$F_X(0)=F_{X'}(0)$ are the average luminance's of the distorted and undistorted images

$$M_t = \frac{1}{CSF(\omega(v))}$$

where CSF(ω) is the contrast sensitivity function

[0118] To find the distortion of our multi-layered display from the ideal in terms of JDN's use the following sum:

$$D_1 = \frac{1}{\ln(2)}\int_{v_o}^{v_{max}}\sqrt{\frac{M_{D_o}(v)}{M_t(v)}}\,d(\ln(v)) - \frac{1}{\ln(2)}\int_{v_o}^{v_{max}}\sqrt{\frac{M_D(v)}{M_t(v)}}\,d(\ln(v)) \quad (23)$$

$$D_2 = \frac{1}{\ln(2)}\int_{v_o}^{v_{max}}\sqrt{\frac{M_{M_o}(v)}{M_t(v)}}\,d(\ln(v)) - \frac{1}{\ln(2)}\int_{v_o}^{v_{max}}\sqrt{\frac{M_M(v)}{M_t(v)}}\,d(\ln(v))$$

$$D = D_1 + D_2$$

where v_o is the smallest spatial frequency viewable on the display corresponding to the size of the display and v_{max} is the maximum frequency viewable by the human visual system.

[0119] The first metric compares the filtered layer to the unfiltered layer. The second term in the metric compares the representation of the front screen to the back screen combination to the retinal of the front screen by itself. In a preferred embodiment the spectral information is calculated such that it forms each sub-term of the metric is calculated via the square root integral.

[0120] Many other metrics incorporating the contrast sensitivity function of the human visual system may be employed including the Modulation Transfer Function Area.

[0121] According to another embodiment of the present invention there is provided an algorithm for predicting and optimising the trade-off between moiré interference and image quality by use of a spatial filter within a multi-layered image system where said layers contain periodic elements.

[0122] As shown in **FIG. 2*b*** display architecture is specified to algorithm which may include but is not limited to the following

[0123] (a) the shape and dimensions of each pixel or sub-pixel (**13**,**14**), and the width of the black matrix (**15**,**16**) that surrounds the pixel or sub-pixel, which form the cell attached to each point on the lattice

[0124] (b) The chromaticity co-ordinates of combinations of pixels or sub-pixels (**17**) of substantially the same or of different spectral absorption or emission characteristics on different layers.

[0125] For example with two layers, each layer with RGB sub-pixels, the chromaticity co-ordinates of the following combinations are necessary

	R	G	B
R	RR (x, y)	RG (x, y)	RB (x, y)
G	GR (x, y)	GG (x, y)	GB (x, y)
B	BR (x, y)	BG (x, y)	BB (x, y)

[0126] Where, for example RR denotes a red sub-pixel is in front of a red sub-pixel, and (x,y) denotes the chromaticity co-ordinates measured when illuminated by a standard D65 source. Note that the combinations can be measured by using a commercially available photo-spectrometer, or calculated using Beer's law.

[0127] Note that because of the effects of interstitial optical layers the co-ordinates of RB do not equal BR for example. In the general 2D case the matrix is not symmetric about its diagonal, and in the nD case the elements of the matrix transpose are not equal.

[0128] (d) The distance of one display layer to the next and the refractive index of interstitial elements between layers

[0129] (e) An approximation to the bidirectional transmission distribution function of each filter

[0130] (f) The distances of each spatial filter from each display layer

[0131] The following MATLAB® code is provided by way of example only and details a possible implementation of the algorithm. The algorithm is in no way required to be implemented in MATLAB® and it should be appreciated that the comments in conjunction with **FIG. 3** are sufficient to teach someone skilled in the art an implementation that is portable to any virtual or Turing machine. MATLAB® documentation, and the http links detailed in the notes section of each function are incorporated herein by way of reference.

[0132] The first section of code provides a top-down script controlling the execution of the functions detailed below

[0133] **FIG. 7** illustrates yet another preferred embodiment of the present invention implemented with a dual screen display (**32**) composed of a plurality of transparent imaging screens in the form of a front LCD screen (**33**), parallel to, but spaced apart from a rear display screen (**34**) provided with a backlight (**35**) and spatial filter between the imaging screens (**36**).

[0134] It should be apparent to one skilled in the art that a number of alternative display technologies may be utilised in place of the LCD screens. Furthermore **FIG. 7** shows a single screen (**33**) in front of the rear display (**34**) for the sake of clarity and convenience any number of additional (at least partially transparent imaging screens (**33**,**34**) may be incorporated. Although the rear screen (**34**) may also be a LCD screen it will be apparent that alternative, non-transparent display technology may be employed.

[0135] Such displays provide a three dimensional quality to the scene viewed by an observer as displayed in the applicants co-pending patents PCT number PCT/NZ98/00098 and PCT/NZ99/00021, incorporated by reference herein.