1428 in accordance with expected frequency response rolloff and variations in the actual scanner versus an ideal scanner. In a region **1430** wherein the upper and lower bounds are on opposite sides of zero, both would be multiplied by a constant greater than one that may be called "upper extend" in order to pull the curves **1426** and **1428** further apart by pushing them both away from zero. Conversely, in a region **1432** wherein the upper and lower bounds are on the same side of zero, the one closest to zero would need to be multiplied by a second constant less than one that may be called "lower extend" in order again to pull the curves farther apart, this time by pulling the one closest to zero toward zero, as shown in FIG. **14***e*. A typical value for "upper extend" is 1.5, and a typical value for "lower extend" is 0.5.

The constants "upper extend" and "lower extend" are typically constants that are dependent on frequency, and may vary from equality at the DC term to widely divergent values at the highest frequency farthest from the DC term. In this case, "upper extend" may vary linearly for 1.0 at DC to 2.0 at highest frequency terms farthest from DC, and "lower extend" may vary linearly from 1.0 at DC to 0.0 at the highest frequency terms. Also, the constants "upper extend" and "lower extend" are typically greater and less than unity respectively, but they do not need to be. For example, if it is known that a scanner responds at a particular frequency with only 50% modulation in the infrared spectrum as compared to the visible spectrum, then both upper and lower extends could be multiplied by 1/50%=2 to compensate, which may make the lower extend greater than unity.

Finally, some scanners do not respond effectively to the higher frequency details in the infrared range, and with these scanners it is necessary to use the lower frequency details in the infrared spectrum to predict a range to correct in the high frequencies. In effect, the high frequencies simply get smudged in proportion to the defect content in the lower frequencies.

To practice this high frequency smudging, the average content of lower frequency defects is found by averaging the absolute value of lower frequency elements of the infrared DCT. This value is used to set upper and lower bounds **1426** and **1428** below which the final bounds **1426** and **1428** below which the final bounds are not allowed to fall. Conversely, the new range extensions **1430** and **1432** can be added to the upper and lower bounds **1426** and **1428** which for such scanners presumably approach zero at high spatial frequencies in the infrared.

FIG. **15** is a block diagram of the teachings of FIG. **14**. At step **1500**, the three offset defects DCT's with highest correlation to visible DCT are obtained as values DCT **1**, DCT**2**, and DCT**3**. The upper and lower extends for each block are received at step **1502**. A new element in the block is obtained at step **1504**. For each element, x, of the 8×8 elements, a calculation is made at step **1506** to calculate DCT Max (x), and DCT Min (x). DCT Max (x) is equal to the maximum of DCT **1**(x), DCT **2**(x), and DCT **3**(x). DCT Min (x) is equal to the minimum of DCT **1**(x), DCT **2**(x), and DCT **3**(x). At step **1508**, a decision is made as to whether both DCT Max (x) and DCT Min (x) is positive. If the decision is yes, at step **1510**, DCT Max (x) is set to the upper extend (x), U. DCT Min (x) is set to the lower extend (x), L. If the decision at step **1508** is no, a decision is made at step **1512** to determine whether both DCT Max (x) and DCT Min (x) is negative. If the decision is yes, at step **1514**, DCT Min (x) is set to the upper extend (x), U. DCT Max (x) is set to the lower extend (x), L. If the decision at step **1512** is no, meaning that DCT Max (x) and DCT Min (x) are of opposite signs, DCT Max (x) is set to the upper extend (x), U and DCT Min (x) is set to the lower extend (x), L. A decision is then made at step **1518** to determine if there are any elements remaining to be analyzed. If the decision is yes, the process continues with step **1504**. If the decision is no, the average of the lower frequency elements excluding DC, for each high frequency element x is calculated. DCT Max (x) is then recalculated at step **1522** as the maximum of DCT Max (x) and a positive constant times the lower frequencies. DCT Min (x) is recalculated at step **1522** as equal to the minimum of DCT Min (x) and a negative constant times the average of the lower frequencies.

Whereas the present invention has been described with respect to specific embodiments thereof, it will be understood that various changes and modifications will be suggested to one skilled in the art, and it is intended to encompass to such changes and modifications as fall within the scope of the appended claims.

What is claimed is:

1. A method for removing the effects of defects from an image comprising:

receiving a defective first image including a plurality of pixels, each having an intensity value;

receiving a defect image of defects in the first image including a plurality of pixels, each having an intensity value and a correspondence to the first image pixels;

selecting an element of the first image comprising a select pixel of the first image and a corresponding pixel of the defect image;

determining an upper bound for the element as a function of the defect image;

determining a lower bound for the element as a function of the defect image; and

correcting the first image as a function of the upper and lower bound.

2. The method as recited in claim **1**, further including the steps of filtering the first image and filtering the second image.

3. The method as recited in claim **2**, wherein the steps of filtering includes passing all high frequencies.

4. The method as recited in claim **2**, wherein filtering is further refined to distinguish spatial frequencies.

5. The method as recited in claim **4**, wherein a first region is defined to include a plurality of pixels of the first image and a corresponding plurality of the pixels of the defect image, and further comprising the steps of

applying a transform to the plurality of pixels from the first image to generate a plurality of elements from the transform distinguishing spatial frequency and angle; and

applying the transform to the plurality of pixels from the defect image to generate a plurality of defect elements from the transform distinguishing spatial frequency and angle.

6. The method as recited in claim **5**, wherein the transform is a DCT (discrete cosine transform).

7. The method as recited in claim **5**, wherein the transform is a Fourier transform.

8. The method as recited in claim **5**, wherein a second region is defined that partially overlaps the first region.

9. The method as recited in claim **1**, wherein the upper bound for the element is determined by multiplying the corresponding defect element by a constant.

10. The method as recited in claim **9**, wherein the constant is greater than 1.0.

11. The method as recited in claim **9**, wherein the lower bound for the elements is determined by multiplying the corresponding defect element by a second constant.