CLAIMS

What is claimed is:

1. A method for displaying a virtual environment picture, performed by a client, the method comprising:

displaying a first virtual environment picture, the first virtual environment picture comprising a first region obtained by observing a virtual environment by using a first observation position as an observation center, the first virtual environment picture displaying a master virtual character located in the virtual environment, and the virtual environment being provided with a camera model;

displaying, in response to receiving an aiming operation, a regional skill indicator configured to select a target region, the regional skill indicator being configured to identify the target region in the virtual environment, the target region being a skill action region when the master virtual character releases a skill;

moving, while keeping the target region unchanged, the camera model from a first camera position to a second camera position according to an offset manner, the first camera position being corresponding to the first observation position, and the second camera position being corresponding to a second observation position; and

displaying a second virtual environment picture according to the second camera position, the second virtual environment picture comprising a second region obtained by observing the virtual environment by using ~~a~~ the second observation position as an observation center, the second observation position being a position that is offset relative to the first observation position, and the second region comprising the target region.

2. The method according to claim 1, wherein ~~the virtual environment is provided with a camera model, and~~ the camera model is configured to observe the virtual environment to obtain the virtual environment picture~~; and~~

~~the displaying a second virtual environment picture comprises:~~

~~moving the camera model from a first camera position to a second camera position according to an offset manner, the first camera position being corresponding to the first observation position, and the second camera position being corresponding to the second observation position; and~~

~~displaying the second virtual environment picture according to the second camera position at which the camera model is located~~.

3. The method according to claim ~~2~~1, wherein the offset manner comprises a first offset manner, the first offset manner is a manner in which the camera model is offset based on a visual field determining box, and the visual field determining box is configured to indicate a visual field range of the camera model; and

the moving the camera model from a first camera position to a second camera position according to an offset manner comprises:

determining, in response to that a region reference point is located outside the visual field determining box, a first offset of the camera model in the first offset manner according to a distance between the region reference point and a frame of the visual field determining box, the region reference point being determined based on a center point of the target region; and

moving the camera model from the first camera position to the second camera position according to the first offset.

4. The method according to claim 3, wherein the determining, in response to that a region reference point is located outside the visual field determining box, a first offset of the camera model in the first offset manner according to a distance between the region reference point and a frame of the visual field determining box comprises:

calculating a vertical distance between the region reference point and the frame of the visual field determining box in response to that the region reference point is located outside the visual field determining box, the vertical distance comprising at least one of a transverse vertical distance and a longitudinal vertical distance, the transverse vertical distance being a vertical distance between the region reference point and a longitudinal frame of the visual field determining box, and the longitudinal vertical distance being a vertical distance between the region reference point and a transverse frame of the visual field determining box; and

determining the vertical distance as the first offset of the camera model in the first offset manner.

5. The method according to claim 3, further comprising:

moving the camera model from the second camera position to a third camera position in response to that the region reference point is relocated in the visual field determining box, the third camera position being located between the second camera position and the first camera position, the third camera position being corresponding to a third observation position; and

displaying a third virtual environment picture according to the camera model located at the third camera position, the third virtual environment picture comprising a third region obtained by

observing the virtual environment by using the third observation position as an observation center, the third region comprising the target region.

6. The method according to claim ~~2~~1, wherein the offset manner comprises a second offset manner, the second offset manner is a manner of offsetting based on an indication direction, and the indication direction is a direction pointing from a position at which the master virtual character is located to a center point of the target region; and

the moving the camera model from a first camera position to a second camera position according to an offset manner comprises:

determining a second offset of the camera model in the second offset manner according to the indication direction; and

moving the camera model from the first camera position to the second camera position according to the second offset.

7. The method according to claim 6, wherein the determining a second offset of the camera model in the second offset manner according to the indication direction comprises:

obtaining an angle between the indication direction and a horizontal direction, the horizontal direction being parallel to a horizontal plane in the virtual environment and perpendicular to an observation direction of the camera model;

obtaining a fixed offset distance of the camera model corresponding to the indication direction;

obtaining an offset ratio of the camera model in the second offset manner, the offset ratio being used for instructing the camera model to move according to the ratio; and

determining the second offset according to the angle, the fixed offset distance, and the offset ratio.

8. The method according to claim 7, wherein the second offset comprises a transverse offset, and the fixed offset distance comprises a transverse offset distance; and

the determining the second offset according to the angle, the fixed offset distance, and the offset ratio comprises:

determining the transverse offset according to a product of a cosine value of the angle, the transverse offset distance, and the offset ratio, the offset ratio being a ratio of a first distance to a second distance, the first distance being a distance between the position at which the master virtual character is located and the center point of the target region, the second distance being a radius of a selection region, the selection region being used for providing a selection range for the regional skill

indicator to select the target region.

9. The method according to claim 7, wherein the second offset comprises a longitudinal offset, and the fixed offset distance comprises a longitudinal offset distance; and

the determining the second offset according to the angle, the fixed offset distance, and the offset ratio comprises:

determining the longitudinal offset according to a product of a sine value of the angle, the longitudinal offset distance, and the offset ratio, the offset ratio being a ratio of a first distance to a second distance, the first distance being a distance between the position at which the master virtual character is located and the center point of the target region, the second distance being a radius of a selection region, the selection region being used for providing a selection range for the regional skill indicator to select the target region.

10. An apparatus for displaying a virtual environment picture, comprising:

a display module, configured to display a first virtual environment picture, the first virtual environment picture comprising a first region obtained by observing a virtual environment by using a first observation position as an observation center, the first virtual environment picture displaying a master virtual character located in the virtual environment, and the virtual environment being provided with a camera model,

the display module being configured to display, in response to receiving an aiming operation, a regional skill indicator configured to select a target region, the regional skill indicator being configured to identify the target region in the virtual environment, the target region being a skill action region when the master virtual character releases a skill;

the display module comprising a control unit, and the control unit being configured to move, while keeping the target region unchanged, the camera model from a first camera position to a second camera position according to an offset manner, the first camera position being corresponding to the first observation position, and the second camera position being corresponding to the second observation position;

the display module being configured to display a second virtual environment picture according to the second camera position, the second virtual environment picture comprising a second region obtained by observing the virtual environment by using ~~a~~ the second observation position as an observation center, the second observation position being a position that is offset relative to the first observation position, and the second region comprising the target region.

11. The apparatus according to claim 10, wherein ~~the virtual environment is provided with a~~

~~camera model,~~ the camera model is configured to observe the virtual environment to obtain the virtual environment picture, and the display module comprises a control unit~~; and~~

~~the control unit is configured to move the camera model from a first camera position to a second camera position according to an offset manner, the first camera position being corresponding to the first observation position, and the second camera position being corresponding to the second observation position; and display the second virtual environment picture according to the second camera position at which the camera model is located~~.

12. The apparatus according to claim ~~11~~10, wherein the offset manner comprises a first offset manner, the first offset manner is a manner in which the camera model is offset based on a visual field determining box, the visual field determining box is configured to indicate a visual field range of the camera model, and the apparatus further comprises a calculation module;

the calculation module is configured to determine, in response to that a region reference point is located outside the visual field determining box, a first offset of the camera model in the first offset manner according to a distance between the region reference point and a frame of the visual field determining box, the region reference point being determined based on a center point of the target region; and

the control unit is configured to move the camera model from the first camera position to the second camera position according to the first offset.

13. The apparatus according to claim 12, wherein the calculation module is configured to calculate a vertical distance between the region reference point and the frame of the visual field determining box in response to that the region reference point is located outside the visual field determining box, the vertical distance comprising at least one of a transverse vertical distance and a longitudinal vertical distance, the transverse vertical distance being a vertical distance between the region reference point and a longitudinal frame of the visual field determining box, and the longitudinal vertical distance being a vertical distance between the region reference point and a transverse frame of the visual field determining box; and

the control unit is configured to determine the vertical distance as the first offset of the camera model in the first offset manner.

14. The apparatus according to claim 12, wherein the control unit is configured to move the camera model from the second camera position to a third camera position in response to that the region reference point is relocated in the visual field determining box, the third camera position being located between the second camera position and the first camera position, the third camera

position being corresponding to a third observation position; and

the display module is configured to display a third virtual environment picture according to the camera model located at the third camera position, the third virtual environment picture comprising a third region obtained by observing the virtual environment by using the third observation position as an observation center, the third region comprising the target region.

15. The apparatus according to claim ~~11~~10, wherein the offset manner comprises a second offset manner, the second offset manner is a manner of offsetting based on an indication direction, the indication direction is a direction pointing from a position at which the master virtual character is located to a center point of the target region, and the apparatus further comprises a calculation module;

the calculation module is configured to determine a second offset of the camera model in the second offset manner according to the indication direction; and

the control unit is configured to move the camera model from the first camera position to the second camera position according to the second offset.

16. The apparatus according to claim 15, wherein the calculation module comprises an obtaining unit;

the obtaining unit is configured to obtain an angle between the indication direction and a horizontal direction, the horizontal direction being parallel to a horizontal plane in the virtual environment and perpendicular to an observation direction of the camera model; obtain a fixed offset distance of the camera model corresponding to the indication direction; and obtain an offset ratio of the camera model in the second offset manner, the offset ratio being used for instructing the camera model to move according to the ratio; and

the calculation module is configured to determine the second offset according to the angle, the fixed offset distance, and the offset ratio.

17. The apparatus according to claim 16, wherein the second offset comprises a transverse offset, and the fixed offset distance comprises a transverse offset distance; and

the calculation module is configured to determine the transverse offset according to a product of a cosine value of the angle, the transverse offset distance, and the offset ratio, the offset ratio being a ratio of a first distance to a second distance, the first distance being a distance between the position at which the master virtual character is located and the center point of the target region, the second distance being a radius of a selection region, the selection region being used for providing a selection range for the regional skill indicator to select the target region.

18. The apparatus according to claim 16, wherein the second offset comprises a longitudinal offset, and the fixed offset distance comprises a longitudinal offset distance; and

the calculation module is configured to determine the longitudinal offset according to a product of a sine value of the angle, the longitudinal offset distance, and the offset ratio, the offset ratio being a ratio of a first distance to a second distance, the first distance being a distance between the position at which the master virtual character is located and the center point of the target region, the second distance being a radius of a selection region, the selection region being used for providing a selection range for the regional skill indicator to select the target region.

19. A computer device, comprising a processor and a memory, the memory storing at least one instruction, at least one program, a code set or an instruction set, the instruction, the program, the code set or the instruction set being loaded and executed by the processor to implement the method for displaying a virtual environment picture according to any one of claims 1 to ~~11~~9.

20. A computer-readable storage medium, storing at least one instruction, at least one program, a code set or an instruction set, the at least one instruction, the at least one program, the code set or the instruction set being loaded and executed by a processor to implement the method for displaying a virtual environment picture according to any one of claims 1 to ~~11~~9.