CLAIMS

1. A method comprising:

receiving image data specifying element settings for each image of multiple original images in a sequence;

analyzing the element settings across the multiple original images; and

utilizing the element settings of the multiple original images in the sequence to produce first encoded image data specifying a set of common image element settings, the set of common image element settings being a baseline to substantially reproduce each of the original images in the sequence.

2. The method as in claim 1 further comprising, for each given image in the sequence:

produce second encoded image data specifying image processing operations necessary to produce, based on the common image element settings, a preliminary rendition of the given image;

producing third encoded image data specifying adjustment values to apply to the settings of the preliminary rendition of the given image to substantially reproduce a rendition of the given image.

3. The method as in claim 1 further comprising:

producing second encoded image data specifying adjustment values to apply to the set of common image element settings to reproduce the multiple original images in the sequence.

4. The method as in claim 1, wherein the common element settings correspond to one or more images, each of the predictor images being a baseline to substantially reproduce at least one image of the multiple original images in the sequence.

5. The method as in claim 1 further comprising:

producing the first encoded image data to include multiple sets of encoded data, the sets specifying image renditions at multiple levels of quality.

6. The method as in claim 5 further comprising:
producing at least one of the successively lower level of quality specified by the first encoded data to include fewer image renditions.

7. The method as in claim 6 further comprising:
encoding each of the image renditions at the successively lower level of quality to be of successively lower resolutions.

8. The method as in claim 1 further comprising:
producing the first encoded image data to include multiple sets of encoded data, the sets specifying image renditions at multiple successively higher levels of aggregation.

9. The method as in claim 8 further comprising:
producing each successively higher level of aggregation specified by the first encoded data to include fewer image renditions.

10. The method as in claim 9 further comprising:
encoding each of the image renditions at the successively higher level of aggregation to be of a same resolution as image renditions at the lower level of aggregation.

11. The method as in claim 1 further comprising:
producing the first encoded image data via:
subdividing the multiple original images at an original level into a first set of sub-groupings, wherein at least one sub-grouping of the sub-groupings in the first set includes at least two images from the multiple original images; and
for each of the respective sub-groupings in the first set, producing a respective image rendition at a first level to be representative of a combination of the images in the respective sub-grouping.

12. The method as in claim 11 further comprising:

varying a number of images included in each respective sub-grouping depending on a similarity of the original images to each other.

13. The method as in claim 11 further comprising:
varying a number of images included in each respective sub-grouping depending on motion information generated by analyzing the sequence of original images.

14. The method as in claim 11 further comprising:
producing the first encoded image data at a second level via:
subdividing the image renditions at the first level into a second set of sub-groupings, wherein at least one respective sub-grouping of the sub-groupings in the second set includes at least two image renditions from the first level; and
for each of the respective sub-groupings in the second set, producing a respective image rendition representative of a combination of the image renditions in the respective sub-grouping.

15. The method as in claim 1, wherein analyzing the image data includes:
identifying a correlation of the element settings across the multiple original images; and
producing first encoded image data based on the identified correlation.

16. The method as in claim 1 further comprising:
combining the element settings of the multiple original images to produce the first encoded data.

17. The method as in claim 1, wherein the multiple original images are residual images, each of the residual images specifying adjustments to combine with a corresponding preliminary image in order to produce a reconstructed image.

18. A method of encoding image data comprising:
receiving a sequence of images;

obtaining settings for each of the images;

blending the settings across the sequence of images to produce a single image ("predictor image") that is representative of the sequence of images; and

for each given image in the sequence of images, producing data corresponding to image processing operations and adjustments ("residuals") specifying how to reconstruct, based on the predictor image, a rendition of the given image.

19. The method as in claim 18, wherein blending the settings across the sequence of images includes:

overlaying the images with respect to each other; and

combining the overlaid images to produce the single image representative of the sequence.

20. The method as in claim 19, wherein for at least one of the images overlaying the image comprises performing motion-compensation operations, based at least in part on motion of objects captured by the image with respect to the sampling position of the predictor image.

21. The method as in claim 18, wherein each of the images in the sequence is received in accordance with a first resolution, the method further comprising:

producing the predictor image to be at a second resolution, the second resolution lower than the first resolution.

22. The method as in claim 21, wherein each of the images in the sequence includes a rendition of a particular object; and

wherein blending the settings includes: producing a rendition of the object in the single image based on a combination of renditions of the object in each of the multiple images.

23. The method as in claim 18, wherein one of the images in the sequence includes settings corresponding to a respective unique visual artifact not found in the other images; and

wherein blending settings of elements in the images includes producing the predictor image to include settings corresponding to the unique visual artifact.

24. The method as in claim 18, wherein blending the settings includes:
identifying settings corresponding to a common object that is captured by each of the images in the sequence; and
aligning portions of the images in the sequence based at least in part on the common object.

25. The method as in claim 24 further comprising:
identifying settings corresponding to a unique object that is captured by fewer than all of the images in the sequence; and
producing the predictor image to include a rendition of the common object and a rendition of the unique object.

26. The method as in claim 18, wherein the sequence of images includes at least a first image and a second image;
wherein obtaining settings includes:
retrieving a setting of an element in the first image, the element in the first image representing a particular portion of an object in the first image;
retrieving a setting of an element in the second image, the element in the second image representing the particular portion of the object.

27. The method as in claim 26, wherein blending the settings of the elements includes:
computing a setting for the particular portion of the object in the predictor image based at least in part on a combination of the setting of the element in the first image and the setting of the element in the second image.

28. The method as in claim 18, wherein the predictor image is of a lower resolution than a resolution of the images in the sequence, the method comprising:
receiving a sequence of images;

obtaining settings for each of the images; and

combining the images in the sequence to produce a single predictor image that is representative of the sequence, the single image being of a lower resolution than a resolution of the images in the sequence.

29. The method as in claim 28, wherein combining the images includes:

identifying settings corresponding to a common object at least partially captured by each of the images in the sequence; and

applying an image processing operation to the images in the sequence images in order to align settings corresponding to the common object in each of the images.

30. The method as in claim 29 further comprising:

identifying settings corresponding to a unique object that is captured by fewer than all of the images in the sequence; and

producing the predictor image to include a rendition of the common object and a rendition of the unique object.

31. The method as in claim 29, wherein applying an image processing operation to align settings of a given image in the sequence further comprises:

applying a first set of image processing operations to a first portion of the given image; and

applying a second set of image processing operations to a second portion of the given image, wherein the second portion of the given image has a different number of elements from the first portion of the given image.

32. The method as in claim 28, wherein each of the images in the sequence includes settings corresponding to a rendition of a particular object; and

wherein combining the images includes: producing a rendition of the particular object in the predictor image based on a combination of settings corresponding with different renditions of the object in the sequence of images.

33. The method as in claim 28, wherein the single image represents a larger field of view than a field of view represented by each of the images.

34. The method as in claim 28, wherein combining settings of the images includes:
stacking the images with respect to each other; and
processing one or more of the images in the stack to align settings of corresponding objects in the images; and
combining settings of corresponding elements of the images in the stack, producing the predictor image.

35. The method as in claim 28, wherein the sequence of images includes at least a first image and a second image;
wherein obtaining the settings includes:
retrieving a setting of an element in the first image, the setting of the element in the first image corresponding to a particular portion of an object rendered in the first image; and
retrieving a setting of an element in the second image, the element in the second image corresponding to the particular portion of the object.

36. The method as in claim 35, wherein combining the images includes:
computing a setting for a particular region of the object in the predictor image based at least in part on a combination of the setting for the element in the first image and the setting of the element in the second image.

37. The method as in claim 18 further comprising:
producing meta information indicating how many of the images were used to derive the predictor image.

38. A method to substantially reproduce a sequence of multiple original images, the method comprising:
receiving first encoded image data derived from multiple original images in a sequence, the

first encoded image data specifying a set of common image element settings to be used as a baseline for reproducing each of the multiple original images in the sequence;

receiving second encoded image data specifying adjustments; and

substantially reproducing the multiple original images in the sequence based on application of the adjustments to preliminary renditions of the original images reconstructed based at least in part on the set of common image elements.

39. The method as in claim 38, wherein substantially reproducing the original images includes:

initially setting image elements in a first image of the multiple images to values based at least in part on the set of common image element settings; and

initially setting image elements in a second image of the multiple images to values based at least in part on the set of common image element settings.

40. The method as in claim 39, wherein substantially reproducing the original images includes:

retrieving a first set of adjustment information from the second encoded image data, the first set of adjustment information indicating how to modify settings of the image elements in the first image;

adjusting settings of the image elements in the first image as specified by the first set of adjustment information to reproduce a first image of the multiple images in the sequence;

retrieving a second set of adjustment information from the second encoded data, the second set of adjustment information indicating how to modify settings of the image elements in the second image; and

adjusting settings of the image elements in the second frame as specified by the second set of adjustment information to reproduce a second image of the multiple images in the sequence.

41. The method as in claim 38, wherein the set of common element settings are derived

from operations on settings of image elements in the original images over two or more images of the sequence.

42. The method as in claim 38, wherein common element settings correspond to one or more image renditions.

43. The method as in claim 38, wherein first encoded data comprises, aside from information corresponding to common element settings, also information specifying operations to be used to reconstruct preliminary renditions of the multiple images in the sequence based at least in part on the common element settings.

44. The method as in claim 43, wherein the information for each given preliminary image rendition comprises information that specifies what portion of the common element settings are processed to produce a preliminary image rendition for the given image.

45. The method as in claim 43, wherein operations to reconstruct a given preliminary image rendition comprise motion compensation operations on common element settings, the method comprising:
applying a first set of image processing operations to a first portion of common element settings, as specified by the information; and
applying a second set of image processing operations to a second portion of common element settings, as specified by the information.

46. The method as in claim 38, wherein any of the preliminary image renditions reconstructed based at least in part on the set of common image elements is generated for any of the original images in the sequence before having substantially reproduced any of the original images in the sequence.

47. The method as in claim 38, wherein the multiple original images correspond to adjustments to combine with other given images in order to produce multiple reconstructed

images.

48. A method of decoding image data comprising:
receiving first predictor image data derived from encoding a first grouping of images in a sequence;
receiving second predictor image data derived from encoding a second grouping of images in the sequence, the first grouping of image disposed adjacent to the second grouping of images in the sequence; and
utilizing a combination of the first predictor image data and the second predictor image data to reconstruct a rendition of the first grouping of images in the sequence.

49. The method as in claim 48, wherein:
the first grouping of images is a first set of contiguous images in the sequence; and
the second grouping of images is a second set of contiguous images in the sequence.

50. The method as in claim 48 further comprising:
receiving the first predictor image data as a first hierarchy of image data decoded from a lowest space-time resolution to a highest space-time resolution; and
receiving the second predictor image data as a second hierarchy of image data decoded from a lowest space-time resolution to a highest space-time resolution.

51. The method as in claim 50, wherein utilizing the combination of the first predictor image data and at least a portion of the second predictor image data to reconstruct the first grouping of images in the sequence includes:
utilizing the first predictor image data to produce an image rendition at a given tier in the first hierarchy;
utilizing the second predictor image data to produce an image rendition at the given tier in the second hierarchy; and
producing at least one image rendition at a next higher tier above the given tier based on combining at least the image rendition at the given tier in the first hierarchy and the image

rendition at the given tier in the second hierarchy.

52. The method as in claim 51, wherein combining at least the image rendition at the given tier in the first hierarchy and the image rendition at the given tier in the second hierarchy comprises performing image processing operations.

53. The method as in claim 48 further comprising:
combining an image rendition derived from the first encoded data and an image rendition derived from the second encoded data to reproduce at least one of the images in the first grouping of images.

54. The method as in claim 50, wherein utilizing the combination of the first predictor image data and the second predictor image data to reconstruct the first grouping of images in the sequence comprises, for at least one given image in the first grouping of images:
combining at least a first image produced by means of image processing operations that comprise performing upsampling operations on an image rendition in the first hierarchy and a second image produced by means of image processing operations that comprise performing upsampling operations on an image rendition in the second hierarchy to reproduce the given image in the first grouping of images.

55. The method as in claim 54 further comprising:
receiving meta information; and
utilizing the meta information to identify the images of a lower tier to process in order to produce a given image of a higher tier.

56. Computer-readable storage hardware having instructions stored thereon, the instructions, when carried out by a processing device, causing the processing device to perform operations of:
receiving first encoded image data, the first encoded image data specifying a set of common image element settings to be used as a baseline for reproducing each of multiple

original images in a sequence;

receiving second encoded image data specifying adjustments; and

substantially reproducing the multiple original images in the sequence based on application of the adjustments to preliminary renditions of the original images reconstructed based at least in part on the set of common image elements.

57. Computer-readable storage hardware having instructions stored thereon, the instructions, when carried out by a processing device, causing the processing device to perform operations of:

receiving first predictor image data derived from encoding a first grouping of images in a sequence;

receiving second predictor image data derived from encoding a second grouping of images in the sequence, the first grouping of image disposed adjacent to the second grouping of images in the sequence; and

utilizing a combination of the first predictor image data and the second predictor image data to reconstruct a rendition of the first grouping of images in the sequence.

58. A device comprising:

a processor;

a memory unit that stores instructions associated with an application executed by the processor; and

an interconnect coupling the processor and the memory unit, enabling the device to execute the application and perform operations of:

receiving first encoded image data, the first encoded image data specifying a set of common image element settings to be used as a baseline for reproducing each of multiple original images in a sequence;

receiving second encoded image data specifying adjustments; and

substantially reproducing the multiple original images in the sequence based on application

of the adjustments to preliminary renditions of the original images reconstructed based at least in part on the set of common image elements.

59. A device comprising:

a processor;

a memory unit that stores instructions associated with an application executed by the processor; and

an interconnect coupling the processor and the memory unit, enabling the device to execute the application and perform operations of:

receiving first image data derived from encoding a first grouping of images in a sequence;

receiving second image data derived from encoding a second grouping of images in the sequence, the first grouping of image disposed adjacent to the second grouping of images in the sequence; and

utilizing a combination of the first image data and the second image data to reconstruct a rendition of the first grouping of images in the sequence.

60. The method as in claim 1 further comprising:

producing the set of common image element settings to include: i) a rendition of a first object as detected in a first image of the multiple original images, and ii) a rendition of a second object as detected in a second image of the multiple original images;

wherein a rendition of the second object is absent from the first image; and

wherein a rendition of the first object is absent from the second image.

CLAIMS

1. A method comprising:

via computer processor hardware, performing operations of:

receiving image data specifying settings of image elements for each image of multiple original images in a sequence;

analyzing the settings across the multiple original images;

utilizing the settings of the multiple original images in the sequence to produce first encoded image data specifying a set of common image element settings, the set of common image element settings encoded to derive renditions of the multiple original images in the sequence;

producing, for each given image in the sequence:

second encoded image data specifying image processing operations necessary to produce, based on the set of common image element settings, a preliminary rendition of the given image; and

third encoded image data specifying adjustments to apply to settings of the preliminary rendition of the given image to substantially reproduce a final rendition of the given image; and

producing the set of common image element settings to include: i) a rendition of a first object as detected in a first image of the multiple original images, and ii) a rendition of a second object as detected in a second image of the multiple original images;

wherein a rendition of the second object is absent from the first image; and

wherein a rendition of the first object is absent from the second image.

2. The method as in claim 1 further comprising:

producing second encoded image data specifying adjustment values to use in conjunction with the set of common image element settings to reproduce the multiple original images in the sequence.

3. The method as in claim 1, wherein the common image element settings specify settings of one or more predictor images, each of the one or more predictor images including base setting information from which to derive at least one image of the multiple original images in the sequence.

4. The method as in claim 1 further comprising:

producing the first encoded image data to include multiple sets of encoded data, the sets specifying image renditions at multiple levels of quality.

5. The method as in claim 4 further comprising:

producing at least one lower level of quality image specified by the first encoded image data to include fewer image renditions.

6. The method as in claim 5 further comprising:

encoding each of the image renditions at successively lower levels of quality to be of successively lower resolutions.

7. The method as in claim 1 further comprising:

producing the first encoded image data to include multiple sets of encoded data, the multiple sets of encoded data specifying image renditions at multiple successively higher levels of aggregation.

8. The method as in claim 7 further comprising:

producing each successively higher level of aggregation specified by the first encoded image data to include fewer image renditions.

9. The method as in claim 8 further comprising:

encoding each of the image renditions at the successively higher level of aggregation to be of a same resolution as image renditions at the lower level of aggregation.

10. The method as in claim 1 further comprising:

producing the first encoded image data via:

subdividing the multiple original images at an original level into a first set of sub-groupings, wherein at least one sub-grouping of the sub-groupings in the first set includes at least two images from the multiple original images; and

for each of the respective sub-groupings in the first set, producing a respective image rendition at a first level to be representative of a combination of the images in the respective sub-grouping.

11. The method as in claim 10 further comprising:

varying a number of images included in each respective subgrouping depending on a similarity of the original images to each other.

12. The method as in claim 10 further comprising:

varying a number of images included in each respective subgrouping depending on motion information generated by analyzing the sequence of original images.

13. The method as in claim 10 further comprising:

producing the first encoded image data at a second level via:

subdividing the image renditions at the first level into a second set of sub-groupings, wherein at least one respective subgrouping of the sub-groupings in the second set includes at least two image renditions from the first level; and

for each of the respective sub-groupings in the second set, producing a respective image rendition representative of a combination of the image renditions in the respective sub-grouping.

14. The method as in claim 1, wherein analyzing the image data includes:

identifying a correlation of the settings of the image elements across the multiple original images; and

producing the first encoded image data based on the identified correlation.

15. The method as in claim 1 further comprising:

combining settings of the multiple original images to produce the first encoded image data.

16. The method of claim 1, wherein said image processing operations comprise motion-compensation operations.

17. The method as in claim 1, wherein at least one of the multiple original images comprises at least one object, the method further comprising: performing a motion compensation operation on said at least one object a rendition of a particular object before producing the first encoded image data

18. A method comprising:

via computer processor hardware, performing operations of:

receiving image data specifying settings of image elements for each image of multiple original images in a sequence;

analyzing the settings across the multiple original images;

utilizing the settings of the multiple original images in the sequence to produce first encoded image data specifying a set of common image element settings, the set of common image element settings encoded to derive a rendition of the multiple original images in the sequence; and

wherein the multiple original images are residual images, each of the residual images specifying adjustments to combine with a corresponding preliminary image in order to produce a reconstructed image.

19. The method as in claim 18 further comprising:

producing the first encoded image data to include multiple sets of encoded data, the multiple sets of encoded data specifying image renditions at multiple successive lower levels of quality.

20. The method as in claim 18 further comprising:

producing the first encoded image data to include multiple sets of encoded data specifying image renditions at multiple successively higher levels of aggregation.

21. The method as in claim 20 further comprising:

producing each successively higher level of aggregation specified by the first encoded image data to include fewer image renditions.

22. The method as in claim 21 further comprising:

encoding each of the image renditions at the successively higher level of aggregation to be of a same resolution as image renditions at the lower level of aggregation.

23. The method as in claim 18 further comprising:

producing the first encoded image data via:

subdividing the multiple original images at an original level into a first set of sub-groupings, wherein at least one sub-grouping of the sub-groupings in the first set includes at least two images from the multiple original images; and

for each of the respective sub-groupings in the first set, producing a respective image rendition at a first level to be representative of a combination of the images in the respective sub-grouping.

24. The method as in claim 23 further comprising:

varying a number of images included in each respective subgrouping depending on a similarity of the original images to each other.

25. The method as in claim 23 further comprising:

varying a number of images included in each respective subgrouping depending on motion information generated by analyzing the sequence of original images.

26. The method as in claim 23 further comprising:

producing the first encoded image data at a second level via:

subdividing the image renditions at the first level into a second set of sub-groupings, wherein at least one respective subgrouping of the sub-groupings in the second set includes at least two image renditions from the first level; and

for each of the respective sub-groupings in the second set, producing a respective image rendition representative of a combination of the image renditions in the respective sub-grouping.

27. The method as in claim 18, wherein analyzing the image data includes:

identifying a correlation of the element settings across the multiple original images; and

producing first encoded image data based on the identified correlation.

28. The method as in claim 18 further comprising:

combining the element settings of the multiple original images to produce the first encoded data.

29. The method as in claim 1, wherein the multiple original images are residual images, each of the residual images specifying adjustments to be applied to a corresponding preliminary image in order to produce a reconstructed image.

30. A method comprising:

via computer processor hardware, performing operations of:

receiving first image data encoded from a sequence of multiple original images including a first image and a second image, the first image data encoded to reproduce renditions of the multiple original images in the sequence, the first image data encoded to produce a combined image including: i) a rendition of a first object as captured in the first image of the multiple original images, the first object absent from the second image, and ii) a rendition of a second object as captured in the second image of the multiple original images, the second object absent from the first image; and

decoding the first image data to reproduce a rendition of the first image and a rendition of the second image, the rendition of the first image derived from the first image data and including the rendition of the first object, the rendition of the second image derived from the first image data and including the rendition of the second object.

31. The method as in claim 30 further comprising:

receiving second image data encoded to specify image processing operations necessary to produce, based at least in part on the first image data, a preliminary rendition of a given image in the sequence;

receiving third encoded image data specifying adjustments to apply to the settings of the preliminary rendition of the given image to substantially reproduce a final rendition of the given image in the sequence.

32. The method as in claim 30 further comprising:

receiving second image data derived from the sequence of multiple original images and encoded to specify adjustment values; and

utilizing the first image data in conjunction with the second image data to reproduce renditions of the multiple original images in the sequence.

33. The method as in claim 32, wherein the first image data is encoded to specify settings of one or more predictor images, each of the one or more predictor images including base setting

information from which to reproduce at least one image of the multiple original images in the sequence.

34. The method as in claim 32 further comprising:

receiving the first encoded image data as multiple sets of encoded data, the multiple sets of encoded data specifying how to reproduce renditions of the original images in the sequence at multiple levels of quality.

35. The method as in claim 30 further comprising:

receiving the first encoded image data as multiple sets of encoded data, the multiple sets of encoded data specifying image renditions at multiple successively higher levels of aggregation.

36. The method as in claim 30, wherein the image data is encoded via an encoder that:

subdivides the multiple original images at an original level into a first set of sub-groupings, wherein at least one sub-grouping of the sub-groupings in the first set includes at least two images from the multiple original images; and

produces, for each of the respective sub-groupings in the first set, a respective image rendition at a first level to be representative of a combination of the images in the respective sub-grouping.