

CLAIMS

1. A computer-implemented method for detecting barcodes in a digital image represented as a two-dimensional digital image array comprising:
 - applying a filter to the image array,
 - computing a discrete Radon transformation of the filtered image array, wherein the discrete Radon Transformation is computed for a plurality of discrete lines across the filtered image array,
 - wherein for each given discrete line with a given slope the discrete Radon transformation is computed for a number of different displacements of the given discrete line, wherein said number of displacements is less than two times a dimension of the image array,
 - detecting in the output of the discrete Radon transformation of the filtered image array the vertex points of a pattern,
 - converting the detected vertex points back to discrete lines in the image array for constraining the location of a barcode present in the digital image.
2. Method according to claim 1, wherein the displacement for a given discrete line with a given slope is characterized by an intercept, e.g. a vertical intercept.
3. Method according to one of the preceding claims, wherein the filter is a gradient filter.
4. Method according to one of the preceding claims, wherein the pattern has a quadrilateral shape, e.g. a rhombus shape.
5. Method according to one of the preceding claims, wherein the discrete Radon transformation for a given slope is computed for a number N of displacements of discrete lines that are closest to the center of the image array, and wherein N is an integer and a dimension of the array.
6. Method according to one of the preceding claims, wherein if the digital image is not square-shaped, the digital image is resized to a square image, i.e. to an image array of size $N \times N$, with N being an integer.

7. Method according to one of the preceding claims, wherein computing the discrete Radon transformation of the filtered image array is carried out for four quadrants, wherein, for example, the first quadrant covers discrete line slopes from 0° to 45° , the second quadrant covers discrete line slopes from 45° to 90° , the third quadrant covers discrete line slopes from -90° to -45° , the fourth quadrant covers discrete line slopes from -45° to 0° , and wherein a rotated and transposed copy of the computed Radon transformation of the first quadrant defining a fifth quadrant is attached to the fourth quadrant.
8. Method according to one of the preceding claims, wherein computing the discrete Radon transformation of the filtered image array is carried out per column of the filtered image array.
9. Method according to the preceding claim, wherein separate memory buffers are assigned for the computation of odd and even columns.
10. Method according to one of the preceding claims, wherein the detection of the vertex points of the pattern is based on their intensity values and variance in the output of the discrete Radon transformation and/or wherein the detection of the vertex points of the detected pattern, e.g. the quadrilateral, is carried out by means of a neural network.
11. Method according to one of the preceding claims, wherein constraining the location of a barcode present in the digital image comprises averaging the vertical index of a detected top vertex point and a detected bottom vertex point of the detected pattern.
12. Method according to one of the preceding claims, wherein constraining the location of a barcode present in the digital image comprises computing the difference of the horizontal index of two detected lateral vertex point, e.g. a left and a right vertex point, of the detected pattern.
13. Method according to one of the preceding claims, wherein converting the detected vertex points back to discrete lines in the image array comprises, converting two detected lateral vertex point, e.g. a left and a right vertex point, into line parameters of two discrete lines in the image array and calculating a crossing point of said two discrete lines.

14. A computer system configured to carry out a method according to any of the preceding method claims.
15. A computer system according to the preceding claim, wherein the computer system comprises a mobile device with a camera.