

WHAT IS CLAIMED IS:

1. A method of decoding video data, the method comprising:
 - determining, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
 - decoding a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.
2. The method of claim 1, wherein:
 - the color component is a first color component and the syntax element is a first syntax element, and
 - the method further comprises:
 - using the first context model to determine the context increment for the first syntax element;
 - making, based on the color format of the picture of the video data, a determination to use the first context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
 - decoding a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.

3. The method of claim 1, wherein:
 - the color component is a first color component and the syntax element is a first syntax element, and
 - the method further comprises:
 - using the first context model to determine the context increment for the first syntax element;
 - making, based on the color format of the picture of the video data, a determination to use the second context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
 - decoding a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.
4. The method of claim 3, wherein the first color component is a luma component and the second color component is a chroma component.
5. The method of claim 3, wherein making the determination to use the second context model to determine the context increment for the second syntax element comprises, based on none of the following conditions being satisfied, making the determination to use the second context model to derive the context increment for the second syntax element:
 - i) the color format of the picture is a monochrome color format or a 4:4:4 color format, and
 - ii) the color format of the picture is a 4:2:0 color format or a 4:2:2 color format and the second color component is a luma component.
6. The method of claim 5, wherein making the determination to use the second context model to determine the context increment for the second syntax element further based on the following condition not being satisfied: iii) the color format of the picture being 4:2:2, the second color component being a chroma component, and the second syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the second color component of the block.

7. The method of claim 3, wherein using the first context model to derive the context increment for the first syntax element comprises:

performing one of:

based on a log base-2 value of a transform size of the block being less than 6, setting a context offset ctxOffset for the first syntax element to $3 * (\log_2 \text{TrafoSize} - 2) + ((\log_2 \text{TrafoSize} - 1) \gg 2)$ and setting a context shift ctxShift for the first syntax element equal to $(\log_2 \text{TrafoSize} + 1) \gg 2$, where $\log_2 \text{TrafoSize}$ indicates the log base-2 value of the transform size, or

based on the log base-2 value of the transform size being greater than or equal to 6, setting the context offset ctxOffset for the first syntax element to $3 * (\log_2 \text{TrafoSize} - 2) + ((\log_2 \text{TrafoSize} - 1) \gg 2) + ((1 \ll \log_2 \text{TrafoSize}) \gg 6) \ll 1 + ((1 \ll \log_2 \text{TrafoSize}) \gg 7)$ and setting the context shift ctxShift for the first syntax element equal to $((\log_2 \text{TrafoSize} + 1) \gg 2) \ll 1$; and

determining the context increment for the first syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the first syntax element.

8. The method of claim 3, wherein using the second context model to determine a context increment for a second syntax element comprises:

setting a context offset ctxOffset for the second syntax element to 18 and setting a context shift ctxShift for the second syntax element to $\text{Max}(0, \log_2 \text{TrafoSize} - 2) - \text{Max}(0, \log_2 \text{TrafoSize} - 4)$, where Max indicates a maximum function and $\log_2 \text{TrafoSize}$ indicates a log base-2 value of a transform size of the block; and

determining the context increment for the second syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the second syntax element.

9. The method of claim 1, wherein determining which context model from among the first context model and the second context model to use to determine the context increment for the syntax element comprises, based on at least one of the following conditions being satisfied, making a determination to use the first context model to derive the context increment for the syntax element:

- i) the color format of the picture being a monochrome color format or a 4:4:4 color format,
- ii) the color format of the picture being a 4:2:0 color format or a 4:2:2 color format and the color component being a luma component; or
- iii) the color format of the picture being a 4:2:2 color format and color component not being the luma component, and the syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the color component the block.

10. A method of encoding video data, the method comprising:

determining, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and

encoding a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.

11. The method of claim 10, wherein:
the color component is a first color component and the syntax element is a first syntax element, and
the method further comprises:
using the first context model to determine the context increment for the first syntax element;
making, based on the color format of the picture of the video data, a determination to use the first context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
encoding a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.
12. The method of claim 10, wherein:
the color component is a first color component and the syntax element is a first syntax element, and
the method further comprises:
using the first context model to determine the context increment for the first syntax element;
making, based on the color format of the picture of the video data, a determination to use the second context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
encoding a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.
13. The method of claim 12, wherein the first color component is a luma component and the second color component is a chroma component.

14. The method of claim 12, wherein making the determination to use the second context model to determine the context increment for the second syntax element comprises, based on none of the following conditions being satisfied, making the determination to use the second context model to derive the context increment for the second syntax element:

- i) the color format of the picture is a monochrome color format or a 4:4:4 color format, and
- ii) the color format of the picture is a 4:2:0 color format or a 4:2:2 color format and the second color component is a luma component.

15. The method of claim 12, wherein making the determination to use the second context model to determine the context increment for the second syntax element further based on the following condition not being satisfied: iii) the color format of the picture being 4:2:2, the second color component being a chroma component, and the second syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the second color component of the block.

16. The method of claim 12, wherein using the first context model to derive the context increment for the first syntax element comprises:

performing one of:

based on a log base-2 value of a transform size of the block being less than 6, setting a context offset ctxOffset for the first syntax element to $3 * (\log_2 \text{TrafoSize} - 2) + ((\log_2 \text{TrafoSize} - 1) \gg 2)$ and setting a context shift ctxShift for the first syntax element equal to $(\log_2 \text{TrafoSize} + 1) \gg 2$, where $\log_2 \text{TrafoSize}$ indicates the log base-2 value of the transform size, or

based on the log base-2 value of the transform size being greater than or equal to 6, setting the context offset ctxOffset for the first syntax element to $3 * (\log_2 \text{TrafoSize} - 2) + ((\log_2 \text{TrafoSize} - 1) \gg 2) + ((1 \ll \log_2 \text{TrafoSize}) \gg 6) \ll 1 + ((1 \ll \log_2 \text{TrafoSize}) \gg 7)$ and setting the context shift ctxShift for the first syntax element equal to $((\log_2 \text{TrafoSize} + 1) \gg 2) \ll 1$; and

determining the context increment for the first syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the first syntax element.

17. The method of claim 12, wherein using the second context model to derive the context increment for the second syntax element comprises:

setting a context offset ctxOffset for the second syntax element to 18 and setting a context shift ctxShift for the second syntax element to $\text{Max}(0, \log_2\text{TrafoSize} - 2) - \text{Max}(0, \log_2\text{TrafoSize} - 4)$, where Max indicates a maximum function and $\log_2\text{TrafoSize}$ indicates a log base-2 value of a transform size of the block; and

determining the context increment for the second syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the second syntax element.

18. The method of claim 10, wherein determining which context model from among the first context model and the second context model to use to determine the context increment for the syntax element comprises, based on at least one of the following conditions being satisfied, making a determination to use the first context model to derive the context increment for the syntax element:

i) the color format of the picture being a monochrome color format or a 4:4:4 color format,

ii) the color format of the picture being a 4:2:0 color format or a 4:2:2 color format and the color component being a luma component; or

iii) the color format of the picture being a 4:2:2 color format and the color component not being the luma component, and the syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the color component of the block.

19. A device for decoding video data, the device comprising:
a memory configured to store the video data; and
one or more processors coupled to the memory, the one or more processors implemented in circuitry and configured to:
determine, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
decode a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.
20. The device of claim 19, wherein:
the color component is a first color component and the syntax element is a first syntax element, and
the one or more processors are further configured to:
use the first context model to determine the context increment for the first syntax element;
make, based on the color format of the picture of the video data, a determination to use the first context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
decode a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.

21. The device of claim 19, wherein:
- the color component is a first color component and the syntax element is a first syntax element, and
 - the one or more processors are further configured to:
 - use the first context model to determine the context increment for the first syntax element;
 - make, based on the color format of the picture of the video data, a determination to use the second context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
 - decode a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.
22. The device of claim 20, wherein the first color component is a luma component and the second color component is a chroma component.
23. The device of claim 21, wherein the one or more processors are configured to make the determination to use the second context model to determine the context increment for the second syntax element comprises, based on none of the following conditions being satisfied, making the determination to use the second context model to derive the context increment for the second syntax element:
- i) the color format of the picture is a monochrome color format or a 4:4:4 color format, and
 - ii) the color format of the picture is a 4:2:0 color format or a 4:2:2 color format and the second color component is a luma component.

24. The device of claim 23, wherein the one or more processors are configured to make the determination to use the second context model to determine the context increment for the second syntax element based on the following condition not being satisfied: iii) the color format of the picture being 4:2:2, the second color component being a chroma component, and the second syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the second color component of the block.

25. The device of claim 21, wherein the one or more processors are configured to, as part of using the first context model to derive the context increment for the first syntax element:

perform one of:

based on a log base-2 value of a transform size of the block being less than 6, setting a context offset ctxOffset for the first syntax element to $3 * (\log_2\text{TrafoSize} - 2) + ((\log_2\text{TrafoSize} - 1) \gg 2)$ and setting a context shift ctxShift for the first syntax element equal to $(\log_2\text{TrafoSize} + 1) \gg 2$, where $\log_2\text{TrafoSize}$ indicates the log base-2 value of the transform size, or

based on the log base-2 value of the transform size being greater than or equal to 6, setting the context offset ctxOffset for the first syntax element to $3 * (\log_2\text{TrafoSize} - 2) + ((\log_2\text{TrafoSize} - 1) \gg 2) + ((1 \ll \log_2\text{TrafoSize}) \gg 6) \ll 1 + ((1 \ll \log_2\text{TrafoSize}) \gg 7)$ and setting the context shift ctxShift for the first syntax element equal to $((\log_2\text{TrafoSize} + 1) \gg 2) \ll 1$; and

determine the context increment for the first syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the first syntax element.

26. The device of claim 21, wherein the one or more processors are configured to, as part of using the second context model to determine a context increment for a second syntax element:

set a context offset ctxOffset for the second syntax element to 18 and setting a context shift ctxShift for the second syntax element to $\text{Max}(0, \log_2\text{TrafoSize} - 2) - \text{Max}(0, \log_2\text{TrafoSize} - 4)$, where Max indicates a maximum function and $\log_2\text{TrafoSize}$ indicates a log base-2 value of a transform size of the block; and

determine the context increment for the second syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the second syntax element.

27. The device of claim 19, wherein the one or more processors are configured to, as part of determining which context model from among the first context model and the second context model to use to determine the context increment for the syntax element, based on at least one of the following conditions being satisfied, make a determination to use the first context model to derive the context increment for the syntax element:

i) the color format of the picture being a monochrome color format or a 4:4:4 color format,

ii) the color format of the picture being a 4:2:0 color format or a 4:2:2 color format and the color component being a luma component; or

iii) the color format of the picture being a 4:2:2 color format and the color component not being the luma component, and the syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the color component of the block.

28. The device of claim 19, further comprising a display configured to display decoded video data.

29. The device of claim 19, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

30. A device for encoding video data, the device comprising:
a memory configured to store the video data; and
one or more processors coupled to the memory, the one or more processors implemented in circuitry and configured to:
determine, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
encode a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.
31. The device of claim 30, wherein:
the color component is a first color component and the syntax element is a first syntax element, and
the one or more processors are further configured to:
use the first context model to determine the context increment for the first syntax element;
make, based on the color format of the picture of the video data, a determination to use the first context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
decode a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.

32. The device of claim 30, wherein:
- the color component is a first color component and the syntax element is a first syntax element, and
 - the one or more processors are further configured to:
 - use the first context model to determine the context increment for the first syntax element;
 - make, based on the color format of the picture of the video data, a determination to use the second context model to determine a context increment for a second syntax element, wherein the second syntax element indicates a prefix of an x or y coordinate of a last significant transform coefficient of a second color component of the block of the picture; and
 - encode a bin of the second syntax element by applying CABAC using a context determined based on the context increment for the second syntax element.
33. The device of claim 32, wherein the first color component is a luma component and the second color component is a chroma component.
34. The device of claim 32, wherein the one or more processors are configured to make the determination to use the second context model to determine the context increment for the second syntax element comprises, based on none of the following conditions being satisfied, making the determination to use the second context model to derive the context increment for the second syntax element:
- i) the color format of the picture is a monochrome color format or a 4:4:4 color format, and
 - ii) the color format of the picture is a 4:2:0 color format or a 4:2:2 color format and the second color component is a luma component.

35. The device of claim 34, wherein the one or more processors are configured to make the determination to use the second context model to determine the context increment for the second syntax element based on the following condition not being satisfied: iii) the color format of the picture being 4:2:2, the second color component being a chroma component, and the second syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the second color component of the block.

36. The device of claim 32, wherein the one or more processors are configured to, as part of using the first context model to derive the context increment for the first syntax element:

perform one of:

based on a log base-2 value of a transform size of the block being less than 6, setting a context offset ctxOffset for the first syntax element to $3 * (\log_2\text{TrafoSize} - 2) + ((\log_2\text{TrafoSize} - 1) \gg 2)$ and setting a context shift ctxShift for the first syntax element equal to $(\log_2\text{TrafoSize} + 1) \gg 2$, where $\log_2\text{TrafoSize}$ indicates the log base-2 value of the transform size, or

based on the log base-2 value of the transform size being greater than or equal to 6, setting the context offset ctxOffset for the first syntax element to $3 * (\log_2\text{TrafoSize} - 2) + ((\log_2\text{TrafoSize} - 1) \gg 2) + ((1 \ll \log_2\text{TrafoSize}) \gg 6) \ll 1 + ((1 \ll \log_2\text{TrafoSize}) \gg 7)$ and setting the context shift ctxShift for the first syntax element equal to $((\log_2\text{TrafoSize} + 1) \gg 2) \ll 1$; and

determine the context increment for the first syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the first syntax element.

37. The device of claim 32, wherein the one or more processors are configured to, as part of using the second context model to determine a context increment for the second syntax element:

set a context offset ctxOffset for the second syntax element to 18 and setting a context shift ctxShift for the second syntax element to $\text{Max}(0, \log_2\text{TrafoSize} - 2) - \text{Max}(0, \log_2\text{TrafoSize} - 4)$, where Max indicates a maximum function and $\log_2\text{TrafoSize}$ indicates a log base-2 value of a transform size of the block; and

determine the context increment for the second syntax element as $(\text{binIdx} \gg \text{ctxShift}) + \text{ctxOffset}$, where binIdx is a bin index of a bin of the second syntax element.

38. The device of claim 30, wherein the one or more processors are configured to, as part of determining which context model from among the first context model and the second context model to use to determine the context increment for the syntax element, based on at least one of the following conditions being satisfied, make a determination to use the first context model to derive the context increment for the syntax element:

i) the color format of the picture being a monochrome color format or a 4:4:4 color format,

ii) the color format of the picture being a 4:2:0 color format or a 4:2:2 color format and the color component being a luma component; or

iii) the color format of the picture being a 4:2:2 color format and the color component not being the luma component, and the syntax element indicating the prefix of the y coordinate of the last significant transform coefficient of the color component of the block.

39. The device of claim 30, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

40. A device for decoding video data, the device comprising:
- means for determining, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
 - means for decoding a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.
41. A device for encoding video data, the device comprising:
- means for determining, based on a color format of a picture of the video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
 - means for encoding a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.
42. A computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to:
- determine, based on a color format of a picture of video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and
 - decode a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.

43. A computer-readable storage medium having stored thereon instructions that, when executed, cause one or more processors to:

determine, based on a color format of a picture of video data, which context model from among a first context model and a second context model to use to determine a context increment for a syntax element that indicates a prefix of an x or y coordinate of a last significant transform coefficient of a color component of a block of the picture; and

encode a bin of the syntax element by applying Context Adaptive Binary Arithmetic Coding (CABAC) using a context determined based on the context increment for the syntax element.