CLAIMS

1. A video encoding method comprising:

splitting an intra coding block into a plurality of transform blocks;

obtaining a decision whether a second transform is to be applied and a selection of an index of a selected transform in a list of transforms, the second transform being a Low-Frequency-Non-Separable Transform;

when the decision is that the second transform is to be applied:

performing a first transform on all of the plurality of transform blocks, wherein the first transform is a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

performing the second transform on all of the plurality of transform blocks of the intra coding block using the selected transform; and

when the decision is that the second transform is not to be applied:

selecting a null value as the index for the second transform in the list of transforms; and

performing a first transform on all of the plurality of transform blocks, the first transform being selected in a set of transforms; and

encoding the intra coding block with signaling information representative of the index of the second transform.

2. The method of claim 1, wherein the second transform is applied when:

the size of the intra coding block is greater than a threshold in at least one of width or height;

the size of the intra coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

3. The method of claim 1, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.

4. A video decoding method for a coding block that is split into a plurality of transform blocks, comprising:

obtaining information representative of an index of a second transform;

when the index is a null value:

performing an inverse of a first transform on all of the plurality of transform blocks of the coding block, the first transform being selected in a set of transforms; and

when the index is not a null value:

performing an inverse of the second transform on all of the plurality of transform blocks of the coding block using a second transform selected identified by the index in a list of second transforms, the second transform being a Low-Frequency-Non-Separable Transform; and

performing an inverse of a first transform on all of the plurality of transform blocks of the coding block, wherein the first transform is a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

decoding the inversed transform blocks.

5. The method of claim 4, wherein the second transform is to be applied when:

the size of the coding block is greater than a threshold in at least one of width or height;

the size of the coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

6. The method of claim 4, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.

7. A video encoding apparatus comprising a processor configured to:

split an intra coding block into a plurality of transform blocks;

obtain a decision whether a second transform is to be applied and a selection of an index of a selected transform in a list of transforms, the second transform being a Low-Frequency-Non-Separable Transform;

when the decision is that the second transform is to be applied:

perform a first transform on all of the plurality of transform blocks, the first transform being a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

perform the second transform on all the transform blocks of the plurality of transform blocks of the intra coding block using the selected transform; and

when the decision is that the second transform is not to be applied:

selecting a null value as the index for the second transform in the list of transforms; and

performing a first transform on all of the plurality of transform blocks, the first transform being selected in a set of transforms; and

encode the intra coding block with signaling information representative of the index of the second transform.

8. A video decoding apparatus for a coding block that is split into a plurality of transform blocks, the apparatus comprising a processor configured to:

obtain information representative of an index of a second transform;

when the index is a null value:

perform an inverse of a first transform on all of the plurality of transform blocks of the coding block, the first transform being selected in a set of transforms; and

when the index is not a null value:

perform an inverse of the second transform on all the transform blocks of the plurality of transform blocks of the coding block using a second transform selected identified by the index in a list of second transforms, the second transform being a Low-Frequency-Non-Separable Transform; and

perform an inverse of a first transform on all of the plurality of transform blocks of the coding block, wherein the first transform is a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

decode the inversed transform blocks.

9. A non-transitory computer-readable storage medium having stored instructions that, when executed by a processor, cause the processor to:

split an intra coding block into a plurality of transform blocks;

obtain a decision whether a second transform is to be applied and a selection of an index of a selected transform in a list of transforms, the second transform being a Low-Frequency-Non-Separable Transform;

when the decision is that the second transform is to be applied:

perform a first transform on all of the plurality of transform blocks, the first transform being a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

perform the second transform on all the transform blocks of the plurality of transform blocks of the intra coding block using the selected transform; and

when the decision is that the second transform is not to be applied:

selecting a null value as the index for the second transform in the list of transforms; and

performing a first transform on all of the plurality of transform blocks, the first transform being selected in a set of transforms; and

encode the intra coding block with signaling information representative of the index of the second transform.

10. A non-transitory computer-readable storage medium having stored instructions that, when executed by a processor on a coding block that is split into a plurality of transform blocks, cause the processor to:

obtain information representative of an index of a second transform;

when the index is a null value:

perform an inverse of a first transform on all of the plurality of transform blocks of the coding block, the first transform being selected in a set of transforms; and

when the index is not a null value:

perform an inverse of the second transform on all the transform blocks of the plurality of transform blocks of the coding block using a second transform selected identified by the index in a list of second transforms, the second transform being a Low-Frequency-Non-Separable Transform; and

perform an inverse of a first transform on all of the plurality of transform blocks of the coding block, wherein the first transform is a two-dimensional (2D) discrete cosine transform (DCT) 2 transform; and

decode the inversed transform blocks.

11. The apparatus of claim 7, wherein the second transform is applied when:

the size of the intra coding block is greater than a threshold in at least one of width or height;

the size of the intra coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

12. The apparatus of claim 7, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.

13. The apparatus of claim 8, wherein the second transform is applied when:

the size of the intra coding block is greater than a threshold in at least one of width or height;

the size of the intra coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

14. The apparatus of claim 8, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.

15. The non-transitory computer-readable storage medium of claim 9, wherein the second transform is applied when:

the size of the intra coding block is greater than a threshold in at least one of width or height;

the size of the intra coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

16. The non-transitory computer-readable storage medium of claim 9, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.

17. The non-transitory computer-readable storage medium of claim 10, wherein the second transform is applied when:

the size of the intra coding block is greater than a threshold in at least one of width or height;

the size of the intra coding block is smaller than a threshold in width and height;

the size of a transform block of the plurality of transform blocks is greater than a threshold in at least one of width or height; or

the size of a transform block of the plurality of transform blocks is smaller than a threshold in width and height.

18. The non-transitory computer-readable storage medium of claim 10, wherein the plurality of transform blocks have different sizes, and wherein the second transform is performed based on a largest transform block of the plurality of transform blocks.