

VIRTUAL OBJECT APPEARANCE CONTROL METHOD AND APPARATUS, DEVICE, MEDIUM, AND PROGRAM PRODUCT

RELATED APPLICATION

[0001] The present application claims priority to Chinese Patent Application No. 202310628581.2, filed on May 30, 2023 and entitled "VIRTUAL OBJECT APPEARANCE CONTROL METHOD AND APPARATUS, DEVICE, MEDIUM, AND PROGRAM PRODUCT". The entire disclosures of the prior application are hereby incorporated by reference.

FIELD OF THE TECHNOLOGY

[0002] This application relates to the field of application technologies, and in particular, to a method and apparatus for controlling display of a virtual object, a device, a medium, and a program product.

BACKGROUND OF THE DISCLOSURE

[0003] In some game applications, a user may attack an enemy virtual object in a manner of controlling a virtual object to shoot, throw a virtual grenade, or throw a virtual bomb in a virtual environment or in another manner.

[0004] In a process of controlling a virtual object to participate in a virtual battle, the virtual object may be controlled to walk, and use a tree, a stone, a house, or the like as a cover, to avoid an attack from an enemy virtual object. Particularly, there is a virtual garment that has a color and a pattern the same as those of green grass. The virtual garment can be hidden in the grass after being worn, and cannot be easily identified.

[0005] However, the foregoing manner of controlling the virtual object to hide is only effective when the virtual object is hidden in the grass.

SUMMARY

[0006] Embodiments of this disclosure provide a method and apparatus for controlling display of a virtual object, a device, a medium, and a program product, so that the virtual object can lie in ambush in different virtual environments and is not easy to be discovered. Technical solutions are as follows:

[0007] According to an aspect of this disclosure, a method for controlling display of a virtual object is provided. The method is performed by a terminal and includes:

- [0008]** displaying the virtual object in a virtual environment, the virtual object having a disguise skill;
- [0009]** receiving a skill release operation to release the disguise skill; and
- [0010]** changing a first coloration of the virtual object to a second coloration in response to the skill release operation, the second coloration being determined based on a coloration in the virtual environment at a location of the virtual object.
- [0011]** According to another aspect of this disclosure, an apparatus for controlling display of a virtual object is provided. The apparatus includes:
- [0012]** a display module, configured to display the virtual object in a virtual environment, the virtual object having a disguise skill;
- [0013]** a receiving module, configured to receive a skill release operation to release the disguise skill; and
- [0014]** a processing module, configured to change a first coloration of the virtual object to a second coloration in response to the skill release operation, the second coloration being determined based on a coloration in the virtual environment at a location of the virtual object.
- [0015]** According to another aspect of this disclosure, a computer device is provided. The computer device includes a processor and a memory. The memory stores at least one program. The at least one program is loaded and executed by the processor to implement the method for controlling display of a virtual object according to various aspects of this disclosure.
- [0016]** According to another aspect of this disclosure, a computer-readable storage medium is provided. The computer-readable storage medium stores at least one program. The at least one program is loaded and executed by a processor to implement the method for controlling display of a virtual object according to various aspects of this disclosure.
- [0017]** According to another aspect of this disclosure, a computer program product or a computer program is provided. The computer program product or the computer program includes computer instructions. The computer instructions are stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium. The processor, when executing the computer instructions, implements the method for controlling display of a virtual object according to various aspects of this disclosure.
- [0018]** According to another aspect of this disclosure, a chip is provided. The chip includes a programmable logic circuit and/or program instructions. When run, the chip is configured to

implement the method for controlling display of a virtual object according to various aspects of this disclosure.

[0019] The technical solutions provided in the embodiments of this disclosure achieve at least the following beneficial effects.

[0020] According to the method for controlling display of a virtual object provided in this disclosure, a skill release operation configured to release a disguise skill is received if a virtual object has the disguise skill, and a first coloration of the virtual object is changed to a second coloration in response to the skill release operation. The second coloration is determined based on a coloration in the virtual environment at a location of the virtual object, so that the virtual object with the changed coloration may blend seamlessly with the surrounding virtual environment to be hidden in the virtual environment. In this way, the virtual object is not easy to be found, and an enemy virtual object can be deceived, so that the virtual object can avoid an attack of the enemy virtual object, or is more likely to successfully ambush the enemy virtual object, thereby achieving an accurate and effective attack on the enemy virtual object.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] FIG. 1 is a schematic diagram of an interface showing an appearance change of a virtual object according to an exemplary embodiment of this disclosure.

[0022] FIG. 2 is a schematic structural diagram of a computer system according to an exemplary embodiment of this disclosure.

[0023] FIG. 3 is a flowchart of a method for controlling display of a virtual object according to an exemplary embodiment of this disclosure.

[0024] FIG. 4 is a schematic diagram of an interface showing a coloration change of a virtual object according to another exemplary embodiment of this disclosure.

[0025] FIG. 5 is a flowchart of a method for controlling display of a virtual object according to another exemplary embodiment of this disclosure.

[0026] FIG. 6 is a schematic diagram of a camera model corresponding to a perspective of a virtual object according to an exemplary embodiment of this disclosure.

[0027] FIG. 7 is a schematic diagram of an imaging plane according to an exemplary embodiment of this disclosure.

[0028] FIG. 8 is a schematic diagram of an interface showing a coloration change of a virtual object according to another exemplary embodiment of this disclosure.

[0029] FIG. 9 is a schematic diagram of an interface showing a coloration change of a virtual object according to another exemplary embodiment of this disclosure.

[0030] FIG. 10 is a flowchart of a method for controlling display of a virtual object according to an exemplary embodiment of this disclosure.

[0031] FIG. 11 is a flowchart of a release process of a disguise skill according to an exemplary embodiment of this disclosure.

[0032] FIG. 12 is a flowchart of a change process of a coloration according to an exemplary embodiment of this disclosure.

[0033] FIG. 13 is a flowchart of a release process of a disguise skill according to another exemplary embodiment of this disclosure.

[0034] FIG. 14 is a block diagram of an apparatus for controlling display of a virtual object according to an exemplary embodiment of this disclosure.

[0035] FIG. 15 is a schematic diagram of an apparatus structure of a computer device according to an exemplary embodiment of this disclosure.

DESCRIPTION OF EMBODIMENTS

[0036] First, terms in the embodiments of this disclosure are described.

[0037] A virtual environment is a virtual environment displayed (or provided) when an application 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. The virtual environment may be any one of a two-dimensional virtual environment, a 2.5-dimensional virtual environment, and a three-dimensional virtual environment. This is not limited in this disclosure. The following embodiments are described by using an example in which the virtual environment is a three-dimensional virtual environment.

[0038] A virtual object is a movable object in a virtual environment. The movable object may be a virtual character, a virtual animal, a cartoon character, or the like, for example, a character, an animal, a plant, an oil drum, a wall, or a stone displayed in a three-dimensional virtual environment. In some embodiments, the virtual object is a three-dimensional stereoscopic model created based on a skeletal animation technology. Each virtual object has a shape and a volume in the three-dimensional virtual environment, and occupies a part of space in the three-dimensional virtual environment.

[0039] A virtual prop is a prop, for example, a virtual vehicle or a virtual instrument, used

by a virtual object in a virtual environment to perform some actions. For example, a virtual explosive is a virtual item that can explode in the virtual environment, and is a virtual instrument used by the virtual object in the virtual environment. When the virtual explosive is activated (or explodes), the virtual explosive includes at least one of a grenade, a landmine, a bomb, an atomic bomb, and a missile, and a hit point of the virtual object within an explosive range is reduced. For another example, a shooting virtual prop may be configured to shoot in the virtual environment, and is another virtual instrument used by the virtual object in the virtual environment. When a shooting virtual prop (for example, a bow and arrow) is used to shoot, an enemy virtual object within range is hit, to reduce a hit point of the enemy virtual object. For example, the virtual prop that is "equipped, carried, or assembled" by the virtual object includes a virtual prop that is being used. The virtual object has a virtual inventory, an inventory slot exists in the virtual inventory, and a virtual prop that is not used temporarily may be stored in the virtual inventory of the virtual object. The virtual prop that is "equipped, carried, or assembled" by the virtual object may further include a virtual prop stored in the virtual inventory.

[0040] A shooting game is a game in which a virtual object is controlled to battle in a virtual environment by using a virtual instrument. For example, the shooting game includes: a first-person shooting (FPS) game and a third-person shooting (TPS) game. The FPS game is a shooting game that can be played by a user from a first-person perspective. A virtual environment picture in the game is a picture for observing a virtual environment from a perspective of a virtual object. The TPS game is a shooting game that can be played by a user from a third-person perspective. A virtual environment picture in the game is a picture for observing a virtual environment from a perspective for observing a virtual object. Actions of the virtual object can be observed from the third-person perspective.

[0041] In the game, at least two virtual objects play a single-round battle in the virtual environment. The virtual object avoids an attack launched by another virtual object and a danger in the virtual environment (for example, a poison circle or a swamp), to survive in the virtual environment. When a hit point of the virtual object in the virtual environment is zero, a life of the virtual object in the virtual environment ends, and a final virtual object surviving in the virtual environment wins. The hit point refers to a life length of the virtual object in the virtual environment. When the hit point of the virtual object is zero, the life of the virtual object in the virtual environment ends. In some embodiments, the battle starts with a moment when a first client joins the battle, and ends with a moment when a last client exits the battle. Each client may control one or more virtual objects in the virtual environment. In some embodiments, arena modes of the battle may include a single-player battle mode, a two-player team battle mode, or a multiplayer

team battle mode. The battle mode is not limited in the embodiments of this disclosure.

[0042] A control is a user interface (UI) control, that is, any visual control or element that can be seen on a user interface of an application, for example, a control such as a picture, an input box, a text box, a button, or a label. Some UI controls may respond to an operation of the user. For example, after triggering a skill release control of a disguise skill, the user can control a virtual object to change a coloration, to achieve a disguise effect in a virtual environment.

[0043] A method for controlling display of a virtual object provided in this disclosure may be applied to a virtual reality (VR) application, an augmented reality (AR) application, an FPS game, a TPS game, a multiplayer online battle arena (MOBA) game, a tactical arena game, a strategy game (SG), or the like. The following embodiments are described by using an application in a game as an example.

[0044] A game based on a virtual environment includes maps of one or more game worlds. The virtual environment in the game is a simulation of real-world scenes, and a user may control a virtual object in the game to perform actions such as walking, running, jumping, shooting, fighting, driving, switching to a virtual instrument, and attacking another virtual object with the virtual instrument in the virtual environment. This realizes high interactivity, and enables a plurality of users to team up online for a battle arena. The virtual object controlled by the user attacks another virtual object in the virtual environment, for example, an enemy virtual object and a non-player character (NPC). The virtual object controlled by the user may also be attacked by another virtual object in the virtual environment, such as the enemy virtual object and the NPC.

[0045] When controlling the virtual object to avoid an attack or to ambush an enemy, the user may control the virtual object to hide. In some games, a virtual garment is provided. The virtual garment has a color and a pattern the same as those of grass. A virtual object wearing the virtual garment is controlled to be hidden in the grass, and is not easy to be identified, but is limited to being hidden in the grass. If the virtual object is in a city, a desert, or a snowfield, the virtual object cannot be hidden.

[0046] According to the method for controlling display of a virtual object provided in this disclosure, a coloration of a virtual object is replaced based on a virtual environment in which the virtual object is located, so that effective hiding can be achieved regardless of the virtual environment in which the virtual object is located. FIG. 1 is a schematic diagram of an interface showing an appearance change of a virtual object according to an exemplary embodiment of this disclosure.

[0047] A virtual environment picture 102 is displayed on a virtual environment interface 101. The virtual environment picture 102 includes a lawn 103 in a virtual environment. A virtual object 104 stands on the lawn 103. A movement control is further displayed on the virtual environment interface 101. The virtual environment picture 102 is a picture for observing the virtual environment from a perspective of the virtual object 104. A user may trigger the movement control to control the virtual object 104 to move in the virtual environment. When the user controls the virtual object 104 to move in the virtual environment, a perspective for the virtual object 104 to observe the virtual environment changes. The virtual environment interface 101 further includes a perspective adjustment control. The user may further control, by using the perspective adjustment control, the perspective for the virtual object 104 to observe the virtual environment to change.

[0048] The virtual object 104 in the virtual environment picture 102 wears a battle garment 105. The virtual environment interface 101 further includes a skill release control 106 of a disguise skill. The user triggers a skill release operation on the skill release control 106. First, a process animation of coloration change for the virtual object 104 is played, as shown in a second interface diagram of FIG. 1. A special effect 107 of coloration change is displayed. Then, a first coloration of the battle garment 105 is changed to a second coloration. The second coloration has a color and a pattern of grass, as shown in a battle garment 108 of the virtual object in a third interface diagram of FIG. 1, to hide the virtual object 104 in the grass, so as to avoid an attack and ambush an enemy virtual object.

[0049] The method for controlling display of a virtual object provided in this disclosure may be applied to a computer system. FIG. 2 shows a structural block diagram of a computer system according to an exemplary embodiment of this disclosure. The computer system 200 includes: a first terminal 220, a server 240, and a second terminal 260.

[0050] An application supporting a virtual environment is installed and run on the first terminal 220. The application may be any one of a virtual reality application, an augmented reality application, an FPS game, a TPS game, an MOBA game, and a multiplayer battle survival game. The first terminal 220 is a terminal used by a first user. The first user uses the first terminal 220 to control a first virtual object in the virtual environment to perform an activity. The activity includes, but is not limited to, at least one of body posture adjustment, crawling, walking, running, riding, jumping, driving, shooting, throwing a virtual smoke bomb, and throwing a virtual explosive. For example, the first virtual object is a first virtual character, such as a simulation character or an anime character.

[0051] The first terminal 220 is connected to the server 240 through a wireless network or

wired network. The server 240 includes at least one of one server, a plurality of servers, a cloud computing platform, and a virtualization center. For example, the server 240 includes a memory 242 and a processor 244. The memory 242 further includes a display module 2421, a control module 2422, and a receiving module 2423. The server 240 is configured to provide a background service for an application that supports a three-dimensional virtual environment. In some embodiments, the server 240 takes on primary computing work, and the first terminal 220 and the second terminal 260 takes on secondary computing work; or the server 240 takes on secondary computing work, and the first terminal 220 and the second terminal 260 takes on primary computing work; or collaborative computing is performed by using a distributed computing architecture among the server 240, the first terminal 220, and the second terminal 260.

[0052] An application supporting a virtual environment is installed and run on the second terminal 260. The application may be any one of a virtual reality application, an augmented reality application, an FPS game, a TPS game, an MOBA game, and a multiplayer battle survival game. The second terminal 260 is a terminal used by a second user. The second user uses the second terminal 260 to control a second virtual object in the virtual environment to perform an activity. The activity includes, but is not limited to, at least one of body posture adjustment, crawling, walking, running, riding, jumping, driving, shooting, throwing a virtual smoke bomb, and throwing a virtual explosive. For example, the second virtual object is a second virtual character, such as a simulation character or an anime character.

[0053] In some embodiments, the first virtual object and the second virtual object are in the same virtual environment. In some embodiments, the first virtual object and the second virtual object may belong to the same team, or the same organization, or have a friend relationship, or have a temporary communication permission. Alternatively, the first virtual object and the second virtual object may belong to different teams, or different organizations, or have a hostile relationship with each other.

[0054] In some embodiments, the application installed on the first terminal 220 is the same as the application installed on the second terminal 260, or the applications installed on the two terminals are the same type of applications on different control system platforms. The first terminal 220 may be one of a plurality of terminals, and the second terminal 260 may be one of a plurality of terminals. This embodiment is described by only using the first terminal 220 and the second terminal 260 as an example. Device types of the first terminal 220 and the second terminal 260 are the same or different, and the device types include at least one of a smartphone, a tablet computer, a notebook computer, a wearable device, an AR intelligent device, a VR intelligent device, an e-book

reader, a moving picture experts group audio layer III (MP3) player, a moving picture experts group audio layer IV (MP4) player, a laptop computer, and a desktop computer. The following embodiments are described based on an example in which the terminal includes a smartphone.

[0055] A person skilled in the art should understand that a quantity of the above terminals may be larger or smaller. For example, there may be only one terminal, or there are dozens of or hundreds of terminals or more terminals. The quantity and the device types of the terminals are not limited in the embodiments of this disclosure.

[0056] FIG. 3 is a flowchart of a method for controlling display of a virtual object according to an exemplary embodiment of this disclosure. The method may be applied to the terminal of the computer system shown in FIG. 2. The method includes the following operations.

[0057] **Operation 301:** Display a virtual object in a virtual environment, the virtual object having a disguise skill.

[0058] An application is run on the terminal. The application supports the virtual environment, and the virtual object exists in the virtual environment. A virtual environment interface is displayed on the terminal, the virtual environment interface includes a virtual environment picture, and the virtual environment picture is a picture obtained by observing the virtual environment from a perspective of the virtual object.

[0059] In some embodiments, the perspective is an observation angle for observation from a first-person perspective or a third-person perspective of the virtual object in the virtual environment. For example, in this embodiment of this disclosure, the perspective is an angle for observing the virtual object through a camera model (virtual camera) in the virtual environment. The camera model automatically follows the virtual object in the virtual environment. To be specific, when a location of the virtual object in the virtual environment changes, a location of the camera model following the location of the virtual object in the virtual environment changes simultaneously, and the camera model is always within a preset distance range from the virtual object in the virtual environment. In some embodiments, in the automatic following process, the relative location between the camera model and the virtual object remain unchanged.

[0060] For example, the virtual environment displayed on the virtual environment picture includes at least one of the following elements: a mountain, a flat land, a river, a lake, an ocean, a desert, the sky, a cloud, the sun, the moon, a star, a plant, an animal, a building, and a vehicle. For example, as shown in FIG. 1, elements such as a lawn, a hill, a stone, and a house are displayed in the virtual environment picture.

[0061] In this embodiment of this disclosure, the disguise skill is a skill that masks the virtual object in the virtual environment by changing a coloration of the virtual object to integrate an appearance of the virtual object into the virtual environment in which the virtual object is located. For example, as shown in FIG. 1, after the coloration of the virtual object is changed, the battle garment 105 of the virtual object is changed to the battle garment 108. When the virtual object is constructed based on a three-dimensional model, a change of the coloration does not affect the three-dimensional model of the virtual object. For example, a material (coloration) of the battle garment in FIG. 1 is changed. However, a model of the battle garment is not changed, and a three-dimensional structure of the battle garment in FIG. 1 is not changed.

[0062] In some embodiments, the disguise skill possessed by the virtual object is a skill possessed by the virtual object. Alternatively, the disguise skill possessed by the virtual object is a skill obtained by using a virtual prop. A manner of obtaining the virtual prop includes, but is not limited to: picking up, purchasing, sharing by another virtual object, and a reward prop obtained by completing a task. Alternatively, the disguise skill possessed by the virtual object is a skill obtained by completing a task. For example, the disguise skill is a reward obtained by controlling the virtual object to complete the task.

[0063] The material is a physical property of an object in a simulated virtual environment. For example, the material may include a color, reflection, transparency, and a map. Properties of the material may be collectively referred to as a material ball. For example, properties of the material ball may include, but are not limited to, ambient occlusion (AO), diffusion, a metal property/specular property, glossiness, emission, opacity, a normal, and an environment. The ambient occlusion refers to manually controlling an illumination intensity and distribution of an ambient light source on an object. The diffusion refers to an inherent color of an object, and is a material property that directly represents a color of the object. The specular property is to keep a specular color of an object from being affected by an environment. The metal property is to simulate a specular effect in a real environment based on ambient light. The glossiness refers to a reflection intensity of an object. The emission refers to a luminous intensity of an object. The opacity refers to an object transparency strength. The normal is configured for achieving a bump effect on a plane, to reserve and enrich details. The environment is a secondary operation on a reflection intensity of an object, and mainly deals with a highly reflective material such as a glass mirror. Moreover, the property of the material ball may be a processing switch for a relationship among object illumination, double-sidedness, and transparency, to process a special effect. In some embodiments, the coloration of the virtual object is a material of a garment worn by the virtual object. Alternatively, the coloration of the virtual object is a surface layer material that can be

observed on the virtual object.

[0064] Operation 302: Receive a skill release operation to release the disguise skill.

[0065] In some embodiments, the skill release operation configured to release the disguise skill may be a preset gesture operation. For example, in response to triggering a gesture operation on an interactive area of the virtual environment interface, the disguise skill is released.

[0066] In some embodiments, the virtual environment interface includes a skill release control of the disguise skill. The terminal receives a skill release operation triggered on the skill release control of the disguise skill. For example, a trigger operation includes, but is not limited to, at least one of the following: a click operation, a double-click operation, a long-press operation, a drag operation, and a slide operation.

[0067] As shown in FIG. 1, the skill release control 106 of the disguise skill is displayed on the virtual environment interface, and is configured to trigger release of the disguise skill possessed by the virtual object. In some embodiments, if the virtual object has the disguise skill, the skill release control of the disguise skill is displayed on the virtual environment interface. For example, if the virtual object obtains the disguise skill through use of the virtual prop, the skill release control of the disguise skill is displayed on the virtual environment interface.

[0068] In some embodiments, the skill release control of the disguise skill is located at any location on the virtual environment interface. For example, the skill release control may be located in an edge area of the virtual environment interface. As shown in FIG. 1, the skill release control is located in a right edge area of the virtual environment interface. Alternatively, a location and a layout of the skill release control on the virtual environment interface may be user-defined. For example, the skill release control may be dragged from a first location to a second location, to change the layout and the location of the skill release control.

[0069] In some embodiments, virtual energy needs to be accumulated for the disguise skill. If the virtual energy accumulated for the disguise skill reaches a preset threshold, skill release of the disguise skill may be triggered. For example, if the virtual energy accumulated for the disguise skill reaches the preset threshold, the skill release control is in a touchable state. If the skill release control is in the touchable state, the terminal may receive the skill release operation triggered on the skill release control. For example, at an initial stage or after one time of skill release is completed, the terminal switches a state of the skill release control from the touchable state to an untouchable state, and after the virtual energy accumulated for the disguise skill reaches the preset threshold, switches the state of the skill release control from the untouchable state to the touchable state. In

this case, the terminal may receive the skill release operation on the skill release control.

[0070] For example, at the initial stage or after one time of skill release, the accumulated virtual energy reaches the preset threshold after cooling duration, and then the state of the skill release control is switched to the touchable state. For example, after one time of skill release, the skill release control is switched to the untouchable state, and after 30s of cooling, the state of the skill release control is switched to the touchable state. At the initial stage or after one time of skill release, virtual energy required for release of the disguise skill may be further obtained by executing a task. For example, the virtual energy required for release of the disguise skill is accumulated by picking up and using a virtual energy crystal.

[0071] **Operation 303:** Change a first coloration of the virtual object with a second coloration in response to the skill release operation, the second coloration being determined based on a coloration in the virtual environment at a location of the virtual object.

[0072] In response to the skill release operation, the terminal determines the second coloration based on the coloration in the virtual environment at the location of the virtual object, and changes the first coloration of the virtual object to the second coloration. In some embodiments, a location of the virtual object in the virtual environment is determined based on the skill release operation. The second coloration is determined based on the coloration at the location of the virtual object in the virtual environment. The first coloration of the virtual object is changed with the second coloration.

[0073] In some embodiments, if the state of the virtual object meets a skill release condition, the terminal performs the operation of changing the first coloration of the virtual object with the second coloration in response to the skill release operation.

[0074] For example, the skill release condition includes, but is not limited to, at least one of the following: the virtual object being in a moving state, the virtual object being in a shooting state, the virtual object being in a jumping state, the virtual object being in a sprinting state, the virtual object being in a sliding tackle state, the virtual object being in a squatting state, the virtual object being in a recumbent state, the virtual object being in a static state, and the virtual object being in a skill release area of the disguise skill. The skill release area of the disguise skill may be any area in the virtual environment or a part of an area in the virtual environment.

[0075] In some embodiments, if the state of the virtual object meets a kill inhibit condition, responding to the skill release operation of the disguise skill is skipped. The kill inhibit condition includes, but is not limited to, at least one of the following: the virtual object being knocked down,

the virtual object climbing, the virtual object rescuing or being rescued, the virtual object driving or the virtual object riding in a virtual vehicle, and the virtual object being in a skill release forbidden area of the disguise skill. The skill release forbidden area of the disguise skill may be a part of the area in the virtual environment.

[0076] The skill release condition corresponding to the disguise skill and the kill inhibit condition are preset based on an application requirement.

[0077] In some embodiments, the terminal switches the entire coloration of the virtual object from the first coloration to the second coloration. Alternatively, the terminal switches a part of coloration of the virtual object exposed to the virtual environment from the first coloration to the second coloration.

[0078] Switching of the coloration may be implemented by changing a parameter of the coloration of the virtual object. The first coloration corresponds to one group of material parameters, and the second coloration corresponds to another group of material parameters. The material parameter corresponding to the first coloration used by the virtual object is changed to the material parameter corresponding to the second coloration, to implement the switching of the coloration.

[0079] In some embodiments, in a process in which the terminal controls the first coloration to be switched to the second coloration, an instantaneous change manner may be used, that is, the coloration is directly transitioned from the first coloration to the second coloration. Alternatively, a gradual transition manner may be used, that is, the coloration is gradually transitioned from the first coloration to the second coloration.

[0080] In some embodiments, the terminal first plays a transition animation of coloration change of the virtual object in response to the skill release operation. In a process of playing the transition animation, the terminal gradually switches the first coloration to the second coloration, and the playing of the transition animation and the switching of the coloration are completed at the same time. Alternatively, after playing the transition animation of coloration change of the virtual object, the terminal directly switches the first coloration to the second coloration.

[0081] For example, as shown in FIG. 4, a virtual environment picture 502 is displayed on a virtual environment interface 501. The virtual environment picture 502 includes a tile 503 in a virtual environment. A virtual object 504 stands on the tile 503. A movement control is further displayed on the virtual environment interface 501. The virtual environment picture 502 is a picture for observing the virtual environment from a perspective of the virtual object 504. A user may

trigger the movement control to control the virtual object 504 to move in the virtual environment. When the user controls the virtual object 504 to move in the virtual environment, a perspective for the virtual object 504 to observe the virtual environment changes. The virtual environment interface 501 further includes a perspective adjustment control. The user may further control, by using the perspective adjustment control, the perspective for the virtual object 504 to observe the virtual environment to change.

[0082] The virtual object 504 in the virtual environment picture 502 wears a battle garment 505. The virtual environment interface 501 further includes a skill release control 506 of a disguise skill. The user triggers a skill release operation on the skill release control 506. First, an animation of coloration change of the virtual object 504 is played, as shown in a second interface diagram of FIG. 4. A special effect 507 of coloration change is displayed, and then a first coloration of the battle garment 505 is replaced with a second coloration. The second coloration has a color and a pattern of the tile 503, as shown in a battle garment 508 of the virtual object in a third interface diagram of FIG. 4, to hide the virtual object 504 in the grass, so as to avoid an attack and ambush an enemy virtual object.

[0083] In some embodiments, the foregoing disguise skill is continuously effective, and subsequently, use of the disguise skill may be ended by terminating the skill release operation. Alternatively, a duration threshold is correspondingly set for the foregoing disguise skill, and the duration threshold is configured to indicate effective duration of the disguise skill. The second coloration of the virtual object is changed to the first coloration when a release duration of the disguise skill reaches the duration threshold. The release duration is a duration of the virtual object wearing the second coloration, starting from a moment at which the first coloration of the virtual object is changed to the second coloration. For example, the disguise skill can last for 60 seconds (s) after being released, and the coloration of the virtual object is switched from the second coloration back to the first coloration after 60s.

[0084] In some embodiments, in the release duration of the disguise skill, the terminal controls the virtual object to continue to move in the virtual environment, and in a movement process, a coloration of the virtual object changes as a surrounding virtual environment of the virtual object changes. For example, after changing the first coloration of the virtual object to the second coloration, the terminal controls the virtual object to continue to move in the virtual environment. The terminal determines, based on a location to which the virtual object moves, a third coloration of the virtual object. The terminal changes the second coloration of the virtual object to the third coloration.

[0085] In some embodiments, in the release duration of the disguise skill, with movement of the virtual object in the virtual environment, a coloration of the virtual object is updated in real time. Alternatively, in the release duration of the disguise skill, the virtual object is controlled to move from a first location to a second location in the virtual environment. When static duration of the virtual object at the second location reaches a static duration threshold, a third coloration of the virtual object is determined based on the second location to which the virtual object moves. The second coloration of the virtual object is changed to the third coloration. For determining the third coloration, refer to a manner of determining the second coloration. Details are not described herein again.

[0086] In some embodiments, in the release duration of the disguise skill, in response to an event of meeting a suspension condition of the disguise skill, the second coloration of the virtual object is replaced with the first coloration.

[0087] In some embodiments, the suspension condition includes, but is not limited to, at least one of the following: the virtual object being hit by the enemy virtual object, a hit point of the virtual object being reduced below a hit point threshold, a spirit point of the virtual object being reduced below a spirit point threshold, the virtual object entering a disguise skill release forbidden area (for example, the virtual object falling into or entering water), and the virtual object performing a first-type action. The first-type action includes, but is not limited to: a climbing action, driving a virtual vehicle, and riding in the virtual vehicle. For example, after the first coloration of the virtual object is changed to the second coloration, when the virtual object is hit by the enemy virtual object, the second coloration of the virtual object is replaced with the first coloration. For another example, after the first coloration of the virtual object is changed to the second coloration, when the virtual object performs the first-type action, the second coloration of the virtual object is changed to the first coloration.

[0088] In some embodiments, in the release duration of the disguise skill, a release effect of a second-type action is further enhanced. The second-type action and the first-type action are actions of different types. For example, when the virtual object performs the second-type action, the release effect of the second-type action is enhanced, and the second-type action and the first-type action are actions of different types. For example, the second-type action may be an attack action and/or an action of supplementing virtual energy of the virtual object. For example, in a period of time in which the disguise skill is effective, the virtual object is controlled to shoot, and a damage value and a range of the shooting are increased based on a first preset proportion, for example, increased to 120% of an original damage value and increased to 110% of an original range. For

another example, in the release duration of the disguise skill, the virtual object is controlled to perform an action of supplementing virtual energy, and duration required for supplementing the virtual energy is reduced based on a second preset proportion. For example, 5s is subtracted from original duration, and/or a virtual energy value of a virtual prop configured to supplement the virtual energy is increased. For example, the virtual energy value of the virtual prop configured to supplement the virtual energy is increased to 110% of an original virtual energy value. For another example, in the release duration of the disguise skill, the virtual object is controlled to throw a virtual explosive, and a damage range and a damage value of the virtual explosive after activation of the virtual explosive are increased based on a third preset proportion, for example, increased to 120% of an original damage value and increased to 120% of an original damage range.

[0089] In some embodiments, the virtual object is further equipped with a virtual prop. The first coloration of the virtual object is replaced with the second coloration, and a fourth coloration of the virtual prop is replaced with the first coloration in response to the skill release operation. For example, in the release duration of the disguise skill, if the virtual object uses a virtual explosive, the fourth coloration of the virtual explosive is replaced with the first coloration. For another example, if the virtual object is equipped with a virtual shooting prop, a fourth coloration of the virtual shooting prop is replaced with the first coloration, and a coloration of a prop generated by shooting is replaced with the first coloration.

[0090] In conclusion, according to the method for controlling display of a virtual object provided in this embodiment, a skill release operation configured to trigger release of a disguise skill is received if a virtual object has the disguise skill, and a first coloration of the virtual object is changed to a second coloration in response to the skill release operation. The second coloration is determined based on a coloration in the virtual environment at a location of the virtual object, so that the virtual object with the changed coloration may blend seamlessly with the surrounding virtual environment to be hidden in the virtual environment. In this way, the virtual object is not easy to be found, and an enemy virtual object can be deceived, so that the virtual object can avoid an attack of the enemy virtual object, or is more likely to successfully ambush the enemy virtual object, thereby achieving an accurate and effective attack on the enemy virtual object.

[0091] In addition, in a period of time in which the disguise skill is effective, with movement of the virtual object in the virtual environment, the coloration of the virtual object is further changed based on a change of the surrounding virtual environment of the virtual object, so that the virtual object can be better hidden in the surrounding virtual environment, to improve a hidden effect of the virtual object in the virtual environment. Further, the disguise skill can further

enhance a release effect for some actions, to better ambush enemies in combination with a disguise effect.

[0092] FIG. 5 is a flowchart of a method for controlling display of a virtual object according to an exemplary embodiment of this disclosure. The method may be applied to the terminal of the computer system shown in FIG. 2. As shown in FIG. 5, operation 303 may be implemented through the following operation 3031 to operation 3033, to determine, based on a location of a virtual object in a virtual environment, a second coloration that is more harmonious with a surrounding virtual environment of the virtual object. The method includes the following operations.

[0093] Operation 3031: Determine a location of the virtual object in the virtual environment in response to the skill release operation.

[0094] The terminal determines the location of the virtual object in the virtual environment in response to the skill release operation. For example, the location of the virtual object is a location of the virtual object on a virtual map.

[0095] Operation 3032: Determine the second coloration based on a coloration of an environmental object in the virtual environment at the location of the virtual object in the virtual environment.

[0096] The terminal determines a contact object at the location of the virtual object in the virtual environment, and determines the second coloration based on the coloration of the contact object. In some embodiments, the terminal determines, in the virtual environment based on the location of the virtual object, a contact object that is an environmental object being in contact with a body part of the virtual object, and determines the second coloration based on the coloration of the contact object. For example, the terminal determines three-dimensional space of the virtual object in the virtual environment based on the location of the virtual object. The three-dimensional space of the virtual object is larger than space occupied by a three-dimensional model of the virtual object. In the three-dimensional space of the virtual object, the contact object that is an environmental object being in contact with the body part of the virtual object is determined. The second coloration is determined based on the coloration of the contact object. For example, a lawn that is in contact with feet of the virtual object is used as the contact object, and the second coloration is determined based on a coloration of the lawn.

[0097] In some embodiments, the terminal may determine the coloration of the contact object as the second coloration. Alternatively, the terminal may determine some parameters of the coloration of the contact object as parameters of the second coloration.

[0098] In some embodiments, there may be one or more contact objects that are environmental objects being in contact with the virtual object. If the body part of the virtual object is in contact with a plurality of contact objects in the virtual environment, at least one of the following manners may be used to determine a contact object in the plurality of objects.

[0099] (1) The terminal determines a first group of candidate objects based on the location of the virtual object. At least two candidate objects in the first group of candidate objects are in contact with at least two body parts of the virtual object in one-to-one correspondence. The terminal determines a first body part with a highest priority from the at least two body parts based on preset priorities of the body parts. The terminal determines a candidate object corresponding to the first body part in the at least two candidate objects as a contact object. For example, if a back of the virtual object is in contact with a wall, the feet of the virtual object are in contact with the ground, and a priority of the back is higher than a priority of the feet, the wall that is in contact with the back of the virtual object is determined as a contact object.

[00100] (2) The terminal determines a first group of candidate objects based on the location of the virtual object. At least two candidate objects in the first group of candidate objects are in contact with at least two body parts of the virtual object in one-to-one correspondence. The terminal calculates, for each candidate object in the first group, a contact area between the candidate object and a body part contacting the candidate object, to obtain at least two contact areas in one-to-one correspondence with the at least two candidate objects. The terminal determines a candidate object with a largest contact area from the first group of candidate objects as the contact object.

[00101] In some other embodiments, the terminal determines the three-dimensional space of the virtual object in the virtual environment based on the location of the virtual object. The terminal determines the contact object in the three-dimensional space. The terminal determines the second coloration based on the coloration of the contact object.

[00102] In some embodiments, the three-dimensional space includes one or more candidate objects that are in contact with the virtual object. When one candidate object is included in the three-dimensional space, the candidate object is determined as the contact object.

[00103] When the three-dimensional space includes the first group of candidate objects, and a plurality of candidate objects in the first group of candidate objects are in contact with the virtual object, for each candidate object in the first group, an overlapping area between projections of respective candidate object in the first group and the virtual object on an imaging plane of the virtual camera is calculated, to obtain at least two overlapping areas; and a candidate object with a largest overlapping area from the first group of candidate objects is determined as the contact

object.

[00104] The camera model is a three-dimensional model located around the virtual object in the virtual environment. From a first-person perspective, the camera model is near a head of the virtual object or located at a head of the virtual object. From a third-person perspective, the camera model may be behind the virtual object and bound to the virtual object, or may be located at any location at a preset distance from the virtual object. Through the camera model, the virtual object in the virtual environment may be observed from different perspectives. For example, when the third-person perspective is a first-person over-shoulder perspective, the camera model is behind the virtual object (for example, a head and a shoulder of a virtual character). In addition to the first-person perspective and the third-person perspective, other perspectives are further included, for example, a top-down perspective. From the top-down perspective, the camera model may be located above the head of the virtual object. The top-down perspective is a perspective for observing the virtual environment from the air. The camera model is not actually displayed in the virtual environment. In other words, the camera model is not displayed in a virtual environment displayed on the virtual environment interface. That is, the camera model is not displayed in the virtual environment picture.

[00105] An example in which the camera model is located at any location at the preset distance from the virtual object is used for description. One virtual object corresponds to one camera model. The camera model may rotate with the virtual object as a rotation center. For example, the camera model rotates with any point of the virtual object as the rotation center. During rotation, the camera model not only performs angular rotation, but also has a displacement deviation. A distance between the camera model and the rotation center remains unchanged during rotation. In other words, the camera model rotates on a surface of a sphere with the rotation center as a sphere center. Any point of the virtual object may be the head or a torso of the virtual object, or any point around the virtual object. This is not limited in the embodiments of this disclosure. In some embodiments, when the virtual object is observed through the camera model, a center orientation of the perspective of the camera model is a direction of a point of a sphere surface on which the camera model is located pointing to the sphere center.

[00106] In some embodiments, the virtual object may alternatively be observed through the camera model at a preset angle in different directions of the virtual object. For example, as shown in FIG. 6, a point is determined in a virtual object 41 as a rotation center 42, a camera model rotates around the rotation center 42, an initial location 43 is configured for the camera model, and the initial location 43 may be a location above and behind the virtual object (for example, a location

behind the head). When the camera model rotates to a location 44 or a location 45, a perspective direction of the camera model changes as the camera model rotates.

[00107] Regarding an imaging plane of the camera model, FIG. 7 is a schematic diagram of a process of mapping an object in three-dimensional space 701 to an imaging plane 703 of the camera model. A camera plane 702 is determined by a pose of the camera model, the camera plane 702 is a plane perpendicular to a photographing direction of the camera model, and the imaging plane 703 and the camera plane 702 are parallel to each other. The imaging plane 703 is a plane of a virtual environment within a field of view during imaging by the camera model when the virtual environment is observed. A sphere represents a virtual object, a cylinder represents an object in contact with a body part of the virtual object, and a coinciding area between spherical imaging and cylindrical imaging on the imaging plane 703 is an overlapping area between projections of respective object and the virtual object on the imaging plane of the camera model.

[00108] For example, the terminal calculates a coinciding area between imaged images of each object and the virtual object on the imaging plane of the camera model, to obtain an overlapping area corresponding to each object.

[00109] For example, a size of the three-dimensional space is set based on an application requirement, and the size of the three-dimensional space is greater than a model size of the virtual object. For example, a distance between each location in the three-dimensional space and the virtual object is less than a preset threshold. The preset threshold may be a height of the virtual object, or 1.5 times or 2 times the height of the virtual object.

[00110] In some other embodiments, the terminal determines a view frustum of the camera model based on the location of the virtual object, the camera model is configured to observe the virtual object in a follow mode, and the virtual object is included in the view frustum of the camera model. A first group of candidate objects in the view frustum of the camera model are determined, the first group of candidate objects include at least two candidate objects, and each candidate object is in contact with the body part of the virtual object. For each candidate object in the first group, an overlapping area between projections of respective candidate object and the virtual object on the imaging plane of the camera model is calculated, to obtain at least two overlapping areas in one-to-one correspondence with the at least two candidate objects. A candidate object with a largest overlapping area from the first group of candidate objects is determined as the contact object. A second coloration is determined based on a coloration of the contact object. In some other embodiments, the terminal determines at least two candidate objects in a view frustum of the camera model. For each of the at least two candidate objects, the terminal calculates an overlapping

area between projections of respective candidate object and the virtual object on the imaging plane of the camera model, to obtain at least two overlapping areas in one-to-one correspondence with the at least two candidate objects. The terminal determines a candidate object with a largest overlapping area from the at least two overlapping areas as the contact object. The terminal determines a second coloration based on a coloration of the contact object.

[00111] In some other embodiments, the terminal determines M objects in a view frustum of the camera model. For each of the M objects, the terminal calculates a vertical distance between the object and a central axis of the view frustum, to obtain M vertical distances corresponding to the M objects. The terminal sorts the M objects from near to far, to obtain M sorted objects. For each of the first R objects in the M sorted objects, the terminal calculates an overlapping area between projections of the object and the virtual object on the imaging plane of the camera model, to obtain R overlapping areas corresponding to the first R objects, where R is an integer greater than 1 and less than or equal to M. The terminal determines a object with a largest overlapping area in the R overlapping areas as the contact object. The terminal determines a second coloration based on a coloration of the contact object. In some other embodiments, the terminal determines M objects in a view frustum of the camera model, where M is an integer greater than one. The terminal determines a distance between each of the M objects and the virtual object based on the location of the virtual object. The terminal sorts the M objects from near to far based on the distances from the virtual object, to obtain M sorted objects. For each of the first R objects in the M sorted objects, the terminal calculates an overlapping area between projections of respective object and the virtual object on the imaging plane of the camera model, to obtain R overlapping areas corresponding to the first R objects, where R is an integer greater than 1 and less than or equal to M. The terminal determines a object with a largest overlapping area in the R overlapping areas as the contact object. The terminal determines a second coloration based on a coloration of the contact object. In some embodiments, the contact object includes at least one of a building, a vehicle, a plant, an animal, and an object in the virtual environment. For example, the contact object may be a wall, a door, a window, a roof, or a column of a house in the virtual environment, or the contact object may be a tree, a flower, a piece of grass, a water bucket, a stone, or a box in the virtual environment.

[00112] In some embodiments, the contact object includes an object that cannot move in the virtual environment, for example, a house, an object, a plant, a stationary vehicle, a stationary aircraft, a parked ship, or other means of transportation in the virtual environment.

[00113] **Operation 3033:** Replace the first coloration of the virtual object with the second coloration.

[00114] For example, as shown in FIG. 8, a virtual environment picture 802 is displayed on a virtual environment interface 801. The virtual environment picture 802 includes a sand 803 in a virtual environment. A virtual object 804 in the virtual environment picture 802 wears a battle garment 805 and stands on the sand 803, and feet of the virtual object 804 are in contact with the sand 803. The virtual environment interface 801 further includes a skill release control 806 of a disguise skill. A user triggers a skill release operation on the skill release control 806, and determines the sand 803 as a contact object. After an animation 807 of replacing a coloration of the virtual object 804 is played, "as shown in a second interface diagram in FIG. 8", a first coloration of the battle garment 805 is replaced with a second coloration corresponding to the sand 803. As shown in a battle garment 808 of the virtual object in a third interface diagram in FIG. 8, the virtual object 804 is hidden in the sand 803, to avoid an attack and ambush an enemy virtual object.

[00115] After replacing the first coloration of the virtual object with the second coloration, the terminal switches the coloration of the virtual object back to the first coloration under a condition. For example, as shown in FIG. 9, in a period of time in which the disguise skill is effective, the virtual object 804 wears the battle garment 808. After the disguise skill is ineffective, an animation 809 indicating that the disguise skill is ineffective is played. Then, a second coloration of the battle garment 808 is replaced with the first coloration, and the virtual object wearing the battle garment 805 is displayed. The first coloration is an original coloration of a virtual garment worn by the virtual object.

[00116] In conclusion, according to the method for controlling display of a virtual object provided in this embodiment, a skill release operation configured to trigger release of a disguise skill is received if a virtual object has the disguise skill, and a first coloration of the virtual object is changed to a second coloration in response to the skill release operation. The second coloration is determined based on a coloration in the virtual environment at a location of the virtual object, so that the virtual object with the changed coloration may blend seamlessly with the surrounding virtual environment to be hidden in the virtual environment. In this way, the virtual object is not easy to be found, and an enemy virtual object can be deceived, so that the virtual object can avoid an attack of the enemy virtual object, or is more likely to successfully ambush the enemy virtual object, thereby achieving an accurate and effective attack on the enemy virtual object. In addition, the contact object in the virtual environment is determined through the contact with the virtual object, so that an appearance of the virtual object after replacement may better blend seamlessly with the virtual environment in which the virtual object is located, to achieve a better hiding effect.

[00117] FIG. 10 is a flowchart of a method for controlling display of a virtual object

according to an exemplary embodiment of this disclosure. The method may be applied to the terminal of the computer system shown in FIG. 2. As shown in FIG. 5, operation 303 may be implemented through operation 3034 to operation 3036, to determine, in terms of a dimension of observation of the virtual object by an observing virtual object, the second coloration that is more harmonious with a surrounding virtual environment of the virtual object. The method includes the following operations.

[00118] Operation 3034: Determine a location of the virtual object in an observation picture in response to the skill release operation.

[00119] In response to the skill release operation, the terminal determines the location of the virtual object in the observation picture. For example, the observation picture is generated from a view perspective of an observing virtual in the virtual environment. The observation picture includes the virtual object.

[00120] For example, the observing virtual object and the virtual object usually belong to different virtual camps, and the observing virtual object may be referred to as an enemy virtual object of the virtual object. An appearance of the virtual object is masked in the virtual environment through the skill release operation, to prevent the observing virtual object from distinguishing the virtual object in the virtual environment, or increase difficulty in distinguishing the virtual object in the virtual environment by the observing virtual object (for example, consuming longer time or distinguishing the virtual object at a shorter distance).

[00121] Operation 3035: Determine the second coloration based on a coloration of the peripheral environment at the location of the virtual object in the observation picture.

[00122] For example, the peripheral environment is an environment at a location of a pixel adjacent to an edge of the virtual object in the observation picture, or an environment in an area whose distance to an edge of the virtual object is less than a preset threshold. For example, similar to the foregoing descriptions, the observation picture is an imaging plane obtained through observation by the camera model, and is a two-dimensional plane obtained through observation of a virtual item, the virtual object, and the like in the virtual environment. The peripheral environment of the virtual object belongs to a type of virtual environment object in the virtual environment. The virtual environment object to which the peripheral environment belongs may be a virtual object such as a virtual sky, or a virtual ground, or a stone, a tree, or a building placed on a virtual ground. This is not limited.

[00123] In an implementation, operation 3035 may be implemented as: determining an

overlapping object in the observation picture based on the location of the virtual object in the observation picture; and determining the second coloration based on a coloration of the overlapping object.

[00124] For example, the virtual object partially blocks the overlapping object in the observation picture. An example in which the virtual environment is observed through the camera model is used. The virtual object is located between the overlapping object and the camera model. This blocks observation of the overlapping object by the camera model.

[00125] For example, the overlapping object is usually a virtual object such as a stone, a tree, or a building in the virtual environment, but a case in which the overlapping object is a virtual sky, a virtual ground, or the like is not excluded.

[00126] In another example, observation of the virtual environment through the camera model is described. Operation 3035 may be implemented as:

[00127] determining a view frustum of the camera model based on a location of the observing virtual object.

[00128] The camera model is configured to observe the observing virtual object in a follow mode, and the virtual object is included in the view frustum of the camera model. For example, the virtual object can be observed through the camera model of the observing virtual object. To mask the virtual object in the virtual environment, to prevent the observing virtual object from distinguishing the virtual object in the virtual environment, or improve difficulty in distinguishing the virtual object in the virtual environment by the observing virtual object, the second coloration needs to be determined based on the observation picture. This improves a masking effect of the virtual object in the observation picture.

[00129] A second group of candidate objects in the view frustum of the camera model are determined.

[00130] The second group of candidate objects include at least two candidate objects, and the virtual object partially blocks the at least two candidate objects on the imaging plane of the camera model. Refer to the foregoing descriptions. The virtual object is located between the overlapping object and the camera model. This blocks observation of the overlapping object by the camera model.

[00131] For each candidate object in the second group, an overlapping area between projections of respective candidate object and the virtual object on the imaging plane is calculated one by one, to obtain at least two overlapping areas. A candidate object with a largest overlapping

area from the at least two overlapping areas is determined as the overlapping object. The second coloration is determined based on a coloration of the overlapping object.

[00132] **Operation 3036:** Replace the first coloration of the virtual object with the second coloration.

[00133] The second coloration is determined based on the coloration of the peripheral environment at the location of the virtual object in the virtual environment. The first coloration of the virtual object is replaced with the second coloration. The second coloration is replaced, so that in an observation picture of the observing virtual object, an edge of the virtual object and the peripheral environment around the virtual object have the same coloration, to prevent the observing virtual object from distinguishing the virtual object in the virtual environment, or increase difficulty in distinguishing the virtual object in the virtual environment by the observing virtual object.

[00134] In conclusion, according to the method for controlling display of a virtual object provided in this embodiment, a skill release operation configured to trigger release of a disguise skill is received if a virtual object has the disguise skill. A first coloration of the virtual object is changed to a second coloration in response to the skill release operation. The second coloration is determined based on the coloration of the peripheral environment at the location of the virtual object in an observation picture, so that the virtual object with the changed coloration may blend seamlessly with a surrounding virtual environment in the observation picture to be hidden in the virtual environment. In this way, the virtual object is not easy to be found, and an enemy virtual object can be deceived, thereby achieving a better hiding effect.

[00135] As described above, the terminal switches the entire coloration of the virtual object from the first coloration to the second coloration. Alternatively, the terminal switches a part of coloration of the virtual object exposed to the virtual environment from the first coloration to the second coloration.

[00136] In an example, the virtual environment interface includes two skill release controls of the disguise skill. The entire coloration of the virtual object is switched to the second coloration in response to a trigger operation for a first skill release control. Alternatively, a part of the coloration of the virtual object is switched to the second coloration in response to a trigger operation for a first skill release control. Further, a virtual energy value consumed by the trigger operation for the first skill release control is greater than that consumed by a trigger operation for a second skill release control, or effective duration of a second coloration corresponding to the first skill release control is shorter than effective duration of a second coloration corresponding to a second skill release control.

[00137] In another example, the virtual environment interface includes a skill release control of the disguise skill. The entire coloration of the virtual object is switched to the second coloration in response to a trigger operation for the skill release control. The skill release control is switched and displayed as a skill conversion control. When there is no trigger operation on the skill conversion control, effective duration of the second coloration is first duration.

[00138] A part of the coloration of the virtual object is switched from the second coloration to the first coloration, and a part of the coloration of the virtual object are reserved as the second coloration in response to a trigger operation on the skill conversion control. Effective duration of the reserved second coloration is second duration, and the second duration is longer than the first duration.

[00139] The triggered skill release control is switched and displayed as the skill conversion control, so that a function entrance for performing personalized setting on the disguise skill is provided, and a function entrance for setting a coverage area and effective duration of a second coloration having a masking effect is provided. In an example, the virtual object prevents the enemy virtual object from distinguishing the location of the virtual object in the virtual environment by triggering the disguise skill. The virtual object launches a virtual attack on the enemy virtual object based on the masking effect, to eliminate the enemy virtual object. After the enemy virtual object is eliminated, there is no other object that constitutes a threat around the virtual object, but a risk that there is another enemy virtual object in an area far away from the virtual object is not excluded. The skill conversion control is triggered, so that a part of the coloration of the virtual object are switched from the second coloration to the first coloration, and a part of the appearances of the virtual object are reserved as the second coloration, to reduce the masking effect in the virtual environment, and increase the effective duration of the second coloration. Requirements for masking a virtual object in different virtual environments can be met.

[00140] An example in which the foregoing disguise skill is used in a game is used for description. The disguise skill includes an active skill and a passive skill.

[00141] •Active skill: After the disguise skill is released, a first coloration of a virtual object becomes a material (that is, a second coloration) of an under-foot contact surface of the virtual object, to hide the virtual object in a virtual environment in which the virtual object is located.

[00142] •Passive skill: An example in which a virtual prop equipped by a virtual object is a virtual shooting prop is used. A shooting velocity and a shooting range of the virtual shooting prop are increased.

[00143] A process of releasing the disguise skill is as follows: 1. Virtual energy of the disguise skill already reaches a preset threshold. 2. An action of a virtual object is in a state in which the disguise skill can be released (for example, the disguise skill cannot be released when the virtual object is climbing, wearing a wingsuit, falling down, or riding in a virtual vehicle). 3. The disguise skill is released, and the virtual object may perform actions such as moving, shooting, jumping, sprinting, and sliding tackle in a period of time in which the disguise skill is effective. 4. Effective duration of the disguise skill is T. 5. It is effective for a virtual object that is a releaser.

[00144] The disguise skill may be cancelled. A cancellation mechanism is as follows: Automatic cancellation is performed when the virtual object is hit or cut, and a special effect of restoration is played. After the virtual object rides in the virtual vehicle, the disguise skill is automatically cancelled, and the special effect of restoration is played. After the virtual object falls into the water, the disguise skill is automatically cancelled, and the special effect of restoration is played.

[00145] A case in which the disguise skill cannot be released includes: The virtual object is in a knock-down state, and the disguise skill cannot be released. The virtual object is in the virtual vehicle, and the disguise skill cannot be released. The virtual object is in a climbing state, and the disguise skill cannot be released. The virtual object is in a rescue state or a rescued state, and the disguise skill cannot be released.

[00146] Resources required for coloration switching include hidden materials (that is, second colorations) on various virtual objects, for example, hidden materials in scenes such as a lawn, a stone, and a building; a special effect used during a change of a coloration when the disguise skill is released; and a special effect of restoring an original coloration when the disguise skill disappears.

[00147] FIG. 11 is a flowchart of a release process of a disguise skill according to an exemplary embodiment of this disclosure. The method includes the following operations.

[00148] Operation 901: Wait for virtual energy of a disguise skill to reach a preset threshold. This process is pre-configured by a planner to determine duration required for the virtual energy to accumulate to reach the preset threshold. A server updates a value and then delivers the value to a client. A virtual energy bar presented as the disguise skill slowly increases, until the virtual energy bar reaches the preset threshold.

[00149] Operation 902: Click a skill release control of the disguise skill.

[00150] When the virtual energy of the disguise skill reaches the preset threshold, the skill release control of the disguise skill may be clicked, to release the disguise skill.

[00151] Operation 903: Provide a hidden material of a virtual object. After the skill is released, the virtual object obtains the hidden material, and a coloration of the virtual object is changed, to achieve a hiding effect.

[00152] Operation 904: Provide an increased shooting velocity and shooting range of the virtual object during shooting.

[00153] After the disguise skill is released, a shooting velocity and a shooting range of the virtual object during shooting will be increased. In this way, an attack power of a character is improved, and an enemy virtual object is quickly killed.

[00154] Operation 905: The disguise skill ends.

[00155] The virtual object is restored to a state before the skill is released, and restored to an original coloration of the virtual object.

[00156] FIG. 12 is a flowchart of a process of changing a coloration according to an exemplary embodiment of this disclosure. The method includes the following operations.

[00157] Operation 1001: Dynamically load various hidden material files.

[00158] A hidden material is a coloration that is made in advance by art workmates based on an object material in a virtual scene. Loading of these material files is changed to dynamic loading, so that various materials can be conveniently replaced without changing code, and only this file needs to be updated during update.

[00159] Operation 1002: Detect a material of an under-foot substance of a virtual object, and select a hidden material.

[00160] A spherical ray is extended downward through heels of the virtual object, to determine a collision point. Then, a material of the collision point is determined. The under-foot substance is determined based on the material of the collision point, and then the hidden material for the virtual object is determined based on the under-foot substance.

[00161] Operation 1003: Transmit the hidden material and effective duration to a material management system.

[00162] The material management system is a system configured to add, search, delete, replace, and present a material. After a disguise skill is triggered, a related material resource identifier and effective duration are used as parameters to be transmitted to the material management system, to implement representation of the hidden material on a character.

[00163] Operation 1004: Replace a coloration of the virtual object with the hidden material

through the material management system.

[00164] The parameters of the hidden material are transmitted to the material management system, to replace an original coloration of the virtual object with the hidden material.

[00165] Operation 1005: Play appearance and disappearance of the hidden material in a chronological order.

[00166] If play time of the hidden material in the material management system does not reach the effective duration, the hidden material is displayed on the virtual object. If the play time of the hidden material reaches the effective duration, the hidden material on the virtual object is restored to a previous original coloration, for example, a first coloration.

[00167] FIG. 13 is a flowchart of a release process of a disguise skill according to an exemplary embodiment of this disclosure. The method includes the following operations.

[00168] Operation 1101: A client receives a skill release operation of a disguise skill triggered by a user, and transmits a network request packet to a server. The network request packet includes user information, information about a virtual object, and information about the disguise skill.

[00169] The client is a client of an application that supports a virtual environment and that is run on a terminal.

[00170] Operation 1102: The server performs verification based on the information in the network request packet, and delivers, when the information is valid, a first network packet in which the disguise skill is successfully released.

[00171] Operation 1103: The server continues to deliver a second network packet, the second network packet being configured to provide a hidden material for a virtual object.

[00172] Operation 1104: The client receives the second network packet, and replaces a coloration of the virtual object with the hidden material through a material management system.

[00173] Operation 1105: The server continues to deliver a third network packet, the third network packet being configured to provide an increased shooting velocity and shooting range.

[00174] Operation 1106: The client controls the hidden virtual object to shoot, and transmits a movement packet, a prop status packet, and the like to the server.

[00175] Operation 1107: The server indicates to the client that the disguise skill ends.

[00176] Operation 1108: The client switches the hidden material of the virtual object back to

an original material (that is, a first coloration).

[00177] The following describes apparatus embodiments of this disclosure. For details not described in the apparatus embodiments, refer to corresponding descriptions in the foregoing method embodiments. Details are not described in this specification again.

[00178] FIG. 14 is a schematic structural diagram of an apparatus for controlling display of a virtual object according to an exemplary embodiment of this disclosure. The apparatus may be implemented as all or a part of a terminal through software, hardware, or a combination of software and hardware. The apparatus includes:

[00179] a display module 1201, configured to perform operation 301 in the embodiment of FIG. 3;

[00180] a receiving module 1202, configured to perform operation 302 in the embodiment of FIG. 3; and

[00181] a processing module 1203, configured to perform operation 303 in the embodiment of FIG. 3.

[00182] In some embodiments, the processing module 1203 is configured to perform operation 3031 to operation 3033 in the embodiment of FIG. 5.

[00183] In some embodiments, the processing module 1203 is configured to: determine, based on a location of the virtual object, a contact object being in contact with a body part of the virtual object in the virtual environment; and

[00184] determine a second coloration based on a coloration of the contact object.

[00185] In some embodiments, the processing module 1203 is configured to:

[00186] determine a first group of candidate objects based on the location of the virtual object, at least two candidate objects in the first group of candidate objects being in contact with at least two body parts of the virtual object in one-to-one correspondence;

[00187] calculate, for each candidate object in the first group, a contact area between the candidate object and a body part contacting the candidate object, to obtain at least two contact areas; and

[00188] determine, as the contact object, a candidate object with a largest contact area from the at least two contact areas.

[00189] In some embodiments, the processing module 1203 is configured to:

- [00190]** determine, based on the location of the virtual object, a view frustum of a camera model for viewing the virtual object, and the virtual object is included in the view frustum of the camera model;
- [00191]** determine a first group of candidate objects in the view frustum of the camera model, the first group of candidate objects including at least two candidate objects, and each candidate object being in contact with a body part of the virtual object;
- [00192]** calculate, for each candidate object in the first group, an overlapping area between projections of respective candidate object and the virtual object on an imaging plane of the camera model, to obtain at least two overlapping areas in one-to-one correspondence with the at least two candidate objects;
- [00193]** determine, as a contact object, a candidate object with a largest overlapping area from the at least two overlapping areas; and
- [00194]** determine the second coloration based on a coloration of the contact object.
- [00195]** In some embodiments, the processing module 1203 is configured to perform operation 3034 to operation 3036 in the embodiment of FIG. 10.
- [00196]** In some embodiments, the processing module 1203 is configured to: determine an overlapping object in the observation picture based on the location of the virtual object in the observation picture, the overlapping object being blocked by the virtual object in the observation picture; and determine the second coloration based on a coloration of the overlapping object.
- [00197]** In some embodiments, the processing module 1203 is configured to:
- [00198]** determine a view frustum of a camera model based on a location of the observing virtual object, the camera model being configured to viewing the observing virtual object in a follow mode, and the virtual object being included in the view frustum of the camera model;
- [00199]** determine a second group of candidate objects in the view frustum of the camera model, the second group of candidate objects including at least two candidate objects that are partially blocked by the virtual object on an imaging plane of the camera model;
- [00200]** calculate, for each candidate object in the second group, an overlapping area between projections of respective candidate object and the virtual object on the imaging plane, to obtain at least two overlapping areas in one-to-one correspondence with the at least two candidate objects;
- [00201]** determine, as an overlapping object, a candidate object with a largest overlapping area from the at least two overlapping areas; and

[00202] determine the second coloration based on a coloration of the overlapping object.

[00203] In some embodiments, the processing module 1203 is configured to: after changing the first coloration of the virtual object to the second coloration, control the virtual object to move in the virtual environment; and determine a third coloration of the virtual object based on a location to which the virtual object moves; and

[00204] change the second coloration of the virtual object to the third coloration.

[00205] In some embodiments, the processing module 1203 is configured to: before changing the first coloration of the virtual object to the second coloration, display a transition animation when a coloration of the virtual object changes.

[00206] In some embodiments, the processing module 1203 is configured to: after changing the first coloration of the virtual object to the second coloration, change the second coloration of the virtual object to the first coloration when a release duration of the disguise skill reaches a duration threshold, the release duration being a duration of the virtual object wearing the second coloration, starting from a moment at which the first coloration of the virtual object is changed to the second coloration.

[00207] In some embodiments, the processing module 1203 is configured to: after changing the first coloration of the virtual object to the second coloration, change the second coloration of the virtual object to the first coloration when the virtual object is attacked by an enemy virtual object.

[00208] In some embodiments, the processing module 1203 is configured to: after changing the first coloration of the virtual object to the second coloration, change the second coloration of the virtual object to the first coloration when the virtual object performs a first-type action.

[00209] Alternatively, the processing module 1203 is configured to: after changing the first coloration of the virtual object to the second coloration, enhance a release effect of a second-type action when the virtual object performs the second-type action, the second-type action and the first-type action being different types of actions.

[00210] In some embodiments, the virtual object is equipped with a virtual prop.

[00211] The processing module 1203 is configured to change a fourth coloration of the virtual prop to the first coloration.

[00212] In some embodiments, the processing module 1203 is configured to: perform, when a state of the virtual object meets a skill release condition, the operation of changing a first coloration of the virtual object to a second coloration in response to the skill release operation.

[00213] In some embodiments, the processing module 1203 is configured to: skip execution of the disguise skill when a state of the virtual object meets a kill inhibit condition, the kill inhibit condition including at least one of the following: the virtual object being knocked down, the virtual object climbing, the virtual object rescuing or being rescued, the virtual object driving, or the virtual object riding in a virtual vehicle.

[00214] FIG. 15 is a structural block diagram of a computer device 1900 according to an exemplary embodiment of this disclosure. The computer device 1900 may be a portable mobile terminal, for example, a smartphone, a tablet computer, a moving picture experts group audio layer III (MP3) player, or a moving picture experts group audio layer IV (MP4) player. The computer device 1900 may also be referred to as user equipment, a portable terminal, or other names.

[00215] The computer device 1900 includes a processor 1901 and a memory 1902. The processor 1901 may include one or more processing cores, for example, a 4-core processor or an 8-core processor. The processor 1901 may be implemented by at least one hardware form in a digital signal processor (DSP), a field programmable gate array (FPGA), and a programmable logic array (PLA). The processor 1901 may alternatively include a main processor and a coprocessor. The main processor is a processor configured to process data in a wake-up state, and is also referred to as a central processing unit (CPU). The coprocessor is a low power processor configured to process data in a standby state. In some embodiments, the processor 1901 may have a graphics processing unit (GPU) integrated therein. The GPU is configured to render and draw content that needs to be displayed on a display. In some embodiments, the processor 1901 may further include an artificial intelligence (AI) processor. The AI processor is configured to process a computing operation related to machine learning.

[00216] The memory 1902 may include one or more computer-readable storage media. The computer-readable storage media may be volatile and non-volatile. The memory 1902 may further include a high-speed random access memory and a non-volatile memory, for example, one or more disk storage devices and flash storage devices. In some embodiments, the non-transient computer-readable storage medium in the memory 1902 is configured to store at least one instruction. The at least one instruction is executed by the processor 1901 to perform the method for controlling display of a virtual object provided in this disclosure.

[00217] In some embodiments, the computer device 1900 may further include: a peripheral device interface 1903 and at least one peripheral device. For example, the peripheral device includes at least one of a radio frequency (RF) circuit 1904, a touch display screen 1905, a camera assembly 1906, an audio circuit 1907, and a power supply 1909.

[00218] The peripheral device interface 1903 may be configured to connect at least one peripheral device related to input/output (I/O) to the processor 1901 and the memory 1902. In some embodiments, the processor 1901, the memory 1902, and the peripheral device interface 1903 are integrated on the same chip or circuit board. In some other embodiments, any one or two of the processor 1901, the memory 1902, and the peripheral device interface 1903 may be implemented on a single chip or circuit board. This is not limited in this embodiment.

[00219] The radio frequency circuit 1904 is configured to receive and transmit a radio frequency (RF) signal, also referred to as an electromagnetic signal. The radio frequency circuit 1904 communicates with a communication network and another communication device by using the electromagnetic signal. The touch display screen 1905 is configured to display a user interface (UI). The UI may include a graph, a text, an icon, a video, or any combination thereof. The camera assembly 1906 is configured to capture an image or a video. In some embodiments, the camera assembly 1906 includes a front-facing camera and a rear-facing camera. The audio circuit 1907 is configured to provide an audio interface between a user and the computer device 1900. The audio circuit 1907 may include a microphone and a speaker. The microphone is configured to acquire sound waves of a user and an environment, and convert the sound waves into an electrical signal to input to the processor 1901 for processing, or input to the radio frequency circuit 1904 for implementing voice communication. The power supply 1909 is configured to supply power to components in the computer device 1900. The power supply 1909 may be an alternating current power supply, a direct current power supply, a disposable battery, or a rechargeable battery. When the power supply 1909 includes a rechargeable battery, the rechargeable battery may be a wired rechargeable battery or a wireless rechargeable battery.

[00220] In some embodiments, the computer device 1900 further includes one or more sensors 1910. The one or more sensors 1910 include, but are not limited to, an acceleration sensor 1911, a gyroscope sensor 1912, a pressure sensor 1913, an optical sensor 1915, and a proximity sensor 1916. The acceleration sensor 1911 may detect a magnitude of acceleration on three coordinate axes of a coordinate system established with the computer device 1900. The gyroscope sensor 1912 may detect a body direction and a rotation angle of the computer device 1900. The gyroscope sensor 1912 may cooperate with the acceleration sensor 1911 to acquire a 3D action by the user on the computer device 1900. The pressure sensor 1913 may be disposed at a side frame of the computer device 1900 and/or a lower layer of the touch display screen 1905. The pressure sensor detects a signal of holding the computer device 1900 by the user, and/or controls an operable control on the UI based on a pressure operation of the user on the touch display screen 1905. The optical sensor 1915 is configured to acquire an ambient light intensity. The proximity sensor 1916,

also referred to as a distance sensor, is disposed on a front surface of the computer device 1900. The proximity sensor 1916 is configured to acquire a distance between the user and the front surface of the computer device 1900.

[00221] A person skilled in the art should understand that, the structure shown in FIG. 15 does not constitute a limitation on the computer device 1900, and may include more or fewer components than these shown in the figure, or combine some components, or use different component arrangements.

[00222] This disclosure further provides a computer device. The computer device includes a processor and a memory. The memory stores at least one program. The at least one program is loaded and executed by the processor to implement the method for controlling display of a virtual object provided in the foregoing method embodiments.

[00223] This disclosure further provides a computer-readable storage medium. The storage medium stores at least one program. The at least one program is loaded and executed by a processor to implement the method for controlling display of a virtual object provided in the foregoing method embodiments.

[00224] This disclosure further provides a computer program product. When the computer program product runs on a computer, the computer is enabled to perform the method for controlling display of a virtual object provided in the foregoing method embodiments.

CLAIMS

What is claimed is:

1. A method for controlling display of a virtual object, performed by a terminal and comprising:

displaying the virtual object in a virtual environment, the virtual object having a disguise skill;
receiving a skill release operation to release the disguise skill; and

changing a first coloration of the virtual object to a second coloration in response to the skill release operation, the second coloration being determined based on a coloration in the virtual environment at a location of the virtual object.

2. The method according to claim 1, wherein the changing the first coloration of the virtual object to the second coloration in response to the skill release operation comprises:

determining the location of the virtual object in the virtual environment in response to the skill release operation;

determining the second coloration based on a coloration of an environmental object in the virtual environment at the location of the virtual object in the virtual environment; and

replacing the first coloration of the virtual object with the second coloration.

3. The method according to claim 2, wherein the determining the second coloration based on the coloration of the environmental object in the virtual environment at the location of the virtual object in the virtual environment comprises:

determining the environmental object in the virtual environment based on the location of the virtual object, the environmental object being in contact with the virtual object; and

determining the second coloration based on the coloration of the environmental object.

4. The method according to claim 3, wherein the determining the environmental object in the virtual environment based on the location of the virtual object comprises:

determining a first group of candidate objects based on the location of the virtual object, at least two candidate objects in the first group of candidate objects being in contact with at least two body parts of the virtual object in one-to-one correspondence;

calculating, for each candidate object in the first group, a contact area between the candidate object and a body part contacting the candidate object, to obtain at least two contact areas; and

determining a candidate object with a largest contact area from the first group of candidate

objects as the environmental object.

5. The method according to claim 2, wherein determining the second coloration based on the coloration of the environmental object in the virtual environment at the location of the virtual object in the virtual environment comprises:

determining, based on the location of the virtual object, a view frustum of a virtual camera for viewing the virtual object, the virtual object being included in the view frustum of the virtual camera;

determining a first group of candidate objects in the view frustum, the first group of candidate objects including at least two candidate objects, and each candidate object being in contact with the virtual object;

calculating, for each candidate object in the first group, an overlapping area between projections of respective candidate object and the virtual object on an imaging plane of the virtual camera, to obtain at least two overlapping areas;

determining, as the environmental object, a candidate object with a largest overlapping area from the first group of candidate objects; and

determining the second coloration based on a coloration of the environmental object.

6. The method according to claim 1, wherein the changing the first coloration of the virtual object to the second coloration in response to the skill release operation comprises:

determining a location of the virtual object in an observation picture in response to the skill release operation, the observation picture being generated from a view perspective of an observing virtual object in the virtual environment;

determining the second coloration based on a coloration of peripheral environment at the location of the virtual object in the observation picture; and

replacing the first coloration of the virtual object with the second coloration.

7. The method according to claim 6, wherein the determining the second coloration based on the coloration of the peripheral environment at the location of the virtual object in the observation picture comprises:

determining an overlapping object in the observation picture based on the location of the virtual object in the observation picture, the overlapping object being partially blocked by the virtual object in the observation picture; and

determining the second coloration based on a coloration of the overlapping object.

8. The method according to claim 6, wherein the determining the second coloration based on the coloration of the peripheral environment at the location of the virtual object in the observation picture comprises:

determining, based on a location of the observing virtual object, a view frustum of a virtual camera for viewing the observing virtual object, the virtual object being included in the view frustum of the virtual camera;

determining a second group of candidate objects in the view frustum of the virtual camera, the second group of candidate objects including at least two candidate objects that are partially blocked by the virtual object on an imaging plane of the virtual camera;

calculating, for each candidate object in the second group, an overlapping area between projections of respective candidate object and the virtual object on the imaging plane of the virtual camera, to obtain at least two overlapping areas;

determining, as an overlapping object, a candidate object with a largest overlapping area from the second group of candidate objects; and

determining the second coloration based on a coloration of the overlapping object.

9. The method according to any one of claims 1 to 8, after changing the first coloration of the virtual object to the second coloration, further comprising:

controlling the virtual object to move in the virtual environment;

determining a third coloration of the virtual object based on a location to which the virtual object moves; and

changing the second coloration of the virtual object with the third coloration.

10. The method according to any one of claims 1 to 8, before changing the first coloration of the virtual object to the second coloration, further comprising:

displaying a transition animation when a coloration of the virtual object changes.

11. The method according to any one of claims 1 to 8, after changing the first coloration of the virtual object to the second coloration, further comprising:

changing the second coloration of the virtual object to the first coloration when a release duration of the disguise skill reaches a duration threshold, the release duration being a duration of the virtual object wearing the second coloration, starting from a moment at which the first

coloration of the virtual object is changed to the second coloration.

12. The method according to any one of claims 1 to 8, after changing the first coloration of the virtual object to the second coloration, further comprising:

changing the second coloration of the virtual object to the first coloration when the virtual object is attacked by another virtual object.

13. The method according to any one of claims 1 to 8, after changing the first coloration of the virtual object to the second coloration, further comprising:

changing the second coloration of the virtual object to the first coloration when the virtual object performs a first-type action; or

enhancing an effect of a second-type action when the virtual object performs the second-type action, the second-type action and the first-type action being different types of actions.

14. The method according to any one of claims 1 to 8, wherein the virtual object is equipped with a virtual prop; and the method further comprises:

changing a coloration of the virtual prop to the first coloration.

15. The method according to any one of claims 1 to 8, wherein changing the first coloration of the virtual object to the second coloration in response to the skill release operation comprises:

changing the first coloration of the virtual object to the second coloration in response to the skill release operation when a state of the virtual object meets a skill release condition.

16. The method according to any one of claims 1 to 8, further comprising:

skipping execution of the disguise skill when a state of the virtual object meets a skill inhibit condition,

wherein the skill inhibit condition includes at least one of: the virtual object being knocked down, the virtual object climbing, the virtual object rescuing or being rescued, the virtual object driving, or the virtual object riding in a virtual vehicle.

17. An apparatus for controlling display of a virtual object, the apparatus comprising:

a display module, configured to display the virtual object in a virtual environment, the virtual object having a disguise skill;

a receiving module, configured to receive a skill release operation to release the disguise skill;
and

a processing module, configured to change a first coloration of the virtual object to a second

coloration in response to the skill release operation, the second coloration being determined based on a coloration in the virtual environment at a location of the virtual object.

18. A computer device, the computer device comprising a processor and a memory, the memory storing at least one program, and the at least one program being loaded and executed by the processor to implement the method according to any one of claims 1 to 16.

19. A computer-readable storage medium storing at least one program, and the at least one program being loaded and executed by a processor to implement the method according to any one of claims 1 to 16.

20. A computer program product, comprising computer instructions, the computer instructions being stored in a computer-readable storage medium, a processor of a computer device reading the computer instructions from the computer-readable storage medium, and the processor, when executing the computer instructions, implementing the method according to any one of claims 1 to 16.