text, a picture, and an emote.

[00149] For example, as shown in FIG. 12, in a text editing area 404 on the display interface, reply information "Brother, you are amazing. You manage to win the game, so impressive" is edited and replied.

[00150] In some embodiments, a manner of replying to the second social information may be sending a reply mail to the second virtual character. For example, the reply mail for the second social information is transmitted to a second user account corresponding to the second virtual character. The reply mail includes the reply information. The second virtual character may view the reply information by viewing the reply mail.

[00151] For example, as shown in FIG. 13, a reply mail 406 for a current reply is received in a mailbox of the second virtual character, and the second virtual character may also reply to the reply mail of the first virtual character.

[00152] The manner of replying to the second social information may alternatively be displaying the reply information on the display interface. The reply information of the first virtual character replying to the second social information is displayed on the display interface. The second virtual character may view the reply information on the display interface, and another virtual character may also view the reply information on the display interface.

[00153] In some embodiments, when the first virtual character replies to the second social information in the three-dimensional virtual environment, and the second virtual character is located in the three-dimensional virtual environment, the second social information is directly displayed on the display interface. When the second virtual character has exited the three-dimensional virtual environment, in addition to being displayed on the display interface, the second social information is also sent to a second user account in a form of an e-mail.

[00154] 2. Establish a social relationship.

[00155] The display interface further includes the character information of the second virtual character and the social relationship establishment control. An application for establishing a social relationship with the second virtual character is transmitted in response to receiving a triggering operation on the social relationship establishment control. The social relationship includes but is not limited to a friend relationship, a single-directional follow relationship, and a bidirectional follow relationship.

[00156] For example, as shown in FIG. 11, a friend adding control 405 is displayed on the display interface. In response to receiving a triggering operation on the friend adding control, a

friend adding request is sent to the second user account corresponding to the second virtual character.

[00157] In response to receiving the triggering operation on the friend adding control, the terminal device sends a friend adding request to the server, the friend adding request including the second user account of the second virtual character. The server sends the friend adding request to a second client where the second user account is located. The second client displays the friend adding request from the first virtual character. A friend consent message is sent to the server in response to receiving a consent operation. The server receives the friend consent message sent by the second client, establishes a friend relationship between a first user account of the first virtual character and the second user account, and sends a friend adding success message to the terminal device. The terminal device receives the friend adding success message, and displays establishment of the friend relationship with the second user account.

[00158] 3. Special interaction.

[00159] The display interface further includes a completion condition and a completion reward corresponding to the second event. In response to the first virtual character meeting the completion condition, the display interface displays that the first virtual character obtains the completion reward. For example, the second event may be: at least one of a prize quiz, snatching a red packet, selling a virtual item, exchanging virtual items, or summoning the second virtual character.

[00160] (1) Prize quiz

[00161] In some embodiments, the completion condition includes answering a question correctly, and the completion reward includes a reward provided in the second social information. The second social information on the display interface includes a question and a reply editing control. The reply information is sent in response to receiving an editing operation on the reply information triggered through the reply editing control. When the reply information is a correct answer to the question, the display interface displays that the first virtual character obtains the reward in the second social information.

[00162] (2) Snatching the red packet

[00163] In some embodiments, the completion condition includes snatching the red packet, and the completion reward includes the red packet provided in the second social information. The display interface includes a red packet snatching control. In response to receiving a triggering

operation on the red packet snatching control, the display interface displays that the first virtual character obtains the red packet in the second social information.

[00164] (3) Selling the virtual item

[00165] In some embodiments, the completion condition includes paying a virtual resource, and the completion reward includes the second virtual item of the second virtual character. The second virtual item sold by the second virtual character in the second social information and a selling amount of the second virtual item are displayed on the display interface, and the display interface further includes a purchase control. In response to receiving a triggering operation on the purchase control, the display interface displays that the first virtual character obtains the second virtual item. A virtual resource of the first virtual character is reduced based on the selling amount, and a virtual resource of the second virtual character is increased based on the selling amount.

[00166] (4) Exchanging the virtual items

[00167] In some embodiments, the completion condition includes exchanging the first virtual item, and the completion reward includes the second virtual item of the second virtual character. In response to an operation of exchanging the first virtual item by the first virtual character, the display interface displays that the first virtual character loses the first virtual item and obtains the second virtual item. An owner of the first virtual item is changed from the first virtual character to the second virtual character, and an owner of the second virtual item is changed from the second virtual character to the first virtual character.

[00168] (5) Summoning the second virtual character

[00169] In some embodiments, the completion condition includes paying a virtual resource, and the completion reward includes summoning the second virtual character to the third position. An amount required for summoning and a summon control are displayed on the display interface. The second virtual character is displayed at the third position in the three-dimensional virtual environment in response to receiving a triggering operation on the summon control. A virtual resource of the first virtual character is reduced based on the amount required for summoning, and a virtual resource of the second virtual character is increased based on the amount required for summoning. In this way, the first virtual character may temporarily summon the second virtual character to participate in a game battle as a teammate. In an optional embodiment, when a duration for which the second virtual character exists reaches a threshold, the second virtual character is controlled to exit the second battle.

[00170] According to the method provided in this embodiment of this application, the another virtual character may further reply to the social information on the check-in marker, and then communicate with the virtual character that posts the social information, to implement game insight sharing in the game battle, and promote communication between stranger players.

[00171] According to the method provided in this embodiment of this application, the reply to the social information may be sent to the publisher by e-mailing, or may be displayed on the display interface of the social information, to facilitate communication between the replier and the publisher.

[00172] According to the method provided in this embodiment of this application, the another virtual character viewing the social information may also add the publisher as a friend. This expands a way for the user to add a friend.

[00173] According to the method provided in this embodiment of this application, the virtual character may also use a check-in marker to exchange the virtual items with another virtual character in the three-dimensional virtual environment. The virtual character creates the check-in marker and releases an intention to exchange on the check-in marker. When the another virtual character views the check-in marker and agrees to exchange, the two virtual characters may complete the exchange of the virtual item. In this way, the two virtual characters can asynchronously complete the exchange of the virtual items. This does not require that the two virtual characters need to arrive at the same position at the same time, and simplifies a virtual item exchange procedure.

[00174] An exemplary embodiment is provided in which after a win is obtained, the win is shared with the another virtual character by creating the check-in marker.

[00175] FIG. 14 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. Based on the embodiment shown in FIG. 2, operation 220 may be replaced with operation 222, operation 223, operation 224, and operation 225, operation 230 may be replaced with operation 231, and operation 250 is further included after operation 230.

[00176] Operation 210: Display a first virtual character located at a first position in a three-dimensional virtual environment.

[00177] For example, the first virtual character performs a first battle in a first map. The first position is a position at which the first virtual character wins the first battle. A first event includes

that the first virtual character wins the first battle, and the first battle is a game battle performed in the three-dimensional virtual environment.

[00178] Operation 222: Display a to-be-checked-in model at a second position when the first virtual character wins the first battle.

[00179] For example, the second position is a position directly in front of the first virtual character by a fixed distance when the first virtual character is located at the first position.

[00180] The to-be-checked-in model may be displayed as a dim gray light beam.

[00181] For example, as shown in (1) in FIG. 15, after the first virtual character has a chicken dinner, a to-be-check-in model 501 is displayed on a ground in front of the first virtual character.

[00182] Operation 223: Display a check-in control when a distance between the first virtual character and the second position is less than a second threshold.

[00183] When the first virtual character approaches the to-be-checked-in model, the check-in control is displayed on a battle interface, and the check-in control is configured for opening a check-in editing interface.

[00184] For example, as shown in (1) in FIG. 15, when the first virtual character approaches a to-be-checked-in model 501, a check-in control 301 is displayed on the battle interface.

[00185] Operation 224: Display the check-in editing interface in response to a triggering operation on the check-in control, the check-in editing interface being a social information editing interface with a topic of winning the first battle.

[00186] The social information editing interface with the topic of winning the first battle may be an interface on which a text prompt for winning the first battle is displayed, an icon for winning is displayed, or the like.

[00187] For example, as shown in (2) in FIG. 15, when a user triggers the check-in control, a terminal displays a check-in pop-up window (check-in editing interface) 502 on the battle interface. The check-in editing interface displays a topic "chicken dinner check-in" of current checking in.

[00188] Operation 225: Receive an editing operation on first social information on the check-in editing interface, the first social information including at least one of a text, a picture, a video, a check-in marker style, or a first event.

[00189] For example, as shown in (2) in FIG. 15, the user may edit the first social information on the check-in editing interface, and after completing editing, the user taps/clicks a check-in confirmation control 305 to complete current checking in.

[00190] Operation 231: Replace the to-be-checked-in model located at the second position in the three-dimensional virtual environment with a check-in model and display the check-in model.

[00191] In some embodiments, when the to-be-checked-in model is replaced with the check-in model, only a display state of the to-be-checked-in model may be updated. For example, a color of the to-be-checked-in model is updated. Alternatively, the entire model may be replaced. For example, a to-be-checked-in model in a light beam form is replaced with a check-in model in a chess piece form.

[00192] After the checking in is completed, the check-in editing interface is turned off, and a battle picture is re-displayed. The to-be-checked-in model in the battle picture is replaced with the check-in model. The check-in model is a first check-in marker, and the check-in model may be displayed as a red light beam. For example, as shown in (3) in FIG. 15, a check-in model 503 is displayed at the second position in the three-dimensional virtual environment.

[00193] Another virtual character approaches the check-in model to view the first social information posted by the first virtual character.

[00194] For example, the check-in model, the second position, and the first social information are associatively stored in a server. The server permanently stores the foregoing information, and reads, after a win is obtained in each game battle performed in the first map, data related to all check-in models in the first map, and displays the check-in models in the three-dimensional virtual environment of the first map.

[00195] For example, the check-in marker (check-in model) is displayed in the three-dimensional virtual environment of the game battle only within a period of time when the virtual character exits the game battle after a win is obtained in the game battle. The virtual character can create the check-in marker, view the check-in marker, and reply to the check-in marker only within the period of time.

[00196] Operation 250: Display a battle picture of a second battle performed in the three-dimensional virtual environment, the battle picture including the first check-in marker located at the second position, and battle start time of the second battle being later than battle end time of the first battle.

[00197] The first check-in marker (check-in model) is created by the first virtual character in the first battle, and the first battle is a game battle performed in the three-dimensional virtual environment.

[00198] The second battle may be a battle spectated by a first user account corresponding to the first virtual character. The second battle may alternatively be a battle in which the first user account participates. The second battle may alternatively be a battle in which another user account is used for participating after the another user account is logged in on a terminal device.

[00199] The first battle and the second battle are two battles performed in the same three-dimensional virtual environment. In some embodiments, both the first battle and the second battle are battles performed in the three-dimensional virtual environment of the first map.

[00200] In some embodiments, a check-in marker created by another virtual character is displayed in the three-dimensional virtual environment only after a win is obtained in the second battle. When a fifth virtual character wins the second battle, a terminal obtains a check-in marker dataset stored in association with the three-dimensional virtual environment, the check-in marker dataset including check-in marker data of at least one check-in marker, and the check-in marker being created by at least one virtual character that wins a battle and checks in in the three-dimensional virtual environment. The terminal renders and displays, based on check-in marker data of the first check-in marker in the check-in marker dataset, the first check-in marker at the second position in the three-dimensional virtual environment, to obtain the battle picture of the second battle.

[00201] The first virtual character and the fifth virtual character are virtual characters controlled by the same user account, or the first virtual character and the fifth virtual character are virtual characters controlled by different user accounts.

[00202] Based on the above, according to the method provided in this embodiment of this application, when the virtual character wins the battle, a dim gray light beam is displayed in the virtual environment, and when the virtual character approaches the dim gray light beam, the check-in control is displayed. The user triggers the check-in control to open the check-in editing interface, to edit and post winning presentation. In this way, one piece of winning social information is left in the three-dimensional virtual environment, and another virtual character can approach the light beam and view the winning social information, to achieve a purpose of sharing a win to the another virtual character. In addition, the virtual character may edit a text related to a winning method, to teach in the field a trick to win near a position point. This facilitates communication between users.

[00203] According to the method provided in this embodiment of this application, the check-in model created by the virtual character in the three-dimensional virtual environment may be permanently stored in the three-dimensional virtual environment, and displayed to a virtual character participating in a subsequent battle in the three-dimensional virtual environment, so that

the virtual character can communicate with respect to a position in the three-dimensional virtual environment, or communicate with respect to an event occurring at a position in the three-dimensional virtual environment. In this way, a new communication manner is provided, so that the virtual character can sense the environment in which the event occurs during communication.

[00204] FIG. 16 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. The method includes the following operations.

[00205] Operation 601: A main virtual character defeats the last enemy to finally win (have a chicken dinner).

[00206] Operation 602: A system needs to record and save the last frame of pictures, denoted as A and B, from perspectives of both the main virtual character and a killed person. A and B are two defeat pictures.

[00207] Operation 603: Generate a "dim gray light beam" in a scene of current coordinates of the main virtual character.

[00208] For example, check-in markers of three types may be displayed in the three-dimensional virtual environment. One type is: a check-in marker to be checked in; one type is: a check-in marker for a current virtual character/current user account to check in; and one type is: a check-in marker for another virtual character/another user account to check in.

[00209] As shown in FIG. 17, the check-in marker to be checked in is displayed as a dim gray light beam 504; the check-in marker for the current virtual character/current user account to check in is displayed as a red light beam 505; and the check-in marker for the another virtual character/another user account to check in is displayed as a cyan light beam 506.

[00210] Operation 604: Determine a light beam model that the main virtual character approaches.

[00211] Operation 605: Display a "reply" button on a screen if there is the "cyan light beam".

[00212] Operation 606: There is no change if there is the "red light beam". The main virtual character cannot view social information posted by the main virtual character.

[00213] Operation 607: Display a "check in" button if there is the "dim gray light beam".

[00214] Operation 608: Determine whether the "check in" button is tapped; and Pop up a "chicken dinner check-in" pop-up window if a tap behavior is performed.

[00215] Operation 609: From this moment until the main control virtual character closes the "chicken dinner check-in" pop-up window, it needs to be determined in real time whether to tap "check-in confirmation". If the check-in confirmation is tapped, a check-in procedure ends, and data of social information in the check-in pop-up window, text content in the pop-up window, and the two pictures A and B are recorded. The pop-up window is closed, and the current "dim gray light beam" is changed to the "red light beam".

[00216] Operation 610: As shown in (2) in FIG. 15, there is a universal text box control above the "chicken dinner check-in" pop-up window. It is determined whether the text box control is tapped. If the text box control is tapped, a universal keyboard of a terminal device system is invoked.

[00217] Operation 611: As shown in (2) in FIG. 15, below the "chicken dinner check-in" pop-up window are thumbnails of two screenshots A and B, and it is determined whether to tap the screenshot. If A/B is tapped, a "view picture" interface is opened. The "view picture" interface displays an enlarged A/B, a "cancel" button, and a "save to album" button.

[00218] Operation 612: Determine whether to tap the "cancel" button, and if the button is tapped, return to the "chicken dinner check-in" pop-up window.

[00219] Operation 613: Determine whether to tap the "save to album" button, and if the button is tapped, save the screenshot to the system album of the terminal device.

[00220] Based on the above, according to the method provided in this embodiment of this application, by checking in in the three-dimensional virtual environment, a player satisfies desire to brag after having a chicken dinner. This enhances a sense of glory of the player when the player has a chicken dinner. In addition, a user-friendly social behavior is promoted in an asynchronous social manner, and communication between players is improved. This serves as an icebreaker for a series of subsequent social features. In addition, the entire system supports two manners: manual input of a text and automatic screenshot of the system, and a full function and a convenient and quick interaction manner can well improve experience of the user when the user plays a game.

[00221] FIG. 18 is a flowchart of a social method based on a three-dimensional virtual environment according to an exemplary embodiment of this application. The method includes the following operations.

[00222] Operation 701: The last enemy is defeated, and a main virtual character wins (has a chicken dinner).

[00223] Operation 702: Display all light beams (check-in markers) in a scene (in the three-dimensional virtual environment), and determine a light beam type that the main virtual character approaches.

[00224] Operation 703: Perform the method procedure shown in FIG. 16 if the main virtual character approaches a dim "gray light beam".

[00225] Operation 704: If the main virtual character approaches a "red light beam", there is no change.

[00226] Operation 705: Display a "reply" button on a screen if the main control virtual character approaches a "cyan light beam".

[00227] Operation 706: Determine whether the "reply" button is tapped, and pop up a "reply check-in" pop-up window if the "reply" button is tapped.

[00228] Operation 707: As shown in FIG. 11, an upper left part of the "reply check-in" pop-up window (display interface 403) is information about a "check-in person", and data stored when the check-in person checks in may be read, which are an avatar, a name, an organization to which the check-in person belongs, a rank badge, and a rank name respectively. There is a "add a friend" button to the right of the "reply check-in" pop-up window. It is determined whether the "add a friend" button is tapped. If the button is tapped, a procedure of "applying to add a friend" is entered, and the button is hidden.

[00229] Operation 708: As shown in FIG. 11, an upper right side of the "reply check-in" pop-up window (display interface 403) is a chicken dinner moment of the "check-in person", and social information edited by the check-in person is displayed: a text, a picture A, and a picture B. It is determined whether to tap to view the picture A/picture B. If tapping is performed, a "view picture" interface is displayed. It is determined whether a "cancel" button is tapped. If the button is tapped, it returns to the "reply check-in" pop-up window. It is determined whether a "save to album" button is tapped. If the button is tapped, the picture A/picture B is saved to the mobile phone album.

[00230] Operation 709: As shown in FIG. 11, below the "reply check-in" pop-up window (display interface 403) is a reply text box. It is determined whether the reply text box is tapped. If the reply text box is tapped, a mobile phone system keyboard is invoked.

[00231] Operation 710: As shown in FIG. 11, a lowermost part of the "reply check-in" pop-up window (display interface 403) is a "reply" button. A terminal device determines in real time whether a text is entered in the text box. If there is no text entered in the text box, the button is grayed out and cannot be tapped. If there is a text entered in the text box, the button is highlighted

and a procedure ends after the button is tapped, the "reply check-in" pop-up window is closed, the information related to the "check-in person" is recorded, and a mail is sent to the "check-in person". In addition, the cyan light beam is changed to the red light beam, and when a replier subsequently approaches the light beam, there is no longer any interaction function.

[00232] FIG. 19 is a block diagram of a structure of a social apparatus based on a three-dimensional virtual environment according to an exemplary embodiment of this application. The apparatus includes:

[00233] a display module 801, configured to display a first virtual character located at a first position in a three-dimensional virtual environment; and

[00234] an interaction module 802, configured to receive a check-in operation, the check-in operation including an operation of editing first social information for a first event; and

[00235] the display module 801 being configured to display a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, and the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

[00236] In an optional embodiment, a second check-in marker created by a second virtual character is displayed at a third position in the three-dimensional virtual environment; and

[00237] the display module 801 is configured to display a display interface of the second check-in marker when a distance between the first virtual character and the third position is less than a first threshold, the display interface displaying second social information edited by the second virtual character for a second event.

[00238] In an optional embodiment, the display interface further includes a reply editing control, and the apparatus further includes:

[00239] the interaction module 802, configured to receive a reply operation on the reply editing control, the reply operation including an operation of editing reply information; and

[00240] a reply module 803, configured to reply to the second social information based on the reply information.

[00241] In an optional embodiment, the reply module 803 is configured to transmit, to a second user account corresponding to the second virtual character, a reply mail for the second social information, the reply mail including the reply information;

[00242] or

[00243] display the reply information of the first virtual character replying to the second social information on the display interface.

[00244] In an optional embodiment, the display interface further includes character information of the second virtual character and a social relationship establishment control, and the apparatus further includes:

[00245] a social relationship establishment module 804, configured to transmit an application for establishing a social relationship with the second virtual character in response to receiving a triggering operation on the social relationship establishment control.

[00246] In an optional embodiment, the display module 801 is configured to display a check-in editing interface, the check-in editing interface including at least one of a text editing area, a picture editing area, a video editing area, a check-in marker style selection area, or an event selection area; and

[00247] the interaction module 802 is configured to receive an operation on the first social information on the check-in editing interface, the first social information including at least one of a text, a picture, a video, a check-in marker style, or the first event.

[00248] In an optional embodiment, the check-in editing interface includes the picture editing area, and the picture editing area displays, by default, at least one picture automatically obtained for the first event.

[00249] In an optional embodiment, the first event includes that the first virtual character wins a first battle;

[00250] when a third virtual character is defeated causing the first virtual character to win the first battle, the at least one picture includes a picture, obtained from a perspective of the third virtual character, that the third virtual character is defeated; and

[00251] when a fourth virtual character defeats the third virtual character causing the first virtual character to win the first battle, the at least one picture includes a picture, obtained from the perspective of the third virtual character, that the third virtual character is defeated, and a picture, obtained from a perspective of the fourth virtual character, that the fourth virtual character defeats the third virtual character.

[00252] The first virtual character and the fourth virtual character are a same virtual character, or the first virtual character and the fourth virtual character are virtual characters of a same camp.

[00253] In an optional embodiment, the first event includes that the first virtual character wins the first battle.

[00254] The display module 801 is configured to display a to-be-checked-in model at the second position when the first virtual character wins the first battle.

[00255] The display module 801 is configured to display a check-in control when a distance between the first virtual character and the second position is less than a second threshold.

[00256] The display module 801 is configured to display the check-in editing interface in response to a triggering operation on the check-in control, the check-in editing interface being a social information editing interface with a topic of winning the first battle.

[00257] In an optional embodiment, the first check-in marker is displayed as a check-in model.

[00258] The display module 801 is configured to replace the to-be-checked-in model located at the second position in the three-dimensional virtual environment with the check-in model and display the check-in model.

[00259] In an optional embodiment, the first check-in marker is created by the first virtual character in the first battle, the first battle being a game battle performed in the three-dimensional virtual environment.

[00260] The display module 801 is configured to display a battle picture of a second battle performed in the three-dimensional virtual environment, the battle picture including the first check-in marker located at the second position, and battle start time of the second battle being later than battle end time of the first battle.

[00261] In an optional embodiment, the apparatus further includes:

[00262] an obtaining module 805, configured to: when a fifth virtual character wins the second battle, obtain a check-in marker dataset stored in association with the three-dimensional virtual environment, the check-in marker dataset including check-in marker data of at least one check-in marker, and the check-in marker being created by at least one virtual character that wins a battle and checks in in the three-dimensional virtual environment; and

[00263] the display module 801, configured to render and display the first check-in marker at the second position in the three-dimensional virtual environment based on check-in marker data of the first check-in marker in the check-in marker dataset, to obtain the battle picture of the second battle,

[00264] the first virtual character and the fifth virtual character being virtual characters controlled by a same user account, or the first virtual character and the fifth virtual character being virtual characters controlled by different user accounts.

[00265] In an optional embodiment, the display interface further includes a completion condition and a completion reward corresponding to the second event, and

[00266] the display module 801 is configured to display, when the first virtual character meets the completion condition, that the first virtual character obtains the completion reward.

[00267] In an optional embodiment, the completion condition includes exchanging a first virtual item, and the completion reward includes a second virtual item of the second virtual character; and

[00268] the display module 801 is configured to display, in response to an operation of exchanging the first virtual item by the first virtual character, that the first virtual character loses the first virtual item and obtain the second virtual item,

[00269] an owner of the first virtual item being changed from the first virtual character to the second virtual character, and an owner of the second virtual item being changed from the second virtual character to the first virtual character.

[00270] FIG. 20 is a block diagram of a structure of a computer device 1800 according to an exemplary embodiment of this application. The computer device 1800 may be a portable mobile terminal, for example, 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 computer device 1800 may also be referred to as another name such as user equipment, a portable terminal, a laptop terminal, or a desktop terminal.

[00271] Usually, the computer device 1800 includes: a processor 1801 and a memory 1802.

[00272] The processor 1801 may include one or more processing cores, for example, a 4-core processor or an 8-core processor. The processor 1801 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 1801 may also include a main processor and a coprocessor. The main processor is a processor configured for processing data in an awake state, and is also referred to as a Central Processing Unit (CPU). The coprocessor is a low power consumption processor configured for processing data in a standby state. In some embodiments, the processor 1801 may be integrated with a graphics processing unit (GPU). The GPU is configured for rendering and draw content that needs to be displayed on a display screen. In some

embodiments, the processor 1801 may further include an artificial intelligence (AI) processor. The AI processor is configured to process computing operations related to machine learning.

[00273] The memory 1802 may include one or more computer-readable storage media. The computer-readable storage medium may be non-transient. The memory 1802 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 1802 is configured for storing at least one instruction, the at least one instruction being configured for being executed by the processor 1801 to implement the social method based on the three-dimensional virtual environment provided in the method embodiments of this application.

[00274] In some embodiments, the computer device 1800 further includes: a peripheral device interface 1803 and at least one peripheral device. The processor 1801, the memory 1802, and the peripheral device interface 1803 may be connected through a bus or a signal cable. Each peripheral device may be connected to the peripheral device interface 1803 through a bus, a signal cable, or a circuit board. For example, the peripheral device may include: at least one of a radio frequency circuit, a display screen, a camera assembly, an audio circuit, a sensor, or a power supply.

[00275] The peripheral device interface 1803 may be configured for connecting the at least one peripheral device related to input/output (I/O) to the processor 1801 and the memory 1802. In some embodiments, the processor 1801, the memory 1802, and the peripheral device interface 1803 are integrated on the same chip or circuit board. In some other embodiments, any one or two of the processor 1801, the memory 1802, and the peripheral device interface 1803 may be implemented on a single chip or circuit board. This is not limited in this embodiment.

[00276] A person skilled in the art may understand that the structure shown in FIG. 20 constitutes no limitation on the computer device 1800, and the computer device 1800 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.

[00277] This application further provides a computer-readable storage medium, the storage medium having at least one instruction, at least one program, a code set or an instruction set stored therein, and the at least one instruction, the at least one program, the code set or the instruction set being loaded and executed by a processor to implement the social method based on the three-dimensional virtual environment provided in the foregoing method embodiments.

[00278] This application provides a computer program product or a computer program, the computer program product or the computer program including computer instructions, and the computer instructions being stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium, and the processor executes the computer instructions, to enable the computer device to perform the social method based on the three-dimensional virtual environment provided in the foregoing method embodiments.

[00279] The sequence numbers of the foregoing embodiments of this application are merely for description but do not imply the preference among the embodiments.

[00280] A person of ordinary skill in the art may understand that all or some of the operations of the foregoing embodiments may be implemented by hardware, or may be implemented by a program instructing relevant hardware. The program may be stored in a computer-readable storage medium. The storage medium may be a read-only memory, a magnetic disk, an optical disc, or the like.

[00281] The foregoing descriptions are merely optional embodiments of this application, but are not intended to limit this application. Any modification, equivalent replacement, or improvement made within the spirit and principle of this application shall fall within the protection scope of this application.

CLAIMS

1. A social method based on a three-dimensional virtual environment, performed by a computer device, and the method comprising:

displaying a first virtual character located at a first position in a three-dimensional virtual environment;

receiving a check-in operation, the check-in operation comprising an operation of editing first social information for a first event; and

displaying a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

2. The method according to claim 1, wherein a second check-in marker created by a second virtual character is displayed at a third position in the three-dimensional virtual environment, and the method further comprises:

displaying a display interface of the second check-in marker when a distance between the first virtual character and the third position is less than a first threshold, the display interface displaying second social information edited by the second virtual character for a second event.

3. The method according to claim 2, wherein the display interface further comprises a reply editing control, and the method further comprises:

receiving a reply operation on the reply editing control, the reply operation comprising an operation of editing reply information; and

replying to the second social information based on the reply information.

4. The method according to claim 3, wherein the replying to the second social information based on the reply information comprises:

transmitting, to a second user account corresponding to the second virtual character, a reply mail for the second social information, the reply mail comprising the reply information;

or

displaying the reply information of the first virtual character replying to the second social information on the display interface.

5. The method according to any one of claims 2 to 4, wherein the display interface further

comprises character information of the second virtual character and a social relationship establishment control, and the method further comprises:

transmitting an application for establishing a social relationship with the second virtual character in response to receiving a triggering operation on the social relationship establishment control.

6. The method according to any one of claims 1 to 5, wherein the receiving a check-in operation comprises:

displaying a check-in editing interface, the check-in editing interface comprising at least one of a text editing area, a picture editing area, a video editing area, a check-in marker style selection area, or an event selection area; and

receiving an editing operation on the first social information on the check-in editing interface, the first social information comprising at least one of a text, a picture, a video, a check-in marker style, or the first event.

7. The method according to claim 6, wherein the check-in editing interface comprises the picture editing area, and the picture editing area displays, by default, at least one picture automatically obtained for the first event.

8. The method according to claim 7, wherein the first event comprises that the first virtual character wins a first battle;

when a third virtual character is defeated causing the first virtual character to win the first battle, the at least one picture comprises a picture, obtained from a perspective of the third virtual character, that the third virtual character is defeated; and

when a fourth virtual character defeats the third virtual character causing the first virtual character to win the first battle, the at least one picture comprises a picture, obtained from the perspective of the third virtual character, that the third virtual character is defeated, and a picture, obtained from a perspective of the fourth virtual character, that the fourth virtual character defeats the third virtual character,

the first virtual character and the fourth virtual character being a same virtual character, or the first virtual character and the fourth virtual character being virtual characters of a same camp.

9. The method according to any one of claims 6 to 8, wherein the first event comprises that the first virtual character wins the first battle; and

the displaying a check-in editing interface comprises:

displaying a to-be-checked-in model at the second position when the first virtual character wins the first battle;

displaying a check-in control when a distance between the first virtual character and the second position is less than a second threshold; and

displaying the check-in editing interface in response to a triggering operation on the check-in control, the check-in editing interface being a social information editing interface with a topic of winning the first battle.

10. The method according to claim 9, wherein the first check-in marker is displayed as a check-in model; and

the displaying a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment comprises:

replacing the to-be-checked-in model located at the second position in the three-dimensional virtual environment with the check-in model and displaying the check-in model.

11. The method according to any one of claims 1 to 9, wherein the first check-in marker is created by the first virtual character in the first battle; and the method further comprises:

displaying a battle picture of a second battle performed in the three-dimensional virtual environment, the battle picture comprising the first check-in marker located at the second position, and battle start time of the second battle being later than battle end time of the first battle.

12. The method according to claim 11, wherein the displaying a battle picture of a second battle performed in the three-dimensional virtual environment comprises:

when a fifth virtual character wins the second battle, obtaining a check-in marker dataset stored in association with the three-dimensional virtual environment, the check-in marker dataset comprising check-in marker data of at least one check-in marker, and the check-in marker being created by at least one virtual character that wins a battle and checks in in the three-dimensional virtual environment; and

rendering and displaying the first check-in marker at the second position in the three-dimensional virtual environment based on check-in marker data of the first check-in marker in the check-in marker dataset, to obtain the battle picture of the second battle,

the first virtual character and the fifth virtual character being virtual characters controlled by a same user account, or the first virtual character and the fifth virtual character being virtual characters controlled by different user accounts.

13. The method according to any one of claims 2 to 4, wherein the display interface further comprises a completion condition and a completion reward corresponding to the second event, and the method further comprises:

displaying, when the first virtual character meets the completion condition, that the first virtual character obtains the completion reward.

14. The method according to claim 13, wherein the completion condition comprises exchanging a first virtual item, and the completion reward comprises a second virtual item of the second virtual character; and

the displaying, when the first virtual character meets the completion condition, that the first virtual character obtains the completion reward comprises:

in response to an operation of exchanging the first virtual item by the first virtual character, displaying that the first virtual character loses the first virtual item and obtaining the second virtual item,

an owner of the first virtual item being changed from the first virtual character to the second virtual character, and an owner of the second virtual item being changed from the second virtual character to the first virtual character.

15. A social apparatus based on a three-dimensional virtual environment, wherein the apparatus comprises:

a display module, configured to display a first virtual character located at a first position in a three-dimensional virtual environment; and

an interaction module, configured to receive a check-in operation, the check-in operation comprising an operation of editing first social information for a first event; and

the display module being configured to display a first check-in marker created by the first virtual character at a second position in the three-dimensional virtual environment, and the first check-in marker being configured for displaying, to a virtual character arriving at the second position, the first social information edited by the first virtual character for the first event.

16. A computer device, wherein the computer device comprises: a processor and a memory, the memory having a computer program stored therein, and the computer program being loaded and executed by the processor to implement the social method based on a three-dimensional virtual environment according to any one of claims 1 to 14.

17. A computer-readable storage medium, the computer-readable storage medium having a

computer program stored therein, and the computer program being loaded and executed by a processor to implement the social method based on a three-dimensional virtual environment according to any one of claims 1 to 14.

18. A computer program product, the computer program product comprising computer instructions, the computer instructions being stored in a computer-readable storage medium, and a processor obtaining the computer instructions from the computer-readable storage medium, so that the processor loads and executes the computer instructions to implement the social method based on a three-dimensional virtual environment according to any one of claims 1 to 14.