Claims

1. A computer-implemented method comprising:

acquiring an original image, wherein the original image comprises a target image;

performing image compression processing comprising bilinear interpolation on the original image according to a preset compression ratio, acquiring a pixel value and position of each pixel point of the original image after the image compression processing, and creating a low-pixel image after the image compression processing based on the pixel value and position of each pixel point;

determining a to-be-detected region from the low-pixel image;

performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region to determine the borderlines of the target image; and

mapping the determined borderlines of the low-pixel image into the original image, and creating a revision of the target image from the original image, wherein mapping the determined borderlines of the low-pixel image into the original image comprises:

acquiring an intersection point of every two adjacent borderlines in the low-pixel image;

separately mapping the acquired intersection points into the original image according to the preset compression ratio, to generate corresponding mapping points in the original image; and

successively connecting the mapping points mapped into the original image, and determining a quadrangle generated after the connection as the target image in the original image.

2. The computer-implemented method of claim 1, wherein determining the to-be-detected region from the low-pixel image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

performing edge detection processing on the binary image to acquire at least one edge line in the binary image;

separately dilating each edge line;

connecting each dilated edge line to acquire connected regions;

screening the connected regions according to position information of each connected region respectively to acquire a specific region, wherein the specific region is a region comprising a specific graphic portion in the target image; and

determining a region other than the specific region in the low-pixel image as the to-be-detected region.

3. The computer-implemented method of claim 2, before the performing edge detection processing on the binary image, further comprising performing Gauss smoothing on the binary image by using a preset Gauss smoothing parameter.

4. The computer-implemented method of claim 1, wherein performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region, to determine the borderlines of the target image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

executing the following operations in an arbitrary direction:

separately comparing a gradient value between every two adjacent pixel points in the to-be-detected region of the binary image in the arbitrary direction with a preset initial gradient threshold corresponding to the arbitrary direction, and

acquiring an initial borderline in the arbitrary direction according to a comparison result; and

determining the borderlines of the target image respectively according to a number of initial borderlines acquired in each direction.

5. The computer-implemented method of claim 4, wherein determining the borderlines of the target image respectively according to the number of initial borderlines acquired in each direction comprises:

executing the following operations for a detection result in an arbitrary direction:

separately performing straight line detection on each initial borderline in the arbitrary direction according to position information of each initial borderline in the

arbitrary direction when the number of initial borderlines acquired in the arbitrary direction is at least two, and acquiring borderlines in the arbitrary direction from at least two of the initial borderlines in the arbitrary direction; or

successively decreasing the preset initial gradient threshold corresponding to the arbitrary direction according to a preset first gradient difference when the number of initial borderlines acquired in the arbitrary direction is less than two, and detecting the to-be-detected region of the binary image in the arbitrary direction by using the decreased initial gradient threshold until the number of initial borderlines acquired in the arbitrary direction is at least two.

6. The computer-implemented method of claim 1, further comprising, after acquiring the target image in the original image, correcting the target image by using a projective transformation algorithm.

7. A non-transitory, computer-readable medium storing one or more instructions executable by a computer system to perform operations comprising:

acquiring an original image, wherein the original image comprises a target image;

performing image compression processing comprising bilinear interpolation on the original image according to a preset compression ratio, acquiring a pixel value and position of each pixel point of the original image after the image compression processing, and creating a low-pixel image after the image compression processing based on the pixel value and position of each pixel point;

determining a to-be-detected region from the low-pixel image;

performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region to determine the borderlines of the target image; and

mapping the determined borderlines of the low-pixel image into the original image, and creating a revision of the target image from the original image, wherein mapping the determined borderlines of the low-pixel image into the original image comprises:

acquiring an intersection point of every two adjacent borderlines in the low-pixel image;

separately mapping the acquired intersection points into the original image according to the preset compression ratio, to generate corresponding mapping points in the original image; and

successively connecting the mapping points mapped into the original image, and determining a quadrangle generated after the connection as the target image in the original image.

8. The non-transitory, computer-readable medium of claim 7, wherein determining the to-be-detected region from the low-pixel image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

performing edge detection processing on the binary image to acquire at least one edge line in the binary image;

separately dilating each edge line;

connecting each dilated edge line to acquire connected regions;

screening the connected regions according to position information of each connected region respectively to acquire a specific region, wherein the specific region is a region comprising a specific graphic portion in the target image; and

determining a region other than the specific region in the low-pixel image as the to-be-detected region.

9. The non-transitory, computer-readable medium of claim 8, before the performing edge detection processing on the binary image, further comprising performing Gauss smoothing on the binary image by using a preset Gauss smoothing parameter.

10. The non-transitory, computer-readable medium of claim 7, wherein performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region, to determine the borderlines of the target image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

executing the following operations in an arbitrary direction:

separately comparing a gradient value between every two adjacent pixel points in the to-be-detected region of the binary image in the arbitrary direction with a preset initial gradient threshold corresponding to the arbitrary direction, and acquiring an initial borderline in the arbitrary direction according to the comparison result; and

determining the borderlines of the target image respectively according to the number of initial borderlines acquired in each direction.

11. The non-transitory, computer-readable medium of claim 10, wherein determining the borderlines of the target image respectively according to the number of initial borderlines acquired in each direction comprises:

executing the following operations for a detection result in an arbitrary direction:

separately performing straight line detection on each initial borderline in the arbitrary direction according to position information of each initial borderline in the arbitrary direction when the number of initial borderlines acquired in the arbitrary direction is at least two, and acquiring borderlines in the arbitrary direction from the at least two initial borderlines in the arbitrary direction; or

successively decreasing the preset initial gradient threshold corresponding to the arbitrary direction according to a preset first gradient difference when the number of initial borderlines acquired in the arbitrary direction is less than two, and detecting the to-be-detected region of the binary image in the arbitrary direction by using the decreased initial gradient threshold until the number of initial borderlines acquired in the arbitrary direction is at least two.

12. The non-transitory, computer-readable medium of claim 7, further comprising, after acquiring the target image in the original image, correcting the target image by using a projective transformation algorithm.

13. A computer-implemented system, comprising:

one or more computers; and

one or more computer memory devices interoperably coupled with the one or more computers and having tangible, non-transitory, machine-readable media storing one or more instructions that, when executed by the one or more computers, perform one or more operations comprising:

acquiring an original image, wherein the original image comprises a target image;

performing image compression processing comprising bilinear interpolation on the original image according to a preset compression ratio, acquiring a pixel value and position of each pixel point of the original image after the image compression processing, and creating a low-pixel image after the image compression processing based on the pixel value and position of each pixel point;

determining a to-be-detected region from the low-pixel image;

performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region to determine the borderlines of the target image; and

mapping the determined borderlines of the low-pixel image into the original image, and creating a revision of the target image from the original image, wherein mapping the determined borderlines of the low-pixel image into the original image comprises:

acquiring an intersection point of every two adjacent borderlines in the low-pixel image;

separately mapping the acquired intersection points into the original image according to the preset compression ratio, to generate corresponding mapping points in the original image; and

successively connecting the mapping points mapped into the original image, and determining a quadrangle generated after the connection as the target image in the original image.

14. The computer-implemented system of claim 13, wherein determining the to-be-detected region from the low-pixel image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

performing edge detection processing on the binary image to acquire at least one edge line in the binary image;

separately dilating each edge line;

connecting each dilated edge line to acquire connected regions;

screening the connected regions according to position information of each connected region respectively to acquire a specific region, wherein the specific region is a region comprising a specific graphic portion in the target image; and

determining a region other than the specific region in the low-pixel image as the to-be-detected region.

15. The computer-implemented system of claim 14, before the performing edge detection processing on the binary image, further comprising performing Gauss smoothing on the binary image by using a preset Gauss smoothing parameter.

16. The computer-implemented system of claim 13, wherein performing borderline detection processing on the to-be-detected region according to a gradient value between every two adjacent pixel points in the to-be-detected region, to determine the borderlines of the target image comprises:

binarizing the low-pixel image to convert the low-pixel image into a binary image, wherein the binary image comprises only two colors;

executing the following operations in an arbitrary direction:

separately comparing a gradient value between every two adjacent pixel points in the to-be-detected region of the binary image in the arbitrary direction with a preset initial gradient threshold corresponding to the arbitrary direction, and acquiring an initial borderline in the arbitrary direction according to the comparison result; and

determining the borderlines of the target image respectively according to the number of initial borderlines acquired in each direction.

17. The computer-implemented system of claim 16, wherein determining the borderlines of the target image respectively according to the number of initial borderlines acquired in each direction comprises:

executing the following operations for a detection result in an arbitrary direction:

separately performing straight line detection on each initial borderline in the arbitrary direction according to position information of each initial borderline in the arbitrary direction when the number of initial borderlines acquired in the arbitrary

direction is at least two, and acquiring borderlines in the arbitrary direction from the at least two initial borderlines in the arbitrary direction; or

successively decreasing the preset initial gradient threshold corresponding to the arbitrary direction according to a preset first gradient difference when the number of initial borderlines acquired in the arbitrary direction is less than two, and detecting the to-be-detected region of the binary image in the arbitrary direction by using the decreased initial gradient threshold until the number of initial borderlines acquired in the arbitrary direction is at least two.