CLAIMS

1. A digital object unique identifier (DOI) recognition method, comprising:

obtaining a code scanning image;

graying the code scanning image, to obtain a grayscale value of each pixel in the code scanning image;

determining a DOI image in the code scanning image according to the grayscale value of each pixel in the code scanning image; and

recognizing the DOI image;

wherein the determining a DOI image in the code scanning image specifically comprises:

determining an average grayscale value of all of the pixels in the code scanning image;

for grayscale values that are not smaller than the average grayscale value or for grayscale values that are not greater than the average grayscale value determined according to the average grayscale average value, determining a correspondence between each of the grayscale values and a quantity of pixels having the grayscale value;

determining, according to the correspondence, one or more grayscale values corresponding to a maximum quantity of pixels in the correspondence, to be maximum grayscale values;

for each of the maximum grayscale values, determining a sub image boundary according to pixels whose grayscale values are the maximum grayscale value, and determining one or more sub images within the sub image boundary in the code scanning image; and

determining the DOI image in the sub images.

2. The method according to claim 1, wherein the determining the DOI image in the sub images specifically comprises:

selecting a sub image of a preset shape according to shapes of the sub images, to be the determined DOI image; and/or

for each of the sub images, determining a ratio of quantities of pixels having different grayscale values in the sub image; and in the sub images, selecting a sub image for which the ratio of quantities is a preset ratio, to be the determined DOI image.

3. The method according to claim 2, wherein the determining a sub image boundary specifically comprises:

determining a rectangular sub image boundary; and

selecting a sub image of a preset shape according to shapes of the sub images specifically comprises:

selecting, according to length-width ratios of the sub images, a sub image whose length-width ratio falls within a preset length-width ratio range.

4. The method according to claim 2, wherein the determining a ratio of quantities of pixels having different grayscale values in the sub image specifically comprises:

determining, according to the average grayscale value, a ratio of the quantity of pixels whose grayscale values are smaller than the average grayscale value to the quantity of pixels whose grayscale values are greater than the average grayscale value in the sub image.

5. The method according to any one of claims 1 to 4, wherein the DOI image comprises at least one of a barcode and a two-dimensional code.

6. A digital object unique identifier (DOI) recognition device, comprising:

an image obtaining module, configured to obtain a code scanning image;

a grayscale value obtaining module, configured to gray the code scanning image, to obtain a grayscale value of each pixel in the code scanning image;

an image determining module, configured to determine a DOI image in the code scanning image according to the grayscale value of each pixel in the code scanning image,

wherein to determine a DOI image in the code scanning image specifically comprises:

determine an average grayscale value of all of the pixels in the code scanning image;

for grayscale values that are not smaller than the average grayscale value or for grayscale values that are or not greater than the average grayscale value determined according to the average grayscale average value, determine a correspondence between each of the grayscale values and a quantity of pixels having the grayscale value;

determine, according to the correspondence, one or more grayscale values corresponding to a maximum quantity of pixels in the correspondence, to be maximum grayscale values;

for each of the maximum grayscale values, determine a sub image boundary according to pixels whose grayscale values are the maximum grayscale value, and determine one or more sub images within the sub image boundary in the code scanning image; and

determine the DOI image in the sub images; and

an image recognition module, configured to recognize the DOI image.

7. The device according to claim 6, wherein the image determining module is configured to: select a sub image of a preset shape according to shapes of the sub images, to be the determined DOI image; and/or

for each of the sub images, determine a ratio of quantities of pixels having different grayscale values in the sub image; and in the sub images, select a sub image for which the ratio of quantities is a preset ratio, to be the determined DOI image.

8. The device according to claim 7, wherein the image determining module is configured to: determine a rectangular sub image boundary; and

select, according to length-width ratios of the sub images, a sub image whose length-width ratio falls within a preset length-width ratio range.

9. The device according to claim 7, wherein the image determining module is configured to determine, according to the average grayscale value, a ratio of the quantity of pixels whose grayscale values are smaller than the average grayscale value to the quantity of pixels whose grayscale values are greater than the average grayscale value in the sub image.

10. The device according to any one of claims 6 to 9, wherein the DOI image comprises at least one of a barcode and a two-dimensional code.