

METHOD, APPARATUS, DEVICE, AND STORAGE MEDIUM FOR CREATING VIRTUAL OBJECT

[0001] This application claims priority to Chinese Patent Application No. 202410390731.5, filed on April 01, 2024, and entitled "METHOD, APPARATUS, DEVICE, AND STORAGE MEDIUM FOR CREATING VIRTUAL OBJECT," which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] Example embodiments of the present disclosure generally relate to the field of computers, and in particular, to a method, an apparatus, a device, and a computer-readable storage medium for creating a virtual object.

BACKGROUND

[0003] With the development of computer technologies, the Internet has become an important platform for people to exchange information. Some platforms also support users in creating corresponding virtual objects (e.g., virtual avatars), thus support the use of such virtual objects in specific scenarios to improve the efficiency of information processing or enrich the experience of user interaction. For example, a user may configure a virtual object for live streaming.

SUMMARY

[0004] In a first aspect of the present disclosure, a method of creating a virtual object is provided. The method includes: presenting a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface including a capturing component; obtaining a set of consecutive pictures of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures; and creating the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.

[0005] In a second aspect of the present disclosure, an apparatus for creating a virtual object is provided. The apparatus includes: a presenting module configured to present a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface including a capturing component; an obtaining module configured to obtain a set of consecutive picture of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures; and a creating module configured to create the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.

[0006] In a third aspect of the present disclosure, an electronic device is provided. The device includes at least one processing unit; and at least one memory coupled to the at least one processing unit and storing instructions executable by the at least one processing unit, the instructions, when executed by the at least one processing unit, causing the device to perform the method of the first aspect.

[0007] In a fourth aspect of the present disclosure, a computer-readable storage medium is provided. The computer-readable storage medium has a computer program stored thereon which is executable by a processor

to implement the method of the first aspect.

[0008] It would be appreciated that the content described in the Summary section of the present disclosure is neither intended to identify key or essential features of the embodiments of the present disclosure, nor is it intended to limit the scope of the present disclosure. Other features of the present disclosure will be readily envisaged through the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The above and other features, advantages, and aspects of the embodiments of the present disclosure will become more apparent in combination with the drawings and with reference to the following detailed description. In the drawings, the same or similar reference symbols refer to the same or similar elements, where:

[0010] Fig. 1 illustrates a schematic diagram of an example environment in which the embodiments according to the present disclosure may be implemented;

[0011] Fig. 2A to Fig. 2F illustrate example interfaces according to some embodiments of the present disclosure;

[0012] Fig. 3 illustrates a flowchart of an example process of creating a virtual object according to some embodiments of the present disclosure;

[0013] Fig. 4 illustrates a schematic structural block diagram of an example apparatus for creating a virtual object according to some embodiments of the present disclosure; and

[0014] Fig. 5 illustrates a block diagram of an electronic device capable of implementing multiple embodiments of the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

[0015] The embodiments of the present disclosure will be described in more detail below with reference to the drawings. Although some embodiments of the present disclosure are shown in the drawings, it would be appreciated that the present disclosure may be implemented in various forms, and should not be interpreted as limited to the embodiments set forth herein. Instead, these embodiments are provided for a more thorough and complete understanding of the present disclosure. It would be appreciated that the drawings and embodiments of the present disclosure are only for illustrative purposes, and are not intended to limit the scope of protection of the present disclosure.

[0016] It should be noted that the titles of any section/subsection provided herein are not restrictive. Various embodiments are described throughout this specification, and any type of embodiment may be included under any section/subsection. Furthermore, the embodiments described in any section/subsection may be combined with any other embodiments described in the same section/subsection and/or different section/subsection in any manner.

[0017] In the description of the embodiments of the present disclosure, the term "include/comprise" and similar terms should be understood as open-ended inclusions, that is, "include/comprise but not limited to". The term "based on" should be understood as "at least partially based on". The term "an embodiment" or "the embodiment" should be understood as "at least one embodiment". The term "some embodiments" should be understood as "at least some embodiments". Other definitions, either explicit or implicit, may also be included below. The terms "first", "second", etc. may refer to different or same objects. Other definitions, either explicit or implicit, may

also be included below.

[0018] The embodiments of the present disclosure may involve user's data, acquisition and/or use of data, etc. These aspects all comply with the corresponding laws, regulations, and related provisions. In the embodiments of the present disclosure, all data collection, acquisition, processing, machining, forwarding, use, etc. are carried out on the premise that the user is aware of and confirms. Accordingly, when implementing the various embodiments of the present disclosure, the user should be informed of the type, scope of use, use scenarios, etc. of data or information that may be involved in an appropriate manner according to relevant laws and regulations, and the authorization of the user should be obtained. The specific manner of informing and/or authorizing may vary according to the actual situation and application scenarios, and the scope of the present disclosure is not limited in this regard.

[0019] The solutions in the specification and embodiments, if involving personal information processing, will all be processed on the premise that there is a legal basis (for example, the consent of the personal information subject is obtained, or it is necessary to perform a contract, etc.), and will only be processed within the scope of regulations or agreements. If a user refuses to process personal information other than the necessary information required for the basic functions, it will not affect the user's use of the basic functions.

[0020] Some platforms also support users in creating corresponding virtual objects (e.g., virtual avatars), thus support the use of such virtual objects in specific scenarios to improve the efficiency of information processing or enrich the experience of user interaction. In the interaction with a virtual object, the visual image of the virtual object is one of the important factors that affect the user's interaction experience and interaction efficiency. For example, people may expect to interact with a more realistic visual image to improve the sense of realism in interaction.

[0021] The embodiments of the present disclosure propose a solution for creating a virtual object. According to this solution, a configuration interface may be presented in response to a request to create a virtual object associated with a user, where the configuration interface includes a capturing component. Furthermore, a set of consecutive pictures of the user may be obtained in real-time via the capturing component to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures. Accordingly, the virtual object associated with the user may be created, the virtual object having a visual image generated based on the plurality of images.

[0022] Based on the method of this embodiment, the user needs not to upload a plurality of facial images with different angles or capture multiple times to obtain the facial images with different angles, but only needs to trigger once to start real-time acquisition of consecutive pictures, so as to obtain the plurality of images associated with the plurality of preset angles required for generating the visual image of the virtual object. In this way, the embodiments of the present disclosure may more efficiently set the visual image of the virtual object by means of video recording, and enable the visual image to better match the user's image, thereby improving the sense of realism in interaction.

[0023] Various example implementations of this solution will be described in detail below in further conjunction with the drawings.

EXAMPLE ENVIRONMENT

[0024] Fig. 1 illustrates a schematic diagram of an example environment 100 in which the embodiments of the present disclosure may be implemented. As shown in Fig. 1, the example environment 100 may include an electronic device 110.

[0025] In the example environment 100, an application 120 supporting interface interaction may be run on the electronic device 110. The application 120 may be any appropriate type of application for interface interaction, examples of which may include, but are not limited to, a video application, a social application, or other appropriate applications. A user 140 may interact with the application 120 via the electronic device 110 and/or its attached devices.

[0026] In the environment 100 of Fig. 1, if the application 120 is active, the electronic device 110 may present an interface 150 for supporting interface interaction through the application 120.

[0027] In some embodiments, the electronic device 110 communicates with a server 130 to implement the provision of services for the application 120. The electronic device 110 may be any type of mobile terminal, fixed terminal, or portable terminal, including a mobile phone, a desktop computer, a laptop computer, a notebook computer, a netbook computer, a tablet computer, a media computer, a multimedia tablet, a palmtop computer, a portable game terminal, a VR/AR device, a personal communication system (PCS) device, a personal navigation device, a personal digital assistant (PDA), an audio/video player, a digital camera/video camera, a positioning device, a television receiver, a radio broadcast receiver, an e-book device, a gaming device, or any combination of the foregoing, including the accessories and peripherals of these devices or any combination thereof. In some embodiments, the electronic device 110 may also support any type of user-specific interface (such as "wearable" circuitry, etc.).

[0028] The server 130 may be an independent physical server, a server cluster or distributed system composed of multiple physical servers, or a cloud server that provides basic cloud computing services such as cloud services, cloud databases, cloud computing, cloud functions, cloud storage, network services, cloud communications, middleware services, domain name services, security services, content delivery networks, and big data and artificial intelligence platforms. The server 130 may include, for example, a computing system/server, such as a mainframe, an edge computing node, a computing device in a cloud environment, and so on. The server 130 may provide background services for the application 120 supporting virtual scenes in the electronic device 110.

[0029] A communication connection may be established between the server 130 and the electronic device 110. The communication connection may be established by wired or wireless means. The communication connection may include, but is not limited to, a Bluetooth connection, a mobile network connection, a universal serial bus (USB) connection, a Wireless Fidelity (WiFi) connection, etc., and the embodiments of the present disclosure are not limited in this regard. In the embodiments of the present disclosure, the server 130 and the electronic device 110 may implement signaling interaction through the communication connection therebetween.

[0030] It would be appreciated that the structures and functions of the various elements in the environment 100 are described for illustrative purposes only, without suggesting any limitation to the scope of the present disclosure.

[0031] Some example embodiments of the present disclosure will be described below with continued reference to the drawings.

EXAMPLE INTERACTION

[0032] The interaction process of creating a virtual object according to the embodiments of the present disclosure will be described below with reference to Fig. 2A to Fig. 2F. Fig. 2A to Fig. 2F illustrate example interfaces 200A to 200F according to some embodiments of the present disclosure. The interfaces 200A to 200F may be provided, for example, by the electronic device 110 as shown in Fig. 1. The interfaces 200A to 200F will be described below with reference to Fig. 1.

[0033] In some embodiments, the electronic device 110 may present the configuration interface 200A based on, for example, a request of the user to create a virtual object associated therewith. Such a configuration interface 200A may be used, for example, to set the visual image of the virtual object. In some scenarios, such a virtual object may also be referred to as a digital avatar, a virtual avatar, etc.

[0034] As shown in Fig. 2A, the configuration interface 200A may include a capturing component 205, such as a viewfinder. The capturing component 205 may present a real-time picture captured by a camera of the electronic device 110.

[0035] Furthermore, the electronic device 110 may also present guidance information 210 in the configuration interface 200A to support the user in placing a specified part (for example, a panel) in the viewfinder.

[0036] Alternatively, the electronic device 110 may also provide an uploading entry 215 to support the user in uploading pictures, videos, or models to set a corresponding visual image.

[0037] Furthermore, as shown in Fig. 2B, the capturing component 205 may present consecutive pictures 220 of the user. After detecting that the specified part by the user appears in the capturing component 205, the electronic device 110 may update the guidance information 210 to guide the acquisition of images corresponding to specific angles.

[0038] Taking Fig. 2B as an example, the electronic device 110 may present the text "turn head to the left", to guide the user to acquire images corresponding to a specific angle by turning the head. In some embodiments, the electronic device 110 may also, for example, present a guiding element corresponding to this orientation in the capturing component 205, or provide voice information to guide the user to adjust the head toward a predetermined angle, as guidance information for the user.

[0039] In some embodiments, the electronic device 110 may also present a progress prompt element 225 associated with the capturing component 205. Furthermore, after the electronic device 110 obtains image content corresponding to the specific angle from the consecutive pictures 220 of the user, the electronic device 110 may update the progress prompt element 225 to indicate that the image corresponding to the specific angle has been obtained.

[0040] As an example, the electronic device 110 may fill in the part corresponding to the specific angle in the progress prompt element 225 to remind the user that the image acquisition of the specific angle has been completed, for example.

[0041] Furthermore, the electronic device 110 may obtain images corresponding to a plurality of preset angles through the consecutive pictures 220 in the capturing component 205. For example, as shown in Fig. 2C, the electronic device 110 may further guide the user to adjust the posture to obtain images corresponding to another preset angle.

[0042] Accordingly, when guiding to obtain the image of another preset angle, the electronic device 110 may

update the guidance information 210 to instruct the user to adjust the posture. Additionally, after obtaining the image of another preset angle via the consecutive pictures 220, the electronic device 110 may also update the progress prompt element 225.

[0043] Furthermore, after obtaining images of a plurality of preset angles via the consecutive pictures 220, the electronic device 110 may update the progress prompt element 225 to indicate that all image acquisition is completed. Accordingly, the electronic device 110 may present the interface as shown in Fig. 2D, and may present status information 230 to indicate that the image acquisition has been completed and the corresponding visual image is being generated.

[0044] In some embodiments, after detecting that the images of the plurality of preset angles have all been acquired, the electronic device 110 may further provide a confirmation interface and present the acquired images with the plurality of preset angles in the confirmation interface. In some embodiments, the electronic device 110 may also provide a re-acquisition entry in the confirmation interface. Furthermore, the electronic device 110 may obtain a new set of consecutive pictures of the user in real-time via the capturing component based on the selection of the re-acquisition entry, to replace at least one of the images of the plurality of preset angles.

[0045] As shown in Fig. 2D, the electronic device 110 may further provide an audio configuration entry 235 to support the user in further configuring audio information of the virtual object. Alternatively, the user may choose not to perform audio configuration, for example, to create the virtual object using preset audio information.

[0046] In some embodiments, after receiving the selection of the audio configuration entry 235, the electronic device 110 may provide the configuration interface 200E as shown in Fig. 2E, and use the configuration interface 200E to obtain audio content of the user.

[0047] Specifically, the electronic device 110 may display target text in the configuration interface 200E, for example, and may provide an audio control 245 for audio recording. As an example, after receiving the selection of the audio control 245, the electronic device 110 may obtain the audio content of the user. The audio content may include, for example, audio of the user reading the target text 240.

[0048] Furthermore, the electronic device 110 may determine at least one audio attribute of the virtual object based on the obtained audio content. As an example, the electronic device 110 and/or the server 130 may determine a timbre attribute of the virtual object by means of, for example, timbre cloning, etc., to cause the virtual object to have a timbre corresponding to the audio content. In some examples, such audio attributes may also include, for example, speech speed, rhythm, etc.

[0049] Furthermore, after completing the acquisition of the audio content, the electronic device 110 may present the preview interface 200F as shown in Fig. 2F. As shown in Fig. 2F, the electronic device 110 may present a visual image 250 generated based on the plurality of acquired images.

[0050] It would be appreciated that the visual image 250 may be generated by the electronic device 110 and/or the server 130 based on any appropriate technology (for example, 3D image synthesis). The present disclosure is not intended to limit the process of how to use images of a plurality of angles to generate the visual image 250.

[0051] Additionally, the electronic device 110 may further provide an entry 255 for re-recording the audio content and an entry 260 for deleting the timbre.

[0052] Additionally, the electronic device 110 may further provide a permission setting control 265 in the interface 200F. The electronic device 110 may use this permission setting control to obtain permission

information associated with the virtual object. The permission information may indicate, for example, at least one user who is allowed to use the virtual object.

[0053] For example, the user may use the permission setting control to set the virtual object to be available only to the user, or to be available to other specific users, and the like.

[0054] Furthermore, the electronic device 110 may create a corresponding virtual object according to the visual image 250 and/or the audio content accordingly based on the user's selection of the creation entry 270.

[0055] In this way, the embodiments of the present disclosure may more efficiently set the visual image of the virtual object by means of video recording, thereby ensuring the smoothness of user interaction. In addition, the embodiments of the present disclosure may also enable the visual image to better match the user's image, thereby improving the sense of realism in interaction.

EXAMPLE PROCESS

[0056] Fig. 3 illustrates a flowchart of an example process 300 of creating a virtual object according to some embodiments of the present disclosure. The process 300 may be implemented at the electronic device 110. The process 300 will be described below with reference to Fig. 1.

[0057] As shown in the figure, at block 310, the electronic device 110 presents a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface including a capturing component.

[0058] At block 320, the electronic device 110 obtains a set of consecutive pictures of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures.

[0059] At block 330, the electronic device 110 creates the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.

[0060] In some embodiments, obtaining the set of consecutive pictures of the user in real-time via the capturing component includes: presenting a real-time picture of the user with the capturing component in response to the request to create the virtual object; obtaining the plurality of images associated with the plurality of preset angles based on a change of the real-time picture; and stopping presenting the real-time picture of the user in the capturing component in response to obtaining the plurality of images.

[0061] In some embodiments, the process 300 further includes: presenting a progress prompt element associated with the capturing component; and updating the progress prompt element in response to obtaining a target image associated with a target preset angle from the set of consecutive pictures.

[0062] In some embodiments, the process 300 further includes: providing guidance information to the user, the guidance information being configured to guide an acquisition of an image corresponding to a respective preset angle.

[0063] In some embodiments, the guidance information includes at least one of: a guiding element in the capturing component to adjust an orientation of the user; text information in the configuration interface to adjust the orientation of the user; voice information to adjust the orientation of the user.

[0064] In some embodiments, the process 300 further includes: obtaining audio content of the user via the configuration interface; and determining at least one audio attribute of the virtual object based on the audio

content.

[0065] In some embodiments, obtaining the audio content of the user via the configuration interface includes: presenting target text in the configuration interface; and obtaining the audio content of the user based on a selection of an audio control in the configuration interface, the audio content corresponding to the target text.

[0066] In some embodiments, obtaining the audio content of the user via the configuration interface includes: providing an audio configuration entry in the configuration interface in response to a completed acquisition of the plurality of images; and obtaining the audio content of the user via the configuration interface based on a selection of the audio entry.

[0067] In some embodiments, the at least one audio attribute includes a timbre attribute.

[0068] In some embodiments, creating the virtual object associated with the user includes: presenting a preview interface displaying the visual image; and creating, based on a selection of a creation entry in the preview interface, the virtual object according to the visual image.

[0069] In some embodiments, the process 300 further includes: obtaining, via a permission setting control in the preview interface, permission information associated with the virtual object, the permission information indicating at least one user allowed to use the virtual object.

[0070] In some embodiments, the set of consecutive pictures is a first set of consecutive pictures, and the process 300 further includes: providing a re-acquisition entry in response to obtaining the plurality of images associated with the plurality of preset angles; and obtaining a second set of consecutive pictures of the user in real-time via the capturing component based on a selection of the re-acquisition entry to replace at least one of the plurality of images.

EXAMPLE APPARATUS AND DEVICE

[0071] The embodiments of the present disclosure further provide a corresponding apparatus for implementing the above method or process. Fig. 4 illustrates a schematic structural block diagram of an example apparatus 400 for creating a virtual object according to some embodiments of the present disclosure. The apparatus 400 may be implemented as or included in the electronic device 110. Each module/component in the apparatus 400 may be implemented by hardware, software, firmware, or any combination thereof.

[0072] As shown in Fig. 4, the apparatus 400 includes a presenting module 410 configured to present a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface including a capturing component; an obtaining module 420 configured to obtain a set of consecutive pictures of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures; and a creating module 430 configured to create the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.

[0073] In some embodiments, the obtaining module 420 is further configured to: present a real-time picture of the user with the capturing component in response to the request to create the virtual object; obtain the plurality of images associated with the plurality of preset angles based on a change of the real-time picture; and stop presenting the real-time picture of the user in the capturing component in response to obtaining the plurality of images.

[0074] In some embodiments, the apparatus 400 further includes a progress prompt module configured to: present a progress prompt element associated with the capturing component; and update the progress prompt element in response to obtaining a target image associated with a target preset angle from the set of consecutive pictures.

[0075] In some embodiments, the apparatus 400 further includes an acquisition prompt module configured to: provide guidance information to the user, the guidance information being configured to guide an acquisition of an image corresponding to a respective preset angle.

[0076] In some embodiments, the guidance information includes at least one of: a guiding element in the capturing component to adjust an orientation of the user; text information in the configuration interface to adjust the orientation of the user; voice information to adjust the orientation of the user.

[0077] In some embodiments, the apparatus 400 further includes an audio acquisition module configured to: obtain audio content of the user via the configuration interface; and determine at least one audio attribute of the virtual object based on the audio content.

[0078] In some embodiments, the audio acquisition module is further configured to: present target text in the configuration interface; and obtain the audio content of the user based on a selection of an audio control in the configuration interface, the audio content corresponding to the target text.

[0079] In some embodiments, the audio acquisition module is further configured to: provide an audio configuration entry in the configuration interface in response to a completed acquisition of the plurality of images; and obtain the audio content of the user via the configuration interface based on a selection of the audio entry.

[0080] In some embodiments, the at least one audio attribute includes a timbre attribute.

[0081] In some embodiments, the creating module 430 is further configured to: present a preview interface displaying the visual image; and create, based on a selection of a creation entry in the preview interface, the virtual object according to the visual image.

[0082] In some embodiments, the creating module 430 is further configured to: obtain, via a permission setting control in the preview interface, permission information associated with the virtual object, the permission information indicating at least one user allowed to use the virtual object.

[0083] In some embodiments, the set of consecutive pictures is a first set of consecutive pictures, and the apparatus 400 further includes a re-acquisition module configured to: provide a re-acquisition entry in response to obtaining the plurality of images associated with the plurality of preset angles; and obtain a second set of consecutive pictures of the user in real-time via the capturing component based on a selection of the re-acquisition entry to replace at least one of the plurality of images.

[0084] Fig. 5 illustrates a block diagram of an electronic device 500 in which one or more embodiments of the present disclosure may be implemented. It would be appreciated that the electronic device 500 shown in Fig. 5 is merely illustrative, without suggesting any limitation to the functionalities and scope of the embodiments described herein. The electronic device 500 shown in Fig. 5 may be used to implement the electronic device 110 in Fig. 1.

[0085] As shown in Fig. 5, the electronic device 500 is in the form of a general-purpose electronic device. The components of the electronic device 500 may include, but are not limited to, one or more processors or processing units 510, a memory 520, a storage device 530, one or more communication units 540, one or more input devices

550, and one or more output devices 560. The processing unit 510 may be an actual or virtual processor and may perform various processes based on the programs stored in the memory 520. In a multi-processor system, a plurality of processing units execute computer executable instructions in parallel to improve the parallel processing capability of the electronic device 500.

[0086] The electronic device 500 typically includes a plurality of computer storage medium. Such medium may be any available medium that is accessible to the electronic device 500, including, but not limited to, volatile and non-volatile medium, removable and non-removable medium. The memory 520 may be volatile memory (for example, a register, cache, Random Access Memory (RAM)), a non-volatile memory (such as a Read-Only Memory (ROM), Electrically Erasable Programmable Read-Only Memory (EEPROM), a flash memory), or any combination thereof. The storage device 530 may be any removable or non-removable medium, and may include a machine-readable medium such as a flash drive, a disk, or any other medium, which may be used to store information and/or data and may be accessed within the electronic device 500.

[0087] The electronic device 500 may further include additional removable/non-removable, volatile/non-volatile memory medium. Although not shown in Fig. 5, it is possible to provide a disk driver for reading from or writing to a removable, non-volatile disk (such as a "floppy disk"), and an optical disk driver for reading from or writing to a removable, non-volatile optical disk. In these cases, each driver may be connected to the bus (not shown) via one or more data medium interfaces. The memory 520 may include a computer program product 525 having one or more program modules configured to perform various methods or acts of the various embodiments of the present disclosure.

[0088] The communication unit 540 implements communication with other electronic devices through the communication medium. Additionally, the functions of the components of the electronic device 500 may be implemented by a single computing cluster or a plurality of computing machines, which may communicate through communication connections. Therefore, the electronic device 500 may use a logical connection with one or more other servers, a network personal computer (PC), or another network node to operate in a networked environment.

[0089] The input device 550 may be one or more input devices, such as a mouse, a keyboard, a tracking ball, etc. The output device 560 may be one or more output devices, such as a display, a speaker, a printer, etc. The electronic device 500 may further communicate with one or more external devices (not shown) such as a storage device, a display device, etc., with one or more devices that enable the user to interact with the electronic device 500, or any device (e.g., a network card, a modem, etc.) that enables the electronic device 500 to communicate with one or more other electronic devices, as needed, via the communication unit 540. Such communication may be performed via input/output (I/O) interfaces (not shown).

[0090] According to an exemplary implementation of the present disclosure, there is provided a computer-readable storage medium having computer executable instructions stored thereon, where the computer executable instructions are executed by a processor to implement the method described above. According to an exemplary implementation of the present disclosure, there is further provided a computer program product tangibly stored on a non-transitory computer-readable medium and including computer executable instructions, the computer executable instructions being executed by a processor to implement the method described above.

[0091] Various aspects of the present disclosure are described herein with reference to the flowcharts and/or

block diagrams of the method, apparatus, device, and computer program product implemented according to the present disclosure. It would be appreciated that each block of the flowchart and/or block diagram, and any combination of blocks in the flowchart and/or block diagram, may be implemented by computer-readable program instructions.

[0092] These computer-readable program instructions may be provided to the processing unit of a general-purpose computer, a special-purpose computer, or other programmable data processing apparatus to produce a machine, such that when these instructions are executed by the processing unit of the computer or other programmable data processing apparatus, an apparatus for implementing the functions/actions specified in one or more blocks in the flowchart and/or block diagram is produced. These computer-readable program instructions may also be stored in a computer-readable storage medium, these instructions enable the computer, the programmable data processing apparatus, and/or other devices to work in a specific way, and thus, the computer-readable medium storing the instructions includes a manufactured product, which includes instructions for implementing various aspects of the functions/actions specified in one or more blocks in the flowchart and/or block diagram.

[0093] The computer-readable program instructions may be loaded onto a computer, another programmable data processing apparatus, or other devices, such that a series of operation steps are performed on the computer, the another programmable data processing apparatus, or other devices to generate a computer-implemented process, so that the instructions executed on the computer, the another programmable data processing apparatus, or other devices implement the functions/actions specified in one or more blocks in the flowchart and/or block diagram.

[0094] The flowchart and block diagram in the drawings show the possibly implemented architectures, functionalities, and operations of the system, method, and computer program product according to multiple implementations of the present disclosure. In this regard, each block in the flowchart or block diagram may represent a module, program segment, or part of an instruction, which contains one or more executable instructions for implementing the specified logical function. In some alternative implementations, the functions marked in the blocks may also occur in an order different from that marked in the drawings. For example, two consecutive blocks may actually be performed substantially in parallel, or they may sometimes be performed in the reverse order, depending on the functions involved. It should also be noted that each block in the block diagram and/or flowchart, and any combination of blocks in the block diagram and/or flowchart may be implemented by a special-purpose hardware-based system that executes specified functions or actions, or by a combination of special-purpose hardware and computer instructions.

[0095] The implementations of the present disclosure have been described above, and the above description is illustrative, non-exhaustive, and not limited to the disclosed implementations. Without departing from the scope and spirit of the illustrated implementations, many modifications and changes will be apparent to those of ordinary skill in the art. The terms used herein are chosen to best explain the principles of the implementations, the actual applications or improvements to the technologies in the market, or to enable other those of ordinary skill in the art to understand the implementations disclosed herein.

CLAIMS

1. A method of creating a virtual object, comprising:
 - presenting a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface comprising a capturing component;
 - obtaining a set of consecutive pictures of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures; and
 - creating the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.
2. The method of claim 1, wherein obtaining the set of consecutive pictures of the user in real-time via the capturing component comprises:
 - presenting a real-time picture of the user with the capturing component in response to the request to create the virtual object;
 - obtaining the plurality of images associated with the plurality of preset angles based on a change of the real-time picture; and
 - stopping presenting the real-time picture of the user in the capturing component in response to obtaining the plurality of images.
3. The method of claim 1, further comprising:
 - presenting a progress prompt element associated with the capturing component; and
 - updating the progress prompt element in response to obtaining a target image associated with a target preset angle from the set of consecutive pictures.
4. The method of claim 1, further comprising:
 - providing guidance information to the user, the guidance information being configured to guide an acquisition of an image corresponding to a respective preset angle.
5. The method of claim 4, wherein the guidance information comprises at least one of:
 - a guiding element in the capturing component to adjust an orientation of the user;
 - text information in the configuration interface to adjust the orientation of the user;
 - voice information to adjust the orientation of the user.
6. The method of claim 1, further comprising:
 - obtaining audio content of the user via the configuration interface; and
 - determining at least one audio attribute of the virtual object based on the audio content.
7. The method of claim 6, wherein obtaining the audio content of the user via the configuration interface comprises:

presenting target text in the configuration interface; and
obtaining the audio content of the user based on a selection of an audio control in the configuration interface, the audio content corresponding to the target text.

8. The method of claim 6, wherein obtaining the audio content of the user via the configuration interface comprises:

providing an audio configuration entry in the configuration interface in response to a completed acquisition of the plurality of images; and

obtaining the audio content of the user via the configuration interface based on a selection of the audio entry.

9. The method of claim 6, wherein the at least one audio attribute comprises a timbre attribute.

10. The method of claim 1, wherein creating the virtual object associated with the user comprises:

presenting a preview interface displaying the visual image; and

creating, based on a selection of a creation entry in the preview interface, the virtual object according to the visual image.

11. The method of claim 10, further comprising:

obtaining, via a permission setting control in the preview interface, permission information associated with the virtual object, the permission information indicating at least one user allowed to use the virtual object.

12. The method of claim 1, wherein the set of consecutive pictures is a first set of consecutive pictures, and the method further comprises:

providing a re-acquisition entry in response to obtaining the plurality of images associated with the plurality of preset angles; and

obtaining a second set of consecutive pictures of the user in real-time via the capturing component based on a selection of the re-acquisition entry to replace at least one of the plurality of images.

13. An apparatus for creating a virtual object, comprising:

a presenting module configured to present a configuration interface in response to a request to create a virtual object associated with a user, the configuration interface comprising a capturing component;

an obtaining module configured to obtain a set of consecutive pictures of the user in real-time via the capturing component, to determine a plurality of images associated with a plurality of preset angles from the set of consecutive pictures; and

a creating module configured to create the virtual object associated with the user, the virtual object having a visual image generated based on the plurality of images.

14. An electronic device, comprising:

at least one processing unit; and

at least one memory coupled to the at least one processing unit and storing instructions executable by the at least one processing unit, the instructions, when executed by the at least one processing unit, causing the electronic device to perform the method of any of claims 1 to 12.

15. A computer-readable storage medium having a computer program stored thereon, the computer program being executable by a processor to implement the method of any of claims 1 to 12.