

Patent Claims

1. A method, comprising:
receiving a data value for encoding in an image (140); and
generating the image (140), the image (140) comprising a plurality of
5 encoding regions (312), each of the encoding regions (312) containing a
respective representation of the data value, the data value being discernible based
on any one of the plurality of encoding regions (312), the encoding regions (312)
being arranged with a selected density within the image (140) of at least two,
wherein the representation of the data value is based on a ratio of a first element in
10 one of the encoding regions and a second element in the one of the encoding
regions (312).
2. The method of claim 1, the generating the image (140) comprising
selecting, based on the data value, an encoding image out of a set of encoding
15 images.
3. The method of claim 2, the selected encoding image comprising a plurality
of elements arranged in a grid, the elements being identical elements or being
different elements.
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4. The method of claim 3, the plurality of elements comprising colored
shapes.
5. The method of claim 4, the colored shapes comprising at least one of
25 squares, rectangles, circles, crosses, triangles, ovals, rhombuses, stars, and
trigrams.
6. The method of claim 4, the colored shapes being at least one of red, blue,
and green.
- 30 7. The method of any of claims 3-6, the plurality of elements being arranged
in a repeating pattern in the grid.

8. The method of any of claims 2-7, the selected image comprising a first element in the representation of the data value, the generating the image further comprising:

5 selecting, based on the data value, an additional image out the set of encoding images, the selected additional image comprising a second element in the representation of the data value; and

 combining the selected encoding image and the selected additional image.

10 9. The method of any of claims 1-8, the ratio being a ratio of a number of the first element to a number of the second element.

 10. The method of any of claims 1-8, the ratio being a ratio of a surface area occupied by the first element to a surface area occupied by the second element.

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 11. The method of any of claims 1-10, the image being one in a sequence of images for decoding, each image in the sequence of images encoding a portion of a piece of information.

20 12. The method of claim 11, the sequence of images being a time-varying sequence displayed on an electronic display (1310).

 13. A method, comprising:

25 using an image sensor (120), obtaining an image of at least a portion of a picture (140) shown on a surface, the picture (140) comprising a plurality of encoding regions (312), each of the regions (312) containing a respective representation of a common data value, the encoding regions (312) being arranged with a selected density within the picture (140) of at least two;

 identifying first and second elements in at least one of the regions (312); and

30 based on the identified first and second elements, determining the common data value, wherein each of the respective representations of the common data value is based on a ratio between the first element in the representation and the second element in the representation, the determining the common data value

comprising determining the ratio and determining an associated value for the ratio.

14. A system (110), comprising:

5 an image sensor (120); and
a computer-based control unit (130) coupled to the image sensor (120), the control unit (130) being configured to,

10 obtain, using the image sensor (120), an image of at least a portion of a picture (140) shown on a surface (1310), the picture (140) comprising a plurality of encoding regions (312), each of the regions (312) containing a respective representation of a common data value, the encoding regions (312) being arranged with a selected density within the image of at least two,
identify first and second elements in at least one of the regions (312), and
15 based on the identified first and second elements, determine the common data value, wherein each of the respective representations of the common data value is based on a ratio between the first element in the representation and the second element in the representation, the determining the common data value comprising determining the ratio and determining an associated value for the ratio.

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15. The system (110) of claim 14, the image sensor (120) being configured to read the image without focusing on the surface (1310).

16. A computer-readable storage medium (1420) having encoded thereon
25 instructions (1430) that, when executed by a computer (1400), cause the computer (1400) to perform a method, the method comprising:

receiving a data value for encoding in an image (140); and
generating the image (140), the image (140) comprising a plurality of
encoding regions (312), each of the encoding regions (312) containing a
30 respective representation of the data value, the data value being discernible based on any one of the plurality of encoding regions (312), the encoding regions (312) being arranged with a selected density within the image (140) of at least two,

wherein the representation of the data value is based on a ratio of a first element in one of the encoding regions and a second element in the one of the encoding regions (312).