[0008] updating a display position of the virtual character on the GUI as the virtual character moves in the virtual environment; and

[0009] increasing a transparency of the control in accordance with a determination that the control blocks a virtual character at the display position.

[0010] According to another aspect of this application, a control display apparatus is provided. The apparatus includes:

[0011] a display module, configured to display a GUI, the GUI including a virtual character located in a virtual environment and a control;

[0012] an update module, configured to update a display position of the virtual character on the GUI as the virtual character moves in the virtual environment; and

[0013] a transparency change module, configured to increase a transparency of the control in accordance with a determination that the control blocks a virtual character at the display position.

[0014] According to another aspect of this application, a computer device is provided. The computer device includes a processor, a memory connected to the processor, and program instructions stored on the memory, the processor, when executing the program instructions, implementing the control display method provided in the aspects of this application.

[0015] According to another aspect of this application, a computer-readable storage medium is provided. The computer-readable storage medium stores program instructions, the program instructions, when executed by a processor, implementing the control display method provided in the aspects of this application.

[0016] According to one aspect of this application, a computer program product is provided. The computer program product includes computer instructions, the computer instructions being stored in a computer-readable storage medium. A processor of a computer device reads the computer instructions from the computer-readable storage medium, and executes the computer instructions, to cause the computer device to perform the foregoing control display method.

[0017] The embodiments of this application include at least the following beneficial effects:

[0018] When a virtual character moves in a virtual environment, a blocking relationship between a display position of the virtual character on a GUI and a position of a control is determined. When the virtual character is blocked by the control, a transparency of the control is increased, to make the control transparent. In this way, a user can observe the virtual character blocked by the control, and dynamic change of the transparency of the control is more likely to

CLAIMS

1. A control display method, executed by a computer device, the method comprising:

displaying a graphical user interface (GUI), the GUI comprising a virtual character located in a virtual environment and a control;

updating a display position of the virtual character on the GUI as the virtual character moves in the virtual environment; and

increasing a transparency of the control in accordance with a determination that the control blocks a virtual character at the display position.

2. The method according to claim 1, wherein the increasing the transparency of the control ~~in accordance with the determination that the control blocks the display position~~ comprises:

switching the transparency of the control from a first transparency directly to a second transparency ~~in accordance with the determination that the control blocks the display position~~, wherein the first transparency is lower than the second transparency; or

gradually increasing the transparency of the control from a first transparency to a second transparency ~~in accordance with a determination that the control blocks the display position~~, wherein the first transparency is lower than the second transparency.

3. The method according to claim 1, wherein the increased transparency of the control positively correlates with a blocking degree of the display position by the control, wherein the blocking degree indicates a size of a blocked area of the virtual character on the GUI.

4. The method according to claim 2, further comprising:

obtaining three-dimensional coordinates of a target point on the virtual character in the virtual environment;

mapping the three-dimensional coordinates to the display position based on a conversion matrix; and

determining, based on a positional relationship between the display position and a two-dimensional region in which the control is located, whether the control blocks the display position.

5. The method according to claim 4, wherein there are n target points, and n is an integer greater than 1; and

the determining, based on the positional relationship between the display position and the

two-dimensional region in which the control is located, whether the control blocks the display position comprises:

in accordance with a determination that i target points of the n target points on the virtual character are located in the two-dimensional region in which the control is located, determining that the control blocks the display position, wherein i is a positive integer less than or equal to n.

6. The method according to claim 5, wherein the ~~in accordance with the determination that the i target points of the n target points on the virtual character are located in the two-dimensional region in which the control is located,~~ determining that the control blocks the display position comprises:

in accordance with the determination that the i target points are located in the two-dimensional region in which the control is located, determining that the control has an i^{th}-level blocking relationship to the display position; and

the method further comprises:

querying an i^{th}-level transparency corresponding to the i^{th}-level blocking relationship in a plurality of correspondences, the plurality of correspondences comprising correspondences between different blocking relationships and different transparencies; and

determining the i^{th}-level transparency as the second transparency.

7. The method according to any one of claims 1 to 6, further comprising:

reducing the transparency of the control in accordance with a determination that the control does not block a virtual character at the display position.

8. The method according to claim 7, wherein the reducing the transparency of the control ~~in accordance with the determination that the control does not block the display position~~ comprises:

switching the transparency of the control from the second transparency to the first transparency ~~in accordance with the determination that the control does not block the display position~~, wherein the first transparency is lower than the second transparency; or

gradually reducing the transparency of the control from the second transparency to the first transparency ~~in accordance with the determination that the control does not block the display position~~, wherein the first transparency is lower than the second transparency.

9. The method according to any one of claims 1 to 6, wherein after increasing the transparency of the control, further comprising:

reducing the transparency of the control in response to an approaching operation triggered on a suspended position above the control.

10. A control display apparatus, comprising:

a display module, configured to display a graphical user interface (GUI), the GUI comprising a virtual character located in a virtual environment and a control;

an update module, configured to update a display position of the virtual character on the GUI as the virtual character moves in the virtual environment; and

a transparency change module, configured to increase a transparency of the control in accordance with a determination that the control blocks a virtual character at the display position.

11. The apparatus according to claim 10, wherein

the transparency change module is configured to switch the transparency of the control from a first transparency directly to a second transparency in accordance with the determination that the control blocks the virtual character at the display position, wherein the first transparency is lower than the second transparency; or

the transparency change module is configured to gradually increase the transparency of the control from a first transparency to a second transparency in accordance with the determination that the control blocks the virtual character at the display position, wherein the first transparency is lower than the second transparency.

12. The apparatus according to claim 11, wherein the increased transparency of the control positively correlates with a blocking degree of the display position by the control; and the blocking degree is used for indicating a size of a blocked area of the virtual character on the GUI.

13. The apparatus according to claim 11, wherein

the update module is configured to obtain three-dimensional coordinates of a target point on the virtual character in the virtual environment;

the update module is configured to map the three-dimensional coordinates to the display position based on a conversion matrix; and

the transparency change module is configured to determine, based on a positional relationship between the display position and a two-dimensional region in which the control is located, whether the control blocks the display position.

14. The apparatus according to claim 13, wherein there are n target points, and n is an integer greater than 1; and

the transparency change module is configured to determine, in accordance with a determination that i target points of the n target points on the virtual character are located in the two-dimensional region in which the control is located, that the control blocks the display position, wherein i is a positive integer less than or equal to n.

15. The apparatus according to claim 14, wherein

the transparency change module is configured to determine, in accordance with the determination that the i target points are located in the two-dimensional region in which the control is located, that the control has an i^{th}-level blocking relationship to the display position; query an i^{th}-level transparency corresponding to the i^{th}-level blocking relationship in a plurality of correspondences, the plurality of correspondences comprising correspondences between different blocking relationships and different transparencies; and determine the i^{th}-level transparency as the second transparency.

16. The apparatus according to any one of claims 10 to 15, wherein

the transparency change module is configured to reduce the transparency of the control in accordance with a determination that the control does not block a virtual character at the display position.

17. The apparatus according to claim 16, wherein

the transparency change module is configured to switch the transparency of the control from the second transparency to the first transparency in accordance with the determination that the control does not block the display position, wherein the first transparency is lower than the second transparency; or gradually reduce the transparency of the control from the second transparency to the first transparency in accordance with the determination that the control does not block the display position, wherein the first transparency is lower than the second transparency.

18. A computer device, comprising a processor, a memory connected to the processor, and program instructions stored on the memory, the processor, when executing the program instructions, implementing the control display method according to any one of claims 1 to 9.

19. A computer-readable storage medium, storing program instructions, the program instructions, when executed by a processor, implementing the control display method according to any one of claims 1 to 9.

20. A computer program product, comprising computer instructions, the computer instructions being stored in a computer-readable storage medium; and

a processor of a computer device reading the computer instructions from the computer-readable storage medium, and executing the computer instructions to cause the computer device to perform the control display method according to any one of claims 1 to 9.