~~**WHAT IS CLAIMED IS:**~~

CLAIMS

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

receiving, in a bitstream that comprises an encoded representation of the video data, information indicative of whether a residual block is partitioned and information indicative of a partition tree type for the residual block based on the residual block being partitioned, wherein the information indicative of the partition tree type is associated only with the residual block, and wherein the residual block is indicative of a difference between a current block and a prediction block;

determining, based on the received information that the residual block is partitioned and the partition tree type for the residual block, a partitioning of the residual block into a plurality of residual sub-blocks ~~into which the residual block is partitioned~~ according to the partition tree type;

inferring, based on the determined partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction;

producing residual data for the current block based at least in part on the residual block being partitioned according to the partition tree type into the plurality of residual sub-blocks and using the inferred transform kernel; and

decoding the current block using the residual data.

2. The method of claim 1, wherein receiving the information indicative of the partition tree type comprises receiving index information into a set of tree types, the method further comprising determining the partition tree type based on the received index information.

3. The method of claim 2, wherein the set of tree types includes one or more of a quad tree partitioning and a binary tree partitioning.

4. The method of claim 2, wherein determining the partition tree type comprises determining the partition tree type is a binary tree partitioning, the method further comprising

receiving information indicative of whether the residual block is horizontally split or vertically split.

5. The method of claim 1, ~~further comprising:~~wherein the current block is inter-predicted or intra-predicted.

~~inferring, from the bitstream, transform kernels for the plurality of residual sub-blocks in at least one of: a horizontal direction or a vertical direction based at least in part on one of: the partition tree type for the residual block or a partitioning type for the residual block, wherein;~~

~~producing the residual data for the current block comprises producing the residual data based at least in part on the transform kernels for the plurality of residual sub-blocks.~~

6. The method of claim 1, wherein the current block ~~is inter-predicted or intra-predicted.~~

~~7. The method of claim 1, wherein the current block~~ comprises a luma block of a coding unit (CU).

~~8~~7. The method of claim 1, wherein:

the current block is a coding unit (CU) or a block of the CU;

the residual block for the current block is a transform unit (TU) or a block of the TU; and

the plurality of residual sub-blocks are non-square sub-TUs and of a different size than the CU.

~~9~~8. The method of claim 1, wherein decoding the current block comprises:

decoding data representative of a prediction mode for the current block;

generating the prediction block for the current block using the prediction mode; and

combining the prediction block with the residual data to reproduce the current block.

~~10~~9. A device for decoding video data, the device comprising:

a memory configured to store video data; and

a processor implemented in circuitry and configured to:

receive, in a bitstream that comprises an encoded representation of the video data, information indicative of whether a residual block is partitioned and information indicative of a partition tree type for the residual block based on the residual block being partitioned, wherein the information indicative of the partition tree type is associated only with the residual block, and wherein the residual block is indicative of a difference between a current block and a prediction block;

determine, based on the received information that the residual block is partitioned and the partition tree type for the residual block, a partitioning of the residual block into a plurality of residual sub-blocks ~~into which the residual block is partitioned~~ according to the partition tree type;

infer, based on the determined partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction;

produce residual data for the current block based at least in part on the residual block being partitioned according to the partition tree type into the plurality of residual sub-blocks and using the inferred transform kernel; and

decode the current block using the residual data.

~~11~~10. The device of claim ~~10~~9, wherein:

the processor configured to receive information indicative of the partition tree type is further configured to receive index information into a set of tree types; and

the processor is further configured to determine the partition tree type based on the received index information.

~~12~~11. The device of claim ~~11~~10, wherein the set of tree types includes one or more of a quad tree partitioning and a binary tree partitioning.

~~13~~12. The device of claim ~~11~~10, wherein:

the processor configured to determine the partition tree type is further configured to determine the partition tree type is a binary tree partitioning; and

the processor is further configured to receive information indicative of whether the residual block is horizontally split or vertically split.

~~14~~13. The device of claim ~~10, wherein the processor is further configured to:~~

~~infer, from the bitstream, transform kernels for the plurality of residual sub-blocks in at least one of: a horizontal direction or a vertical direction based at least in part on one of: the partition tree type for the residual block or a partitioning type for the residual block, wherein;~~

~~the processor configured to produce the residual data for the current block is further configured to produce the residual data based at least in part on the transform kernels for the plurality of residual sub-blocks.~~

~~15. The device of claim 10~~9, wherein the current block is inter-predicted or intra-predicted.

~~16~~14. The device of claim ~~10~~9, wherein the current block comprises a luma block of a coding unit (CU).

~~17~~15. The device of claim ~~10~~9, wherein:

the current block is a coding unit (CU) or a block of the CU;

the residual block for the current block is a transform unit (TU) or a block of the TU; and

the plurality of residual sub-blocks are non-square sub-TUs and of a different size than the CU.

~~18~~16. The device of claim ~~10~~9, wherein the processor configured to decode the current block is further configured to:

decode data representative of a prediction mode for the current block;

generate the prediction block for the current block using the prediction mode; and

combine the prediction block with the residual data to reproduce the current block.

~~19~~17. The device of claim ~~10~~9, further comprising a display configured to display the decoded current block.

~~20~~18. The device of claim ~~10~~9, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

~~21~~19. The device of claim ~~10~~9, wherein the device comprises at least one of:

an integrated circuit;

a microprocessor; or

a wireless communication device.

~~22. A~~20. A non-transitory computer-readable storage medium having stored thereon instructions that, when executed, cause a processor to:

receive, in a bitstream that comprises an encoded representation of video data, information indicative of whether a residual block is partitioned and information indicative of a partition tree type for the residual block based on the residual block being partitioned, wherein the information indicative of the partition tree type is associated only with the residual block, wherein the residual block is indicative of a difference between a current block and a prediction block;

determine, based on the received information that the residual block is partitioned and the partition tree type for the residual block, a partitioning of the residual block into a plurality of residual sub-blocks ~~into which the residual block is partitioned~~ according to the partition tree type;

infer, based on the determined partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction;

produce residual data for the current block based at least in part on the residual block being partitioned according to the partition tree type into the plurality of residual sub-blocks and using the inferred transform kernel; and

decode the current block using the residual data.

~~23.~~21. A device for decoding video data, the device comprising:

means for receiving, in a bitstream that comprises an encoded representation of the video data, information indicative of whether a residual block is partitioned and information indicative of a partition tree type for the residual block based on the residual block being partitioned, wherein the information indicative of the partition tree type is associated only with the residual block, and wherein the residual block is indicative of a difference between a current block and a prediction block;

means for determining, based on the received information that the residual block is partitioned and the partition tree type for the residual block, a partitioning of the residual block into a plurality of residual sub-blocks ~~into which the residual block is partitioned~~ according to the partition tree type;

means for inferring, based on the determined partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction;

means for producing residual data for the current block based at least in part on the residual block being partitioned according to the partition tree type into the plurality of residual sub-blocks and using the inferred transform kernel; and

means for decoding the current block using the residual data.

~~24.~~22. A method of encoding video data, the method comprising:

~~determining that~~ partitioning a residual block for a current block of video data ~~is partitioned~~ according to a partition tree type into a plurality of residual sub-blocks; ~~and~~

determining, based on the determined partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction; and

encoding a bitstream as an encoded representation of video data that signals information indicative of whether the residual block is partitioned and further signals information indicative of the partition tree type for the residual block that is partitioned, wherein the information indicative of the partition tree type is associated only with the residual block and wherein the bitstream is encoded without a signaled index for the transform types for the plurality of residual sub-blocks.

~~25~~23. The method of claim ~~24~~22, wherein:

the bitstream that signals the information indicative of the partition tree type for the residual block includes index information into a set of tree types.

~~26~~24. The method of claim ~~25~~23, wherein the set of tree types includes one or more of a quadtree partitioning and a binary tree partitioning.

~~27~~25. The method of claim ~~25~~23, wherein:

when the information indicative of the partition tree type for the residual block indicates the partition tree type is the binary tree partitioning, the bitstream further signals information indicative of whether the residual block is horizontally split or vertically split.

~~28~~26. The method of claim ~~24~~22, wherein:

the current block is a coding unit (CU) or a block of the CU;

the residual block for the current block is a transform unit (TU) or a block of the TU; and

the plurality of residual sub-blocks are non-square sub-TUs and of a different size than the CU.

~~29~~27. A device for encoding video data, the device comprising:

a memory configured to store video data; and

a processor implemented in circuitry and configured to:

~~determine that~~partition a residual block for a current block of video data ~~is partitioned~~ according to a partition tree type into a plurality of residual sub-blocks; ~~and~~

determine, based on the partitioning of the plurality of residual sub-blocks, transform types of transform kernels for the plurality of residual sub-blocks in at least one of a horizontal direction or a vertical direction; and

encode a bitstream as an encoded representation of video data that signals information indicative of whether the residual block is partitioned and further signals information indicative of the partition tree type for the residual block that is partitioned, wherein the information indicative of the partition tree type is associated only with the residual block and wherein the bitstream is encoded without a signaled index for the transform types for the plurality of residual sub-blocks.

~~30~~28. The device of claim ~~29~~27, wherein:

the bitstream that signals the information indicative of the partition tree type for the residual block includes index information into a set of tree types.

~~31~~29. The device of claim ~~30~~28, wherein the set of tree types includes one or more of a quadtree partitioning and a binary tree partitioning.

~~32~~30. The device of claim ~~31~~29, wherein:

when the bitstream signals that the partition tree type for the residual block is the binary tree partitioning, the bitstream further signals a partitioning type for the residual block that indicates whether the residual block is horizontally split or vertically split.

~~33~~31. The device of claim ~~29~~27, wherein:

the current block is a coding unit (CU) or a block of the CU;

the residual block for the current block is a transform unit (TU) or a block of the TU; and

the plurality of residual sub-blocks are non-square sub-TUs and of a different size than the CU.

~~34~~32. The device of claim ~~29~~27, further comprising a camera configured to capture the video data.

~~35~~33. The device of claim ~~29~~27, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

~~36~~34. The device of claim ~~29~~27, wherein the device comprises at least one of:

an integrated circuit;

a microprocessor; or

a wireless communication device.

35. The method of claim 1, wherein the transform types include a DST-7, a DCT-8, or a DCT-2.

36. The device of claim 9, wherein the transform types include a DST-7, a DCT-8, or a DCT-2.

37. The method of claim 22, wherein the transform types include a DST-7, a DCT-8, or a DCT-2.

38. The device of claim 27, wherein the transform types include a DST-7, a DCT-8, or a DCT-2.