METHOD, APPARATUS, DEVICE, MEDIUM AND PROGRAM PRODUCT FOR MANAGING AN APPLICATION INTERFACE

[0001] The present application claims priority to Chinese Patent Application No. 202411516989.1, filed on October 28, 2024 and entitled "METHOD, APPARATUS, DEVICE, MEDIUM AND PROGRAM PRODUCT FOR MANAGING AN APPLICATION INTERFACE ", which is hereby incorporated 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, an electronic device, a computer-readable storage medium and a computer program product for managing an application interface.

BACKGROUND

[0003] Currently, more and more applications are designed to provide various services to users. For example, a user may publish, browse and view various types of content in an application, including multimedia content such as videos, images, image sets, and sounds. The user may also interact with other users in the application, for example, give a like to, add to favorites, comment on, or the like, content posted by other users, or follow other users, visit personal profile pages of other users, or the like.

SUMMARY

[0004] In a first aspect of the present disclosure, a method of managing an application interface is provided. The method includes: presenting a floating control at a first position of the application interface; in response to receiving an interaction request for the floating control, determining, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface; and presenting the floating control at the second position of the application interface.

[0005] In a second aspect of the present disclosure, an apparatus for managing an application interface is provided. The apparatus includes: a first presenting module configured to present a floating control at a first position of the application interface; a position determining module configured to, in response to receiving an interaction request for the floating control, determine, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface; and a second presenting module configured to present the floating control at the second position of the application interface.

[0006] In a third aspect of the present disclosure, an electronic device is provided. The device includes at least one processor; and at least one memory, the at least one memory is coupled to the at least one processor and stores instructions for execution by the at least one processor, the instructions, when executed by the at least one processor, causes the electronic 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 computer-executable instructions stored thereon, the computer-

executable instructions, when executed by a processor, implement the method of the first aspect.

[0008] In a fifth aspect of the present disclosure, a computer program product is provided. The computer program product includes computer-executable instructions, where the computer-executable instructions, when executed by a processor, implement the method of the first aspect.

[0009] It should be appreciated that the content described in this Summary section 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

[0010] 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:

[0011] Fig. 1 illustrates a schematic diagram of an example environment in which the embodiments of the present disclosure may be implemented;

[0012] FIGS. 2A to 2G illustrate example interfaces according to some embodiments of the present disclosure;

[0013] Fig. 3 illustrates a flowchart of a method for managing an application interface according to some embodiments of the present disclosure;

[0014] Fig. 4 illustrates an example structural block diagram of an apparatus for managing an application interface according to some embodiments of the present disclosure; and

[0015] Fig. 5 illustrates a block diagram of an electronic device capable of implementing one or more embodiments of the present disclosure.

DETAILED DESCRIPTION OF EMBODIMENTS

[0016] 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 should be understood that the present disclosure may be implemented in various forms and should not be construed 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 should be understood that the drawings and embodiments of the present disclosure are only used for the purpose of example, rather than limiting the protection scope of the present disclosure.

[0017] In the description of the embodiments of the present disclosure, the term "include/comprise" and its 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 "based at least in part on". The term "one 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 explicit and implicit definitions may also be included below.

[0018] In this paper, unless explicitly stated, "in response to A" to perform a step does not mean that the step is performed immediately after "A", but may include one or more intermediate steps.

[0019] It may be understood that the data involved in the subject matter (including but not limited to the data

itself, acquisition, use, storage or deletion of the data) should comply with requirements of corresponding laws, regulations and related provisions.

[0020] It may be understood that before using the subject matter disclosed in the embodiments of the present disclosure, the user shall be informed of the type, range of use, use scenarios, an the like of personal information involved in the present disclosure and acquire the authorization of the user in an appropriate manner in accordance with relevant laws and regulations.

[0021] For example, in response to receiving an active request from the user, prompt information is sent to the user to clearly prompt the user that the requested operation will require acquisition and use of the user's personal information, so that the user may independently choose whether to provide the personal information to the software or hardware, such as an electronic device, an application, a server or a storage medium, that performs the operations of the subject matter of the present disclosure based on the prompt information.

[0022] As an optional but non-restrictive implementation, in response to receiving the active request from the user, the prompt information may be sent to the user in the form of, for example, a pop-up window, in which the prompt information may be presented in text. In addition, the pop-up window may also carry a selection control for the user to select "agree" or "disagree" to provide the personal information to the electronic device.

[0023] It may be understood that the above process of notifying and acquiring user authorization is only for the purpose of example and does not limit the implementations of the present disclosure, and other methods that meet the relevant laws and regulations may also be applied to the implementations of the present disclosure.

[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 a terminal device 110.

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

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

[0027] In some embodiments, the terminal device 110 communicates with a server 130 to enable provision of services of the application 120. The terminal 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 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 terminal device 110 may also support any type of user-specific interfaces (such as "wearable" circuitry and the like).

[0028] The server 130 may be an independent physical server, a server cluster or distributed system composed of a plurality of 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 backend services for the application 120 supporting content presentation in the terminal device 110.

[0029] A communication connection may be established between the server 130 and the terminal device 110. The communication connection may be established in a wired or wireless manner. The communication connection may include but is not limited to a Bluetooth connection, a mobile network connection, a universal serial bus connection, a wireless fidelity connection, and the like, 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 terminal device 110 may implement signaling interaction through the communication connection therebetween.

[0030] It should be appreciated that the structure and functions of various elements in the environment 100 are described only for the purpose of example, without suggesting any limitation to the scope of the present disclosure.

[0031] A terminal device/application may present a control on an application interface of the application, and receive various trigger operations from a user on the control. Conventionally, the control may be fixedly presented at a certain position of the application interface. If there are other controls near this position, and the position corresponding to the control is close to positions corresponding to other controls, there may be accidental touches by the user. For example, the user intends to trigger control A, but accidentally touches another control B. This affects the accuracy of user interaction and the efficiency of user interaction with the control.

[0032] In view of this, embodiments of the present disclosure provide an improved solution for managing an application interface. According to the solution, a floating control is proposed, which is different from a fixed control presented at a fixed position in an application interface in that a user may move the position of the floating control. Specifically, the floating control is presented at a first position of the application interface. In response to receiving an interaction request for the floating control, a second position for presenting the floating control is determined, within a candidate region in the application interface, based on an interaction position of the interaction request in the application interface. The floating control is presented at the second position of the application interface. For example, the user may use a finger to drag an icon of the floating control to move the floating control to a desired position within the candidate region in the application interface.

[0033] In this way, embodiments of the present disclosure may move the floating control based on the user's interaction request, which may help the user manage the application interface conveniently and quickly, improve the interactivity between the user and the application interface, and make the application interface more in line with user needs. Furthermore, the candidate region may limit the moving range of the floating control, thereby preventing the floating control from being moved to some positions (for example, the center of a screen, or a position overlapping with other controls in the application interface) to interfere with the user's normal use of the application.

[0034] The following describes the process of example interface interaction according to embodiments of the present disclosure with reference to the drawings. FIGS. 2A to 2G illustrate example interfaces 200A to 200G

(which may also be referred to as examples 200A to 200G for short) according to some embodiments of the present disclosure. The interfaces shown in examples 200A to 200G may be presented at the terminal device 110. For the convenience of discussion, examples 200A to 200G will be described with reference to the environment 100 of Fig. 1.

[0035] It should be understood that the interfaces shown in the drawings are only examples, and various interface designs may actually exist. Various graphic elements in the interface may have different arrangements and different visual representations, one or more elements therein may be omitted or replaced, and there may also be one or more other elements. The embodiments of the present disclosure are not limited in this regard.

[0036] In the environment 100, the terminal device 110 presents an application interface (for example, the interface 150) of the application 120. In some cases, the application interface presented by the terminal device 110 may be a specific viewing interface of the application 120, in which media content is presented. In some embodiments, the viewing interface refers to an interface for displaying or pushing media content and other related information to the user, which may also be referred to as a content display interface, a content presentation interface, a content browsing interface, a media item presentation page, and the like. A set of media items may be presented in the viewing interface, and the set of media items may include one or more media items. The set of media items to be presented in the specific viewing interface may be determined according to application design needs. The specific media content to be displayed in the set of media items and the number thereof will vary in different scenarios.

[0037] The viewing interface may be any appropriate interface of the application 120. In some embodiments, the viewing interface may also be presented by detecting a start operation of the application 120, for example, the viewing interface is a default interface presented when the application is started. In some embodiments, the terminal device 110 may present the set of media items in the viewing interface in any appropriate view mode (for example, a default view mode, where the default view mode may be a view mode preset by the user, or may be a historical view mode when the user exited the application and/or a page last time).

[0038] In some embodiments, the terminal device 110 may support displaying the set of media items in a plurality of view modes. The plurality of view modes may at least include, for example, a single view mode, at least one multi-column view mode (including but not limited to a double-column view mode, a three-column view mode, and the like), and at least one multi-row view mode, and the like. The single view mode may reduce the cost of thinking and selection by the user, while the at least one multi-column view mode and the at least one multi-row view mode facilitate the user to explore more content of interest. Providing the plurality of view modes may facilitate the user to select or switch the view mode for displaying the set of media items according to his/her own needs.

[0039] In some embodiments, as shown in Fig. 2A, the terminal device 110 may present example 200A. Example 200A illustrates an example of presenting an application interface in a first view mode (for example, a single view mode). Example 200A presents a floating control 210 and a set of fixed controls 220. The set of fixed controls 220 may include at least one fixed control, including but not limited to one or more of a follow control, a user avatar, a like control, a share control, a comment control, a favorite control, and the like. The floating control and the fixed control may be presented in different styles, for example, the floating control and the fixed control may be distinguished by different colors, transparency, fonts, font sizes, and the like.

[0040] In some embodiments, a presentation position of the floating control 210 may be related to a presentation position of the set of fixed controls 220. As an example, if the set of fixed controls 220 are arranged longitudinally and the centers of the set of fixed controls 220 are all on a vertical line 225, the center of the floating control 210 may also be on the vertical line 225. That is, the floating control 210 and the set of fixed controls 220 are arranged longitudinally. It may be understood that this is only an example, at least one control in the set of fixed controls 210 may be presented at any appropriate position, and the floating control 210 may be presented at any appropriate position in example 200A. The presentation position of the floating control 210 in example 200A may be referred to as a first position.

[0041] It should be understood that Fig. 2A only illustrates, for the purpose of example, an example of presenting the application interface in a vertical screen mode, and alternatively and/or additionally, the application interface may be presented in a horizontal screen mode. In this case, various controls may be arranged in a horizontal direction (for example, displayed at the top or bottom of the application interface). Alternatively and/or additionally, various controls may be arranged in a longitudinal direction (for example, displayed on the left or right side of the application interface).

[0042] The floating control 210 may include any appropriate control with any appropriate function. For example, the floating control 210 may include a view switching control (or a control for implementing other functions). The terminal device 110 may determine that the interaction request for the floating control 210 or any control in the set of fixed controls 220 is received in response to receiving a trigger operation from a user (for example, the user 140) on the floating control 210 or any control in the set of fixed controls 220. For example, the terminal device 110 may present an element 230 in example 200A in response to receiving the interaction request, where the element 230 may indicate that the interaction request is received, and may indicate the specific position where the trigger operation is received. For example, if the trigger operation is received at the media item presented in example 200A, the terminal device 110 may present the element 230 at a corresponding position where the trigger operation is received. Alternatively and/or additionally, the step of presenting the element 230 may be skipped, and different actions may be performed directly based on the type of the trigger operation.

[0043] The trigger operation may include various types of operations, and accordingly, the interaction request may also include various types of interaction requests. For example, the trigger operation may include a click operation of a first type and a drag operation of a second type, and the interaction request may include a click request of the first type corresponding to the click operation and a drag request of the second type corresponding to the drag operation. If the floating control 210 is the view switching control, the terminal device 110 may switch the view mode of the application interface (for example, switch a first view mode to a second view mode, the second view mode being different from the first view mode) in response to receiving the interaction request for the floating control 210 and determining that the interaction request does not satisfy a predetermined type (for example, if the second type is the predetermined type, and the interaction request is the first type, it may be determined that the interaction request does not satisfy the predetermined type). By using some embodiments of the present disclosure, the floating control may be used to switch between different view modes, thereby facilitating information obtainment by the user.

[0044] As an example, the terminal device 110 may present example 200B, for example, in response to determining that the interaction request for the floating control 210 does not satisfy the predetermined type.

Example 200B illustrates an example of presenting an application interface in a second view mode (for example, a double-column view mode). Example 200B may present a floating control 240. The floating control 240 may also be, for example, a view switching control. For example, the terminal device 110 may switch back to the view mode of presenting example 200A in response to determining that an interaction request for the floating control 240 received in example 200B does not satisfy the predetermined type.

[0045] It should be understood that the application interface always displays media items before and after the view switching, and the application interface may provide a different number of media items in the two view modes. Specifically, the application interface may display a single media item in the first view mode, and the application interface may provide a plurality of media items in the second view mode. Alternatively and/or additionally, the floating control 210 presented in the first view mode may be different from the floating control 240 presented in the second view mode. In other words, in response to the user's interaction request for the floating control 210 being a click operation, the visual representation of the floating control may be updated. Specifically, the visual representation of the floating control may be updated from an icon for switching to the double-column mode (as shown in the floating control 210 in Fig. 2A) to an icon for switching to the single view mode (as shown in the floating control 240 in Fig. 2B). According to some implementations of the present disclosure, the floating control 240 may be presented at any position of the application interface, for example, the floating control 240 may be presented at a random position, at the same position as the floating control 210, or at a blank position that does not overlap with other controls in the application interface.

[0046] In some embodiments, the terminal device 110 may also determine a second position for presenting the floating control 210 based on an interaction position of the interaction request in the application interface, in response to determining that the interaction request for the floating control 210 received in example 200A satisfies a predetermined type (for example, if the second type is the predetermined type and the interaction request is the second type, it may be determined that the interaction request satisfies the predetermined type). The terminal device 110 may present the floating control 210 at the second position. In some embodiments, the terminal device 110 may also present the floating control 210 at the second position in response to determining that the interaction request stops. For example, the position of the floating control may stop being moved after the user's drag operation ends. In this way, it is convenient for the user to specify a target position of the floating control.

[0047] In some embodiments, the terminal device 110 may also store the second position after the interaction request stops, and in response to determining that the application interface is restarted, present the floating control at the second position in the restarted application interface. That is, the terminal device 110 may determine the stored second position as a default position for presenting the floating control 210 in the application interface after the application 120 is started next time. In this way, it is supported to store the position of the floating control specified by the user according to his/her own needs, and the default position may be automatically stored in the subsequent automatic application process.

[0048] In some embodiments, before determining the second position, the terminal device 110 may also determine its own resolution, and determine the second position based on the interaction position in response to the resolution satisfying a predetermined condition. The resolution of the terminal device 110 is associated with sizes of the height and width of the screen of the terminal device 110. For example, the greater the height and

width of the screen of the terminal device 110, the greater its corresponding resolution. The predetermined condition may indicate a threshold resolution (including two directions of height and width). For example, the terminal device 110 may compare its own resolution with the threshold resolution, and determine that its own resolution satisfies the predetermined condition in response to the resolution reaching the threshold resolution, and then determine the second position based on the interaction position. For example, in the vertical screen display mode, only the height direction in the resolution may be compared; in the horizontal screen display mode, only the width direction in the resolution may be compared, and so on. In this way, it may be supported to move the position of the floating control at a large-sized device, and to avoid misoperation at a small-sized device.

[0049] Regarding the specific manner of determining the second position, in some embodiments, the terminal device 110 may directly determine the second position based on the interaction position. For example, the terminal device 110 may directly determine the interaction position (that is, the contact position between the user's finger and the screen) as the second position, and may perform coordinate conversion on the interaction position to determine the second position. Alternatively or additionally, in some embodiments, the terminal device 110 may also determine a candidate region for presenting the floating control 210 based on the presentation position of the set of fixed controls 220 in the application interface. The size of the candidate region may be smaller than the size of the application interface. In this way, the moving range of the floating control may be specified.

[0050] The terminal device 110 may use any method to determine the candidate region based on the position of the fixed control. For example, the terminal device 110 may obtain setting information pre-input by the user, and the setting information may indicate the positional relationship between the position of the set of fixed controls 220 and the candidate region. The set of fixed controls 220 may be located outside the candidate region, that is, the candidate region does not include the fixed control. The terminal device 110 may then determine the candidate region based on the position of the set of fixed controls 220 and the setting information. As shown in Fig. 2C, if the setting information indicates that the candidate region is located above the set of fixed controls 220, the terminal device 110 may determine the candidate region 250 in response to receiving the interaction request of a predetermined type for the floating control 210 in example 200C. In this way, the floating control may be moved in the blank area in the application interface, thereby preventing the floating control from being displayed overlapping with the fixed control.

[0051] In some embodiments, the fixed control in the application interface may further include a navigation tab, for example, the application interface shown in example 200C may further include a plurality of navigation tabs such as a "Same City" navigation tab, a "Follow" navigation tab, and a "Recommendation" navigation tab. The terminal device 110 may switch to present an interface corresponding to a navigation tab in response to receiving the interaction request for the navigation tab. In some embodiments, in order to prevent the navigation tab from being blocked by the moved floating control 210, the terminal device 110 may further determine the candidate region based on a position of the navigation tab. For example, as shown in Fig. 2C, the candidate region 250 may be located below the "Same City" navigation tab, the "Follow" navigation tab, the "Recommendation" navigation tab, and the like, and above the "Home Page" navigation tab, the "Friends" navigation tab, and the like.

[0052] In some embodiments, in order to avoid accidental touch between the floating control 210 and the set of

fixed controls 220, a distance between the second position and the set of fixed controls 220 satisfies a threshold condition. The threshold condition may indicate a threshold distance. For example, the terminal device 110 may determine that the distance satisfies the threshold condition in response to the distance between the second position and the set of fixed controls 220 reaching or being higher than the threshold distance (for example, 20 pixels, or other values). In some embodiments, in order to ensure that the distance may always satisfy the threshold condition, the terminal device 110 may further determine that a distance from the edge (for example, the lower edge of the candidate region 250 in example 200C) closest to the set of fixed controls 220 in the candidate region to the set of fixed controls 220 satisfies the threshold condition.

[0053] In some embodiments, the terminal device 110 may switch a state of the floating control 210 to a moving state in response to receiving the interaction request for the floating control 210 that satisfies the predetermined type. The terminal device 110 may superimpose an interaction layer in the candidate region 250 to indicate that the floating control 250 is in the moving state. In some embodiments, the terminal device 110 may further present prompt information in the candidate region to indicate that the floating control is in the moving state. For example, as shown in Fig. 2C, the terminal device 110 may present the prompt text "Release to complete position adjustment" in the candidate region 250. In this way, positive feedback may be provided to the user to inform the user that the position of the floating control is currently being moved.

[0054] In some embodiments, when the floating control 210 is not in the moving state, the terminal device 110 may present the floating control in a first style. Furthermore, when the floating control 210 is not in the moving state, the terminal device 110 may present the floating control in a second style different from the first style. It may be understood that the style may include one or more of shape, size, color, transparency, and the like of the floating control. For example, referring to FIGS. 2A and 2C, in the case that the interaction request for the floating control 210 that satisfies the predetermined type is not received, the terminal device 110 may present the floating control in the first style at the first position of example 200A (at this time, the floating control is in a static state). In response to receiving the interaction request for the floating control 210 that satisfies the predetermined type, the terminal device 110 may present the floating control in the second style in the candidate region 250 of example 200C (at this time, the floating control is in the moving state). For example, the second style may indicate a smaller size, a different color, a different transparency, and the like. In this way, the user may be supported to distinguish different states of the floating control.

[0055] In some embodiments, the terminal device 110 may determine a position corresponding to a first dimension of the application interface based on the position of the set of fixed controls 220, and determine a position corresponding to a second dimension of the application interface based on the interaction position. The terminal device 110 may determine the second position based on the position corresponding to the first dimension and the position corresponding to the second dimension. The first dimension here may be, for example, a horizontal dimension, and the second dimension may be, for example, a longitudinal dimension. For example, in order to ensure aesthetics of the interface, it may be ensured that the center of each fixed control in the set of fixed controls 220 and the center of the floating control 210 are all on the same vertical line, that is, the horizontal dimension of each fixed control and the horizontal dimension of the floating control 210 are the same. The terminal device 110 may adjust the longitudinal dimension of the second position for presenting the floating control 210 based on the interaction position.

[0056] Referring to FIGS. 2D and 2E, as shown in example 200D and example 200E, if the interaction position moves longitudinally from the position shown in example 200D to the position shown in example 200E, the terminal device 110 may determine that the second position is the position shown in example 200E, and present the floating control 210 at the second position. It should be noted that since the second position is in the candidate region 250, if the second position is at the edge of the candidate region 250 and the interaction position indicates a movement out of the candidate region, the terminal device 110 will no longer adjust the second position.

[0057] Referring to FIGS. 2D and 2F, as shown in example 200D and example 200F, if the interaction position moves longitudinally from the position shown in example 200D to the position shown in example 200F, since the second position for presenting the floating control 210 in example 200D is already at the lower edge of the candidate region 250, the terminal device 110 may not adjust the second position, and still present the floating control 210 at the second position.

[0058] Referring to FIGS. 2D and 2G, as shown in example 200D and example 200G, if the interaction position moves horizontally from the position shown in example 200D to the position shown in example 200G, since the terminal device 110 only adjusts the longitudinal dimension of the second position and does not adjust the horizontal dimension of the second position, the terminal device still presents the floating control 210 at the second position shown in example 200D.

[0059] It should be understood that although only the example of determining the second position based on the interaction position is described above, alternatively and/or additionally, the second position may be determined based on other methods. For example, the interaction position may be moved within the entire scope of the application interface, and at this time, the interaction position may be mapped to the second position in the candidate region based on the proportional relationship between the height of the application interface and the height of the candidate region. Assuming that the height of the application interface is N times the height of the candidate region, when the user's finger moves down X pixels, the second position moves down $\lfloor X/N \rfloor$ pixels. In this way, the second position may be supported to be adjusted with higher precision.

[0060] It should be noted that in some embodiments, the application interface may include a plurality of floating controls. In order to avoid the problem of the floating controls blocking each other, positions of the plurality of floating controls cannot overlap. In this case, if another floating control is presented at the second position determined based on the interaction position, the terminal device 110 may present prompt information to prompt the user that this position cannot be determined as the second position for presenting the floating control. For example, the terminal device 110 may present the prompt text "This position is not selectable". Alternatively and/or additionally, the second position may be determined along the user's dragging direction and skipping the positions of other floating controls.

[0061] To sum up, the floating control may be moved based on the user's interaction request, which may help the user manage the application interface conveniently and quickly, improve the interactivity between the user and the application interface, and make the application interface more in line with user needs.

[0062] Fig. 3 illustrates a flowchart of a method 300 for managing an application interface according to some embodiments of the present disclosure. The method 300 may be implemented at the terminal device 110. The method 300 is described below with reference to Fig. 1.

[0063] As shown in the figure, at block 310, the terminal device 110 presents a floating control at a first position

of the application interface.

[0064] At block 320, in response to receiving an interaction request for the floating control, the terminal device 110 determines, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface.

[0065] At block 330, the terminal device 110 presents the floating control at the second position of the application interface.

[0066] In some embodiments, the candidate region is determined based on a position of at least one fixed control in the application interface.

[0067] In some embodiments, the method 300 further includes at least one of the following: superimposing an interaction layer in the candidate region to indicate that the floating control is in a moving state; or presenting prompt information in the candidate region to indicate that the floating control is in the moving state.

[0068] In some embodiments, determining the second position in the candidate region includes: determining a position corresponding to a first dimension of the application interface based on the position of the at least one fixed control; and determining a position corresponding to a second dimension of the application interface based on the interaction position; and determining the second position based on the position corresponding to the first dimension and the position corresponding to the second dimension.

[0069] In some embodiments, the interaction request is a drag request for the floating control, and the method 300 further includes: presenting the floating control at the second position of the application interface in response to determining that the interaction request stops.

[0070] In some embodiments, a size of the candidate region is smaller than a size of the application interface, and the at least one fixed control is located outside the candidate region.

[0071] In some embodiments, a distance between the second position and the position of the at least one fixed control satisfies a threshold condition.

[0072] In some embodiments, presenting the floating control at the first position of the application interface includes: presenting the floating control in a first style; and presenting the floating control at the second position of the application interface includes: presenting the floating control in a second style, the second style being different from the first style.

[0073] In some embodiments, the method is implemented at a terminal device, and the method 300 further includes: performing the method in response to determining that a resolution of the terminal device satisfies a predetermined condition.

[0074] In some embodiments, the method 300 further includes: storing the second position; and in response to determining that the application interface is restarted, presenting the floating control at the second position in the restarted application interface.

[0075] In some embodiments, the method 300 further includes: determining the second position based on the interaction position in response to determining that the interaction request satisfies a predetermined type.

[0076] In some embodiments, the floating control includes a view switching control, the application interface is presented in a first view mode, and the method 300 further includes: presenting the application interface in a second view mode in response to determining that the interaction request does not satisfy a predetermined type, the second view mode being different from the first view mode.

[0077] The embodiments of the present disclosure further provide a corresponding apparatus for implementing the above method or process. Fig. 4 illustrates an example structural block diagram of an apparatus 400 for managing an application interface according to some embodiments of the present disclosure. The apparatus 400 may be implemented as or included in the terminal device 110. Each module/component in the apparatus 400 may be implemented by hardware, software, firmware, or any combination thereof.

[0078] As shown in Fig. 4, the apparatus 400 includes: a first presenting module 410 configured to present a floating control at a first position of the application interface; a position determining module 420 configured to, in response to receiving an interaction request for the floating control, determine, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface; and a second presenting module 430 configured to present the floating control at the second position of the application interface.

[0079] In some embodiments, the candidate region is determined based on a position of at least one fixed control in the application interface.

[0080] In some embodiments, the apparatus 400 further includes at least one of the following: a layer presenting module configured to superimpose an interaction layer in the candidate region to indicate that the floating control is in a moving state; or an information presenting module configured to present prompt information in the candidate region to indicate that the floating control is in the moving state.

[0081] In some embodiments, the position determining module 420 is further configured to: determine a position corresponding to a first dimension of the application interface based on the position of the at least one fixed control; and determine a position corresponding to a second dimension of the application interface based on the interaction position; and determine the second position based on the position corresponding to the first dimension and the position corresponding to the second dimension.

[0082] In some embodiments, the interaction request is a drag request for the floating control, and the apparatus 400 further includes: a first control presenting module configured to present the floating control at the second position of the application interface in response to determining that the interaction request stops.

[0083] In some embodiments, a size of the candidate region is smaller than a size of the application interface, and the at least one fixed control is located outside the candidate region.

[0084] In some embodiments, a distance between the second position and the position of the at least one fixed control satisfies a threshold condition.

[0085] In some embodiments, the first presenting module 410 is further configured to: present the floating control in a first style; and presenting the floating control at the second position of the application interface includes: presenting the floating control in a second style, the second style being different from the first style.

[0086] In some embodiments, the method is implemented at a terminal device, and the apparatus 400 further includes: an executing module configured to perform the method in response to determining that a resolution of the terminal device satisfies a predetermined condition.

[0087] In some embodiments, the apparatus 400 further includes: a position storing module configured to store the second position; and a second control presenting module configured to in response to determining that the application interface is restarted, present the floating control at the second position in the restarted application interface.

[0088] In some embodiments, the apparatus 400 further includes: a second position determining module configured to determine the second position based on the interaction position in response to determining that the interaction request satisfies a predetermined type.

[0089] In some embodiments, the floating control includes a view switching control, the application interface is presented in a first view mode, and the apparatus 400 further includes: an interface presenting module configured to present the application interface in a second view mode in response to determining that the interaction request does not satisfy a predetermined type, the second view mode being different from the first view mode.

[0090] The modules included in the apparatus 400 may be implemented in various ways, including software, hardware, firmware, or any combination thereof. In some embodiments, one or more units may be implemented using software and/or firmware, for example machine executable instructions stored on a storage medium. In addition to machine executable instructions or as an alternative, part or all modules in the apparatus 400 may be implemented at least partially by one or more hardware logic components. As an example, rather than a limitation, example types of hardware logic components that may be used include field programmable gate array (FPGA), application specific integrated circuit (ASIC), application specific standard (ASSP), system on chip (SOC), complex programmable logic device (CPLD), and so on.

[0091] 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 should be understood that the electronic device 500 shown in Fig. 5 is only for the purpose of example, and should not constitute any limitation on the functionality and scope of the embodiments described herein. The electronic device 500 shown in Fig. 5 may be used to implement the terminal device 110 of Fig. 1.

[0092] As shown in Fig. 5, the electronic device 500 is in the form of a general electronic device. The components of the electronic device 500 may include but are not limited to one or more processing units or processors 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 processor 510 may be a physical or virtual processor and may execute various processes based on the programs stored in the memory 520. In a multi-processor system, a plurality of processors execute computer executable instructions in parallel to improve the parallel processing capability of the electronic device 500.

[0093] 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, a cache, a random access memory (RAM)), a non-volatile memory (such as a read-only memory (ROM), an 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.

[0094] The electronic device 500 may further include additional removable/non-removable, volatile/non-volatile memory medium. Although not shown in Fig. 5, a disk drive for reading from or writing to a removable, non-volatile disk (such as a "floppy disk"), and an optical disk drive for reading from or writing to a removable, non-volatile optical disk may be provided. In these cases, each drive may be connected to a bus (not shown) by one

or more data medium interfaces. The memory 520 may include a computer program product 525, which has one or more program modules configured to perform various methods or acts of various embodiments of the present disclosure.

[0095] The communication unit 540 enables communication with other electronic devices via a communication medium. Additionally, the functionality 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 via communication connections. Therefore, the electronic device 500 may use logical connections with one or more other servers, network personal computers (PCs) or another network node to operate in a networked environment.

[0096] The input device 550 may be one or more input devices, such as a mouse, a keyboard, a tracking ball, and the like. The output device 560 may be one or more output devices, such as a display, a speaker, a printer, and the like. The electronic device 500 may also communicate with one or more external devices (not shown) as needed through the communication unit 540, the external devices such as a storage device, a display device, and the like, communicate with one or more devices that enable a user to interact with the electronic device 500, or communicate with any devices (for example, a network card, a modem, and the like) that enable the electronic device 500 to communicate with one or more other electronic devices. Such communication may be performed via input/output (I/O) interfaces (not shown).

[0097] According to example implementations 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 example implementations 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, which are executed by a processor to implement the method described above.

[0098] Various aspects of the present disclosure are described herein with reference to flowcharts and/or block diagrams of the method, apparatus, device and computer program product implemented according to the present disclosure. It should be understood that each block of the flowcharts and/or block diagrams, and combinations of blocks in the flowcharts and/or block diagrams may be implemented by computer-readable program instructions.

[0099] These computer-readable program instructions may be provided to a processor of a general-purpose computer, a special-purpose computer, or other programmable data processing apparatus to produce a machine, such that when the instructions are executed by the processor of the computer or other programmable data processing apparatus, a means to implement functions/actions specified in one or more blocks in the flowcharts and/or block diagrams is produced. These computer-readable program instructions may also be stored in a computer-readable storage medium, and these instructions cause the computer, the programmable data processing apparatus, and/or other devices to work in a specific manner, so that the computer-readable medium storing the instructions includes a manufactured product, which includes instructions to implement various aspects of the functions/actions specified in one or more blocks in the flowcharts and/or block diagrams.

[0100] The computer-readable program instructions may be loaded onto a computer, other 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 the other devices to produce a computer-implemented

process, so that the instructions executed on the computer, the another programmable data processing apparatus, or the other devices implement the functions/actions specified in one or more blocks in the flowcharts and/or block diagrams.

[0101] The flowcharts and block diagrams in the drawings show the possibly implemented architectures, functions and operations of the system, method and computer program product according to a plurality of implementations of the present disclosure. In this regard, each block in the flowcharts or block diagrams may represent a module, a program segment or a part of instructions, which contains one or more executable instructions to implement the specified logical functions. 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 diagrams and/or the flowcharts, as well as combinations of blocks in the block diagrams and/or the flowcharts may be implemented by a special-purpose hardware-based system that executes specified functions or actions, or may be implemented by a combination of special-purpose hardware and computer instructions.

[0102] Various implementations of the present disclosure have been described above, and the above descriptions are for the purpose of example, non-exhaustive, and not limited to the disclosed implementations. Without departing from the scope and spirit of the described 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 practical 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 managing an application interface, comprising:

presenting a floating control at a first position of the application interface;

in response to receiving an interaction request for the floating control, determining, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface; and

presenting the floating control at the second position of the application interface.

2. The method of claim 1, wherein the candidate region is determined based on a position of at least one fixed control in the application interface.

3. The method of claim 2, further comprising at least one of:

superimposing an interaction layer in the candidate region to indicate that the floating control is in a moving state; or

presenting prompt information in the candidate region to indicate that the floating control is in the moving state.

4. The method of claim 2, wherein determining the second position in the candidate region comprises:

determining a position corresponding to a first dimension of the application interface based on the position of the at least one fixed control; and

determining a position corresponding to a second dimension of the application interface based on the interaction position; and

determining the second position based on the position corresponding to the first dimension and the position corresponding to the second dimension.

5. The method of claim 1, wherein the interaction request is a drag request for the floating control, the method further comprising:

presenting the floating control at the second position of the application interface in response to determining that the interaction request stops.

6. The method of claim 2, wherein a size of the candidate region is smaller than a size of the application interface, and at least one fixed control is located outside the candidate region.

7. The method of claim 2, wherein a distance between the second position and the position of the at least one fixed control satisfies a threshold condition.

8. The method of claim 1, wherein presenting the floating control at the first position of the application interface comprises:

presenting the floating control in a first style; and

presenting the floating control at the second position of the application interface comprises: presenting the floating control in a second style, the second style being different from the first style.

9. The method of claim 1, wherein the method is implemented at a terminal device, and the method further comprises:

performing the method in response to determining that a resolution of the terminal device satisfies a predetermined condition.

10. The method of claim 1, further comprising:

storing the second position; and

in response to determining that the application interface is restarted, presenting the floating control at the second position in the restarted application interface.

11. The method of claim 1, further comprising:

determining the second position based on the interaction position in response to determining that the interaction request satisfies a predetermined type.

12. The method of claim 1, wherein the floating control comprises a view switching control, the application interface is presented in a first view mode, and the method further comprises:

presenting the application interface in a second view mode in response to determining that the interaction request does not satisfy a predetermined type, the second view mode being different from the first view mode.

13. An apparatus for managing an application interface, comprising:

a first presenting module configured to present a floating control at a first position of the application interface;

a position determining module configured to, in response to receiving an interaction request for the floating control, determine, within a candidate region in the application interface, a second position for presenting the floating control based on an interaction position of the interaction request in the application interface; and

a second presenting module configured to present the floating control at the second position of the application interface.

14. An electronic device, comprising:

at least one processor; and

at least one memory, coupled to the at least one processor and storing instructions for execution by the at least one processor, the instructions, when executed by the at least one processor, causing the electronic device to perform the method of any of claims 1-12.

15. A computer program product comprising computer-executable instructions, wherein the computer-executable instructions, when executed by a processor, implement the method of any of claims 1-12.