Amended Set of Claims 1 to 83

1. A method of coding coefficients associated with a block of video data during a video coding process, the method comprising:

coding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block,

wherein coding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises performing a context adaptive binary arithmetic coding process that includes coding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order.

2. The method of claim 1, wherein coding comprises encoding, and wherein encoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

determining a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

determining a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

encoding the horizontal coordinate and the vertical coordinate.

3. The method of claim 2, wherein the block comprises a first block and the scanning order comprises a first scanning order, the method further comprising:

arranging coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

mapping the continuous sequence into the first block using the first scanning order to generate the first block.

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 46 of 71 was completed at 25.01.2013 23:48:59
Received at the EPO on Jan 25, 2013 23:54:30. Page 46 of 71

4. The method of claim 2, wherein encoding each of the horizontal coordinate and the vertical coordinate comprises binarizing the respective coordinate, such that the coordinate comprises a sequence of one or more bins, and encoding the sequence.

5. The method of claim 4, wherein the sequence of one or more bins comprises one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, and a concatenated codeword.

6. The method of claim 5, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

7. The method of claim 5, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

8. The method of claim 4, wherein encoding each bin of the sequence of one or more bins comprises performing the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes a position of the respective bin within the sequence.

9. The method of claim 4, wherein encoding the horizontal coordinate and the vertical coordinate comprises encoding at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

10. The method of claim 9, wherein encoding the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprises performing the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

11. The method of claim 4, wherein encoding the horizontal coordinate and the vertical coordinate comprises encoding the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

12. The method of claim 11, wherein at least one bin of each of the one or more bins of the sequence of one or more bins corresponding to the one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to the other one of the coordinates comprises a bin encoded using a regular coding mode, and at least one bin of each of the sequences comprises a bin encoded using a bypass coding mode, and wherein encoding the one or more bins of the sequence corresponding to the one of the coordinates and the one or more bins of the sequence corresponding to the other one of the coordinates in the interleaved manner comprises:

encoding the at least one bin of the one or more bins of the sequence corresponding to the one of the coordinates encoded using the regular coding mode prior to encoding the at least one bin of the one or more bins of the sequence corresponding to the other one of the coordinates encoded using the regular coding mode, followed by encoding the at least one bin of the one or more bins of the sequence corresponding to the one of the coordinates encoded using the bypass coding mode prior to encoding the at least one bin of the one or more bins of the sequence corresponding to the other one of the coordinates encoded using the bypass coding mode.

13. The method of claim 1, wherein the scanning order comprises a first scanning order, wherein coding comprises encoding, and wherein encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

tion 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 48 of 71 was completed at 25.01.2013 23:49:26
Received at the EPO on Jan 25, 2013 23:54:30. Page 48 of 71
AMENDED SHEET

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determining whether the coefficient is a non-zero coefficient, and generating a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arranging the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

encoding the continuous sequence.

14. The method of claim 1, wherein coding comprises encoding, and wherein encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

arranging one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determining whether the one or more of the coefficients are non-zero coefficients, and generating one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arranging the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encoding the continuous sequence.

15. The method of claim 1, wherein coding comprises decoding, and wherein decoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

ition 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 49 of 71 was completed at 25.01.2013 23:49:39
Received at the EPO on Jan 25, 2013 23:54:30. Page 49 of 71

decoding a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

decoding a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

for each coefficient associated with the block, determining whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

16. The method of claim 15, wherein the block comprises a first block and the scanning order comprises a first scanning order, the method further comprising:

arranging the coefficients associated with the first block into a continuous sequence based on the first scanning order;

mapping the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determining whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

17. The method of claim 15, wherein each of the horizontal coordinate and the vertical coordinate comprises a binarized coordinate, such that the respective coordinate comprises a sequence of one or more bins, and wherein decoding each of the horizontal coordinate and the vertical coordinate comprises decoding the corresponding sequence.

18. The method of claim 17, wherein the sequence of one or more bins comprises one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, and a concatenated codeword.

19. The method of claim 18, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 50 of 71 was completed at 25.01.2013 23:49:53
Received at the EPO on Jan 25, 2013 23:54:30. Page 50 of 71

in the event the coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

20. The method of claim 18, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

21. The method of claim 17, wherein decoding each bin of the sequence of one or more bins comprises performing the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes a position of the respective bin within the sequence.

22. The method of claim 17, wherein decoding the horizontal coordinate and the vertical coordinate comprises decoding at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

23. The method of claim 22, wherein decoding the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprises performing the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

24. The method of claim 17, wherein decoding the horizontal coordinate and the vertical coordinate comprises decoding the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

tion 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 51 of 71 was completed at 25.01.2013 23:50:05
:eceived at the EPO on Jan 25, 2013 23:54:30. Page 51 of 71

25. The method of claim 24, wherein at least one bin of each of the one or more bins of the sequence of one or more bins corresponding to the one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to the other one of the coordinates comprises a bin decoded using a regular coding mode, and at least one bin of each of the sequences comprises a bin decoded using a bypass coding mode, and wherein decoding the one or more bins of the sequence corresponding to the one of the coordinates and the one or more bins of the sequence corresponding to the other one of the coordinates in the interleaved manner comprises:

decoding the at least one bin of the one or more bins of the sequence corresponding to the one of the coordinates decoded using the regular coding mode prior to decoding the at least one bin of the one or more bins of the sequence corresponding to the other one of the coordinates decoded using the regular coding mode, followed by decoding the at least one bin of the one or more bins of the sequence corresponding to the one of the coordinates decoded using the bypass coding mode prior to decoding the at least one bin of the one or more bins of the sequence corresponding to the other one of the coordinates decoded using the bypass coding mode.

26. The method of claim 1, wherein the scanning order comprises a first scanning order, wherein coding comprises decoding, and wherein decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

decoding a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

27. The method of claim 1, wherein coding comprises decoding, and wherein decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 52 of 71 was completed at 25.01.2013 23:50:19
Received at the EPO on Jan 25, 2013 23:54:30. Page 52 of 71

decoding a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients,

wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

28. The method of claim 1, wherein coding the information that identifies the positions of the other non-zero coefficients within the block comprises performing the context adaptive binary arithmetic coding process, wherein the process includes applying a context model based on at least one context, wherein,

when coding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the at least one context includes the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and,

when coding the information that identifies the positions of the other non-zero coefficients within the block, the at least one context includes one of the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and the information that identifies the positions of the other non-zero coefficients within the block.

29. An apparatus for coding coefficients associated with a block of video data during a video coding process, the apparatus comprising a video coder configured to:

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 53 of 71 was completed at 25.01.2013 23:50:33
Received at the EPO on Jan 25, 2013 23:54:30. Page 53 of 71

code information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block,

wherein to code the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, the video coder is configured to perform a context adaptive binary arithmetic coding process that includes the video coder coding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order.

30. The apparatus of claim 29, wherein the video coder comprises an entropy encoding unit, and wherein to code the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the entropy encoding unit is configured to:

determine a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

determine a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

encode the horizontal coordinate and the vertical coordinate.

31. The apparatus of claim 30, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the entropy encoding unit is further configured to:

arrange coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

map the continuous sequence into the first block using the first scanning order to generate the first block.

32. The apparatus of claim 30, wherein to encode each of the horizontal coordinate and the vertical coordinate, the entropy encoding unit is configured to binarize the respective coordinate, such that the coordinate comprises a sequence of one or more bins, and encode the sequence.

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 54 of 71 was completed at 25.01.2013 23:50:46
Received at the EPO on Jan 25, 2013 23:54:30. Page 54 of 71

33. The apparatus of claim 32, wherein to encode the horizontal coordinate and the vertical coordinate, the entropy encoding unit is configured to encode at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

34. The apparatus of claim 33, wherein to encode the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates, the entropy encoding unit is configured to perform the context adaptive binary arithmetic coding process, such that the process includes the entropy encoding unit applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

35. The apparatus of claim 32, wherein to encode the horizontal coordinate and the vertical coordinate, the entropy encoding unit is configured to encode the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

36. The apparatus of claim 29, wherein the video coder comprises an entropy encoding unit, wherein the scanning order comprises a first scanning order, and wherein to code the information that identifies the positions of the other non-zero coefficients within the block, the entropy encoding unit is configured to:

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determine whether the coefficient is a non-zero coefficient, and generate a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arrange the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

tion 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 55 of 71 was completed at 25.01.2013 23:50:59.
Received at the EPO on Jan 25, 2013 23:54:30. Page 55 of 71

encode the continuous sequence.

37. The apparatus of claim 29, wherein the video coder comprises an entropy encoding unit, and wherein to code the information that identifies the positions of the other non-zero coefficients within the block, the entropy encoding unit is configured to:

arrange one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determine whether the one or more of the coefficients are non-zero coefficients, and generate one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arrange the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encode the continuous sequence.

38. The apparatus of claim 29, wherein the video coder comprises an entropy decoding unit, and wherein to code the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the entropy decoding unit is configured to:

decode a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

decode a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

for each coefficient associated with the block, determine whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 56 of 71 was completed at 25.01.2013 23:51:12
Received at the EPO on Jan 25, 2013 23:54:30. Page 56 of 71

39. The apparatus of claim 38, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the entropy decoding unit is further configured to:

arrange the coefficients associated with the first block into a continuous sequence based on the first scanning order;

map the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determine whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

40. The apparatus of claim 38, wherein each of the horizontal coordinate and the vertical coordinate comprises a binarized coordinate, such that the respective coordinate comprises a sequence of one or more bins, and wherein to decode each of the horizontal coordinate and the vertical coordinate, the entropy decoding unit is configured to decode the corresponding sequence.

41. The apparatus of claim 40, wherein to decode the horizontal coordinate and the vertical coordinate, the entropy decoding unit is configured to decode at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

42. The apparatus of claim 41, wherein to decode the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates, the entropy decoding unit is configured to perform the context adaptive binary arithmetic coding process, such that the process includes the entropy decoding unit applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 57 of 71 was completed at 25.01.2013 23:51:26
Received at the EPO on Jan 25, 2013 23:54:30. Page 57 of 71

43. The apparatus of claim 40, wherein to decode the horizontal coordinate and the vertical coordinate, the entropy decoding unit is configured to decode the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

44. The apparatus of claim 29, wherein the video coder comprises an entropy decoding unit, wherein the scanning order comprises a first scanning order, and wherein to code the information that identifies the positions of the other non-zero coefficients within the block, the entropy decoding unit is configured to:

decode a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

45. The apparatus of claim 29, wherein the video coder comprises an entropy decoding unit, and wherein to code the information that identifies the positions of the other non-zero coefficients within the block, the entropy decoding unit is configured to:

decode a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 58 of 71 was completed at 25.01.2013 23:51:40
Received at the EPO on Jan 25, 2013 23:54:30. Page 58 of 71

more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

46. The apparatus of claim 29, wherein to code the information that identifies the positions of the other non-zero coefficients within the block, the video coder is configured to perform the context adaptive binary arithmetic coding process, wherein the process includes the video coder applying a context model based on at least one context, wherein,

when the video coder is configured to code the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the at least one context includes the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and,

when the video coder is configured to code the information that identifies the positions of the other non-zero coefficients within the block, the at least one context includes one of the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and the information that identifies the positions of the other non-zero coefficients within the block.

47. The apparatus of claim 29, wherein the apparatus comprises at least one of:

an integrated circuit;

a microprocessor; and

a wireless communication device that includes the video coder.

48. A device for coding coefficients associated with a block of video data during a video coding process, the device comprising:

means for coding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block, and

means for coding the information that identifies the positions of the other non-zero coefficients within the block,

ion 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 59 of 71 was completed at 25.01.2013 23:51:52
eceived at the EPO on Jan 25, 2013 23:54:30. Page 59 of 71

wherein the means for coding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises means for performing a context adaptive binary arithmetic coding process that includes means for coding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order.

49. The device of claim 48, wherein coding comprises encoding, and wherein the means for encoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

means for determining a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

means for determining a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

means for encoding the horizontal coordinate and the vertical coordinate.

50. The device of claim 49, wherein the block comprises a first block and the scanning order comprises a first scanning order, the device further comprising:

means for arranging coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

means for mapping the continuous sequence into the first block using the first scanning order to generate the first block.

51. The device of claim 49, wherein the means for encoding each of the horizontal coordinate and the vertical coordinate comprises means for binarizing the respective coordinate, such that the coordinate comprises a sequence of one or more bins, and means for encoding the sequence.

52. The device of claim 51, wherein the means for encoding the horizontal coordinate and the vertical coordinate comprises means for encoding at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 60 of 71 was completed at 25.01.2013 23:52:05
Received at the EPO on Jan 25, 2013 23:54:30. Page 60 of 71

in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

53. The device of claim 52, wherein the means for encoding the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprises means for performing the context adaptive binary arithmetic coding process, such that the process includes means for applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

54. The device of claim 51, wherein the means for encoding the horizontal coordinate and the vertical coordinate comprises means for encoding the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

55. The device of claim 48, wherein the scanning order comprises a first scanning order, wherein coding comprises encoding, and wherein the means for encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for, for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determining whether the coefficient is a non-zero coefficient, and generating a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

means for arranging the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

means for encoding the continuous sequence.

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 61 of 71 was completed at 25.01.2013 23:52:18
Received at the EPO on Jan 25, 2013 23:54:30. Page 61 of 71

56. The device of claim 48, wherein coding comprises encoding, and wherein the means for encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for arranging one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

means for, for each of the one or more groups, determining whether the one or more of the coefficients are non-zero coefficients, and generating one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

means for arranging the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

means for encoding the continuous sequence.

57. The device of claim 48, wherein coding comprises decoding, and wherein the means for decoding the two-dimensional position within the block comprises:

means for decoding a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

means for decoding a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

means for, for each coefficient associated with the block, determining whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

58. The device of claim 57, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the device further comprises:

means for arranging the coefficients associated with the first block into a continuous sequence based on the first scanning order;

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 62 of 71 was completed at 25.01.2013 23:52:32
Received at the EPO on Jan 25, 2013 23:54:30. Page 62 of 71

means for mapping the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

means for, for each coefficient associated with the second block, determining whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

59. The device of claim 57, wherein each of the horizontal coordinate and the vertical coordinate comprises a binarized coordinate, such that the respective coordinate comprises a sequence of one or more bins, and wherein the means for decoding each of the horizontal coordinate and the vertical coordinate comprises means for decoding the corresponding sequence.

60. The device of claim 59, wherein the means for decoding the horizontal coordinate and the vertical coordinate comprises means for decoding at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

61. The device of claim 60, wherein the means for decoding the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprises means for performing the context adaptive binary arithmetic coding process, such that the process includes means for applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

62. The device of claim 59, wherein the means for decoding the horizontal coordinate and the vertical coordinate comprises means for decoding the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

ration: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 63 of 71 was completed at 25.01.2013 23:52:45
Received at the EPO on Jan 25, 2013 23:54:30. Page 63 of 71

63. The device of claim 48, wherein the scanning order comprises a first scanning order, wherein coding comprises decoding, and wherein the means for decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for decoding a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

means for, for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

64. The device of claim 48, wherein coding comprises decoding, and wherein the means for decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for decoding a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

means for, for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

65. The device of claim 48, wherein the means for coding the information that identifies the positions of the other non-zero coefficients within the block comprises the

tion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 64 of 71 was completed at 25.01.2013 23:53:00
Received at the EPO on Jan 25, 2013 23:54:30. Page 64 of 71

means the for performing the context adaptive binary arithmetic coding process that includes means for applying a context model based on at least one context, wherein,

when coding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the at least one context includes the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and,

when coding the information that identifies the positions of the other non-zero coefficients within the block, the at least one context includes one of the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and the information that identifies the positions of the other non-zero coefficients within the block.

66. A computer-readable medium comprising instructions that, when executed, cause a processor to code coefficients associated with a block of video data during a video coding process, wherein the instructions cause the processor to:

code information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block,

wherein the instructions that cause the processor to code the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to perform a context adaptive binary arithmetic coding process that includes the processor coding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order.

67. The computer-readable medium of claim 66, wherein the instructions that cause the processor to code the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to encode the two-dimensional position, the instructions causing the processor to:

determine a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

determine a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

uration: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 65 of 71 was completed at 25.01.2013 23:53:14
Received at the EPO on Jan 25, 2013 23:54:30. Page 65 of 71

encode the horizontal coordinate and the vertical coordinate.

68. The computer-readable medium of claim 67, wherein the block comprises a first block and the scanning order comprises a first scanning order, further comprising instructions that cause the processor to:

arrange coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

map the continuous sequence into the first block using the first scanning order to generate the first block.

69. The computer-readable medium of claim 67, wherein the instructions that cause the processor to encode each of the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to binarize the respective coordinate, such that the coordinate comprises a sequence of one or more bins, and instructions that cause the processor to encode the sequence.

70. The computer-readable medium of claim 69, wherein the instructions that cause the processor to encode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to encode at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

71. The computer-readable medium of claim 70, wherein the instructions that cause the processor to encode the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprise instructions that cause the processor to perform the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

tion 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 66 of 71 was completed at 25.01.2013 23:53:27
eceived at the EPO on Jan 25, 2013 23:54:30. Page 66 of 71
AMENDED SHEET

72. The computer-readable medium of claim 69, wherein the instructions that cause the processor to encode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to encode the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

73. The computer-readable medium of claim 66, wherein the scanning order comprises a first scanning order, and wherein the instructions that cause the processor to code the information that identifies the positions of the other non-zero coefficients within the block comprise instructions that cause the processor to encode the information, the instructions causing the processor to:

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determine whether the coefficient is a non-zero coefficient, and generate a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arrange the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

encode the continuous sequence.

74. The computer-readable medium of claim 66, wherein the instructions that cause the processor to code the information that identifies the positions of the other non-zero coefficients within the block comprise instructions that cause the processor to encode the information, the instructions causing the processor to:

arrange one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determine whether the one or more of the coefficients are non-zero coefficients, and generate one or more flags, wherein the one

ition: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 67 of 71 was completed at 25.01.2013 23:53:41
Received at the EPO on Jan 25, 2013 23:54:30. Page 67 of 71

or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arrange the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encode the continuous sequence.

75. The computer-readable medium of claim 66, wherein the instructions that cause the processor to code the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to decode the two-dimensional position, the instructions causing the processor to:

decode a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order;

decode a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order; and

for each coefficient associated with the block, determine whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

76. The computer-readable medium of claim 75, wherein the block comprises a first block and the scanning order comprises a first scanning order, further comprising instructions that cause the processor to:

arrange the coefficients associated with the first block into a continuous sequence based on the first scanning order;

map the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determine whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

ation 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 68 of 71 was completed at 25.01.2013 23:53:55
Received at the EPO on Jan 25, 2013 23:54:30. Page 68 of 71
AMENDED SHEET

77. The computer-readable medium of claim 75, wherein each of the horizontal coordinate and the vertical coordinate comprises a binarized coordinate, such that the respective coordinate comprises a sequence of one or more bins, and wherein the instructions that cause the processor to decode each of the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to decode the corresponding sequence.

78. The computer-readable medium of claim 77, wherein the instructions that cause the processor to decode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to decode at least one bin of the sequence of one or more bins corresponding to one of the coordinates based at least in part on a value of at least one bin of the sequence of one or more bins corresponding to another one of the coordinates.

79. The computer-readable medium of claim 78, wherein the instructions that cause the processor to decode the at least one bin of the sequence of one or more bins corresponding to the one of the coordinates based at least in part on the value of the at least one bin of the sequence of one or more bins corresponding to the other one of the coordinates comprise instructions that cause the processor to perform the context adaptive binary arithmetic coding process, such that the process includes applying a context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the sequence corresponding to the other one of the coordinates.

80. The computer-readable medium of claim 77, wherein the instructions that cause the processor to decode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to decode the one or more bins of the sequence of one or more bins corresponding to one of the coordinates and the one or more bins of the sequence of one or more bins corresponding to another one of the coordinates in an interleaved manner.

81. The computer-readable medium of claim 66, wherein the scanning order comprises a first scanning order, and wherein the instructions that cause the processor to code the information that identifies the positions of the other non-zero coefficients

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 69 of 71 was completed at 25.01.2013 23:54:08
Received at the EPO on Jan 25, 2013 23:54:30. Page 69 of 71

within the block comprise instructions that cause the processor to decode the information, the instructions causing the processor to:

decode a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

82. The computer-readable medium of claim 66, wherein the instructions that cause the processor to code the information that identifies the positions of the other non-zero coefficients within the block comprise instructions that cause the processor to decode the information, the instructions causing the processor to:

decode a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

83. The computer-readable medium of claim 66, wherein the instructions that cause the processor to code the information that identifies the positions of the other non-zero coefficients within the block comprise instructions that cause the processor to perform

ation: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 70 of 71 was completed at 25.01.2013 23:54:22
Received at the EPO on Jan 25, 2013 23:54:30. Page 70 of 71

the context adaptive binary arithmetic coding process, wherein the process includes applying a context model based on at least one context, wherein,

when coding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the at least one context includes the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and,

when coding the information that identifies the positions of the other non-zero coefficients within the block, the at least one context includes one of the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, and the information that identifies the positions of the other non-zero coefficients within the block.

ion: 25.01.2013 23:38:49 - 25.01.2013 23:54:30. This page 71 of 71 was completed at 25.01.2013 23:54:30
Received at the EPO on Jan 25, 2013 23:54:30. Page 71 of 71

CLAIMS

1. A method of encoding coefficients associated with a block of video data during a video encoding process, the method comprising:

encoding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to encoding information that identifies positions of other non-zero coefficients within the block, wherein encoding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises encoding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein encoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

determining a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarizing the horizontal coordinate, such that the horizontal coordinate comprises a first sequence of one or more bins;

determining a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarizing the vertical coordinate, such that the vertical coordinate comprises a second sequence of one or more bins; and

encoding the first sequence of one or more bins and encoding the second sequence of one or more bins by performing a context adaptive binary encoding process.

2. The method of claim **1**, wherein the block comprises a first block and the scanning order comprises a first scanning order, the method further comprising:

arranging coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

mapping the continuous sequence into the first block using the first scanning order to generate the first block.

3. The method of claim **1**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

4. The method of claim **3**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

5. The method of claim **3**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

6. The method of claim **1**, wherein performing the context adaptive binary arithmetic encoding process includes applying at least one context model based on at least one context, wherein the at least one context includes a position of the respective bin within the sequence.

7. The method of claim **1**, wherein encoding the horizontal coordinate and the vertical coordinate comprises encoding at

least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

8. The method of claim **7**, wherein encoding the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprises applying at least one context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

9. The method of claim **1**, wherein encoding the horizontal coordinate and the vertical coordinate comprises encoding the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

10. The method of claim **9**, wherein encoding in the interleaved manner comprises:

encoding one or more first bins of the first sequence using a regular coding mode prior to encoding one or more second bins of the second sequence using the regular coding mode, followed by encoding one or more third bins of the first sequence using the bypass coding mode prior to encoding one or more fourth bins of the second sequence using the bypass coding mode.

11. The method of claim **1**, wherein the scanning order comprises a first scanning order, and wherein encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determining whether the coefficient is a

non-zero coefficient, and generating a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arranging the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

encoding the continuous sequence.

12. The method of claim **1**, wherein encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

arranging one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determining whether the one or more of the coefficients are non-zero coefficients, and generating one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arranging the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encoding the continuous sequence.

13. A method of decoding coefficients associated with a block of video data during a video decoding process, the method comprising:

decoding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to decoding information that identifies positions of other non-zero coefficients within the block, wherein decoding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises decoding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order,

and wherein decoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

decoding a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order including decoding a first sequence of one or more bins associated with the horizontal component using a context adaptive binary decoding process;

decoding a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order including decoding a second sequence of bins one or more bins associated with the vertical component using the context adaptive binary decoding process; and

for each coefficient associated with the block, determining whether the coefficient is the last non-zero coefficient within the block according to the scanning

order, based on the horizontal coordinate and the vertical coordinate.

14. The method of claim **13**, wherein the block comprises a first block and the scanning order comprises a first scanning order, the method further comprising:

arranging the coefficients associated with the first block into a continuous sequence based on the first scanning order;

mapping the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determining whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

15. The method of claim **13**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

16. The method of claim **15**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event respective the coordinate has a value that is greater than or equal to the truncated value, a predeter-

mined number of the first symbol, the predetermined number corresponding to the truncated value.

17. The method of claim **15**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

18. The method of claim **13**, wherein performing the context adaptive binary arithmetic decoding process includes applying at least one context model based on at least one context, wherein the at least one context includes a position of the respective bin within the sequence.

19. The method of claim **13**, wherein decoding the horizontal coordinate and the vertical coordinate comprises decoding at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

20. The method of claim **19**, wherein decoding the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprises applying at least one context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

21. The method of claim **13**, wherein decoding the horizontal coordinate and the vertical coordinate comprises decoding the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

22. The method of claim **21**, wherein decoding in the interleaved manner comprises:

decoding one or more bins of the first sequence using a regular coding mode prior to decoding one or more second bins of the second sequence using the regular coding mode, followed by decoding one or more third bins of the first sequence using the bypass coding mode

prior to decoding one or more fourth bins of the second sequence using the bypass coding mode.

23. The method of claim **13**, wherein the scanning order comprises a first scanning order, and wherein decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

decoding a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

24. The method of claim **13**, wherein decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

decoding a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients,

wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether

the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

25. An apparatus for encoding coefficients associated with a block of video data during a video encoding process, the apparatus comprising:

a memory configured to store the block of video data; and

a video encoder configured to:

encode information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to encoding information that identifies positions of other non-zero coefficients within the block, wherein to encode the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, the video encoder is configured to encode a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein to encode the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the video encoder is configured to:

determine a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarize the horizontal coor-

dinate, such that the horizontal coordinate comprises a first sequence of one or more bins;

determine a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarize the vertical coordinate, such that the vertical coordinate comprises a second sequence of one or more bins; and

encode the first sequence of one or more bins and encoding the second sequence of one or more bins by performing a context adaptive binary encoding process.

26. The apparatus of claim **25**, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the video encoder is further configured to:

arrange coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

map the continuous sequence into the first block using the first scanning order to generate the first block.

27. The apparatus of claim **25**, wherein to encode the horizontal coordinate and the vertical coordinate, the entropy encoding unit is configured to encode at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

28. The apparatus of claim **27**, wherein to encode the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence, the video encoder is configured to apply at least one context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

29. The apparatus of claim **25**, wherein to encode the horizontal coordinate and the vertical coordinate, the video encoder is configured to encode the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

30. The apparatus of claim **25**, wherein the scanning order comprises a first scanning order, and wherein to encode the information that identifies the positions of the other non-zero coefficients within the block, the video encoder is configured to:

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determine whether the coefficient is a non-zero coefficient, and generate a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arrange the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

encode the continuous sequence.

31. The apparatus of claim **25**, wherein to encode the information that identifies the positions of the other non-zero coefficients within the block, the video encoder is configured to:

arrange one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning

order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determine whether the one or more of the coefficients are non-zero coefficients, and generate one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arrange the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encode the continuous sequence.

32. The apparatus of claim **25**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

33. The apparatus of claim **32**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predeter-

mined number of the first symbol, the predetermined number corresponding to the truncated value.

34. The apparatus of claim **32**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

35. An apparatus for decoding coefficients associated with a block of video data during a video decoding process, the apparatus comprising:

a memory configured to store the block of video data; and

a video decoder configured to:

decode information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to decoding information that identifies positions of other non-zero coefficients within the block, wherein to decode the information that identifies the position of the last non-zero coefficient within the block according to the scanning order, the video decoder is configured to decode a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein to decode the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the video decoder is configured to:

decode a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order including decoding a first sequence of one or more bins associated with the horizontal component using a context adaptive binary decoding process;

decode a vertical coordinate of the position of the last non-zero coefficient within the block according to the

scanning order including decoding a second sequence of bins one or more bins associated with the vertical component using the context adaptive binary decoding process; and

for each coefficient associated with the block, determine whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

36. The apparatus of claim **35**, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the video decoder is further configured to:

arrange the coefficients associated with the first block into a continuous sequence based on the first scanning order;

map the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determine whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

37. The apparatus of claim **35**, wherein to decode the horizontal coordinate and the vertical coordinate, the video decoder is configured to decode at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

38. The apparatus of claim **37**, wherein to decode the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence, the video decoder is configured to apply at least one context model

based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

39. The apparatus of claim **35**, wherein to decode the horizontal coordinate and the vertical coordinate, the video decoder is configured to decode the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

40. The apparatus of claim **35**, wherein the scanning order comprises a first scanning order, and wherein to decode the information that identifies the positions of the other non-zero coefficients within the block, the video decoder is configured to:

decode a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

41. The apparatus of claim **35**, wherein to decode the information that identifies the positions of the other non-zero coefficients within the block, the video decoder is configured to:

decode a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with

the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

42. The apparatus of claim **35**, wherein the apparatus comprises at least one of:

an integrated circuit;

a microprocessor; or

a wireless communication device that includes the video coder.

43. The apparatus of claim **35**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

44. The apparatus of claim **43**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the

variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

45. The apparatus of claim **43**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

46. A device for encoding coefficients associated with a block of video data during a video encoding process, the device comprising:

means for encoding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block; and

means for encoding the information that identifies the positions of the other non-zero coefficients within the block,

wherein the means for encoding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises means for encoding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein the means for encoding the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises:

means for determining a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarizing

the horizontal coordinate, such that the horizontal coordinate comprises a first sequence of one or more bins;

means for determining a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarizing the vertical coordinate, such that the vertical coordinate comprises a second sequence of one or more bins; and

means for encoding the first sequence of one or more bins and encoding the second sequence of one or more bins by performing a context adaptive binary encoding process.

47. The device of claim **46**, wherein the block comprises a first block and the scanning order comprises a first scanning order, the device further comprising:

means for arranging coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

means for mapping the continuous sequence into the first block using the first scanning order to generate the first block.

48. The device of claim **46**, wherein the means for encoding the horizontal coordinate and the vertical coordinate comprises means for encoding at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

49. The device of claim **48**, wherein the means for encoding the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprises means for applying at least one context model

based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

50. The device of claim **46**, wherein the means for encoding the horizontal coordinate and the vertical coordinate comprises means for encoding the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

51. The device of claim **46**, wherein the scanning order comprises a first scanning order, and wherein the means for encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for, for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determining whether the coefficient is a non-zero coefficient, and generating a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

means for arranging the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

means for encoding the continuous sequence.

52. The device of claim **46**, wherein the means for encoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for arranging one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the

scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

means for, for each of the one or more groups, determining whether the one or more of the coefficients are non-zero coefficients, and generating one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

means for arranging the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

means for encoding the continuous sequence.

53. The device of claim **46**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

54. The apparatus of claim **53**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predeter-

mined number of the first symbol, the predetermined number corresponding to the truncated value.

55. The apparatus of claim **53**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

56. A device for decoding coefficients associated with a block of video data during a video decoding process, the device comprising:

means for decoding information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block; and

means for decoding the information that identifies the positions of the other non-zero coefficients within the block,

wherein the means for decoding the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprises means for decoding a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein the means for decoding the two-dimensional position within the block comprises:

means for decoding a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order including means for decoding a first sequence of one or more bins associated with the horizontal component using a context adaptive binary decoding process;

means for decoding a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order including means for decoding a second sequence of bins one or more bins

associated with the vertical component using the context adaptive binary decoding process; and

means for, for each coefficient associated with the block, determining whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

57. The device of claim **56**, wherein the block comprises a first block and the scanning order comprises a first scanning order, and wherein the device further comprises:

means for arranging the coefficients associated with the first block into a continuous sequence based on the first scanning order;

means for mapping the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

means for, for each coefficient associated with the second block, determining whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

58. The device of claim **56**, wherein the means for decoding the horizontal coordinate and the vertical coordinate comprises means for decoding at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

59. The device of claim **58**, wherein the means for decoding the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprises means for applying at least one context model

based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

60. The device of claim **56**, wherein the means for decoding the horizontal coordinate and the vertical coordinate comprises means for decoding the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

61. The device of claim **56**, wherein the scanning order comprises a first scanning order, and wherein the means for decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for decoding a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

means for, for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

62. The device of claim **56**, wherein the means for decoding the information that identifies the positions of the other non-zero coefficients within the block comprises:

means for decoding a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the

block according to the scanning order, and proceeding according to the scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

means for, for each coefficient associated with the block, determining whether the coefficient is a non-zero coefficient, based on the continuous sequence.

63. The apparatus of claim **56**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

64. The apparatus of claim **63**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

65. The apparatus of claim **63**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

66. A non-transitory computer-readable medium comprising instructions that, when executed, cause a processor to encode coefficients associated with a block of video data during a video encoding process, wherein the instructions cause the processor to:

encode information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block, wherein the instructions that cause the processor to encode the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to encode a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, and wherein to encode the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order, the instructions cause the processor to:

determine a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarize the horizontal coordinate, such that the horizontal coordinate comprises a first sequence of one or more bins;

determine a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order and binarize the vertical coordinate, such that the vertical coordinate comprises a second

sequence of one or more bins; and

encode the first sequence of one or more bins and encode the second sequence of one or more bins by performing a context adaptive binary encoding process.

67. The non-transitory computer-readable medium of claim **66**, wherein the block comprises a first block and the scanning order comprises a first scanning order, further comprising instructions that cause the processor to:

arrange coefficients associated with a second block of video data into a continuous sequence based on a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order; and

map the continuous sequence into the first block using the first scanning order to generate the first block.

68. The non-transitory computer-readable medium of claim **66**, wherein the instructions that cause the processor to encode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to encode at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

69. The non-transitory computer-readable medium of claim **68**, wherein the instructions that cause the processor to encode the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprise instructions that cause the processor to apply at least one context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

70. The non-transitory computer-readable medium of claim **66**, wherein the instructions that cause the processor to encode the horizontal coordinate and the vertical coordinate

comprise instructions that cause the processor to encode the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

71. The non-transitory computer-readable medium of claim **66**, wherein the scanning order comprises a first scanning order, and wherein the instructions further cause the processor to:

for each of one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, determine whether the coefficient is a non-zero coefficient, and generate a significant coefficient flag that indicates whether the coefficient is a non-zero coefficient;

arrange the significant coefficient flags for the one or more coefficients into a continuous sequence based on the second scanning order; and

encode the continuous sequence.

72. The non-transitory computer-readable medium of claim **66**, wherein the instructions further cause the processor to:

arrange one or more coefficients associated with the block, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the scanning order, into one or more groups, wherein each of the one or more groups comprises one or more of the coefficients;

for each of the one or more groups, determine whether the

one or more of the coefficients are non-zero coefficients, and generate one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient;

arrange the one or more flags for the one or more groups into a continuous sequence based on the scanning order; and

encode the continuous sequence.

73. The non-transitory computer-readable medium of claim **66**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

74. The non-transitory computer-readable medium of claim **73**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

75. The non-transitory computer-readable medium of claim **73**, wherein the concatenated codeword comprises a

concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.

76. A non-transitory computer-readable medium comprising instructions that, when executed, cause a processor to decode coefficients associated with a block of video data during a video decoding process, wherein the instructions cause the processor to:

decode information that identifies a position of a last non-zero coefficient within the block according to a scanning order associated with the block prior to coding information that identifies positions of other non-zero coefficients within the block, wherein the instructions that cause the processor to decode the information that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to decode a two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order,

and wherein the instructions that cause the processor to decode the two-dimensional position within the block that identifies the position of the last non-zero coefficient within the block according to the scanning order comprise instructions that cause the processor to:

decode a horizontal coordinate of the position of the last non-zero coefficient within the block according to the scanning order including decoding a first sequence of one or more bins associated with the horizontal component using a context adaptive binary decoding process;

decode a vertical coordinate of the position of the last non-zero coefficient within the block according to the scanning order including decoding a second sequence

of bins one or more bins associated with the vertical component using the context adaptive binary decoding process; and

for each coefficient associated with the block, determine whether the coefficient is the last non-zero coefficient within the block according to the scanning order, based on the horizontal coordinate and the vertical coordinate.

77. The non-transitory computer-readable medium of claim **76**, wherein the block comprises a first block and the scanning order comprises a first scanning order, further comprising instructions that cause the processor to:

arrange the coefficients associated with the first block into a continuous sequence based on the first scanning order;

map the continuous sequence into a second block of video data using a second scanning order, wherein the second block is different than the first block, and wherein the second scanning order is different than the first scanning order, to generate the second block; and

for each coefficient associated with the second block, determine whether the coefficient is the last non-zero coefficient within the second block according to the second scanning order, based on the determinations for the first block.

78. The non-transitory computer-readable medium of claim **76**, wherein the instructions that cause the processor to decode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to decode at least one bin of the first sequence of one or more bins based at least in part on a value of at least one bin of the second sequence of one or more bins.

79. The non-transitory computer-readable medium of claim **78**, wherein the instructions that cause the processor to

decode the at least one bin of the first sequence based at least in part on the value of the at least one bin of the second sequence comprise instructions that cause the processor to apply at least one context model based on at least one context, wherein the at least one context includes the value of the at least one bin of the second sequence.

80. The non-transitory computer-readable medium of claim **76**, wherein the instructions that cause the processor to decode the horizontal coordinate and the vertical coordinate comprise instructions that cause the processor to decode the first sequence of one or more bins and the second sequence of one or more bins in an interleaved manner.

81. The non-transitory computer-readable medium of claim **76**, wherein the scanning order comprises a first scanning order, and wherein the instructions further cause the processor to:

decode a continuous sequence of significant coefficient flags for one or more coefficients associated with the block, starting with the last non-zero coefficient within the block according to the first scanning order and ending with a first coefficient within the block according to the first scanning order, and proceeding according to a second scanning order that is reversed relative to the first scanning order, wherein each of the significant coefficient flags indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

82. The non-transitory computer-readable medium of claim **76**, wherein the instructions further cause the processor to:

decode a continuous sequence of flags for one or more coefficients associated with the block arranged into one or more groups, starting with a first coefficient within the block according to the scanning order and ending with the last non-zero coefficient within the block according to the scanning order, and proceeding according to the

scanning order, wherein each of the one or more groups comprises one or more of the coefficients, wherein for each of the one or more groups, the continuous sequence comprises one or more flags, wherein the one or more flags include a group flag that indicates whether the one or more of the coefficients are all zero-valued coefficients, and, when at least one of the one or more of the coefficients is a non-zero coefficient, the one or more flags further include a significant coefficient flag for each of the one or more of the coefficients that indicates whether the respective coefficient is a non-zero coefficient; and

for each coefficient associated with the block, determine whether the coefficient is a non-zero coefficient, based on the continuous sequence.

83. The non-transitory computer-readable medium of claim **76**, wherein the first sequence of one or more bins and the second sequence of one or more bins each comprise one of a unary codeword, a truncated unary codeword, an exponential Golomb codeword, or a concatenated codeword.

84. The non-transitory computer-readable medium of claim **83**, wherein the truncated unary codeword comprises:

in the event the respective coordinate has a value that is less than a predetermined truncated value, a unary codeword comprising a variable number of a first symbol, the variable number corresponding to the value of the coordinate, followed by a second symbol, wherein the first symbol is different than the second symbol; and

in the event the respective coordinate has a value that is greater than or equal to the truncated value, a predetermined number of the first symbol, the predetermined number corresponding to the truncated value.

85. The non-transitory computer-readable medium of claim **83**, wherein the concatenated codeword comprises a concatenation of a first codeword and a second codeword, wherein the first codeword is different than the second codeword.