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(54) Titre : ORIENTATION DE MOTIF PPI DENSE  
(54) Title: HIGH PPI PATTERN ORIENTATION

(57) **Abrégé/Abstract:**

A pixel pattern of material light emissive areas for an emissive display system having pixels, each pixel having subpixels, each subpixel having a light emitting device defining the material light emissive area of the subpixel, the pixel pattern comprising: for each pixel, a shared elongated subpixel of a first primary color shared with an adjacent pixel and an elongated subpixel of a second or third primary color located in an area on an opposite side of the shared elongated subpixel from the adjacent pixel.



**ABSTRACT OF THE DISCLOSURE**

A pixel pattern of material light emissive areas for an emissive display system having pixels, each pixel having subpixels, each subpixel having a light emitting device defining the material light emissive area of the subpixel, the pixel pattern comprising: for each pixel, a shared elongated subpixel of a first primary color shared with an adjacent pixel and an elongated subpixel of a second or third primary color located in an area on an opposite side of the shared elongated subpixel from the adjacent pixel.



# **IGNIS Patents**

## **HIGH PPI PATTERN ORIENTATION**

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The colour patterning in emissive devices is done through masking. However, the design rules between each patterns and the width of patterns are generally coarse due to the fabrication process. This results in lower number of pattern (pixel) per (PPI) inch or small fill factor in high PPI. One method is to have the pixel in orientation shown in Figure 1 to get better PPI or fill factor.

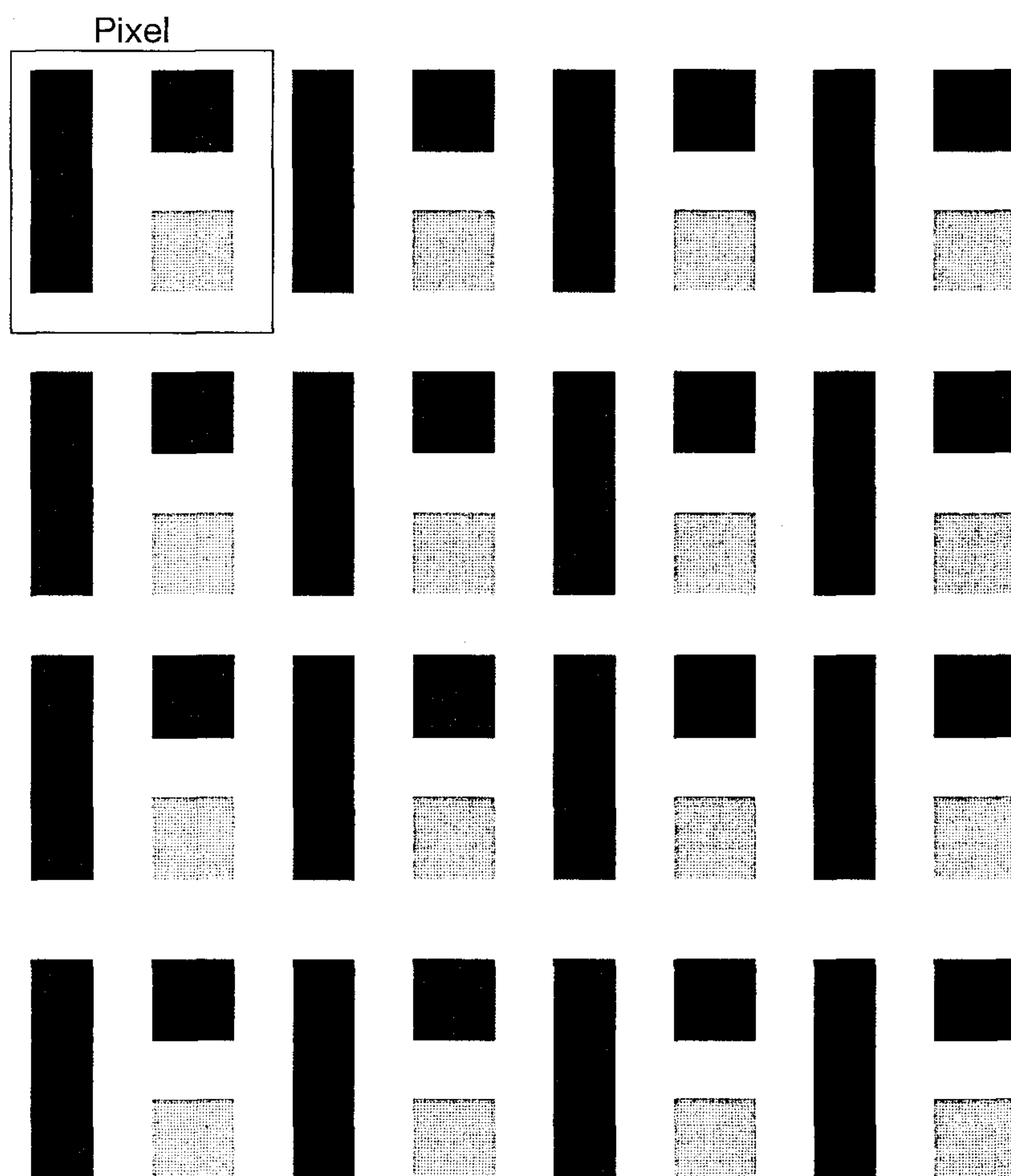


Figure 1: High-PPI pattern orientation.

However, the pattern presented in Figure 1 is not efficient at very high ppi. One method is to reduce the number of patterning. In this case, the red and green sub pixel is shared between each adjacent pixel. The main issue is the resolution lost is too much.

Figure 2 presents a pixel that shared only one sub-pixel (blue) which has less effect on resolution. In this case, blue sub-pixel (or any other colour with less effect on resolution) can be driven by one pixel or two separate pixel circuits. In case of two pixel circuit driven condition, the resolution loss will be minimized significantly.

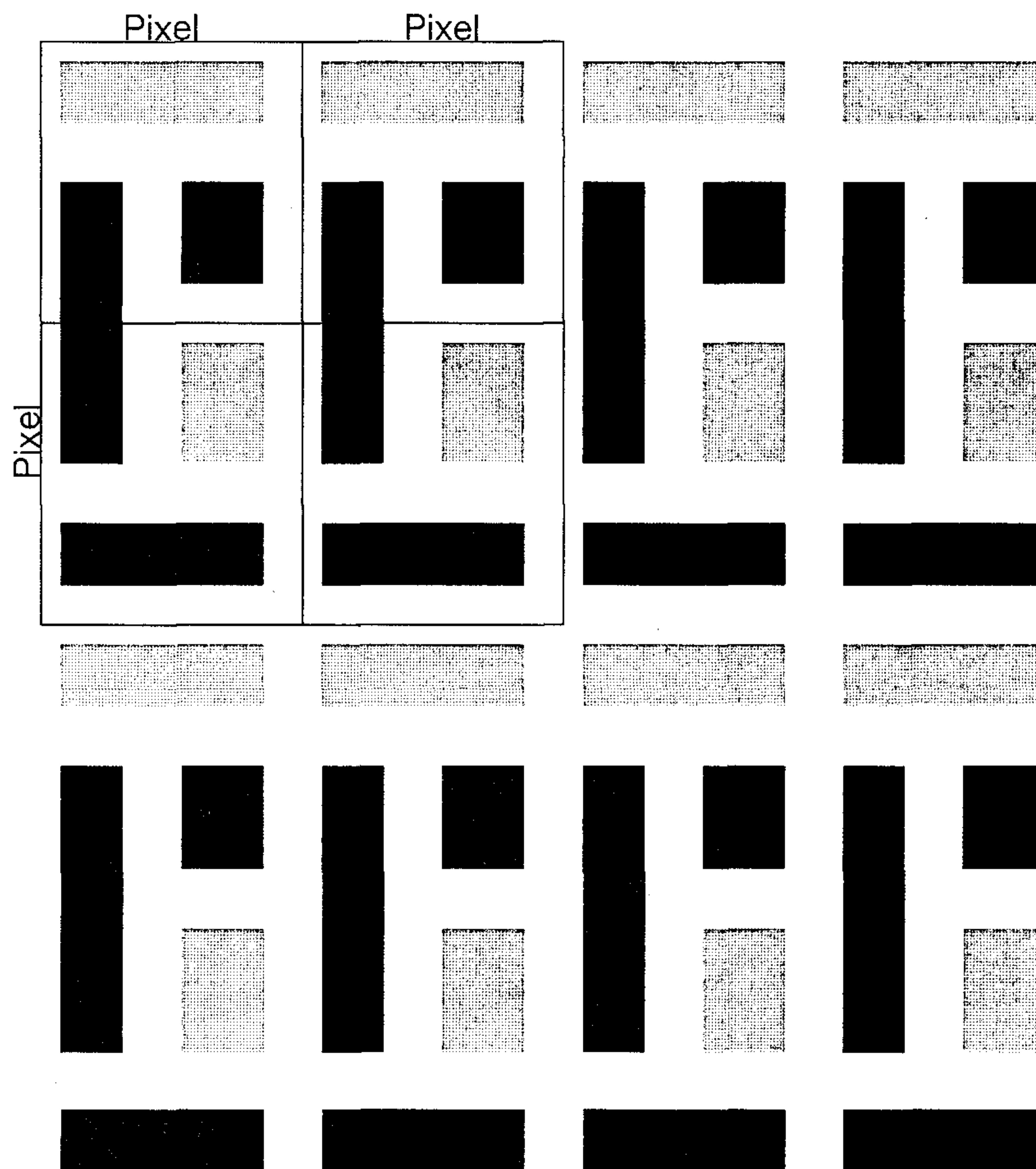


Figure 2: High-PPI pattern orientation with one sub-pixel share.

The pattern shown in Figure 2 can result in much larger pattern area for a similar PPI compared to the one in Figure 1. Different size and shape of pattern for each colour may cause some visual artifact. This can be solved by driving each pattern differently to cover the visual artifact. Another solution is presented in Figure 3. Figure 3 offers an improved structure that can offer less visual artifact.

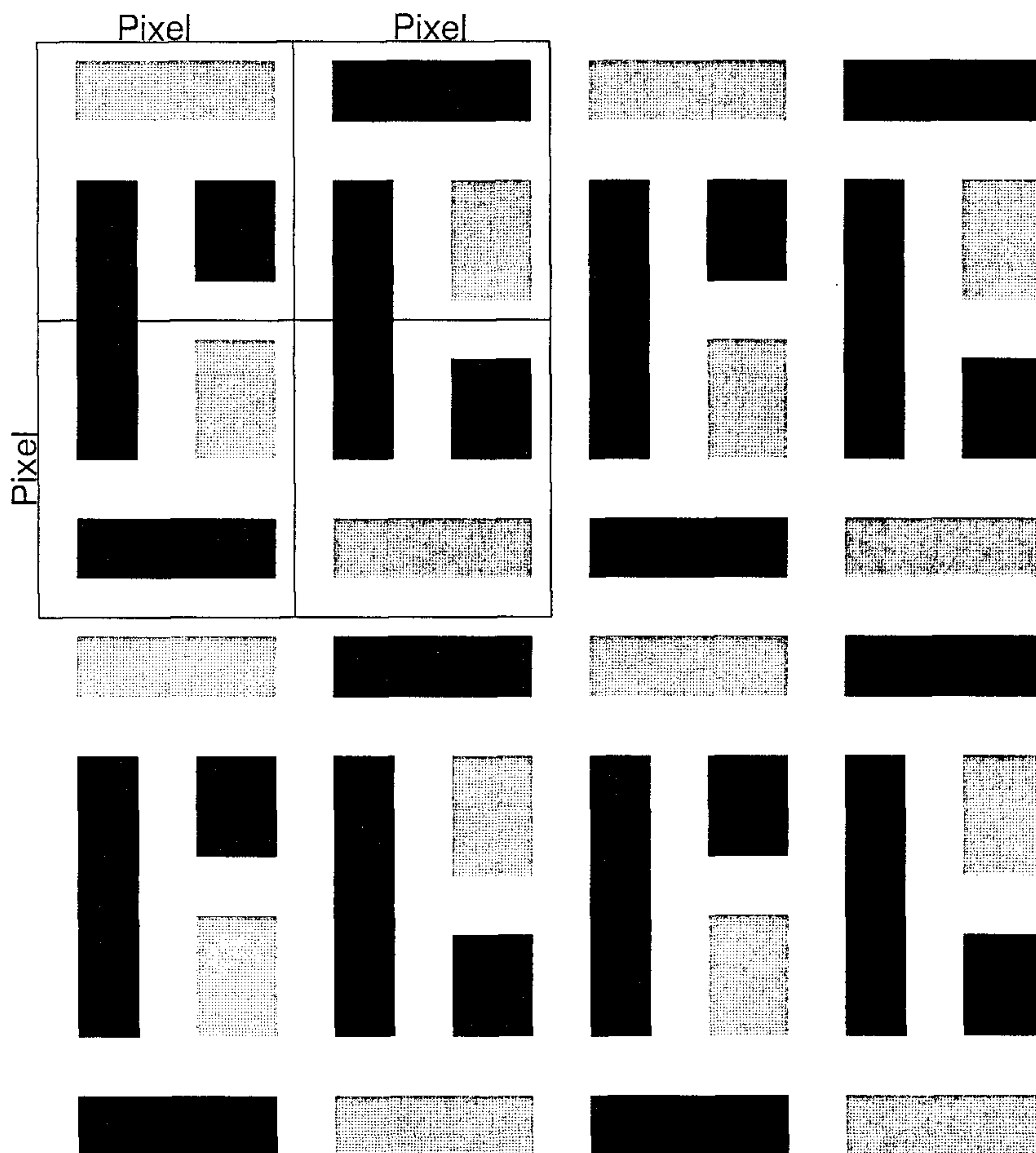


Figure 3: High-PPI pattern orientation with less visual artifact.

**WHAT IS CLAIMED IS:**

1. A pixel pattern of material light emissive areas for an emissive display system having pixels, each pixel having subpixels, each subpixel having a light emitting device defining the material light emissive area of the subpixel, the pixel pattern comprising:

for each pixel, a shared elongated subpixel of a first primary color shared with an adjacent pixel and an elongated subpixel of a second or third primary color located in an area on an opposite side of the shared elongated subpixel from the adjacent pixel.

2. The pixel pattern of claim 1, wherein the shared elongated subpixel has a length greater than half of a length or width of a pixel.

3. The pixel pattern of claim 2, wherein the shared elongated subpixel has a length extending substantially to the length or width of the pixel.

4. The pixel pattern of claim 1, wherein the pixel pattern further comprises, for each pixel, at least one further subpixel of a the third or second primary color different from the second or third primary color of the elongated subpixel.

5. The pixel pattern of claim 1, wherein the first primary color has less of an effect on perceived resolution than the second primary color.

6. The pixel pattern of claim 5, wherein the first primary color is blue.

7. The pixel pattern of claim 1, wherein the shared elongated subpixel is driven with data for the first primary color associated with a first color for display by the pixel and data for the first primary color associated with a second color for display by the adjacent pixel.

8. The pixel pattern of claim 7, wherein the shared elongated subpixel is driven by a first subpixel circuit associated with the pixel with data for the first primary color associated with a first color for display by the pixel and is driven by a second subpixel circuit associated with the

adjacent pixel with data for the first primary color associated with a second color for display by the adjacent pixel.

9. A pixel pattern of material light emissive areas for an emissive display system having pixels, each pixel having subpixels, each subpixel having a light emitting device defining the material light emissive area of the subpixel, the pixels of the pixel pattern arranged into pixel pairs, the pixel pattern comprising:

for each pixel pair, a first pixel, and a second pixel adjacent the first pixel,

each first pixel comprising a shared elongated subpixel of a first primary color shared with the second pixel, and an elongated subpixel of a second or third primary color located in an area on an opposite side of the shared elongated subpixel from the second pixel, and

each second pixel comprising the shared elongated subpixel shared with the first pixel, and an elongated subpixel of a third or second primary color different from the second or third primary color of the elongated subpixel of the first pixel located in an area on an opposite side of the shared elongated subpixel from the first pixel.

10. The pixel pattern of claim 9, wherein the pixel pairs are arranged in rows and columns, and adjacent columns or rows of pixel pairs possess alternating arrangement of second and third primary colors among the subpixels of the pixels.

11. The pixel pattern of claim 9, wherein adjacent pixels possess alternating arrangement of second and third primary colors among the subpixels of the pixels.

12. The pixel pattern of claim 9, wherein the shared elongated subpixel of each pixel pair has a length greater than half of a length or width of a pixel.

13. The pixel pattern of claim 12, wherein the shared elongated subpixel of each pixel pair has a length extending substantially to the length or width of the pixel.



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14. The pixel pattern of claim 9, wherein the pixel pattern further comprises, for each pixel of each pixel pair, at least one further subpixel of a the third or second primary color different from the second or third primary color of the elongated subpixel of the pixel.

15. The pixel pattern of claim 9, wherein the first primary color has less of an effect on perceived resolution than the second and third primary colors.

16. The pixel pattern of claim 15, wherein the first primary color is blue.

17. The pixel pattern of claim 9, wherein the shared elongated subpixel of each pixel pair is driven with data for the first primary color associated with a first color for display by the first pixel and data for the first primary color associated with a second color for display by second pixel.

18. The pixel pattern of claim 17, wherein the shared elongated subpixel of each pixel pair is driven by a first subpixel circuit associated with the first pixel with data for the first primary color associated with a first color for display by the first pixel and is driven by a second subpixel circuit associated with the second pixel with data for the first primary color associated with a second color for display by the second pixel.