to the abscissa and ordinate values of the pixel in the weight map, which may be the coordinate values in the coordinate system established with the lower left corner of the weight map as the origin. Floor is a rounding-down function. Here, floor(X/3) is the first intermediate value and (X%3) is the second intermediate value. The WeightMapUVResult calculated through the first intermediate value and the second intermediate value is the position coordinate of the reference pixel in the weight map, so that the terminal can read the pixel value of the pixel at this position coordinate, and the read pixel value is the target display weight of the reference pixel in the weight map.

[0111] In an embodiment, in a case that rendering is performed by software, the landscape layer index map stores three pixels a, b and c, and the weight map stores nine pixels a1, a2, a3, b1, b2, b3, c1, c2 and c3~~9~~. The terminal can perform sampling on the landscape layer index map and the weight map at the same time to perform picture rendering based on the sampling result. For example, during first sampling, the terminal may determine the current sampled pixel a in the landscape layer index map, and determine the current sampled pixel a1 in the landscape layer index map through the target mapping formula, and perform picture rendering based on the landscape layer texture map pointed to by a1 and a. Further, during second sampling, the terminal may determine the current sampled pixel b in the landscape layer index map, and determine the current sampled pixel b1 in the landscape layer index map through the target mapping formula (at this time, the two protection pixels a2 and a3 are skipped), and perform picture rendering based on the landscape layer texture map pointed to by b1 and b. And so on until the whole target landscape area is successfully rendered.

[0112] After skipping the protection pixel of the weight map in the above manner, the processing result of the GPU will be, as illustrated in FIG. 16, a broken line diagram. The value of the abscissa rises in a vertical line, as if the value of part Y is skipped, and the skipped part is the protection pixel.

[0113] In this embodiment of this application, the target display weight corresponding to the pixel in the landscape layer index map recorded in the reference pixel is obtained by skipping the protection pixel in the weight map. Therefore, the protection pixel is prevented from interfering with the rendering and display.

[0114] As an optional solution, acquiring the landscape layer index map corresponding to the target landscape area to be displayed currently includes:

CLAIMS

What is claimed is:

1. A method for displaying a virtual landscape picture, executed by a terminal, the method comprising:

acquiring a landscape layer index map corresponding to a target landscape area to be displayed currently, and acquiring a weight map matching the landscape layer index map, each pixel in each image color channel in the landscape layer index map being used for storing an index value of one landscape layer in a texture array, a display weight cluster of the one landscape layer being correspondingly stored in a pixel cluster in each image color channel of the weight map, the pixel cluster comprising a reference pixel and a protection pixel matching the reference pixel, the reference pixel being a pixel having a mapping relationship with a pixel in the landscape layer index map, the protection pixel matching the reference pixel being a pixel having a positional association relationship with the reference pixel and representing a virtual landscape layer, and the display weight cluster comprising a target display weight corresponding to the reference pixel and a reference weight corresponding to the protection pixel;

performing filtering calculation on each of the pixel clusters in the weight map to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map; and

performing picture rendering according to the landscape layer index map and the target display weight in the weight map to display the virtual landscape picture corresponding to the target landscape area.

2. The method according to claim 1, further comprising:

for each group of adjacent pixels in a plurality of groups of adjacent pixels in the landscape layer index map, determining a first pixel cluster corresponding to a first adjacent pixel in a current group of adjacent pixels and determining a second pixel cluster corresponding to a second adjacent pixel in the current group of adjacent pixels;

performing linear interpolation processing on the current group of adjacent pixels according to the target display weight of the reference pixel in the first pixel cluster, the reference weight of the protection pixel in the first pixel cluster, the target display weight of

the reference pixel in the second pixel cluster and the reference weight of the protection pixel in the second pixel cluster to obtain a transition weight; and

performing smooth transition rendering on the current group of adjacent pixels according to the transition weight; and

the displaying the virtual landscape picture corresponding to the target landscape area comprises:

displaying the virtual landscape picture corresponding to the target landscape area according to a picture rendering result and a smooth transition rendering result.

3. The method according to claim 1, wherein before the acquiring the weight map matching the landscape layer index map, the method further comprises:

for each image color channel of the landscape layer index map, sequentially determining a protection pixel matching each pixel in the image color channel in each direction and determining the reference weight corresponding to each of the protection pixels to generate the weight map.

4. The method according to claim 3, wherein the protection pixel comprises a first protection pixel and a second protection pixel, a reference weight of the first protection pixel is a first reference weight, a reference weight of the second protection pixel is a second reference weight, and for each image color channel of the landscape layer index map, the sequentially determining the protection pixel matching each pixel in the image color channel in each direction and determining the reference weight corresponding to each of the protection pixels to generate the weight map comprises:

for each image color channel of the landscape layer index map, sequentially repeating the following operations until each pixel in the landscape layer index map is traversed:

determining a current pixel pair from the landscape layer index map, the current pixel pair comprising a first current pixel and a second current pixel; and

determining the first reference weight of the first protection pixel of the first current pixel in a first direction and the second reference weight of the second protection pixel of the second current pixel in a second direction based on a linear interpolation algorithm, the first direction and the second direction being opposite directions, and an average value of the target display weight of the first current pixel and the first reference weight of the first

protection pixel is equal to an average value of the target display weight of the second current pixel and the second reference weight of the second protection pixel.

5. The method according to claim 4, wherein the protection pixel further comprises a first oblique protection pixel, a second oblique protection pixel, a third oblique protection pixel and a fourth oblique protection pixel, a reference weight of the first oblique protection pixel is a first oblique reference weight, a reference weight of the second oblique protection pixel is a second oblique reference weight, a reference weight of the third oblique protection pixel is a third oblique reference weight, a reference weight of the fourth oblique protection pixel is a fourth oblique reference weight, and the method further comprises:

determining a third current pixel associated with the first current pixel and a fourth current pixel associated with the second current pixel in the landscape layer index map;

determining the first oblique reference weight of the first oblique protection pixel of the first current pixel in a first oblique direction based on the linear interpolation algorithm;

determining the second oblique reference weight of the second oblique protection pixel of the second current pixel in a second oblique direction based on the linear interpolation algorithm;

determining the third oblique reference weight of the third oblique protection pixel of the third current pixel in a third oblique direction based on the linear difference algorithm; and

determining the fourth oblique reference weight of the fourth oblique protection pixel of the fourth current pixel in a fourth oblique direction based on the linear interpolation algorithm, an average value of the target display weight of the first current pixel, the target display weight of the second current pixel, the target display weight of the third current pixel and the target display weight of the fourth current pixel being equal to an average value of the first oblique reference weight, the second oblique reference weight, the third oblique reference weight and the fourth oblique reference weight.

6. The method according to claim 1, wherein the performing filtering calculation on each of the pixel clusters in the weight map to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map comprises:

performing compression processing on the weight map according to a target ratio, the target ratio being determined according to a resolution ratio of the landscape layer index map

to the weight map; and

acquiring a target mapping formula, and inputting display coordinates in the compressed weight map into the target mapping formula for calculation to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map.

7. The method according to claim 6, wherein the inputting display coordinates in the compressed weight map into the target mapping formula for calculation to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map comprises:

acquiring a reference parameter value associated with the target ratio;

performing rounding processing on the display coordinates in the compressed weight map based on the reference parameter value to obtain a first intermediate value;

performing remainder-taking processing on the display coordinates in the compressed weight map based on the reference parameter value to obtain a second intermediate value; and

determining the target display weight obtained after skipping the protection pixel based on the first intermediate value and the second intermediate value.

8. The method according to any one of claims 1 to 7, wherein the acquiring a landscape layer index map corresponding to a target landscape area to be displayed currently comprises:

acquiring a plurality of landscape layer types comprised in the target landscape area to be displayed currently and determining a type weight corresponding to each landscape layer type in the plurality of landscape layer types;

screening at least one target landscape layer type with a corresponding type weight which satisfies a preset condition from the plurality of landscape layer types, and acquiring an index value of a landscape layer corresponding to each of the screened at least one target landscape layer type; and

sequentially storing the index value in each image color channel of the landscape layer index map to obtain the landscape layer index map corresponding to the target landscape area to be displayed currently.

9. The method according to claim 8, wherein the screening at least one target landscape layer type with a corresponding type weight which satisfies a preset condition from the

plurality of landscape layer types, and acquiring an index value of a landscape layer corresponding to each of the screened at least one target landscape layer type comprises:

performing type weight ranking according to a size of the type weights of the plurality of landscape layer types, and acquiring index values of landscape layers corresponding to first *N* landscape layer types according to a ranking result of the type weights.

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

processing circuitry, configured to perform the method operations according to any one of claims 1 to 9.

~~an acquisition unit, configured to acquire a landscape layer index map corresponding to a target landscape area to be displayed currently, and a weight map matching the landscape layer index map, each pixel in each image color channel in the landscape layer index map being used for storing an index value of one landscape layer in a texture array, a display weight cluster of the one landscape layer being correspondingly stored in a pixel cluster in each image color channel of the weight map, the pixel cluster comprising a reference pixel and a protection pixel matching the reference pixel, the reference pixel being a pixel having a mapping relationship with a pixel in the landscape layer index map, the protection pixel matching the reference pixel being a pixel having a positional association relationship with the reference pixel and representing a virtual landscape layer, and the display weight cluster comprising a target display weight corresponding to the reference pixel and a reference weight corresponding to the protection pixel; a calculation unit, configured to perform filtering calculation on each of the pixel clusters in the weight map to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map; and~~

~~a display unit, configured to perform picture rendering according to the landscape layer index map and the target display weight in the weight map to display the virtual landscape picture corresponding to the target landscape area.~~

~~11. The apparatus according to claim 10, wherein the display unit is further configured to, for each group of adjacent pixels in a plurality of groups of adjacent pixels in the landscape layer index map, determine a pixel cluster corresponding to a first adjacent pixel in a current group of adjacent pixels and determine a pixel cluster corresponding to a second adjacent pixel in the current group of adjacent pixels; take the pixel cluster corresponding to~~

~~the first adjacent pixel as a first pixel cluster and take the pixel cluster corresponding to the second adjacent pixel as a second pixel cluster; perform linear interpolation processing on the current group of adjacent pixels according to the target display weight of the reference pixel in the first pixel cluster, the reference weight of the protection pixel in the first pixel cluster, the target display weight of the reference pixel in the second pixel cluster and the reference weight of the protection pixel in the second pixel cluster to obtain a transition weight; perform smooth transition rendering on the current group of adjacent pixels according to the transition weight; and display the virtual landscape picture corresponding to the target landscape area according to a picture rendering result and a smooth transition rendering result.~~

~~12. The apparatus according to claim 10, wherein the apparatus for displaying a virtual landscape picture further comprises a map generation module, configured to, for each image color channel of the landscape layer index map, sequentially determine a protection pixel matching each pixel in the image color channel in each direction and determine the reference weight corresponding to each of the protection pixels to generate the weight map.~~

~~13. The apparatus according to claim 12, wherein the protection pixel comprises a first protection pixel and a second protection pixel, a reference weight of the first protection pixel is a first reference weight, and a reference weight of the second protection pixel is a second reference weight; the map generation module is further configured to, for each image color channel of the landscape layer index map, sequentially repeat the following operations until each pixel in the landscape layer index map is traversed: determining a current pixel pair from the landscape layer index map, the current pixel pair comprising a first current pixel and a second current pixel; and determining the first reference weight of the first protection pixel of the first current pixel in a first direction and the second reference weight of the second protection pixel of the second current pixel in a second direction based on a linear interpolation algorithm, the first direction and the second direction being opposite directions, and an average value of the target display weight of the first current pixel and the first reference weight of the first protection pixel is equal to an average value of the target display weight of the second current pixel and the second reference weight of the second protection pixel.~~

~~14. The apparatus according to claim 13, wherein the protection pixel further comprises a first oblique protection pixel, a second oblique protection pixel, a third oblique protection~~

pixel and a fourth oblique protection pixel, a reference weight of the first oblique protection pixel is a first oblique reference weight, a reference weight of the second oblique protection pixel is a second oblique reference weight, a reference weight of the third oblique protection pixel is a third oblique reference weight, a reference weight of the fourth oblique protection pixel is a fourth oblique reference weight, and the map generation module is further configured to: determine a third current pixel associated with the first current pixel and a fourth current pixel associated with the second current pixel in the landscape layer index map; determine the first oblique reference weight of the first oblique protection pixel of the first current pixel in a first oblique direction based on the linear interpolation algorithm; determine the second oblique reference weight of the second oblique protection pixel of the second current pixel in a second oblique direction based on the linear interpolation algorithm; determine the third oblique reference weight of the third oblique protection pixel of the third current pixel in a third oblique direction based on the linear difference algorithm; and determine the fourth oblique reference weight of the fourth oblique protection pixel of the fourth current pixel in a fourth oblique direction based on the linear interpolation algorithm, an average value of the target display weight of the first current pixel, the target display weight of the second current pixel, the target display weight of the third current pixel and the target display weight of the fourth current pixel being equal to an average value of the first oblique reference weight, the second oblique reference weight, the third oblique reference weight and the fourth oblique reference weight.

15. The apparatus according to claim 10, wherein the display unit is further configured to perform compression processing on the weight map according to a target ratio, the target ratio being determined according to a resolution ratio of the landscape layer index map to the weight map; and acquire a target mapping formula, and input display coordinates in the compressed weight map into the target mapping formula for calculation to skip the protection pixel and obtain the target display weight corresponding to the pixel in the landscape layer index map.

16. The apparatus according to claim 15, wherein the display unit is further configured to: acquire a reference parameter value associated with the target ratio; perform rounding processing on the display coordinates in the compressed weight map based on the reference parameter value to obtain a first intermediate value; perform remainder-taking processing on the display coordinates in the compressed weight map based on the reference parameter value

~~to obtain a second intermediate value; and determine the target display weight obtained after skipping the protection pixel based on the first intermediate value and the second intermediate value.~~

~~17. The apparatus according to any one of claims 10 to 16, wherein the apparatus for displaying a virtual landscape picture is further configured to: acquire a plurality of landscape layer types comprised in the target landscape area to be displayed currently and determine a type weight corresponding to each landscape layer type in the plurality of landscape layer types; screen at least one target landscape layer type with a corresponding type weight which satisfies a preset condition from the plurality of landscape layer types, and acquire an index value of a landscape layer corresponding to each of the screened at least one target landscape layer type; and sequentially store the index value in each image color channel of the landscape layer index map to obtain the landscape layer index map corresponding to the target landscape area to be displayed currently.~~

1~~8~~1. A computer-readable storage medium, storing computer-readable instructions, the computer-readable instructions, when executed by one or more processors, causing the one or more processors to perform the method according to any one of claims 1 to 9.

1~~9~~12. An electronic device, comprising a memory and a processor, the memory storing computer-readable instructions, the computer-readable instructions, when executed by the processor, causing the processor to perform the method according to any one of claims 1 to 9.

2~~0~~13. A computer program product, comprising a computer program, the computer program, when executed by a processor, implementing the operations of the method according to any one of claims 1 to 9.