~~WHAT IS CLAIMED IS:~~

CLAIMS

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

obtaining ~~an encoded~~a block of the video data;

determining, using intra-prediction or inter-prediction, a predictive block for the block;

determining at least one of a width of the block and a height of the block;

comparing at least one of the width of the block to a first threshold and the height of the block to a second threshold;

determining a horizontal transform and a vertical transform to use for the block based on comparing at least one of the width of the block to the first threshold and the height of the block to the second threshold, the horizontal transform and the vertical transform being determined without decoding a syntax element that indicates the horizontal transform and the vertical transform~~;~~, comprising:

determining the horizontal transform for the block to be a first type of horizontal transform based on the comparing indicating that the width of the block is less than the first threshold;

determining the horizontal transform for the block to be a second type of horizontal transform based on the comparing indicating that the width of the block is greater than the first threshold;

determining the vertical transform for the block to be a first type of vertical transform based on the comparing indicating that the height of the block is less than the second threshold; and

determining the vertical transform for the block to be a second type of vertical transform based on the comparing indicating that the height of the block is greater than the second threshold;

determining a block of residual data based on the horizontal transform and the vertical transform determined for the block; and

decoding~~, using intra-prediction or inter-prediction,~~ a video block based on the block of residual data and ~~a~~the predictive block.

2. The method of claim 1, wherein the horizontal transform is determined for the block based on comparing the width of the block to the first threshold.

3. The method of claim 1, wherein the vertical transform is determined for the block based on comparing the height of the block to the second threshold.

4. The method of claim 1, wherein the horizontal transform is determined for the block based on comparing the width of the block to the first threshold, and wherein the vertical transform is determined for the block based on comparing the height of the block to the second threshold.

5. The method of claim 1, wherein the block is a transform unit (TU), and wherein the horizontal transform is restricted for the block based on the width of the block.

6. The method of claim 1, wherein the block is a transform unit (TU), and wherein the vertical transform is restricted for the block based on the height of the block.

7. The method of claim 1, wherein the ~~horizontal transform for the block is determined to be a first type of horizontal transform when the width of the block is less than the first threshold, and wherein the horizontal transform for the block is determined to be a second type of horizontal transform when the width of the block is greater than the first threshold.~~

~~8. The method of claim 7, wherein the~~ first type of horizontal transform is different than the second type of horizontal transform.

~~9~~8. The method of claim ~~7~~1, wherein the second type of horizontal transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of horizontal transform is a transform that is different than a DCT Type-II transform.

~~10~~9. The method of claim ~~9~~8, wherein the first type of horizontal transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~11. The method of claim 1, wherein the vertical transform for the block is determined to be a first type of vertical transform when the height of the block is less than the second threshold, and wherein the vertical transform for the block is determined to be a second type of vertical transform when the height of the block is greater than the second threshold.~~

~~12. The method of claim 11~~10. The method of claim 1, wherein the first type of vertical transform is different than the second type of vertical transform.

~~13~~11. The method of claim ~~11~~1, wherein the second type of vertical transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of vertical transform is a transform that is different than a DCT Type-II transform.

~~14~~12. The method of claim ~~13~~11, wherein the first type of vertical transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~15~~13. The method of claim 1, wherein the block includes a coding unit (CU) or a transform unit (TU).

14. The method of claim 1, wherein the first threshold and the second threshold have a same value.

~~16~~15. An apparatus for decoding video data, comprising:

a memory configured to store at least one encoded block of the video data; and

a video decoder comprising at least one of fixed-function and programmable circuitry, the video decoder being configured to:

obtain ~~an encoded~~a block of the video data;

determine, using intra-prediction or inter-prediction, a predictive block for the block;

determine at least one of a width of the block and a height of the block;

compare at least one of the width of the block to a first threshold and the height of

the block to a second threshold;

determine a horizontal transform and a vertical transform to use for the block based on a comparison of at least one of the width of the block to the first threshold and the height of the block to the second threshold, the horizontal transform and the vertical transform being determined without decoding a syntax element that indicates the horizontal transform and the vertical transform~~;~~, wherein to determine the horizontal transform and the vertical transform to use for the block, the video decoder is further configured to:

determine the horizontal transform for the block to be a first type of horizontal transform based on the comparison indicating that the width of the block is less than the first threshold;

determine the horizontal transform for the block to be a second type of horizontal transform based on the comparison indicating that the width of the block is greater than the first threshold;

determine the vertical transform for the block to be a first type of vertical transform based on the comparison indicating that the height of the block is less than the second threshold; and

determine the vertical transform for the block to be a second type of vertical transform based on the comparison indicating that the height of the block is greater than the second threshold; and

the video decoder being further configured to:

determine a block of residual data based on the horizontal transform and the vertical transform determined for the block; and

decode~~, using intra-prediction or inter-prediction,~~ a video block based on the block of residual data and ~~a~~the predictive block.

16. The apparatus of claim 15, wherein the horizontal transform is determined for the block based on a comparison of the width of the block to the first threshold.

17. The apparatus of claim 15, wherein the vertical transform is determined for the block based on a comparison of the height of the block to the second threshold.

~~17. The apparatus of claim 16~~18. The apparatus of claim 15, wherein the horizontal transform is determined for the block based on a comparison of the width of the block to the first threshold~~.~~

~~18. The apparatus of claim 16,~~, and wherein the vertical transform is determined for the block based on a comparison of the height of the block to the second threshold.

19. The apparatus of claim ~~16, wherein the horizontal transform is determined for the block based on a comparison of the width of the block to the first threshold, and wherein the vertical transform is determined for the block based on a comparison of the height of the block to the second threshold.~~

~~20. The apparatus of claim 16~~15, wherein the block is a transform unit (TU), and wherein the horizontal transform is restricted for the block based on the width of the block.

~~21~~20. The apparatus of claim ~~16~~15, wherein the block is a transform unit (TU), and wherein the vertical transform is restricted for the block based on the height of the block.

~~22. The apparatus of claim 16, wherein the horizontal transform for the block is determined to be a first type of horizontal transform when the width of the block is less than the first threshold, and wherein the horizontal transform for the block is determined to be a second type of horizontal transform when the width of the block is greater than the first threshold.~~

~~23. The apparatus of claim 22~~21. The apparatus of claim 15, wherein the first type of horizontal transform is different than the second type of horizontal transform.

~~24~~22. The apparatus of claim ~~22~~15, wherein the second type of horizontal transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of horizontal transform is a transform that is different than a DCT Type-II transform.

~~25~~23. The apparatus of claim ~~24~~22, wherein the first type of horizontal transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~26. The apparatus of claim 16, wherein the vertical transform for the block is determined to be a first type of vertical transform when the height of the block is less than the second threshold, and wherein the vertical transform for the block is determined to be a second type of vertical transform when the height of the block is greater than the second threshold.~~

~~27. The apparatus of claim 26~~24. The apparatus of claim 15, wherein the first type of vertical transform is different than the second type of vertical transform.

~~28~~25. The apparatus of claim ~~26~~15, wherein the second type of vertical transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of vertical transform is a transform that is different than a DCT Type-II transform.

~~29~~26. The apparatus of claim ~~28~~25, wherein the first type of vertical transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~30~~27. The apparatus of claim ~~16~~15, wherein the block includes a coding unit (CU) or a transform unit (TU).

~~31~~28. The apparatus of claim ~~16~~15, further comprising a display configured to display the video data.

~~32~~29. The apparatus of claim ~~16~~15, wherein the apparatus comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

30. The apparatus of claim 15, wherein the first threshold and the second threshold have a same value.

~~33~~31. A method of encoding video data, the method comprising:

obtaining a block of video data;

determining at least one of a width of the block and a height of the block;

comparing at least one of the width of the block to a first threshold and the height of the block to a second threshold;

determining a horizontal transform and a vertical transform to use for the block based on comparing at least one of the width of the block to the first threshold and the height of the block to the second threshold~~; and~~, comprising:

determining the horizontal transform for the block to be a first type of horizontal transform based on the comparing indicating that the width of the block is less than the first threshold;

determining the horizontal transform for the block to be a second type of horizontal transform based on the comparing indicating that the width of the block is greater than the first threshold;

determining the vertical transform for the block to be a first type of vertical transform based on the comparing indicating that the height of the block is less than the second threshold;

determining the vertical transform for the block to be a second type of vertical transform based on the comparing indicating that the height of the block is greater than the second threshold; and

generating, without a syntax element that indicates the horizontal transform and the vertical transform, an encoded video bitstream.

~~34~~32. The method of claim ~~33~~31, wherein the horizontal transform is determined for the block based on comparing the width of the block to the first threshold.

~~35~~33. The method of claim ~~33~~31, wherein the vertical transform is determined for the block based on comparing the height of the block to the second threshold.

~~36~~34. The method of claim ~~33~~31, wherein the horizontal transform is determined for the block based on comparing the width of the block to the first threshold, and wherein the vertical transform is determined for the block based on comparing the height of the block to the second

threshold.

~~37~~35. The method of claim ~~33~~31, wherein the block is a transform unit (TU), and wherein the horizontal transform is restricted for the block based on the width of the block.

~~38~~36. The method of claim ~~33~~31, wherein the block is a transform unit (TU), and wherein the vertical transform is restricted for the block based on the height of the block.

~~39. The method of claim 33, wherein the horizontal transform for the block is determined to be a first type of horizontal transform when the width of the block is less than the first threshold, and wherein the horizontal transform for the block is determined to be a second type of horizontal transform when the width of the block is greater than the first threshold.~~

~~40. The method of claim 39~~37. The method of claim 31, wherein the first type of horizontal transform is different than the second type of horizontal transform.

~~41~~38. The method of claim ~~39~~31, wherein the second type of horizontal transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of horizontal transform is a transform that is different than a DCT Type-II transform.

~~42~~39. The method of claim ~~41~~38, wherein the first type of horizontal transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~43. The method of claim 33, wherein the vertical transform for the block is determined to be a first type of vertical transform when the height of the block is less than the second threshold, and wherein the vertical transform for the block is determined to be a second type of vertical transform when the height of the block is greater than the second threshold.~~

~~44. The method of claim 43~~40. The method of claim 31, wherein the first type of vertical transform is different than the second type of vertical transform.

~~45~~41. The method of claim ~~43~~31, wherein the second type of vertical transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of vertical transform is a transform that is different than a DCT Type-II transform.

~~46~~42. The method of claim ~~45~~41, wherein the first type of vertical transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~47~~43. The method of claim ~~33~~31, wherein the block includes a coding unit (CU) or a transform unit (TU).

~~48~~44. The method of claim ~~33~~31, further comprising:

generating a transform block including one or more transform coefficients based on application of the horizontal transform and the vertical transform to residual data; and

encoding the transform block.

45. The method of claim 31, wherein the first threshold and the second threshold have a same value.

~~49~~46. An apparatus for encoding video data, comprising:

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

a video encoder comprising at least one of fixed-function and programmable circuitry, the video encoder being configured to:

obtain a block of video data;

determine at least one of a width of the block and a height of the block;

compare at least one of the width of the block to a first threshold and the height of the block to a second threshold;

determine a horizontal transform and a vertical transform to use for the block based on a comparison of at least one of the width of the block to the first threshold and the height of the block to the second threshold~~; and~~, wherein to determine the horizontal transform and the vertical transform to use for the block, the video encoder is further configured to:

determine the horizontal transform for the block to be a first type of horizontal transform based on the comparison indicating that the width of the block is less than the first threshold;

determine the horizontal transform for the block to be a second type of horizontal transform based on the comparison indicating that the width of the block is greater than the first threshold;

determine the vertical transform for the block to be a first type of vertical transform based on the comparison indicating that the height of the block is less than the second threshold;

determine the vertical transform for the block to be a second type of vertical transform based on the comparison indicating that the height of the block is greater than the second threshold; and

the video encoder being further configured to:

generate, without a syntax element that indicates the horizontal transform and the vertical transform, an encoded video bitstream.

~~50~~47. The apparatus of claim ~~49~~46, wherein the horizontal transform is determined for the block based on a comparison of the width of the block to the first threshold.

~~51~~48. The apparatus of claim ~~49~~46, wherein the vertical transform is determined for the block based on a comparison of the height of the block to the second threshold.

~~52~~49. The apparatus of claim ~~49~~46, wherein the horizontal transform is determined for the block based on a comparison of the width of the block to the first threshold, and wherein the vertical transform is determined for the block based on a comparison of the height of the block to the second threshold.

~~53~~50. The apparatus of claim ~~49~~46, wherein the block is a transform unit (TU), and wherein the horizontal transform is restricted for the block based on the width of the block.

~~54~~51. The apparatus of claim ~~49~~46, wherein the block is a transform unit (TU), and

wherein the vertical transform is restricted for the block based on the height of the block.

~~55. The apparatus of claim 49, wherein the horizontal transform for the block is determined to be a first type of horizontal transform when the width of the block is less than the first threshold, and wherein the horizontal transform for the block is determined to be a second type of horizontal transform when the width of the block is greater than the first threshold.~~

~~56. The apparatus of claim 55~~52. The apparatus of claim 46, wherein the first type of horizontal transform is different than the second type of horizontal transform.

~~57~~53. The apparatus of claim ~~55~~46, wherein the second type of horizontal transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of horizontal transform is a transform that is different than a DCT Type-II transform.

~~58~~54. The apparatus of claim ~~57~~53, wherein the first type of horizontal transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~59. The apparatus of claim 49, wherein the vertical transform for the block is determined to be a first type of vertical transform when the height of the block is less than the second threshold, and wherein the vertical transform for the block is determined to be a second type of vertical transform when the height of the block is greater than the second threshold.~~

~~60. The apparatus of claim 59~~55. The apparatus of claim 46, wherein the first type of vertical transform is different than the second type of vertical transform.

~~61~~56. The apparatus of claim ~~59~~46, wherein the second type of vertical transform is a discrete cosine transform (DCT) Type-II transform, and wherein the first type of vertical transform is a transform that is different than a DCT Type-II transform.

~~62~~57. The apparatus of claim ~~61~~56, wherein the first type of vertical transform is one of a discrete sine transform (DST) Type-VII transform or a DCT Type-VIII transform.

~~63~~58. The apparatus of claim ~~49~~46, wherein the block includes a coding unit (CU) or a transform unit (TU).

~~64~~59. The apparatus of claim ~~49~~46, wherein the video encoder is further configured to:

generate a transform block including one or more transform coefficients based on application of the horizontal transform and the vertical transform to residual data; and

encode the transform block.

~~65~~60. The apparatus of claim ~~49~~46, wherein the apparatus comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

61. The apparatus of claim 46, wherein the first threshold and the second threshold have a same value.