CLAIMS

What is claimed is:

1. A device that analyzes an image, comprising:

a circuit that receives an image that includes a plurality of pixels, creates a histogram of said image and analyzes said histogram to determine an acceptable exposure of said image.

2. The device of claim 1, wherein said circuit is a processor.

3. The device of claim 1, wherein said histogram includes a plurality of bins that relate to an image characteristic versus a population of pixels.

4. The device of claim 1, wherein said circuit converts said image into a low dynamic range image defined by a first number of bits.

5. The device of claim 4, wherein said circuit generates a plurality of low dynamic range images each at a different exposure time.

6. The device of claim 5, wherein said circuit generates an extended dynamic range image defined by a second number of bits from said plurality of low dynamic range images.

7. The device of claim 6, wherein said circuit generates a low dynamic range image at a selected exposure from said extended dynamic range image and generates a low dynamic range histogram from said low dynamic range image.

8. The device of claim 6, wherein said circuit generates an extended dynamic range histogram from said extended dynamic range image.

9. The device of claim 8, wherein said circuit generates a low dynamic range histogram at a selected exposure from said extended dynamic range image.

10. The device of claim 8, wherein said circuit generates a plurality of low dynamic range images each at a different exposure time from said extended dynamic range histogram, generates a plurality of low dynamic range histograms from said low dynamic range images and selects a low dynamic range histogram at a selected exposure.

11. The device of claim 6, wherein said circuit generates a plurality of low dynamic range images each at a different exposure time from said extended dynamic range image, generates a plurality of low dynamic range histograms from said low dynamic range images and selects a low dynamic range histogram at a selected exposure.

12. The device of claim 6, wherein said circuit generates a plurality of low dynamic range images each at a different exposure time from said extended dynamic range histogram, selects a low dynamic range image at a selected exposure and generates a plurality of low dynamic range histograms from said low dynamic range images.

13. The device of claim 5, wherein said circuit generates a plurality of low dynamic range histograms from said low dynamic range images, generates an extended dynamic range

histogram from said low dynamic range histograms and generates a low dynamic range histogram at a selected exposure from said extended dynamic range histogram.

14. The device of claim 1, wherein said circuit detects a sky-peak within said image.

15. The device of claim 14, wherein said circuit utilizes said sky-peak to determine a sky-contrast and determines whether said sky-contrast is below a threshold.

16. The device of claim 1, wherein said circuit detects a right-peak within said image.

17. The device of claim 16, wherein said circuit utilizes said right-peak to determine a peak-contrast and determines whether said peak-contrast is below a threshold.

18. A device that analyzes an image, comprising:

image generating means for generating an image that includes a plurality of pixels;

histogram means for generating at least one histogram of said image; and,

analyzing means for analyzing said histogram to determine an acceptable exposure of said image.

19. A method for analyzing an image, comprising:

receiving an image that includes a plurality of pixels;

creating a histogram of the image; and,

analyzing the histogram to determine an acceptable exposure of the image.

20. The method of claim 19, wherein the histogram includes a plurality of bins that relate to an image characteristic versus a population of pixels.

21. The method of claim 19, wherein creating the histogram includes converting the image into a low dynamic range image defined by a first number of bits.

22. The method of claim 21, wherein creating the histogram includes generating a plurality of low dynamic range images each at a different exposure time.

23. The method of claim 22, wherein creating the histogram includes generating an extended dynamic range image defined by a second number of bits from the plurality of low dynamic range images.

24. The method of claim 23, wherein creating the histogram includes generating a low dynamic range image at a selected exposure from the extended dynamic range image and generating a low dynamic range histogram from the low dynamic range image.

25. The method of claim 23, wherein creating the histogram includes generating an extended dynamic range histogram from the extended dynamic range image.

26. The method of claim 25, wherein creating the histogram includes generating a low dynamic range histogram at a selected exposure from the extended dynamic range image.

27. The method of claim 25, wherein creating the histogram includes generating a plurality of low dynamic range images each at a different exposure time from the extended dynamic range histogram, generating a plurality of low dynamic range histograms from the low dynamic range images and selecting a low dynamic range histogram at a selected exposure.

28. The method of claim 23, wherein creating the histogram includes generating a plurality of low dynamic range images each at a different exposure time from the extended dynamic range image, generating a plurality of low dynamic range histograms from the low dynamic range images and selecting a low dynamic range histogram at a selected exposure.

29. The device of claim 23, wherein creating the histogram includes generating a plurality of low dynamic range images each at a different exposure time from the extended dynamic range histogram, selecting a low dynamic range image at a selected exposure and generating a plurality of low dynamic range histograms from the low dynamic range images.

30. The method of claim 22, wherein creating the histogram includes generating a plurality of low dynamic range histograms from the low dynamic range images, generating an extended dynamic range histogram from the low dynamic range histograms and generating a low dynamic range histogram at a selected exposure from the extended dynamic range histogram.

31. The method of claim 19, wherein analyzing the histogram includes detecting a sky-peak within the image.

32. The method of claim 31, wherein analyzing the histogram utilizing the sky-peak to determine a sky-contrast and determining whether the sky-contrast is below a threshold.

33. The method of claim 19, wherein analyzing the histogram detecting a right-peak within the image.

34. The method of claim 33, wherein analyzing the histogram utilizing the right-peak to determine a peak-contrast and determining whether the peak-contrast is below a threshold.

35. A device that analyzes an image, comprising:

a circuit that receives an image that includes a plurality of pixels and determines a number of dark pixels and a number of mid-range pixels, said circuit determines a proportion of said dark pixels versus a combination of dark and mid-range pixels and determines whether said proportion is below a threshold.

Claims

What is claimed is:

1. A method for analyzing an image of a scene in a device, the image having a tentative exposure value, comprising:

receiving pixel data for a plurality of pixels of the image into the device;

computing a histogram for the image in the device;

analyzing the histogram to determine whether the tentative exposure value is acceptable; and,

rejecting the tentative exposure value and causing a new image of a lesser exposure value to be generated where a population of a maximum in the histogram is less than a threshold that is a multiple of a population of a minimum in the histogram,

wherein the minimum has higher intensity value than any other minimum in the histogram and the maximum is a maximum that is nearest to the minimum and that has a lower intensity value than the minimum,

wherein the histogram does not include pixels of sky region(s).

2. The method of claim 1, wherein the histogram is generated from the image and the image is generated by an image sensor.

3. The method of claim 1, wherein the histogram is generated from the image and the image is synthesized from a plurality of images of the scene, the plurality of images having different exposure values, the tentative exposure value being intermediate between a maximum exposure value and a minimum exposure value among the different exposure values.

4. The method of claim 1, wherein the histogram is not generated from the image but is synthesized for the tentative exposure value from a plurality of histograms that are generated from a plurality of images of the scene, the plurality of images having different exposure values, the tentative exposure value being intermediate between a maximum exposure value and a minimum exposure value among the different exposure values.

5. The method of claim 1, further comprising:

determining a ratio of the population of the minimum to the population of the maximum; and,

comparing the ratio with a threshold.

6. The method of claim 5, wherein the threshold with which the ratio is compared is a predetermined percentage.