~~CLAIMS~~

~~WHAT IS CLAIMED IS:~~

CLAIMS

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

~~obtaining~~ determining a size of a current block of video data;

~~determining a size of the current block;~~

determining, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determining a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modifying a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the wide angle intra-prediction mode; determining one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~; and~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modifying, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; and reconstructing a ~~sample of the current~~ block based on the modified prediction sample and a residual value.

2. ~~—~~ The method of claim 1, wherein determining the size of the current block includes determining a width of the current block and a height of the current block are different sizes.

3. The method of claim 1, wherein the ~~one or more reference samples that are external to the current block are determined using an angle of the wide angle intra-prediction mode relative to the prediction sample.~~

~~4. The method of claim 3, wherein the~~ angle of the wide angle intra-prediction mode is less than ~~-~~–135 degrees or greater than to 45 degrees relative to the intra-predicted prediction sample.

~~5.~~ 4. The method of claim 1, further comprising:

determining one or more weights based on x- and y-coordinates of the intra-predicted prediction sample, wherein modifying the intra-predicted prediction sample comprises modifying the intra-predicted prediction sample to generate the modified prediction sample based on the ~~determined~~ one or more PDPC reference samples, the ~~determined~~ one or more weights, and the intra-predicted prediction sample.

~~6.~~ 5. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block comprises determining the one or more PDPC reference samples having both an x-coordinate and a y-coordinate that are different than both a respective x-coordinate and y-coordinate of the intra-predicted prediction sample in the prediction block.

~~7.~~ 6. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is equal to an x-coordinate of the intra-predicted prediction sample plus a y-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~8.~~ 7. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is equal to a y-coordinate of the intra-predicted prediction sample plus an x-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~9.~~ 8. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is based on an angle of the wide angle intra-prediction mode relative to the intra-predicted prediction sample; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~10.~~ 9. The method of claim ~~9~~8, wherein determining the x-coordinate in the determined row comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the x-coordinate in the determined row based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~11.~~ 10. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is based on an angle of the wide angle intra-prediction mode; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~12.~~ 11. The method of claim ~~11~~10, wherein determining the y-coordinate in the determined column comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the y-coordinate in the determined column based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~13.~~ 12. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining a set of one or more samples based on the wide angle intra-prediction mode; and

at least one of interpolating, rounding with offset, or rounding without offset the set of one or more samples to generate the one or more PDPC reference samples.

~~14.~~ 13. The method of claim 1, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining that one or more samples external to the current block identified based on the wide angle intra-prediction mode are not stored in a reference line buffer; and

determining the one or more PDPC reference samples based on a last PDPC reference sample stored in the reference line buffer.

~~15.~~ 14. The method of claim 1, wherein modifying the intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block comprises modifying a first intra-predicted prediction sample of the prediction block, and wherein the one or more PDPC reference samples comprise a first set of one or more PDPC reference samples, the method further comprising:

determining, for a second intra-predicted prediction sample of the prediction block, that at least one PDPC reference sample of a second set of one or more PDPC reference samples for the second intra-predicted prediction sample are not stored in a reference line buffer; and

one of not applying PDPC to the second intra-predicted prediction sample or applying PDPC using only PDPC reference samples available in reference line buffer.

~~16.~~ 15. The method of claim 1, wherein the wide angle intra-prediction mode is not a DC, planar, horizontal, or vertical intra-prediction mode.

~~17.~~ 16. A method of encoding video data, the method comprising:

~~obtaining~~ determining a size of a current block of video data;

~~determining a size of the current block;~~

determining, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determining a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modifying a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the wide angle intra-prediction mode; determining one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~;~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modifying, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; determining a residual value for a residual block based on the modified prediction sample and a sample value in the current block; and

signaling information indicative of the residual value.

~~18.~~ 17. The method of claim ~~17~~16, wherein determining the size of the current block includes determining a width of the current block and a height of the current block are different sizes.

~~19.~~ 18. The method of claim ~~17, wherein the one or more reference samples that are external to the current block are determined using an angle of the wide angle intra-prediction mode relative to the prediction sample.~~

~~20. The method of claim 19~~16, wherein the angle of the wide angle intra-prediction mode is less than ~~-~~−135 degrees or greater than to 45 degrees relative to the intra-predicted prediction sample.

~~21.~~ 19. The method of claim ~~17~~16, further comprising:

determining one or more weights based on x- and y-coordinates of the intra-predicted prediction sample, wherein modifying the intra-predicted prediction sample comprises modifying the intra-predicted prediction sample to generate the modified prediction sample based on the ~~determined~~ one or more PDPC reference samples, the ~~determined~~ one or more weights, and the intra-predicted prediction sample.

~~22.~~ 20. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block comprises determining the one or more PDPC reference samples having both an x-coordinate and a y-coordinate that are different than

both a respective x-coordinate and y-coordinate of the intra-predicted prediction sample in the prediction block.

~~23.~~ 21. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is equal to an x-coordinate of the intra-predicted prediction sample plus a y-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~24.~~ 22. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is equal to a y-coordinate of the intra-predicted prediction sample plus an x-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~25.~~ 23. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is based on an angle of the wide angle intra-prediction mode relative to the intra-predicted prediction sample; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~26.~~ 24. The method of claim ~~25~~23, wherein determining the x-coordinate in the determined row comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the x-coordinate in the determined row based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~27.~~ 25. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is based on an angle of the wide angle intra-prediction mode; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~28.~~ 26. The method of claim ~~27~~25, wherein determining the y-coordinate in the determined column comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the y-coordinate in the determined column based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~29.~~ 27. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining a set of one or more samples based on the wide angle intra-prediction mode; and

at least one of interpolating, rounding with offset, or rounding without offset the set of one or more samples to generate the one or more PDPC reference samples.

~~30.~~ 28. The method of claim ~~17~~16, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining that one or more samples external to the current block identified based on the wide angle intra-prediction mode are not stored in a reference line buffer; and

determining the one or more PDPC reference samples based on a last PDPC reference sample stored in the reference line buffer.

~~31.~~ 29. The method of claim ~~17~~16, wherein modifying the intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block comprises modifying a first intra-predicted prediction sample of the prediction block, and wherein the one or more PDPC reference samples comprise a first set of one or more PDPC reference samples, the method further comprising:

determining, for a second intra-predicted prediction sample of the prediction block, that at least one PDPC reference sample of a second set of one or more PDPC reference samples for the second intra-predicted prediction sample are not stored in a reference line buffer; and

one of not applying PDPC to the second intra-predicted prediction sample or applying PDPC using only PDPC reference samples available in reference line buffer.

~~32.~~ 30. The method of claim ~~17~~16, wherein the wide angle intra-prediction mode is not a DC, planar, horizontal, or vertical intra-prediction mode.

~~33.~~ 31. A device for decoding video data, the device comprising:

a memory configured to store one or more prediction blocks; and

a video decoder comprising at least one of fixed-function or programmable circuitry, wherein the video decoder is configured to:

~~obtain~~ determine a size of a current block of video data;

~~determine a size of the current block;~~

determine, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determine a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modify a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using Position Dependent Intra Prediction Combination (PDPC), wherein modifying the prediction sample comprises:~~

~~determining one or more reference samples that are external to the current block based on the wide angle intra-prediction mode; and~~

~~modifying the prediction sample to generate the modified prediction sample based on the determined one or more reference samples; and~~

~~reconstruct a sample of the current block based on the modified prediction sample and a residual value.~~

~~34. The device of claim 33, wherein determining the size of the current block includes determining a width of the block and a height of the block are different sizes.~~

~~35. The device of claim 33, wherein the one or more reference samples that are external to the current block are~~ determined using an angle of the wide angle intra-prediction mode; determine one or more Position Dependent Intra Prediction Combination (PDPC) reference samples that are external to the current block for modifying the plurality of intra-predicted prediction samples of the prediction block, wherein each PDPC reference sample of the one or more PDPC reference samples are determined using the angle of the wide angle intra-prediction mode relative to ~~the prediction sample.~~

~~36. The device of claim 35~~a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modify, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; and reconstruct a block based on the modified prediction sample and a residual value.

32. The device of claim 31, wherein determining the size of the current block includes determining a width of the current block and a height of the current block are different sizes.

33. The device of claim 31, wherein the angle of the wide angle intra-prediction mode is less than -135 degrees or greater than to 45 degrees relative to the intra-predicted prediction sample.

~~37.~~ 34. The device of claim ~~33~~31, wherein the video decoder is configured to:

determine one or more weights based on x- and y-coordinates of the intra-predicted prediction sample, wherein modifying the intra-predicted prediction sample comprises modifying the intra-predicted prediction sample to generate the modified prediction sample based on the ~~determined~~ one or more PDPC reference samples, the ~~determined~~ one or more weights, and the intra-predicted prediction sample.

~~38.~~ 35. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block comprises determining the one or more PDPC reference samples having both an x-coordinate and a y-coordinate that are different than both a respective x-coordinate and y-coordinate of the intra-predicted prediction sample in the prediction block.

~~39.~~ 36. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is equal to an x-coordinate of the intra-predicted prediction sample plus a y-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~40.~~ 37. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is equal to a y-coordinate of the intra-predicted prediction sample plus an x-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~41.~~ 38. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is based on an angle of the wide angle intra-prediction mode relative to the intra-predicted prediction sample; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~42.~~ 39. The device of claim ~~41~~38, wherein determining the x-coordinate in the determined row comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the x-coordinate in the determined row based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~43.~~ 40. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is based on an angle of the wide angle intra-prediction mode; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~44.~~ 41. The device of claim ~~43~~40, wherein determining the y-coordinate in the determined column comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the y-coordinate in the determined column based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~45.~~ 42. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining a set of one or more samples based on the wide angle intra-prediction mode; and

at least one of interpolating, rounding with offset, or rounding without offset the set of one or more samples to generate the one or more PDPC reference samples.

~~46.~~ 43. The device of claim ~~33~~31, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining that one or more samples external to the current block identified based on the wide angle intra-prediction mode are not stored in a reference line buffer; and

determining the one or more PDPC reference samples based on a last PDPC reference sample stored in the reference line buffer.

~~47.~~ 44. The device of claim ~~33~~31, wherein modifying the intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block comprises modifying a first intra-predicted prediction sample of the prediction block, wherein the one or

more PDPC reference samples comprise a first set of one or more PDPC reference samples, and wherein the video decoder is configured to:

determine, for a second intra-predicted prediction sample of the prediction block, that at least one PDPC reference sample of a second set of one or more PDPC reference samples for the second intra-predicted prediction sample are not stored in a reference line buffer; and

one of not apply PDPC to the second intra-predicted prediction sample or apply PDPC using only PDPC reference samples available in reference line buffer.

~~48.~~ 45. The device of claim ~~33~~31, wherein the wide angle intra-prediction mode is not a DC, planar, horizontal, or vertical intra-prediction mode.

~~49.~~ 46. The device of claim ~~33~~31, further comprising a display configured to display the current block.

~~50.~~ 47. The device of claim ~~33~~31, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

~~51.~~ 48. A device of encoding video data, the device comprising:

a memory configured to store one or more prediction blocks; and

a video encoder comprising at least one of fixed-function or programmable circuitry, wherein the video encoder is configured to:

~~obtain~~ determine a size of a current block of video data;

~~determine a size of the current block;~~

determine, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determine a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modify a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the

wide angle intra-prediction mode; determine one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~;~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modify, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; determine a residual value for a residual block based on the modified prediction sample and a sample value in the current block; and

signal information indicative of the residual value.

~~52.~~ 49. The device of claim ~~51~~48, wherein determining the size of the current block includes determining a width of the current block and a height of the current block are different sizes.

~~53.~~ 50. The device of claim ~~51, wherein the one or more reference samples that are external to the current block are determined using an angle of the wide angle intra-prediction mode relative to the prediction sample.~~

~~54. The device of claim 53~~48, wherein the angle of the wide angle intra-prediction mode is less than ~~-~~–135 degrees or greater than to 45 degrees relative to the intra-predicted prediction sample.

~~55.~~ 51. The device of claim ~~51~~48, wherein the video encoder is configured to:

determine one or more weights based on x- and y-coordinates of the intra-predicted prediction sample, wherein modifying the intra-predicted prediction sample comprises modifying the intra-predicted prediction sample to generate the modified prediction sample based on the ~~determined~~ one or more PDPC reference samples, the ~~determined~~ one or more weights, and the intra-predicted prediction sample.

~~56.~~ 52. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block comprises determining the one or more PDPC reference samples having both an x-coordinate and a y-coordinate that are different than both a respective x-coordinate and y-coordinate of the intra-predicted prediction sample in the prediction block.

~~57.~~ 53. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is equal to an x-coordinate of the intra-predicted prediction sample plus a y-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~58.~~ 54. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is equal to a y-coordinate of the intra-predicted prediction sample plus an x-coordinate of the intra-predicted prediction sample plus 1; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~59.~~ 55. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a row that is above the current block;

determining an x-coordinate in the determined row, wherein the x-coordinate in the determined row is based on an angle of the wide angle intra-prediction mode relative to the intra-predicted prediction sample; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined row and the determined x-coordinate.

~~60.~~ 56. The device of claim ~~59~~55, wherein determining the x-coordinate in the determined row comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the x-coordinate in the determined row based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~61.~~ 57. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block comprises:

determining a column that is left of the current block;

determining a y-coordinate in the determined column, wherein the y-coordinate in the determined column is based on an angle of the wide angle intra-prediction mode; and

determining a PDPC reference sample of the one or more PDPC reference samples based on the determined column and the determined y-coordinate.

~~62.~~ 58. The device of claim ~~61~~57, wherein determining the y-coordinate in the determined column comprises:

determining one of a cotangent or tangent of the angle of the wide angle intra-prediction mode; and

determining the y-coordinate in the determined column based on one of the cotangent or tangent of the angle of the wide angle intra-prediction mode, an x-coordinate of the intra-predicted prediction sample, and a y-coordinate of the intra-predicted prediction sample.

~~63.~~ 59. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining a set of one or more samples based on the wide angle intra-prediction mode; and

at least one of interpolating, rounding with offset, or rounding without offset the set of one or more samples to generate the one or more PDPC reference samples.

~~64.~~ 60. The device of claim ~~51~~48, wherein determining the one or more PDPC reference samples that are external to the current block based on the wide angle intra-prediction mode comprises:

determining that one or more samples external to the current block identified based on the wide angle intra-prediction mode are not stored in a reference line buffer; and

determining the one or more PDPC reference samples based on a last PDPC reference sample stored in the reference line buffer.

~~65.~~ 61. The device of claim ~~51~~48, wherein modifying the intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block comprises modifying a first intra-predicted prediction sample of the prediction block, wherein the one or more PDPC reference samples comprise a first set of one or more PDPC reference samples, and wherein the video encoder is configured to:

determine, for a second intra-predicted prediction sample of the prediction block, that at least one PDPC reference sample of a second set of one or more PDPC reference samples for the second intra-predicted prediction sample are not stored in a reference line buffer; and

one of not apply PDPC to the second intra-predicted prediction sample or apply PDPC using only PDPC reference samples available in reference line buffer.

~~66.~~ 62. The device of claim ~~51~~48, wherein the wide angle intra-prediction mode is not a DC, planar, horizontal, or vertical intra-prediction mode.

~~67.~~ 63. The device of claim ~~51~~48, wherein the device comprises one or more of a camera, a computer, a mobile device, a broadcast receiver device, or a set-top box.

~~68.~~ 64. A computer-readable storage medium storing instructions that when executed cause one or more processors of a device for decoding video data to:

~~obtain~~ determine a size of a current block of video data;

~~determine a size of the current block;~~

determine, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determine a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modify a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the wide angle intra-prediction mode; determine one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~; and~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modify, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; and reconstruct a ~~sample of the~~ current block based on the modified prediction sample and a residual value.

~~69.~~ 65. A computer-readable storage medium storing instructions that when executed cause one or more processors of a device for encoding video data to:

~~obtain~~ determine a size of a current block of video data;

~~determine a size of the current block;~~

determine, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

determine a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~modify a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the wide angle intra-prediction mode; determine one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~;~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; modify, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; determine a residual value for a residual block based on the modified prediction sample and a sample value in the current block; and

signal information indicative of the residual value.

~~70.~~ 66. A device for decoding video data, the device comprising:

~~means for obtaining a current block of video data;~~

means for determining a size of ~~the~~a current block~~;~~

of video data; means for determining, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

means for determining a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~means for modifying a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of the wide angle intra-prediction mode; means for determining one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~; and~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; means for modifying, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; and means for reconstructing a ~~sample of the current~~ block based on the modified prediction sample and a residual value.

~~71.~~ 67. A device for encoding video data, the device comprising:

~~means for obtaining a current block of video data;~~

means for determining a size of ~~the~~a current block~~;~~ of video data; means for determining, based on the size of the current block, a wide angle intra-prediction mode to use for the current block;

means for determining a prediction block for the current block using the wide angle intra-prediction mode, the prediction block including a plurality of intra-predicted prediction samples~~;~~

~~means for modifying a prediction sample of the plurality of prediction samples of the prediction block to generate a modified prediction sample using~~ determined using an angle of

the wide angle intra-prediction mode; means for determining one or more Position Dependent Intra Prediction Combination (PDPC~~), wherein modifying the prediction sample comprises:~~

~~determining one or more~~) reference samples that are external to the current block ~~based on~~for modifying the ~~wide angle~~plurality of intra-predicted prediction ~~mode; and~~

~~modifying~~samples of the prediction block, wherein each PDPC reference sample ~~to generate~~of the ~~modified prediction sample based on the determined~~ one or more PDPC reference samples~~;~~

are determined using the angle of the wide angle intra-prediction mode relative to a respective intra-predicted prediction sample of the plurality of intra-predicted prediction samples; means for modifying, using the one or more PDPC reference samples, an intra-predicted prediction sample of the plurality of intra-predicted prediction samples of the prediction block to generate a modified prediction sample; means for determining a residual value for a residual block based on the modified prediction sample and a sample value in the current block; and

means for signaling information indicative of the residual value.