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CLAIMS

1. A method comprising:

receiving, by a computing device, a binary identifier comprising a plurality of bits;

5 determining, by the computing device, one or more encoded cells that encode the binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter;

10 generating, by the computing device, a cell array that includes the one or more encoded cells; and

outputting, by the computing device, data for producing a graphical representation of the cell array.

2. The method of claim 1,

15 wherein determining the one or more encoded cells in accordance with the encoding scheme includes determining, for each of the one or more encoded cells, a cell colour, and

wherein the cell colour is one of a plurality of colours.

20 ~~3. The method of claim 2, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits, and~~

~~4. The method of claim 3, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or~~
25 ~~more bits represented by the cell colour.~~

~~5. The method of claim 4, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

30 ~~6. The method of claim 4, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

~~73.~~ The method of ~~any of claims 2 and 3,~~ wherein determining the cell colour includes determining a cell colour associated with a predetermined sequence of two or more bits
35 that matches the predetermined sequence of two or more bits indicated by the line pattern

of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.

84. The method of claim 1, further comprising:

determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells.

95. The method of ~~any of claims 2 to 7~~ or 3, further comprising:

determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells, ~~and~~

~~10. The method of claim 9, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

~~11. The method of any of claims 8 to 10, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array, or~~

~~12. The method of any of claims 8 to 10, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

~~13. The method of any of claims 8 to 12, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

~~14. The method of any of claims 8 to 13, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

~~15. The method of any of claims 8 to 14, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

167. The method of ~~any of claims 1 to 15~~ preceding claims, wherein the generated cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.

178. The method of any one of claims 1 to 167,

wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and

wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.

~~18. The method of claim 17, wherein the plurality of predefined line patterns comprises an empty cell line pattern.~~

~~19. The method of any of claims 17 and 18, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

~~20. The method of any of claims 17 to 19, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

~~21. The method of any of claims 17 to 20, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

~~22. The method of any of claims 17 to 21, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

~~23. The method of any of claims 17 to 22, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

249. The method of any one of claims 1 to 238, wherein the perimeter is a polygon, and

~~25. The method of claim 24, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

2610. The method of claim 259,

wherein the alignment mark includes a centre,

wherein the polygon includes a centre, and

wherein the alignment mark centre is at the polygon centre. or

~~27. The method of claim 25,~~

~~wherein the alignment mark includes a centre,~~
~~wherein the polygon includes a centre, and~~
wherein the alignment mark centre is offset from the polygon centre.

5 | ~~28~~11. The method of any one of claims 1 to ~~23~~8, wherein the perimeter includes a curved line.

~~29. The method of any of claims 1 to 28, wherein a width of the perimeter equals a width of a line within the line pattern.~~

10

~~30~~12. The method of any ~~of claims 1 to 29~~ preceding claims, wherein outputting data for producing the graphical representation of the cell array includes transmitting the data from the computing device to a printer, or

15 | ~~31. The method of any of claims 1 to 30, wherein outputting data for producing the graphical representation of the cell array includes transmitting the data from the computing device to a display device.~~

~~32~~13. The method of any ~~of preceding claims 1 to 31~~, further comprising:

20 | determining, by the computing device, a layout selection for generating the cell array, and

 determining, by the computing device, a layout in accordance with the determined layout selection,

25 | wherein generating the cell array includes positioning the one or more encoded cells in the layout in accordance with the determined layout selection.

~~33. The method of claim 32,~~

~~wherein generating the cell array includes positioning one or more layout cells, and~~

30 | ~~wherein the one or more layout cells form a portion of the layout but do not encode any portion of the binary identifier.~~

~~34~~14. The method of any one of claims 1 to ~~33~~13, further comprising:

35 | determining, by the computing device, a selected noise tolerance level, wherein the one or more encoded cells have a noise tolerance level that is more noise tolerant or that matches the selected noise tolerance level.

3515. The method of any one of claims 1 to 3414, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.

3616. The method of any one of claims 1 to 3515, further comprising:

receiving, by the computing device, a non-binary identifier equivalent to the binary identifier; and

converting, by the computing device, the non-binary identifier to the binary identifier,

wherein receiving the binary identifier includes receiving the binary identifier converted by the computing device from the non-binary identifier.

~~37. A machine comprising:~~

~~a computing device; and~~

~~a computer-readable medium storing program instructions, that when executed by the computing device, cause a set of functions to be performed, the set of functions comprising:~~

~~receiving, by the computing device, a binary identifier comprising a plurality of bits;~~

~~determining, by the computing device, one or more encoded cells that encode the binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a~~

~~predetermined sequence of two or more bits, and wherein each encoded cell includes a~~

~~perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter;~~

~~generating, by the computing device, a cell array that includes the one or more encoded cells; and~~

~~38. The machine of claim 37,~~

~~wherein determining the one or more encoded cells in accordance with the encoding scheme includes determining, for each of the one or more encoded cells, a cell colour, and~~

~~wherein the cell colour is one of a plurality of colours.~~

~~39. The machine of claim 38, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.~~

40. ~~The machine of claim 39, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

41. ~~The machine of claim 40, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

42. ~~The machine of claim 40, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

43. ~~The machine of any of claims 38 and 39, wherein determining the cell colour includes determining a cell colour associated with a predetermined sequence of two or more bits that matches the predetermined sequence of two or more bits indicated by the line pattern of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.~~

44. ~~The machine of claim 37, wherein the set of functions further comprises: determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells.~~

45. ~~The machine of any of claims 38 to 43, wherein the set of functions further comprises: determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells.~~

46. ~~The machine of claim 45, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

47. ~~The machine of any of claims 44 to 46, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

48. ~~The machine of any of claims 44 to 46, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

49. ~~The machine of any of claims 44 to 48, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

50. ~~The machine of any of claims 44 to 49, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

51. ~~The machine of any of claims 44 to 50, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty-cell line pattern.~~

52. ~~The machine of any of claims 37 to 51, wherein the generated cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

53. ~~The machine of any of claims 37 to 52, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

54. ~~The machine of claim 53, wherein the plurality of predefined line patterns comprises an empty-cell line pattern.~~

55. ~~The machine of any of claims 53 and 54, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

56. ~~The machine of any of claims 53 to 55, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

57. ~~The machine of any of claims 53 to 56, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

58. ~~The machine of any of claims 53 to 57, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

59. ~~The machine of any of claims 53 to 58, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

5 60. ~~The machine of any of claims 37 to 59, wherein the perimeter is a polygon.~~

61. ~~The machine of claim 60, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

10 62. ~~The machine of claim 61,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

15 63. ~~The machine of claim 61,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

20 64. ~~The machine of any of claims 37 to 59, wherein the perimeter includes a curved line.~~

65. ~~The machine of any of claims 37 to 64, wherein a width of the perimeter equals a width of a line within the line pattern.~~

25 66. ~~The machine of any of claims 37 to 65, wherein outputting data for producing the graphical representation of the cell array includes transmitting the data from the computing device to a printer.~~

30 67. ~~The machine of any of claims 37 to 66, wherein outputting data for producing the graphical representation of the cell array includes transmitting the data from the computing device to a display device.~~

35 68. ~~The machine of any of claims 37 to 67, wherein the set of functions further comprises:~~

determining, by the computing device, a layout selection for generating the cell array, and
determining, by the computing device, a layout in accordance with the determined layout
selection,

5 wherein generating the cell array includes positioning the one or more encoded cells in the
layout in accordance with the determined layout selection.

69. The machine of claim 68,

wherein generating the cell array includes positioning one or more layout cells, and

10 wherein the one or more layout cells form a portion of the layout but do not encode any
portion of the binary identifier.

70. The machine of any of claims 37 to 69, wherein the set of functions further
comprises:

15 determining, by the computing device, a selected noise tolerance level, wherein the one or
more encoded cells have a noise tolerance level that is more noise tolerant or that matches
the selected noise tolerance level.

71. The machine of any of claims 37 to 70, wherein the predetermined sequence of two
20 or more bits for one or more of the encoded cells is based on an angular position of the line
pattern from a predetermined reference direction.

72. The machine of any of claims 37 to 71, wherein the set of functions further
comprises:

25 receiving, by the computing device, a non-binary identifier equivalent to the binary
identifier; and

converting, by the computing device, the non-binary identifier to the binary identifier,

wherein receiving the binary identifier includes receiving the binary identifier converted by
the computing device from the non-binary identifier.

30 73. A computer-readable medium storing program instructions, that when executed by a
computing device, cause a set of functions to be performed, the set of functions
comprising:

receiving, by the computing device, a binary identifier comprising a plurality of bits;

determining, by the computing device, one or more encoded cells that encode the binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter;

generating, by the computing device, a cell array that includes the one or more encoded cells; and

outputting, by the computing device, data for producing a graphical representation of the cell array.

74. The computer-readable medium of claim 73, wherein determining the one or more encoded cells in accordance with the encoding scheme includes determining, for each of the one or more encoded cells, a cell colour, and wherein the cell colour is one of a plurality of colours.

75. The computer-readable medium of claim 74, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.

76. The computer-readable medium of claim 75, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.

77. The computer-readable medium of claim 76, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.

78. The computer-readable medium of claim 76, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.

79. The computer-readable medium of any of claims 74 and 75, wherein determining the cell colour includes determining a cell colour associated with a predetermined sequence of two or more bits that matches the predetermined sequence of two or more bits indicated by the line pattern of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.

80. ~~The computer-readable medium of claim 73, wherein the set of functions further comprises:~~

~~determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells.~~

81. ~~The computer-readable medium of any of claims 74 to 79, wherein the set of functions further comprises:~~

~~determining, by the computing device, one or more alignment cells, wherein the generated cell array includes the one or more alignment cells.~~

82. ~~The computer-readable medium of claim 81, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

83. ~~The computer-readable medium of any of claims 80 to 82, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

84. ~~The computer-readable medium of any of claims 80 to 82, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

85. ~~The computer-readable medium of any of claims 80 to 84, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

86. ~~The computer-readable medium of any of claims 80 to 85, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

87. ~~The computer-readable medium of any of claims 80 to 86, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

88. ~~The computer-readable medium of any of claims 73 to 87, wherein the generated cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

89. ~~The computer-readable medium of any of claims 73 to 88, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

90. ~~The computer-readable medium of claim 89, wherein the plurality of predefined line patterns comprises an empty-cell line pattern.~~

91. ~~The computer-readable medium of any of claims 89 and 90, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

92. ~~The computer-readable medium of any of claims 89 to 91, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

93. ~~The computer-readable medium of any of claims 89 to 92, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

94. ~~The computer-readable medium of any of claims 89 to 93, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

95. ~~The computer-readable medium of any of claims 89 to 94, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

96. ~~The computer-readable medium of any of claims 73 to 95, wherein the perimeter is a polygon.~~

97. ~~The computer-readable medium of claim 96, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

98. — ~~The computer-readable medium of claim 97,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

99. — ~~The computer-readable medium of claim 97,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

100. — ~~The computer-readable medium of any of claims 73 to 95, wherein the perimeter
includes a curved line.~~

101. — ~~The computer-readable medium of any of claims 73 to 100, wherein a width of the
perimeter equals a width of a line within the line pattern.~~

102. — ~~The computer-readable medium of any of claims 73 to 101, wherein outputting data
for producing the graphical representation of the cell array includes transmitting the data
from the computing device to a printer.~~

103. — ~~The computer-readable medium of any of claims 73 to 102, wherein outputting data
for producing the graphical representation of the cell array includes transmitting the data
from the computing device to a display device.~~

104. — ~~The computer-readable medium of any of claims 73 to 103, wherein the set of
functions further comprises:
determining, by the computing device, a layout selection for generating the cell array, and
determining, by the computing device, a layout in accordance with the determined layout
selection,
wherein generating the cell array includes positioning the one or more encoded cells in the
layout in accordance with the determined layout selection.~~

105. — ~~The computer-readable medium of claim 104,
wherein generating the cell array includes positioning one or more layout cells, and~~

wherein the one or more layout cells form a portion of the layout but do not encode any portion of the binary identifier.

106. The computer-readable medium of any of claims 73 to 105, wherein the set of functions further comprises:

determining, by the computing device, a selected noise tolerance level, wherein the one or more encoded cells have a noise tolerance level that is more noise tolerant or that matches the selected noise tolerance level.

107. The computer-readable medium of any of claims 73 to 106, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.

108. The computer-readable medium of any of claims 73 to 107, wherein the set of functions further comprises:

receiving, by the computing device, a non-binary identifier equivalent to the binary identifier; and

converting, by the computing device, the non-binary identifier to the binary identifier,

wherein receiving the binary identifier includes receiving the binary identifier converted by the computing device from the non-binary identifier.

109. The computer-readable medium of any of claims 73 to 108, wherein the computer-readable medium comprises a non-transitory computer-readable medium.

11017. A method comprising:

receiving, by a computing device, a captured cell array including one or more encoded cells that encode a binary identifier in accordance with an encoding scheme,

wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter;

decoding, by the computing device, each encoded cell in the captured cell array in accordance with a decoding scheme corresponding to the encoding scheme to recover the bits indicated by the encoded cell;

recovering, by the computing device, the binary identifier by combining the recovered bits; and

outputting, by the computing device, the recovered binary identifier.

5 | ~~111~~18. The method of claim ~~110~~17, wherein decoding each encoded cell in the captured cell array includes detecting, by the computing device, each encoded cell in the captured cell array₁.

~~112. The method of any of claims 110 and 111, wherein receiving the captured cell array includes receiving a captured image of the cell array.~~

10 | ~~113. The method of any of claims 110 and 111, wherein receiving the captured cell array includes receiving a scanned image of the cell array.~~

~~114. The method of any of claims 110 to 113,~~
wherein decoding each encoded cell in accordance with the decoding scheme
15 | includes decoding, for each of the one or more encoded cells, a cell colour, and
wherein the cell colour is one of a plurality of colours₁.

~~115. The method of claim 114, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits₁ and~~

20 | ~~116. The method of claim 115, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

25 | ~~117. The method of claim 116, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

~~118. The method of claim 116, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

30 | ~~119~~19. The method of claim ~~110~~17, further comprising:
identifying, by the computing device, one or more alignment cells within the captured cell array.

35 | ~~120~~20. The method of ~~any of claims 111 to 118~~18, further comprising:

identifying, by the computing device, one or more alignment cells within the captured cell array.

~~121. The method of claim 120, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

~~122. The method of any of claims 119 to 121, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

~~123~~21. The method of ~~any of claims 119 to 124~~ 19 or 20, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.

~~124~~22. The method of claim ~~123~~21, further comprising:

determining, by the computing device, a distance between alignment marks within two adjacent alignment cells, and

determining, by the computing device, presence of an encoded cell in the captured cell array by detecting an alignment mark of the encoded cell in the captured cell array and an alignment mark of another cell of the captured cell array being separated by a distance equal to the distance between alignment marks within two adjacent alignment cells.

~~125. The method of any of claims 119 to 124, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

~~126. The method of any of claims 119 to 125, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

~~127. The method of any of claims 119 to 126, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

~~128~~23. The method of any one of claims ~~110 to 127~~17 to 22, wherein the captured cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier, and

~~129. The method of any of claims 110 to 128, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

~~130. The method of claim 129, wherein the plurality of predefined line patterns comprises an empty cell line pattern.~~

~~131. The method of any of claims 129 and 130, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

~~132. The method of any of claims 129 to 131, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

~~133. The method of any of claims 129 to 132, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

~~134. The method of any of claims 129 to 133, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

~~135. The method of any of claims 129 to 134, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

~~136~~24. The method of any of claims ~~110 to 135~~ 17 to 23, wherein the perimeter is a polygon.

~~137. The method of claim 136, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

~~138. The method of claim 137,~~
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre. or

~~139. The method of claim 137,~~
wherein the alignment mark includes a centre,

wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.

14025. The method of any one of claims ~~110 to 135~~17 to 23, wherein the perimeter
includes a curved line.

~~141. The method of any of claims 110 to 140, wherein a width of the perimeter equals a
width of a line within the line pattern.~~

~~142. The method of any of claims 110 to 141, wherein outputting the recovered binary
identifier includes transmitting the recovered binary identifier from the computing device to
a display device.~~

14326. The method of any of claims ~~110 17~~ to ~~142~~25, further comprising:
converting, by the computing device, the recovered binary identifier to an alpha-
numeric representation of the recovered binary identifier,
wherein outputting the recovered binary identifier includes transmitting the alpha-
numeric representation to a printer or to a display device.

~~144. A machine comprising:
a computing device; and
a computer-readable medium storing program instructions, that when executed by the
computing device, cause a set of functions to be performed, the set of functions
comprising:
receiving, by the computing device, a captured cell array including one or more encoded
cells that encode a binary identifier in accordance with an encoding scheme, wherein each
encoded cell indicates a predetermined sequence of two or more bits, and wherein each
encoded cell includes a perimeter, an alignment mark within the perimeter, and a line
pattern within the perimeter;
decoding, by the computing device, each encoded cell in the captured cell array in
accordance with a decoding scheme corresponding to the encoding scheme to recover the
bits indicated by the encoded cell;
recovering, by the computing device, the binary identifier by combining the recovered bits;
and
outputting, by the computing device, the recovered binary identifier.~~

145. ~~The machine of claim 144, wherein decoding each encoded cell in the captured cell array includes detecting, by the computing device, each encoded cell in the captured cell array.~~

5 146. ~~The machine of any of claims 144 and 145, wherein receiving the captured cell array includes receiving a captured image of the cell array.~~

147. ~~The machine of any of claims 144 and 145, wherein receiving the captured cell array includes receiving a scanned image of the cell array.~~

10 148. ~~The machine of any of claims 144 to 147, wherein decoding each encoded cell in accordance with the decoding scheme includes decoding, for each of the one or more encoded cells, a cell colour, and wherein the cell colour is one of a plurality of colours.~~

15 149. ~~The machine of claim 148, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.~~

20 150. ~~The machine of claim 149, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

25 151. ~~The machine of claim 150, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

152. ~~The machine of claim 150, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

30 153. ~~The machine of claim 144, the set of functions further comprising: identifying, by the computing device, one or more alignment cells within the captured cell array.~~

35 154. ~~The machine of any of claims 145 to 152, the set of functions further comprising: identifying, by the computing device, one or more alignment cells within the captured cell array.~~

155. ~~The machine of claim 154, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

156. ~~The machine of any of claims 153 to 155, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

157. ~~The machine of any of claims 153 to 155, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

158. ~~The machine of claim 157, the set of functions further comprising:
determining, by the computing device, a distance between alignment marks within two adjacent alignment cells, and
determining, by the computing device, presence of an encoded cell in the captured cell array by detecting an alignment mark of the encoded cell in the captured cell array and an alignment mark of another cell of the captured cell array being separated by a distance equal to the distance between alignment marks within two adjacent alignment cells.~~

159. ~~The machine of any of claims 153 to 158, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

160. ~~The machine of any of claims 153 to 159, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

161. ~~The machine of any of claims 153 to 160, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

162. ~~The machine of any of claims 144 to 161, wherein the captured cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

163. ~~The machine of any of claims 144 to 162, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

5 164. ~~The machine of claim 163, wherein the plurality of predefined line patterns comprises an empty cell line pattern.~~

165. ~~The machine of any of claims 163 and 164, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

10 166. ~~The machine of any of claims 163 to 165, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

167. ~~The machine of any of claims 163 to 166, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

168. ~~The machine of any of claims 163 to 167, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

20 169. ~~The machine of any of claims 163 to 168, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

170. ~~The machine of any of claim 144 to 169, wherein the perimeter is a polygon.~~

25 171. ~~The machine of claim 170, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

172. ~~The machine of claim 171,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

30 173. ~~The machine of claim 171,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and~~

35

wherein the alignment mark centre is offset from the polygon centre.

174. ~~The machine of any of claims 144 to 169, wherein the perimeter includes a curved line.~~

175. ~~The machine of any of claims 144 to 174, wherein a width of the perimeter equals a width of a line within the line pattern.~~

176. ~~The machine of any of claims 144 to 175, wherein outputting the recovered binary identifier includes transmitting the recovered binary identifier from the computing device to a display device.~~

177. ~~The machine of any of claims 144 to 176, the set of functions further comprising: converting, by the computing device, the recovered binary identifier to an alpha-numeric representation of the recovered binary identifier, wherein outputting the recovered binary identifier includes transmitting the alpha-numeric representation to a printer or to a display device.~~

178. ~~A computer-readable medium storing program instructions, that when executed by a computing device, cause a set of functions to be performed, the set of functions comprising:~~

~~receiving, by the computing device, a captured cell array including one or more encoded cells that encode a binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter;~~

~~decoding, by the computing device, each encoded cell in the captured cell array in accordance with a decoding scheme corresponding to the encoding scheme to recover the bits indicated by the encoded cell;~~

~~recovering, by the computing device, the binary identifier by combining the recovered bits; and~~

~~outputting, by the computing device, the recovered binary identifier.~~

179. ~~The computer-readable medium of claim 178, wherein decoding each encoded cell in the captured cell array includes detecting, by the computing device, each encoded cell in the captured cell array.~~

180. ~~The computer-readable medium of any of claims 178 and 179, wherein receiving the captured cell array includes receiving a captured image of the cell array.~~

181. ~~The computer-readable medium of any of claims 178 and 179, wherein receiving the captured cell array includes receiving a scanned image of the cell array.~~

182. ~~The computer-readable medium of any of claims 178 to 181, wherein decoding each encoded cell in accordance with the decoding scheme includes decoding, for each of the one or more encoded cells, a cell colour, and wherein the cell colour is one of a plurality of colours.~~

183. ~~The computer-readable medium of claim 182, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.~~

184. ~~The computer-readable medium of claim 183, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

185. ~~The computer-readable medium of claim 184, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

186. ~~The computer-readable medium of claim 184, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

187. ~~The computer-readable medium of claim 178, the set of functions further comprising: identifying, by the computing device, one or more alignment cells within the captured cell array.~~

188. ~~The computer-readable medium of any of claims 179 to 186, the set of functions further comprising:~~

identifying, by the computing device, one or more alignment cells within the captured cell array.

189. The computer-readable medium of claim 188, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.

190. The computer-readable medium of any of claims 187 to 189, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.

191. The computer-readable medium of any of claims 187 to 189, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.

192. The computer-readable medium of claim 191, the set of functions further comprising:

determining, by the computing device, a distance between alignment marks within two adjacent alignment cells, and

determining, by the computing device, presence of an encoded cell in the captured cell array by detecting an alignment mark of the encoded cell in the captured cell array and an alignment mark of another cell of the captured cell array being separated by a distance equal to the distance between alignment marks within two adjacent alignment cells.

193. The computer-readable medium of any of claims 187 to 192, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.

194. The computer-readable medium of any of claims 187 to 193, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.

195. ~~The computer-readable medium of any of claims 187 to 194, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty-cell line pattern.~~

5 196. ~~The computer-readable medium of any of claims 178 to 195, wherein the captured cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

10 197. ~~The computer-readable medium of any of claims 178 to 196, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

15 198. ~~The computer-readable medium of claim 197, wherein the plurality of predefined line patterns comprises an empty-cell line pattern.~~

20 199. ~~The computer-readable medium of any of claims 197 and 198, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

200. ~~The computer-readable medium of any of claims 197 to 199, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

25 201. ~~The computer-readable medium of any of claims 197 to 200, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

202. ~~The computer-readable medium of any of claims 197 to 201, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

30 203. ~~The computer-readable medium of any of claims 197 to 202, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

35 204. ~~The computer-readable medium of any of claim 178 to 203, wherein the perimeter is a polygon.~~

205. ~~The computer-readable medium of claim 204, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

206. ~~The computer-readable medium of claim 205,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

207. ~~The computer-readable medium of claim 205,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

208. ~~The computer-readable medium of any of claims 178 to 203, wherein the perimeter includes a curved line.~~

209. ~~The computer-readable medium of any of claims 178 to 208, wherein a width of the perimeter equals a width of a line within the line pattern.~~

210. ~~The computer-readable medium of any of claims 178 to 209, wherein outputting the recovered binary identifier includes transmitting the recovered binary identifier from the computing device to a display device.~~

211. ~~The computer-readable medium of any of claims 178 to 210, the set of functions further comprising:
converting, by the computing device, the recovered binary identifier to an alpha-numeric representation of the recovered binary identifier,
wherein outputting the recovered binary identifier includes transmitting the alpha-numeric representation to a printer or to a display device.~~

212. ~~The computer-readable medium of any of claims 178 to 211, wherein the computer-readable medium comprises a non-transitory computer-readable medium.~~

21327. A method comprising:

receiving, by a computing device, data specifying a cell array, wherein the cell array includes one or more encoded cells that encode a binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter; and

displaying, by a display connected to the computing device, a graphical representation of the cell array, wherein the displayed cell array includes the one or more encoded cells that encode the binary identifier in accordance with the encoding scheme, wherein each displayed encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter.

~~214. The method of claim 213, wherein the data indicates a cell colour for each of the one or more encoded cells, and wherein the cell colour is one of a plurality of colours.~~

~~215. The method of claim 214, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.~~

~~216. The method of claim 215, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

~~217. The method of claim 216, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

~~218. The method of claim 216, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

~~219. The method of any of claims 214 and 215, wherein, for each of the one or more encoded cells, the distinct sequence of two or more bits represented by the cell colour indicated for the cell matches the predetermined sequence of two or more bits indicated by the line pattern of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.~~

220. ~~The method of claim 213, wherein the cell array includes one or more alignment cells.~~

5 221. ~~The method of any of claims 214 to 219, wherein the cell array includes one or more alignment cells.~~

222. ~~The method of claim 221,
wherein the plurality of colours includes a predetermined number of colours,
10 wherein the two or more adjacent cells includes a predetermined number of cells equal to the predetermined number of colours, and
wherein each cell of the two or more adjacent cells corresponds to a distinct colour of the predetermined number of colours.~~

15 223. ~~The method of any of claims 220 and 222, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

20 224. ~~The method of any of claims 220 to 222, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

225. ~~The method of any of claims 220 to 224, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

25 226. ~~The method of any of claims 220 to 225, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

30 227. ~~The method of any of claims 220 to 226, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

228. ~~The method of any of claims 220 to 227, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

229. ~~The method of any of claims 213 to 228, wherein the cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

230. ~~The method of any of claims 213 to 229,~~

5 ~~wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and~~

~~wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

10 231. ~~The method of claim 230, wherein the plurality of predefined line patterns comprises an empty cell line pattern.~~

232. ~~The method of any of claims 230 and 231, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

15 233. ~~The method of any of claims 230 to 232, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

234. ~~The method of any of claims 230 to 233, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

235. ~~The method of any of claims 230 to 234, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

25 236. ~~The method of any of claims 230 to 235, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

237. ~~The method of any of claims 213 to 236, wherein the perimeter is a polygon.~~

30 238. ~~The method of claim 237, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

239. ~~The method of claim 238,~~

~~wherein the alignment mark includes a centre,~~

35 ~~wherein the polygon includes a centre, and~~

wherein the alignment mark centre is at the polygon centre.

240. ~~The method of claim 238,~~

~~wherein the alignment mark includes a centre,~~

~~wherein the polygon includes a centre, and~~

~~wherein the alignment mark centre is offset from the polygon centre.~~

241. ~~The method of any of claims 213 to 236, wherein the perimeter includes a curved line.~~

242. ~~The method of any of claims 213 to 241, wherein a width of the perimeter equals a width of a line within the line pattern.~~

243. ~~The method of any of claims 213 to 242, further comprising:~~

~~determining, by the computing device, a layout selection for generating the cell array, and~~

~~determining, by the computing device, a layout in accordance with the determined layout selection,~~

~~wherein generating the cell array includes positioning the one or more encoded cells in the layout in accordance with the determined layout selection.~~

244. ~~The method of any of claims 213 to 243, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.~~

245. ~~The method of any of claims 213 to 244, further comprising:~~

~~receiving, by the computing device, a non-binary identifier equivalent to the binary identifier; and~~

~~converting, by the computing device, the non-binary identifier to the binary identifier,~~

~~wherein receiving the binary identifier includes receiving the binary identifier converted by the computing device from the non-binary identifier.~~

246. ~~The method of any of claims 213 to 245, wherein the display is connected to the computing device by at least one of a wireless communication link, a wired communication link, and a wired and wireless communication link.~~

24728. A machine comprising:

a display;

a computing device; and

a computer-readable medium storing program instructions, that when executed by the computing device, cause a set of functions to be performed, the set of functions comprising a method in accordance with any one of claims 1 to 27.:

~~receiving, by the computing device, data specifying a cell array, wherein the cell array includes one or more encoded cells that encode a binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter; and~~

~~displaying, by the display connected to the computing device, a graphical representation of the cell array, wherein the displayed cell array includes the one or more encoded cells that encode the binary identifier in accordance with the encoding scheme, wherein each displayed encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter.~~

~~248. The machine of claim 247,~~

~~wherein the data indicates a cell colour for each of the one or more encoded cells, and wherein the cell colour is one of a plurality of colours.~~

~~249. The machine of claim 248, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.~~

~~250. The machine of claim 249, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.~~

~~251. The machine of claim 250, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

~~252. The machine of claim 250, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

253. ~~The machine of claim 249, wherein, for each of the one or more encoded cells, the distinct sequence of two or more bits represented by the cell colour indicated for the cell matches the predetermined sequence of two or more bits indicated by the line pattern of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.~~

254. ~~The machine of claim 247, wherein the cell array includes one or more alignment cells.~~

255. ~~The machine of any of claims 248 to 253, wherein the cell array includes one or more alignment cells.~~

256. ~~The machine of claim 255, wherein the plurality of colours includes a predetermined number of colours, wherein the two or more adjacent cells includes a predetermined number of cells equal to the predetermined number of colours, and wherein each cell of the two or more adjacent cells corresponds to a distinct colour of the predetermined number of colours.~~

257. ~~The machine of any of claims 255 and 256, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

258. ~~The machine of any of claims 254 to 257, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

259. ~~The machine of any of claims 254 to 257, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

260. ~~The machine of any of claims 254 to 259, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

261. ~~The machine of any of claims 254 to 260, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

262. ~~The machine of any of claims 254 to 261, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty-cell line pattern.~~

263. ~~The machine of any of claims 247 to 262, wherein the cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

264. ~~The machine of any of claims 247 to 263, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

265. ~~The machine of claim 264, wherein the plurality of predefined line patterns comprises an empty-cell line pattern.~~

266. ~~The machine of any of claims 264 and 265, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

267. ~~The machine of any of claims 264 to 266, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

268. ~~The machine of any of claims 264 to 267, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

269. ~~The machine of any of claims 264 to 268, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

270. ~~The machine of any of claims 264 to 269, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

271. ~~The machine of any of claim 247 to 270, wherein the perimeter is a polygon.~~

272. ~~The machine of claim 271, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

5 273. ~~The machine of claim 272,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

10 274. ~~The machine of claim 272,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

15 275. ~~The machine of any of claims 247 to 270, wherein the perimeter includes a curved line.~~

20 276. ~~The machine of any of claims 247 to 275, wherein a width of the perimeter equals a width of a line within the line pattern.~~

25 277. ~~The machine of any of claims 247 to 276, wherein the set of functions further comprises:
determining, by the computing device, a layout selection for generating the cell array, and
determining, by the computing device, a layout in accordance with the determined layout selection,
wherein generating the cell array includes positioning the one or more encoded cells in the layout in accordance with the determined layout selection.~~

30 278. ~~The machine of any of claims 247 to 277, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.~~

279. ~~The machine of any of claims 247 to 278, wherein the set of functions further comprises:~~

receiving, by the computing device, a non-binary identifier equivalent to the binary identifier; and

converting, by the computing device, the non-binary identifier to the binary identifier,

wherein receiving the binary identifier includes receiving the binary identifier converted by the computing device from the non-binary identifier.

280. The machine of any of claims 247 to 279, wherein the display is connected to the computing device by at least one of a wireless communication link, a wired communication link, and a wired and wireless communication link.

~~281~~29. A computer-readable medium storing program instructions, that when executed by a computing device, cause a set of functions to be performed, the set of functions comprising a method in accordance with any one of claims 1 to 27:

receiving, by the computing device, data specifying a cell array, wherein the cell array includes one or more encoded cells that encode a binary identifier in accordance with an encoding scheme, wherein each encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter; and

displaying, by a display connected to the computing device, a graphical representation of the cell array, wherein the displayed cell array includes the one or more encoded cells that encode the binary identifier in accordance with the encoding scheme, wherein each displayed encoded cell indicates a predetermined sequence of two or more bits, and wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter.

282. The computer-readable medium of claim 281, wherein the data indicates a cell colour for each of the one or more encoded cells, and wherein the cell colour is one of a plurality of colours.

283. The computer-readable medium of claim 282, wherein each cell colour of the plurality of colours represents a distinct sequence of two or more bits.

284. The computer-readable medium of claim 283, wherein the predetermined sequence of two or more bits includes two or more bits based on the line pattern within the perimeter and the two or more bits represented by the cell colour.

285. ~~The computer-readable medium of 284, wherein the two or more bits represented by the cell colour are a precursor to the two or more bits based on the line pattern.~~

286. ~~The computer-readable medium of 284, wherein the two or more bits based on the line pattern are a precursor to the two or more bits represented by the cell colour.~~

287. ~~The computer-readable medium of claim 283, wherein, for each of the one or more encoded cells, the distinct sequence of two or more bits represented by the cell colour indicated for the cell matches the predetermined sequence of two or more bits indicated by the line pattern of the cell so as to encode redundant sequences of two or more bits in the encoded cell that can be compared during decoding of the encoded cell to confirm proper decoding.~~

288. ~~The computer-readable medium of claim 281, wherein the cell array includes one or more alignment cells.~~

289. ~~The computer-readable medium of any of claims 282 to 287, wherein the cell array includes one or more alignment cells.~~

290. ~~The computer-readable medium of claim 289, wherein the plurality of colours includes a predetermined number of colours, wherein the two or more adjacent cells includes a predetermined number of cells equal to the predetermined number of colours, and wherein each cell of the two or more adjacent cells corresponds to a distinct colour of the predetermined number of colours.~~

291. ~~The computer-readable medium of any of claims 289 and 290, wherein the one or more alignment cells includes a plurality of coloured alignment cells, each coloured alignment cell comprises an alignment cell coloured to match a corresponding colour of the plurality of colours.~~

292. ~~The computer-readable medium of any of claims 288 to 291, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

293. ~~The computer-readable medium of any of claims 288 to 291, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

294. ~~The computer-readable medium of any of claims 288 to 293, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

295. ~~The computer-readable medium of any of claims 288 to 294, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

296. ~~The computer-readable medium of any of claims 288 to 295, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty-cell line pattern.~~

297. ~~The computer-readable medium of any of claims 281 to 296, wherein the cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

298. ~~The computer-readable medium of any of claims 281 to 297, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

299. ~~The computer-readable medium of claim 298, wherein the plurality of predefined line patterns comprises an empty-cell line pattern.~~

300. ~~The computer-readable medium of any of claims 298 and 299, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

301. ~~The computer-readable medium of any of claims 298 to 300, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

302. ~~The computer-readable medium of any of claims 298 to 301, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

303. ~~The computer-readable medium of any of claims 298 to 302, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

304. ~~The computer-readable medium of any of claims 298 to 303, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

305. ~~The computer-readable medium of any of claim 271 to 304, wherein the perimeter is a polygon.~~

306. ~~The computer-readable medium of claim 305, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

307. ~~The computer-readable medium of claim 306,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

308. ~~The computer-readable medium of claim 306,
wherein the alignment mark includes a centre,
wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

309. ~~The computer-readable medium of any of claims 271 to 304, wherein the perimeter includes a curved line.~~

310. ~~The computer-readable medium of any of claims 271 to 309, wherein a width of the perimeter equals a width of a line within the line pattern.~~

311. ~~The computer-readable medium of any of claims 271 to 310, wherein the set of functions further comprises:~~

5 ~~determining, by the computing device, a layout selection for generating the cell array, and determining, by the computing device, a layout in accordance with the determined layout selection,~~

~~wherein generating the cell array includes positioning the one or more encoded cells in the layout in accordance with the determined layout selection.~~

10 312. ~~The computer-readable medium of any of claims 271 to 311, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.~~

15 313. ~~The computer-readable medium of any of claims 271 to 312, wherein the set of functions further comprises:~~

~~receiving, by the computing device, a non-binary identifier equivalent to the binary identifier; and~~

~~converting, by the computing device, the non-binary identifier to the binary identifier,~~

20 ~~wherein receiving the binary identifier includes receiving the binary identifier converted by the computing device from the non-binary identifier.~~

25 314. ~~The computer-readable medium of any of claims 271 to 313, wherein the display is connected to the computing device by at least one of a wireless communication link, a wired communication link, and a wired and wireless communication link.~~

31530. An article of manufacture comprising:

a surface; and

a cell array, readable by a computing device, at the surface,

30 wherein the cell array includes one or more encoded cells that encode, in accordance with an encoding scheme, a binary identifier that represents information pertaining to the article of manufacture,

wherein the binary identifier comprises a plurality of bits,

wherein each encoded cell indicates a predetermined sequence of two or more bits,

and

wherein each encoded cell includes a perimeter, an alignment mark within the perimeter, and a line pattern within the perimeter.

~~316. The article of manufacture of claim 315,~~

~~wherein each of the one or more encoded cells is coloured a cell colour, and
wherein the cell colour is one of a plurality of colours.~~

~~317. The article of manufacture of claim 316, wherein each cell colour of the plurality of
colours represents a distinct sequence of two or more bits.~~

~~318. The article of manufacture of claim 317, wherein the predetermined sequence of
two or more bits includes two or more bits based on the line pattern within the perimeter
and the two or more bits represented by the cell colour.~~

~~319. The article of manufacture of 318, wherein the two or more bits represented by the
cell colour are a precursor to the two or more bits based on the line pattern.~~

~~320. The article of manufacture of 318, wherein the two or more bits based on the line
pattern are a precursor to the two or more bits represented by the cell colour.~~

~~321. The article of manufacture of any of claims 316 and 317, wherein the cell colour is
associated with a predetermined sequence of two or more bits that matches the
predetermined sequence of two or more bits indicated by the line pattern of the cell so as to
encode redundant sequences of two or more bits in the encoded cell that can be compared
during decoding of the encoded cell to confirm proper decoding.~~

~~322. The article of manufacture of claim 315, wherein the cell array includes one or more
alignment cells.~~

~~323. The article of manufacture of any of claims 316 to 321, wherein the cell array
includes one or more alignment cells.~~

~~324. The article of manufacture of claim 323, wherein the one or more alignment cells
includes a plurality of coloured alignment cells, each coloured alignment cell comprises an
alignment cell coloured to match a corresponding colour of the plurality of colours.~~

325. ~~The article of manufacture of any of claims 322 to 324, wherein the one or more alignment cells includes at least one alignment cell that indicates a start point within the cell array.~~

326. ~~The article of manufacture of any of claims 322 to 324, wherein the one or more alignment cells includes an alignment node including two or more adjacent alignment cells that collectively identify a start point within the cell array.~~

327. ~~The article of manufacture of any of claims 322 to 326, wherein the one or more alignment cells include at least one alignment cell that indicates an end point within the cell array.~~

328. ~~The article of manufacture of any of claims 322 to 327, wherein the one or more alignment cells include at least one alignment cell that indicates an end point of a row within the cell array.~~

329. ~~The article of manufacture of any of claims 322 to 328, wherein the one or more alignment cells include at least one alignment cell that is an inverse of an empty cell line pattern.~~

330. ~~The article of manufacture of any of claims 322 to 329, wherein the cell array includes at least one decoding cell that indicates the encoding scheme used to encode the binary identifier.~~

331. ~~The article of manufacture of any of claims 315 to 330, wherein the line pattern in each encoded cell corresponds to one of a plurality of predefined line patterns, and wherein each predefined line pattern corresponds to a predetermined sequence of two or more bits.~~

332. ~~The article of manufacture of claim 331, wherein the plurality of predefined line patterns comprises an empty cell line pattern.~~

333. ~~The article of manufacture of any of claims 331 and 332, wherein each of one or more of the plurality of predefined line patterns comprises one or more asymmetric radial vectors.~~

5 334. ~~The article of manufacture of any of claims 331 to 333, wherein each of one or more of the plurality of predefined line patterns comprises one or more diametric vectors.~~

335. ~~The article of manufacture of any of claims 331 to 334, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric cross.~~

10 336. ~~The article of manufacture of any of claims 331 to 335, wherein each of one or more of the plurality of predefined line patterns comprises a symmetric star.~~

15 337. ~~The article of manufacture of any of claims 331 to 336, wherein each of one or more of the plurality of line patterns comprises a curved line pattern.~~

338. ~~The article of manufacture of any of claim 315 to 337, wherein the perimeter is a polygon.~~

20 339. ~~The article of manufacture of claim 338, wherein the polygon is a triangle, a quadrilateral, pentagon, a hexagon, or a dodecagon.~~

340. ~~The article of manufacture of claim 339,
wherein the alignment mark includes a centre,
25 wherein the polygon includes a centre, and
wherein the alignment mark centre is at the polygon centre.~~

341. ~~The article of manufacture of claim 339,
wherein the alignment mark includes a centre,
30 wherein the polygon includes a centre, and
wherein the alignment mark centre is offset from the polygon centre.~~

342. ~~The article of manufacture of any of claims 315 to 337, wherein the perimeter includes a curved line.~~

343. ~~The article of manufacture of any of claims 315 to 342, wherein a width of the perimeter equals a width of a line within the line pattern.~~

344. ~~The article of manufacture of any of claims 315 to 343, wherein the cell array includes one or more layout cells that form a portion of the cell array but do not encode any portion of the binary identifier.~~

345. ~~The article of manufacture of any of claims 315 to 344, wherein the predetermined sequence of two or more bits for one or more of the encoded cells is based on an angular position of the line pattern from a predetermined reference direction.~~

346. ~~The article of manufacture of any of claims 315 to 345, wherein the cell array at the surface comprises a cell array on the surface.~~

347. ~~The article of manufacture of claim 346, wherein the cell array on the surface comprises a cell array printed on the surface.~~

348. ~~The article of manufacture of claim 346, wherein the cell array on the surface comprises a cell array affixed to the surface using an adhesive.~~

349. ~~The article of manufacture of any of claims 315 to 345, wherein the cell array at the surface comprises a cell array within the surface.~~

350. ~~The article of manufacture of claim 349, wherein the cell array within the surface comprises a cell array engraved within the surface.~~

351. ~~The article of manufacture of claim 349, wherein the cell array within the surface comprises a cell array etched within the surface.~~

352. ~~The article of manufacture of any of claims 315 to 351, wherein the surface comprises a metal surface, a plastic surface, a glass surface, or a wooden surface.~~

353. ~~The article of manufacture of any of claims 315 to 352, wherein the article of manufacture comprises a magazine or a newspaper.~~

~~354. The article of manufacture of any of claims 315 to 353, wherein the information pertaining to the article of manufacture includes at least one of an advertisement, a uniform resource locator, and a telephone number.~~