unfeasible. The time that a user has to wait when trying to access an arbitrary point is currently in strict trade off with compression efficiency. An example of this phenomenon is the GOP constraint in MPEG family methods: in order to allow for minimum time delay and for random access along time, a GOP of one sample (i.e., intra-only encoding) must be used.

Lastly, current methods are unsuitable for very high sample rates (e.g., very high frame rates for video signals), due to the amount of computational power and bandwidth that would be required. Several studies, for instance, demonstrated that all humans can easily appreciate quality differences of video signals up to 300 frames per second, but computational and bandwidth constraints currently make it extremely expensive to encode and transmit high quality video signals at more than 25-60 frames per second.

BRIEF DESCRIPTION OF INVENTIVE EMBODIMENTS

According to a first aspect of the present invention, there is provided a method for encoding a sequence of original sets of value, comprising:

processing a sequence of original sets of values;

utilizing the sequence of original sets of values to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include data corresponding to the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

According to a second aspect of the present invention, there is provided a method comprising:

via computer processor hardware:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

According to a third aspect of the present invention, there is provided a 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:

processing a sequence of original sets of values;

utilizing the values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

According to the fourth aspect of the present invention, there is provided a 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:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

According to a fifth aspect of the present invention, there is provided a device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

processing a sequence of original sets of values;

utilizing the values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

According to the sixth aspect of the present invention, there is provided a device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

Innovative methods described herein focus on improvements in techniques for encoding, transmitting and decoding residual data related to multiple samples of a signal, especially along dimensions of significant correlation for the signal.

According to its broadest aspect, non-limiting embodiments of the invention described herein include a method for encoding and reconstructing multiple sets of residual data based on a support buffer (e.g., without limitation, a set of support elements). Some non-limiting embodiments also implement the method by generating a tiered hierarchy of support buffers. This method comprises an encoding step – during which sets of residual data are processed, generating support element information and relative residual data – and a decoding step, during which support element information is processed to generate predictions for residual data, which, combined with relative residual data, allow to reconstruct residual data.

Particular attention will be given to non-limiting embodiments in which said methods are used within the encoding and decoding loop of tiered hierarchical encoding methods, wherein a signal is encoded in a tiered hierarchy of samples that comprises two or more tiers, and wherein each of the tiers has a distinct level of quality (e.g., corresponding to the level of fidelity of the signal rendition). Such methods comprise a decoding step

1. A method for encoding a sequence of original sets of value, comprising:

processing a sequence of original sets of values;

utilizing the sequence of original sets of values to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include data corresponding to the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

2. The method as in claim 1 further comprising:

for a given original set of values in the sequence: producing a first portion of the reconstruction data based on the given original set of values and the set of support values.

3. The method as in claim 1 further comprising:

deriving a preliminary rendition of a given original set of values in the sequence based at least in part on the set of support values;

producing a set of residual values, the set of residual values representing differences between the given original set of values and the preliminary rendition of the given original set of values; and

storing the set of residual values as part of the reconstruction data, the residual values representing adjustment values indicating how to modify the preliminary rendition to produce a final rendition of the given original set of values.

4. The method as in claim 3 further comprising:

producing motion compensation information indicating how to derive the preliminary rendition of the given original set of values based on the set of support values; and

storing the motion compensation information as part of the reconstruction data.

5. The method as in claim 1, wherein producing the set of support values comprises:

analyzing setting information associated with the sequence of original sets of values;

identifying a first group of elements, the first group of elements present in a first original set of values in the sequence, the first group of elements associated with a first location in the first original set of values;

identifying a second group of elements, the second group of elements present in a second original set of values in the sequence, the second group of elements associated with a second location in the second original set of values in the sequence;

mapping the second group of elements to the first group of elements;

generating motion compensation information mapping the second group of elements to the first group of elements;

utilizing the motion compensation information to produce a rendition of the second group of elements as an overlay with respect to the first group of elements; and

utilizing a combination of the first group of elements and the rendition of the second group of elements to derive settings for a corresponding portion of the set of support values.

6. The method as in claim 5, wherein the motion compensation information is first motion compensation information; and

wherein producing the set of support values further comprises:

identifying a third group of elements, the third group of elements present in a third original set of values in the sequence, the third group of elements associated with a third location in the third original set of values;

mapping the third group of elements to the first group of elements;

generating second motion compensation information mapping the third group of elements to the first group of elements;

utilizing the second motion compensation information to produce a rendition of the third group of elements as an overlay with respect to the first group of elements; and

utilizing a combination of the first group of elements, the rendition of the second group of elements, and the rendition of the third group of elements to derive settings for a corresponding portion of the set of support values.

7. The method as in claim 6, wherein utilizing the combination to derive the settings for the corresponding portion is includes executing an operation selected from the group consisting of:

    i) weighted average,

    ii) arithmetic mean,

    iii) median, and

    iv) mode.

8. The method as in claim 5, wherein the set of support values represents a support plane, the method further comprising:

in response to detecting that a difference between an element setting in the rendition of the second group of elements and a corresponding element in the first group of elements is greater than a threshold value, assigning a default value to a corresponding element in the support plane.

9. The method as in claim 1 further comprising:

applying operations to the set of support values to produce a set of reference values, the operations selected from the group consisting of:

    i) resampling calculations,

    ii) motion-compensation operations, and

    iii) equalization operations.

10. The method as in claim 5, wherein generating motion compensation information mapping the second group of elements to the first group of elements includes execution of at least one operation selected from the group consisting of:

    i) resampling calculations,

    ii) motion-compensation operations, and

    iii) equalization operations.

11. The method as in claim 5, wherein settings for the first group of elements in the first original set of values is substantially equal to settings of corresponding coordinates in the set of support values; and

wherein settings for the second group of elements in the second original set of values is substantially different than settings of corresponding coordinates in the set of support values.

12. The method as in claim 5 further comprising:

producing a plane of motion compensation settings for the second original set of values, the plane of motion compensation settings indicating that a first group of elements resides in a motion zone in which settings of elements in the first group are derivable at least in part based on the set of support values; and

producing a portion of the plane of motion compensation settings for the second original set of values to a default setting, the portion residing outside the motion zone, the default setting indicating that a corresponding second group of elements in the second original set of values is not to be derived from the set of support values.

13. The method as in claim 1 further comprising:

utilizing the set of support values as a baseline to reconstruct an original set of values that is not included in the sequence.

14. The method as in claim 1, wherein the set of support values represents a first portion of the reconstruction data, the method further comprising:

producing a second portion of the reconstruction data to include residual reconstruction data corresponding to one of the original sets of values in the sequence; and

generating synch-marking information to indicate a location of the second portion in the reconstruction data.

15. The method as in claim 1, wherein the set of support values represents a different sized region of display elements than a region represented by each of the original sets of values in the sequence.

16. The method as in claim 1, wherein each of said original sets of values represents a group of adjustment values to apply to a preliminary rendition of a signal at a first

level of quality to reproduce a target rendition of the signal, the preliminary rendition of the signal at the first level of quality produced based at least in part on processing a rendition of the signal at a second level of quality, the second level of quality being lower than the first level of quality.

17. The method as in claim 1, wherein generating the reconstruction data includes:

generating a portion of the reconstruction data to indicate compensation operations to perform on the set of support values in order to produce preliminary renditions of the set of original set of values.

18. The method as in claim 3 further comprising:

processing the set of residual values based at least in part on a rendition of a signal at a lower level of quality, the method comprising:

processing a portion of residual values in the set of residual values, the portion of residual values corresponding to adjustments to be made to a first rendition of the signal at a first level of quality; and

producing a set of transformed residual values, the transformed residuals being based at least in part on the portion of residual values and on a rendition of the signal at a second level of quality, the second level of quality lower than the first level of quality.

19. The method as in claim 3, wherein the set of residual values is encoded into distinct subsets, the method comprising:

processing the set of residual values to produce a plurality of subsets of residual values; and

individually encoding each subset of residual values, producing corresponding subsets of reconstruction data that can each be decoded independently of the other subsets in the plurality of subsets.

20. The method as in claim 1, wherein the sequence is first sequence;

wherein encoder processor hardware processes at least the first sequence of original sets of values and a second sequence of original sets of values, the method comprising:

processing the first sequence of original sets of values and utilizing the values of the multiple sets in the first sequence to produce a first set of support values, the first set of support values being a baseline to substantially reproduce each of the original sets of values in the first sequence;

processing the second sequence of original sets of values and utilizing the values of the multiple sets in the first sequence to produce a second set of support values, the second set of support values being a baseline to substantially reproduce each of the original sets of values in the second sequence;

processing any additional nthsequence of sets of absolute values and utilizing the values of the multiple sets in the sequence to produce an nthset of support values, said nthset of support values being a baseline to substantially reproduce each of the original sets of values in the nthsequence;

processing the generated sets of support values and utilizing the values of the multiple sets of support values to produce a higher-order set of support values, the higher-order set of support values being a baseline to substantially reproduce each of the generated sets of support values;

generating higher-order support reconstruction data corresponding to the higher-order set of support values; and

generating support reconstruction data corresponding to each of the sets of support values.

21. The method as in claim 1, wherein the set of support values is encoded according to a tiered hierarchy of levels of quality, the method comprising:

processing a rendition of the set of support values at a lower level of quality;

producing, based at least in part on the rendition of the set of support values at the lower level of quality, a preliminary rendition of the set of support values;

producing a set of support plane residual values, the support plane residual values corresponding to differences between the set of support values and the preliminary rendition of the set of support values;

producing support plane reconstruction data corresponding to the support plane residual values.

22. The method as in claim 1, wherein the sequence of original sets of values includes a first original set of values and a second original set of values, the first original set of values representing a first image for playback at a first time in the sequence, the second original set of values representing a second image for playback at a second time in the sequence.

23. The method as in claim 22, wherein the first original set of values includes first encoded data, the first encoded data representing a rendition of a first object;

wherein the second original set of values includes second encoded data, the second encoded data representing a rendition of a second object; and

wherein utilizing the sequence of original sets of values to produce the set of support values includes: encoding the set of support values to specify the rendition of the first object and the rendition of the second object.

24. The method as in claim 23, wherein the rendition of the first object is absent from being present in the second image; and

wherein the rendition of the second object is absent from being present in the first image.

25. The method as in claim 1, wherein utilizing the sequence of original sets of values to produce the set of support values includes:

applying a combination of spatial downsampling and temporal downsampling to the original sets of values to produce the set of support values.

26. The method as in claim 25, wherein the sequence of the original sets of values is encoded in accordance with a first resolution;

wherein the set of support values is encoded in accordance with a second resolution, the second resolution lower than the first resolution.

27. The method as in claim 1, wherein the sequence of the original sets of values is encoded in accordance with a first resolution;

wherein the set of support values is encoded in accordance with a second resolution, the second resolution lower than the first resolution.

28. The method as in claim 27, wherein the sequence of the original sets of values is spatially downsampled to produce the set of support values.

29. The method as in claim 1, wherein the original sets of values includes a first original set of values representing a first image and a second original set of values representing a second image, the method further comprising:

spatially combining the first original set of values and the second original set of values to produce the original sets of values.

30. A method comprising:

via computer processor hardware:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

31. The method as in claim 30, wherein receiving the compensation information includes receiving a first set of compensation information and a second set of compensation information, the method further comprising:

applying the first compensation information to produce a preliminary rendition of a first original set of values; and

applying the second compensation information to the first original set of values to produce a preliminary rendition of a second original set of values.

32. The method as in claim 31, wherein receiving the first compensation information includes:

receiving first zone information, the first zone information specifying which elements in the first original set of values belong to a first zone in the first original set of values; and

wherein applying the first compensation information includes: for each respective element in the first zone: identifying a respective location in the support plane and deriving a setting of the respective element in the first zone based on a grouping of elements in a vicinity of the respective location in the support plane.

33. The method as in claim 32, wherein receiving the second compensation information includes:

receiving second zone information, the second zone information specifying which elements in the second original set of values belong to a second zone, the second zone present in the second original set of values; and

wherein applying the second compensation information includes:

for each corresponding element in the second zone: identifying a corresponding location in the support plane and deriving a setting of the corresponding element in the second zone based on a grouping of elements in a vicinity of the corresponding location in the support plane.

34. The method as in claim 32 further comprising:

producing the preliminary rendition of the first original set of values using the derived settings of the respective elements; and

producing the preliminary rendition of the second original set of values using the derived settings of the corresponding elements.

35. The method as in claim 34 further comprising:

receiving residual reconstruction data specifying first adjustments, the first adjustments to be applied to the preliminary rendition of the first original set of values;

applying the first adjustments to the preliminary rendition of the first original set of values to reproduce a rendition of the first original set of values; receiving residual reconstruction data specifying second adjustments, the second

adjustments to be applied to the preliminary rendition of the second original set of values; and

applying the second adjustments to the preliminary rendition of the second original set of values to reproduce a rendition of the second original set of values.

36. The method as in claim 35 further comprising:

processing reconstruction data to reproduce the support plane and the first original set of values, the processing including execution of at least one operation selected from a group consisting of:

i) resampling calculations,

ii) motion-compensation operations,

iii) equalization operations;

wherein the reconstruction data specifies the at least one operation to reproduce the support plane and the set of values.

37. The method as in claim 30, wherein the compensation information is motion-compensation information specifying operations including: offset, scaling, and rotation.

38. The method as in claim 30, wherein the support plane comprises a greater number of display elements than a number of display elements associated with each of the original set of values.

39. The method as in claim 30, wherein the support plane comprises a fewer number of display elements than a number of display elements associated with each of the original set of values.

40. The method as in claim 30, wherein an original set of values in the multiple original sets represents adjustment to apply to a preliminary rendition of a signal at a first level of quality, the preliminary rendition of the signal produced based at least in part on a rendition of the signal at a second level of quality, the second level of quality being lower than the first level of quality.

41. 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:

processing a sequence of original sets of values;

utilizing the values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

42. 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:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

43. A device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

processing a sequence of original sets of values;

utilizing the values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of values based on the set of support values.

44. A device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

reproducing a support plane including a set of support values, the set of support values derived from combining a sequence of multiple original sets of values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of values based on the set of support values.

45. The method as in claim 1, wherein the sequence of original sets of values includes a first original set of values encoded for playback at a first playback time in the sequence;

wherein the sequence of original sets of values includes a second original set of values encoded for playback at a second playback time in the sequence, the second original set of values being different than the first original set of values, the method further comprising:

deriving the set of support values based on a combination of the first original set of values and the second original set of values.

46. The method as in claim 45, wherein deriving the set of support values includes:

producing the set of support values based on combining a less-than-all portion of the first original set of values and a less-than-all portion of the second original set of values.

unfeasible. The time that a user has to wait when trying to access an arbitrary point is currently in strict trade off with compression efficiency. An example of this phenomenon is the GOP constraint in MPEG family methods: in order to allow for minimum time delay and for random access along time, a GOP of one sample (i.e., intra-only encoding) must be used.

Lastly, current methods are unsuitable for very high sample rates (e.g., very high frame rates for video signals), due to the amount of computational power and bandwidth that would be required. Several studies, for instance, demonstrated that all humans can easily appreciate quality differences of video signals up to 300 frames per second, but computational and bandwidth constraints currently make it extremely expensive to encode and transmit high quality video signals at more than 25-60 frames per second.

BRIEF DESCRIPTION OF INVENTIVE EMBODIMENTS

According to a first aspect of the present invention, there is provided a method comprising:

via computer processor hardware, performing image-processing operations of:

processing a sequence of original sets of image values, each of the original sets representing a different video frame in the sequence;

utilizing the sequence of original sets of image values to produce a set of support values, the set of support values being a temporal combination of the original sets of image values and representing an image baseline from which to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include data corresponding to the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support values.

According to a second aspect of the present invention, there is provided method comprising:

via computer processor hardware:

reproducing a support plane including a set of support image values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of image values based on the set of support image values.

According to a third aspect of the present invention, there is provided a 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:

processing a sequence of original sets of image values;

utilizing the image values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline image from which to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support values.

According to the fourth aspect of the present invention, there is provided a 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:

reproducing a support plane including a set of support values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary image renditions for the multiple original sets of image values based on the set of support values.

According to a fifth aspect of the present invention, there is provided a device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

processing a sequence of original sets of image values;

utilizing the image values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support value.

According to the sixth aspect of the present invention, there is provided a device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

reproducing a support plane including a set of support values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary image renditions of the multiple original sets of image values based on the set of support values.

Innovative methods described herein focus on improvements in techniques for encoding, transmitting and decoding residual data related to multiple samples of a signal, especially along dimensions of significant correlation for the signal.

According to its broadest aspect, non-limiting embodiments of the invention described herein include a method for encoding and reconstructing multiple sets of residual data based on a support buffer (e.g., without limitation, a set of support elements). Some non-

limiting embodiments also implement the method by generating a tiered hierarchy of support buffers. This method comprises an encoding step – during which sets of residual data are processed, generating support element information and relative residual data – and a decoding step, during which support element information is processed to generate predictions for residual data, which, combined with relative residual data, allow to reconstruct residual data.

Particular attention will be given to non-limiting embodiments in which said methods are used within the encoding and decoding loop of tiered hierarchical encoding methods, wherein a signal is encoded in a tiered hierarchy of samples that comprises two or more tiers, and wherein each of the tiers has a distinct level of quality (e.g., corresponding to the level of fidelity of the signal rendition). Such methods comprise a decoding step

1. A method comprising:

via computer processor hardware, performing image-processing operations of:

processing a sequence of original sets of image values, each of the original sets representing a different video frame in the sequence;

utilizing the sequence of original sets of image values to produce a set of support values, the set of support values being a temporal combination of the original sets of image values and representing an image baseline from which to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include data corresponding to the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support values.

2. The method as in claim 1 further comprising:

for a given original set of image values in the sequence: producing a first portion of the reconstruction data based on the given original set of image values and the set of support values.

3. The method as in claim 1 further comprising:

deriving a preliminary rendition of a given original set of image values in the sequence based at least in part on the set of support values;

producing a set of residual values, the set of residual values representing differences between the given original set of image values and the preliminary rendition of the given original set of image values; and

storing the set of residual values as part of the reconstruction data, the residual values representing adjustment values indicating how to

modify the preliminary rendition to produce a final rendition of the given original set of image values.

4. The method as in claim 3 further comprising:

producing motion compensation information indicating how to derive the preliminary rendition of the given original set of image values based on the set of support values; and

storing the motion compensation information as part of the reconstruction data.

5. The method as in claim 1, wherein producing the set of support values comprises:

analyzing setting information associated with the sequence of original sets of image values;

identifying a first group of elements, the first group of elements present in a first original set of image values in the sequence, the first group of elements associated with a first location in the first original set of image values;

identifying a second group of elements, the second group of elements present in a second original set of image values in the sequence, the second group of elements associated with a second location in the second original set of image values in the sequence;

mapping the second group of elements to the first group of elements;

generating motion compensation information mapping the second group of elements to the first group of elements;

utilizing the motion compensation information to produce a rendition of the second group of elements as an overlay with respect to the first group of elements; and

utilizing a combination of the first group of elements and the rendition of the second group of elements to derive settings for a corresponding portion of the set of support values.

6. The method as in claim 5, wherein the motion compensation information is first motion compensation information; and

wherein producing the set of support values further comprises:

identifying a third group of elements, the third group of elements present in a third original set of image values in the sequence, the third group of elements associated with a third location in the third original set of image values;

mapping the third group of elements to the first group of elements;

generating second motion compensation information mapping the third group of elements to the first group of elements;

utilizing the second motion compensation information to produce a rendition of the third group of elements as an overlay with respect to the first group of elements; and

utilizing a combination of the first group of elements, the rendition of the second group of elements, and the rendition of the third group of elements to derive settings for a corresponding portion of the set of support values.

7. The method as in claim 6, wherein utilizing the combination to derive the settings for the corresponding portion is includes executing an operation selected from the group consisting of:

i) weighted average,

ii) arithmetic mean,

iii) median, and

iv) mode.

8. The method as in claim 5, wherein the set of support values represents a support plane, the method further comprising:

in response to detecting that a difference between an element setting in the rendition of the second group of elements and a corresponding element in the first group of elements is greater than a threshold value, assigning a default value to a corresponding element in the support plane.

9. The method as in claim 1 further comprising:

applying operations to the set of support values to produce a set of reference values, the operations selected from the group consisting of:

i) resampling calculations,

ii) motion-compensation operations, and

iii) equalization operations.

10. The method as in claim 5, wherein generating motion compensation information mapping the second group of elements to the first group of elements includes execution of at least one operation selected from the group consisting of:

i) resampling calculations,

ii) motion-compensation operations, and

iii) equalization operations.

11. The method as in claim 5, wherein settings for the first group of elements in the first original set of image values is substantially equal to settings of corresponding coordinates in the set of support values; and

wherein settings for the second group of elements in the second original set of image values is substantially different than settings of corresponding coordinates in the set of support values.

12. The method as in claim 5 further comprising:

producing a plane of motion compensation settings for the second original set of image values, the plane of motion compensation settings indicating that a first group of elements resides in a motion zone in which settings of elements in the first group are derivable at least in part based on the set of support values; and

producing a portion of the plane of motion compensation settings for the second original set of image values to a default setting, the portion residing outside the motion zone, the default setting indicating that a corresponding second group of elements in the second original set of image values is not to be derived from the set of support values.

13. The method as in claim 1 further comprising:

utilizing the set of support values as a baseline to reconstruct an original set of image values that is not included in the sequence.

14. The method as in claim 1, wherein the set of support values represents a first portion of the reconstruction data, the method further comprising:

producing a second portion of the reconstruction data to include residual reconstruction data corresponding to one of the original sets of image values in the sequence; and

generating synch-marking information to indicate a location of the second portion in the reconstruction data.

15. The method as in claim 1, wherein the set of support values represents a different sized region of display elements than a region represented by each of the original sets of image values in the sequence.

16. The method as in claim 1, wherein each of said original sets of image values represents a group of adjustment values to apply to a preliminary rendition of a signal at a first level of quality to reproduce a target rendition of the signal, the preliminary rendition of the signal at the first level of quality produced based at least in part on processing a rendition of the signal at a second level of quality, the second level of quality being lower than the first level of quality.

17. The method as in claim 1, wherein generating the reconstruction data includes:

generating a portion of the reconstruction data to indicate compensation operations to perform on the set of support values in order to produce preliminary renditions of the set of original set of image values.

18. The method as in claim 3 further comprising:

processing the set of residual values based at least in part on a rendition of a signal at a lower level of quality, the method comprising:

processing a portion of residual values in the set of residual values, the portion of residual values corresponding to adjustments to be made to a first rendition of the signal at a first level of quality; and

producing a set of transformed residual values, the transformed residuals being based at least in part on the portion of residual values and on a rendition of the signal at a second level of quality, the second level of quality lower than the first level of quality.

19. The method as in claim 3, wherein the set of residual values is encoded into distinct subsets, the method comprising:

processing the set of residual values to produce a plurality of subsets of residual values; and

individually encoding each subset of residual values, producing corresponding subsets of reconstruction data that can each be decoded independently of the other subsets in the plurality of subsets.

20. The method as in claim 1, wherein the sequence is first sequence;

wherein encoder processor hardware processes at least the first sequence of original sets of image values and a second sequence of original sets of image values, the method comprising:

processing the first sequence of original sets of image values and utilizing the values of the multiple sets in the first sequence to produce a first set of support values, the first set of support values being a baseline to substantially reproduce each of the original sets of image values in the first sequence;

processing the second sequence of original sets of image values and utilizing the values of the multiple sets in the first sequence to produce a second set of support values, the second set of support values being a baseline to substantially reproduce each of the original sets of image values in the second sequence;

processing any additional n^{th} sequence of sets of absolute values and utilizing the values of the multiple sets in the sequence to produce an nth set of support values, said n^{th} set of support values being a baseline to substantially reproduce each of the original sets of image values in the nth sequence;

processing the generated sets of support values and utilizing the values of the multiple sets of support values to produce a higher-order set of support values, the higher-order set of support values being a baseline to substantially reproduce each of the generated sets of support values;

generating higher-order support reconstruction data corresponding to the higher-order set of support values; and

generating support reconstruction data corresponding to each of the sets of support values.

21. The method as in claim 1, wherein the set of support values is encoded according to a tiered hierarchy of levels of quality, the method comprising:

processing a rendition of the set of support values at a lower level of quality;

producing, based at least in part on the rendition of the set of support values at the lower level of quality, a preliminary rendition of the set of support values;

producing a set of support plane residual values, the support plane residual values corresponding to differences between the set of support values and the preliminary rendition of the set of support values;

producing support plane reconstruction data corresponding to the support plane residual values.

22. A method comprising:

via computer processor hardware:

reproducing a support plane including a set of support image values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary renditions of the multiple original sets of image values based on the set of support image values.

23. The method as in claim 22, wherein receiving the compensation information includes receiving a first set of compensation information and a second set of compensation information, the method further comprising:

applying the first compensation information to produce a preliminary rendition of a first original set of image values; and

applying the second compensation information to the first original set of image values to produce a preliminary rendition of a second original set of image values.

24. The method as in claim 23, wherein receiving the first compensation information includes: receiving first zone information, the first zone information specifying which elements in the first original set of image values belong to a first zone in the first original set of image values; and

wherein applying the first compensation information includes:

for each respective element in the first zone: identifying a respective location in the support plane and deriving a setting of the respective element in the first zone based on a grouping of elements in a vicinity of the respective location in the support plane.

25. The method as in claim 24, wherein receiving the second compensation information includes: receiving second zone information, the second zone information specifying which elements in the second original set of image values belong to a second zone, the second zone present in the second original set of image values; and

wherein applying the second compensation information includes:

for each corresponding element in the second zone: identifying a corresponding location in the support plane and deriving a setting of the corresponding element in the second zone based on a grouping of elements in a vicinity of the corresponding location in the support plane.

26. The method as in claim 25 further comprising:

producing the preliminary rendition of the first original set of image values using the derived settings of the respective elements; and

producing the preliminary rendition of the second original set of image values using the derived settings of the corresponding elements.

27. The method as in claim 26 further comprising:

receiving residual reconstruction data specifying first adjustments, the first adjustments to be applied to the preliminary rendition of the first original set of image values;

applying the first adjustments to the preliminary rendition of the first original set of image values to reproduce a rendition of the first original set of image values;

receiving residual reconstruction data specifying second adjustments, the second adjustments to be applied to the preliminary rendition of the second original set of image values; and

applying the second adjustments to the preliminary rendition of the second original set of image values to reproduce a rendition of the second original set of image values.

28. The method as in claim 27 further comprising:

processing reconstruction data to reproduce the support plane and the first original set of image values, the processing including execution of at least one operation selected from a group consisting of:

i) resampling calculations,

ii) motion-compensation operations,

iii) equalization operations;

wherein the reconstruction data specifies the at least one operation to reproduce the support plane and the set of values.

29. The method as in claim 22, wherein the compensation information is motion-compensation information specifying operations including: offset, scaling, and rotation.

30. The method as in claim 22, wherein the support plane comprises a greater number of display elements than a number of display elements associated with each of the original set of image values.

31. The method as in claim 22, wherein the support plane comprises a fewer number of display elements than a number of display elements associated with each of the original set of image values.

32. The method as in claim 22, wherein an original set of image values in the multiple original sets represents adjustment to apply to a preliminary rendition of a signal at a first level of quality, the preliminary rendition of the signal produced based at least in part on a rendition of the signal at a second level of quality, the second level of quality being lower than the first level of quality.

33. 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:

processing a sequence of original sets of image values;

utilizing the image values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline image from which to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support values.

34. 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:

reproducing a support plane including a set of support values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary image renditions for the multiple original sets of image values based on the set of support values.

35. A device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

processing a sequence of original sets of image values;

utilizing the image values of the original sets in the sequence to produce a set of support values, the set of support values representing a baseline to reproduce a rendition of each of the original sets of image values in the sequence; and

generating reconstruction data to include the set of support values, the reconstruction data indicating how to reconstruct the original sets of image values based on the set of support values.

36. A device comprising:

computer processor hardware;

a storage unit that stores instructions; and

an interconnect coupling the computer processor hardware and the storage unit, the computer processor hardware executing the instructions and performing operations of:

reproducing a support plane including a set of support values, the set of support values derived from temporally combining a sequence of multiple original sets of image values;

receiving compensation information; and

utilizing the compensation information to produce preliminary image renditions of the multiple original sets of image values based on the set of support values.

37. The method as in claim 1, wherein the sequence of original sets of image values includes a first original set of image values encoded for playback at a first playback time in the sequence;

wherein the sequence of original sets of image values includes a second original set of image values encoded for playback at a second playback time in the sequence, the second original set of image values different than the first original set of image values, the method further comprising:

deriving the set of support values based on a combination of the first original set of image values and the second original set of image values.

38. The method as in claim 37, wherein deriving the set of support values includes: producing the set of support values based on combining a less-than-all portion of the first original set of image values and a less-than-all portion of the second original set of image values.

39. The method as in claim 1, wherein the sequence of original sets of image values includes a first original set of image values and a second original

set of image values, the first original set of image values representing a first image for playback at a first time in the sequence, the second original set of image values representing a second image for playback at a second time in the sequence.

40. The method as in claim 39, wherein the first original set of image values includes first encoded data, the first encoded data representing a rendition of a first object;

wherein the second original set of image values includes second encoded data, the second encoded data representing a rendition of a second object; and

wherein utilizing the sequence of original sets of image values to produce the set of support values includes: encoding the set of support values to specify the rendition of the first object and the rendition of the second object.

41. The method as in claim 40, wherein the rendition of the first object is absent from being present in the second image; and

wherein the rendition of the second object is absent from being present in the first image.

42. The method as in claim 1, wherein utilizing the sequence of original sets of image values to produce the set of support values includes:

applying a combination of spatial downsampling and temporal downsampling to the original sets of image values to produce the set of support values.

43. The method as in claim 42, wherein the sequence of the original sets of image values is encoded in accordance with a first resolution;

wherein the set of support values is encoded in accordance with a second resolution, the second resolution lower than the first resolution.

44. The method as in claim 1, wherein the sequence of the original sets of image values is encoded in accordance with a first resolution;

wherein the set of support values is encoded in accordance with a second resolution, the second resolution lower than the first resolution.

45. The method as in claim 44, wherein the sequence of the original sets of image values is spatially downsampled to produce the set of support values.

46. The method as in claim 1, wherein the original sets of image values includes a first original set of image values representing a first image for playback at a first time in the video and a second original set of image values representing a second image for playback at a second time in the video, the method further comprising:

spatially combining the first original set of image values and the second original set of image values to produce the set of support values.

47. The method as in claim 1, wherein each of the original sets of image values indicates how to reproduce an image rendition of an object, the object present at a first location in a region of image display elements during a first frame, the object present at a second location in a region of image display elements during a second frame.

48. The method as in claim 47, wherein the sequence of original sets of image values includes a first original set of image values and a second original set of image values, the first original set of image values defining a

rendition of the object at the first location, the second original set of image values defining a rendition of the object at the second location.

49. The method as in claim 48, wherein the reconstruction data further includes motion compensation information indicating motion of the object from the first location to the second location in the region of display elements.

50. The method as in claim 49, wherein a shape of the object at the first location as defined by the first original set of image values is different than a shape of the object at the second location as defined by the original set of image values.

51. The method as in claim 1, wherein a first original set of image values in the original sets of image values represents a first video frame for playback at a first time in the sequence;

wherein a second original set of image values in the original sets of image values represents a second video frame for playback at a second time in the sequence; and

wherein the set of support values is a single image frame defining attributes of a first object and a second object, the first object in the first video frame, the second object in the second video frame.

52. The method as in claim 51, wherein the first object is absent from the second video frame; and

wherein the second object is absent from the first video frame.

53. The method as in claim 1 further comprising:

producing the reconstruction data to indicate how to reconstruct a first video frame and a second video frame of the sequence from the set of support values.

54. The method as in claim 1, wherein utilizing the sequence of original sets of image values to produce the set of support values includes:

downsampling a temporal combination of the original sets of values into the set of support values, the set of support values being of lower resolution than a corresponding resolution of the original sets of values.