CLAIMS

1. A method of processing video data, the method comprising:

receiving video data;

determining luma scale parameters for each of a plurality of ranges of codeword values for luminance components of the video data;

performing a dynamic range adjustment process on the luminance components using the luma scale parameters;

determining chroma scale parameters for chrominance components of the video data using a function of the luma scale parameters and a quantization parameter used to code the chrominance components; and

performing a dynamic range adjustment process on the chrominance components of the video data using the chroma scale parameters.

2. The method of claim 1, wherein determining the chroma scale parameters comprises:

determining chroma scale parameters for chrominance components associated with luminance components having a first range of codeword values of the plurality of ranges of codeword values using a function of the luma scale parameters determined for the luminance components having the first range of codeword values and the quantization parameter used to code the chrominance components.

3. The method of claim 1, wherein determining the chroma scale parameters comprises:

determining chroma scale parameters for chrominance components associated with luminance components having a first range of codeword values and a second range of codeword values of the plurality of ranges of codeword values using a function of the luma scale parameters determined for the luminance components having the first range of codeword values and the second range of codeword values and the quantization parameter used to code the chrominance components.

4. The method of claim 1, wherein the luma scale parameters for each of the plurality of ranges of codeword value for the luminance components are represented by a discontinuous function, the method further comprising:

applying a linearization process to the discontinuous function to produce linearized luma scale parameters; and

determining the chroma scale parameters for the chrominance components of the video data using a function of the linearized luma scale parameters and the quantization parameter used to code the chrominance components.

5. The method of claim 4, wherein the linearization process is one or more of a linear interpolation process, a curve fitting process, an averaging process, a low pass filtering process, or a higher order approximation process.

6. The method of claim 1, wherein determining the chroma scale parameters further comprises:

determining the chroma scale parameters for the chrominance components of the video data using a function of the luma scale parameters, the quantization parameter used to code the chrominance components, and a color representation parameter derived from characteristics of the chrominance component of the video data.

7. The method of claim 6, wherein the color representation parameter includes a transfer function associated with the video data.

8. The method of claim 1, further comprising:

determining initial chroma scale parameters for the chrominance components of the video data,

wherein determining the chroma scale parameters comprises determining the chroma scale parameters for the chrominance components of the video data using a function of the luma scale parameters, the quantization parameter used to code the chrominance components, and the initial chroma scale parameters.

9. The method of claim 1, further comprising:

determining luma offset parameters for the luminance components;

performing the dynamic range adjustment process on the luminance components using

the luma scale parameters and the luma offset parameters;

determining chroma offset parameters for the chrominance components; and

performing the dynamic range adjustment process on the chrominance components of the video data using the chroma scale parameters and the chroma offset parameters.

10. The method of claim 1, further comprising:

encoding the video data after performing the dynamic range adjustment process on the luminance components and after performing the dynamic range adjustment process on the chrominance components; and

outputting the encoded video data.

11. The method of claim 1, wherein the dynamic range adjustment process is an inverse dynamic range adjustment process, the method further comprising:

decoding the video data before performing the inverse dynamic range adjustment process on the luminance components and before performing the inverse dynamic range adjustment process on the chrominance components; and

displaying outputted decoded video data.

12. An apparatus configured to process video data, the apparatus comprising:

a memory configured to store the video data; and

one or more processors in communication with the memory, the one or more processors configured to:

receive the video data;

determine luma scale parameters for each of a plurality of ranges of codeword values for luminance components of the video data;

perform a dynamic range adjustment process on the luminance components using the luma scale parameters;

determine chroma scale parameters for chrominance components of the video data using a function of the luma scale parameters and a quantization parameter used to code the chrominance components; and

perform a dynamic range adjustment process on the chrominance components of

the video data using the chroma scale parameters.

13. The apparatus of claim 12, wherein to determine the chroma scale parameters, the one or more processors are further configured to:

determine chroma scale parameters for chrominance components associated with luminance components having a first range of codeword values of the plurality of ranges of codeword values using a function of the luma scale parameters determined for the luminance components having the first range of codeword values and the quantization parameter used to code the chrominance components.

14. The apparatus of claim 12, wherein to determine the chroma scale parameters, the one or more processors are further configured to:

determine chroma scale parameters for chrominance components associated with luminance components having a first range of codeword values and a second range of codeword values of the plurality of ranges of codeword values using a function of the luma scale parameters determined for the luminance components having the first range of codeword values and the second range of codeword values and the quantization parameter used to code the chrominance components.

15. The apparatus of claim 12, wherein the luma scale parameters for each of the plurality of ranges of codeword value for the luminance components are represented by a discontinuous function, and wherein the one or more processors are further configured to:

apply a linearization process to the discontinuous function to produce linearized luma scale parameters; and

determine the chroma scale parameters for the chrominance components of the video data using a function of the linearized luma scale parameters and the quantization parameter used to code the chrominance components.

16. The apparatus of claim 15, wherein the linearization process is one or more of a linear interpolation process, a curve fitting process, an averaging process, a low pass filtering process, or a higher order approximation process.

17. The apparatus of claim 12, wherein to determine the chroma scale parameters further, the one or more processors are further configured to:

determine the chroma scale parameters for the chrominance components of the video data using a function of the luma scale parameters, the quantization parameter used to code the chrominance components, and a color representation parameter derived from characteristics of the chrominance component of the video data.

18. The apparatus of claim 17, wherein the color representation parameter includes a transfer function associated with the video data.

19. The apparatus of claim 12, wherein the one or more processors are further configured to:

determine initial chroma scale parameters for the chrominance components of the video data,

wherein to determine the chroma scale parameters, the one or more processors are further configured to determine the chroma scale parameters for the chrominance components of the video data using a function of the luma scale parameters, the quantization parameter used to code the chrominance components, and the initial chroma scale parameters.

20. The apparatus of claim 12, wherein the one or more processors are further configured to:

determine luma offset parameters for the luminance components;

perform the dynamic range adjustment process on the luminance components using the luma scale parameters and the luma offset parameters;

determine chroma offset parameters for the chrominance components; and

perform the dynamic range adjustment process on the chrominance components of the video data using the chroma scale parameters and the chroma offset parameters.

21. The apparatus of claim 12, wherein the one or more processors are further configured to:

encode the video data after performing the dynamic range adjustment process on the luminance components and after performing the dynamic range adjustment process on the chrominance components; and

output the encoded video data.

22. The apparatus of claim 21, further comprising:

a camera configured to capture the video data.

23. The apparatus of claim 12, wherein the dynamic range adjustment process is an inverse dynamic range adjustment process, wherein the one or more processors are further configured to:

decode the video data before performing the inverse dynamic range adjustment process on the luminance components and before performing the inverse dynamic range adjustment process on the chrominance components.

24. The apparatus of claim 23, further comprising:

a display configured to display the video data after performing the inverse dynamic range adjustment process on the luminance components and after performing the inverse dynamic range adjustment process on the chrominance components.

25. An apparatus configured to process video data, the apparatus comprising:

means for receiving video data;

means for determining luma scale parameters for each of a plurality of ranges of codeword values for luminance components of the video data;

means for performing a dynamic range adjustment process on the luminance components using the luma scale parameters;

means for determining chroma scale parameters for chrominance components of the video data using a function of the luma scale parameters and a quantization parameter used to code the chrominance components; and

means for performing a dynamic range adjustment process on the chrominance components of the video data using the chroma scale parameters.

26. The apparatus of claim 25, wherein the luma scale parameters for each of the plurality of ranges of codeword value for the luminance components are represented by a discontinuous function, the apparatus further comprising:

means for applying a linearization process to the discontinuous function to produce linearized luma scale parameters; and

means for determining the chroma scale parameters for the chrominance components of the video data using a function of the linearized luma scale parameters and the quantization parameter used to code the chrominance components.

27. A non-transitory computer-readable storage medium storing instructions that, when executed, causes one or more processors of a device configured to process video data to:

receive the video data;

determine luma scale parameters for each of a plurality of ranges of codeword values for luminance components of the video data;

perform a dynamic range adjustment process on the luminance components using the luma scale parameters;

determine chroma scale parameters for chrominance components of the video data using a function of the luma scale parameters and a quantization parameter used to code the chrominance components; and

perform a dynamic range adjustment process on the chrominance components of the video data using the chroma scale parameters.

28. The non-transitory computer-readable storage medium of claim 27, wherein the luma scale parameters for each of the plurality of ranges of codeword value for the luminance components are represented by a discontinuous function, and wherein the instructions further cause the one or more processors to:

apply a linearization process to the discontinuous function to produce linearized luma scale parameters; and

determine the chroma scale parameters for the chrominance components of the video data using a function of the linearized luma scale parameters and the quantization parameter used to code the chrominance components.