

CLAIMS

1. A method for intra prediction of a current block of a picture, the method comprising:
 obtaining an aspect ratio of the current block according to a width and a height of the current block;
- 5 obtaining a weighting factor based on the aspect ratio, and
 determining an intra-prediction value of the current block based on the weighting factor.
2. The method of claim 1, wherein the current block is a rectangular block, and the intra-prediction value is a DC value.
- 10 3. The method of claim 1 or 2, wherein determining the intra-prediction value of the current block based on a multiplication between the weighting factor and adjacent pixels of the current block.
- 15 4. The method of any one of claims 1 to 3, wherein the weighting factor corresponds to an inverse of a sum of the aspect ratio of the current block and 1.
5. The method of claim 4, wherein the weighting factor equals $\frac{1}{R_A + 1}$, wherein R_A is the aspect ratio.
- 20 6. The method of claim 4, wherein the weighting factor equals $\frac{(1 \ll q)}{R_A + 1}$, wherein R_A is the aspect ratio.
7. The method of any one of claims 1 to 6, wherein a value of the weighting factor is tabulated and stored in a look up table (LUT).
- 25 8. The method of any one of claims 1 to 7, wherein the width W of the current block $W = 2^w$ and a height H of the current block $H = 2^h$,
 when $W > H$, the aspect ratio $R_A = 2^{w-h}$;
 When $H > W$, the aspect ratio $R_A = 2^{h-w}$.
- 30 9. The method of claim 8, when the intra-prediction value is a DC value, the DC value is determined as:

$$DC = \frac{\sum_{i=0}^{W+H-1} p_i}{2^m (R_A + 1)},$$

wherein $m = \min(w, h)$, p_i is an adjacent pixel of the current block, $\frac{1}{R_A + 1}$ is the weighting factor.

- 5 10. The method of claim 8 or 9, when the intra-prediction value is a DC value, the DC value is determined as:

$$DC = \left(\left(\frac{1}{R_A + 1} \cdot \sum_{i=0}^{W+H-1} p_i \right) + (1 \ll (m-1)) \right) \gg m$$

Wherein $m = \min(w, h)$, p_i is an adjacent pixel of the current block, $\frac{1}{R_A + 1}$ is the weighting factor, $\ll$ and $\gg$ are left and right shift operations, respectively.

10

11. The method of claim 8, when the intra-prediction value is a DC value, the DC value is determined as:

$$DC = \left(\left(\left(\left(\frac{(1 \ll q)}{R_A + 1} \cdot \sum_{i=0}^{W+H-1} p_i \right) + (1 \ll (q-1)) \right) \gg q \right) + (1 \ll (m-1)) \right) \gg m$$

wherein $m = \min(w, h)$, p_i is an adjacent pixel of the current block, $\frac{(1 \ll q)}{R_A + 1}$ is the weighting factor, q is an integer parameter that takes a maximum possible value that does not cause an overflow of a data type.

15

12. The method of claim 8 or 11, when the intra-prediction value is a DC value, the DC value is determined as:

20
$$DC = \left(\left(\frac{(1 \ll q)}{R_A + 1} \cdot \sum_{i=0}^{W+H-1} p_i \right) + (1 \ll (m+q-1)) \right) \gg (m+q)$$

wherein $m = \min(w, h)$, p_i is an adjacent pixel of the current block, $\frac{(1 \ll q)}{R_A + 1}$ is the weighting factor, q is an integer parameter that takes a maximum possible value that does not cause an overflow of a data type.

13. The method of any one of claims 1-12, when $W > f_{\text{THR}} \cdot H$, f_{THR} is a threshold value, the width W of the current block $W = 2^w$ and a height H of the current block $H = 2^h$, the intra-prediction value is a DC value, the DC value is determined as:

$$5 \quad DC = \frac{\left(\sum_{i=0}^{W+H-1} p_i \right) + ((W+H) \gg 1)}{W+H} \approx \frac{\left(\sum_{i=0}^{W-1} p_i \right) + (W \gg 1)}{W} = \left(\left(\sum_{i=0}^{W-1} p_i \right) + (W \gg 1) \right) \gg w.$$

14. The method of any one of claims 1-13, when $H > f_{\text{THR}} \cdot W$, f_{THR} is a threshold value, the width W of the current block $W = 2^w$ and a height H of the current block $H = 2^h$, the intra-prediction value is a DC value, the DC value is determined as:

$$10 \quad DC = \frac{\left(\sum_{i=0}^{W+H-1} p_i \right) + ((W+H) \gg 1)}{W+H} \approx \frac{\left(\sum_{i=0}^{H-1} p_i \right) + (H \gg 1)}{H} = \left(\left(\sum_{i=0}^{H-1} p_i \right) + (H \gg 1) \right) \gg h.$$

15. The method of any one of claims 1-14, when the method is applied to blocks only of a color plane of a picture.

- 15 16. A method for intra prediction of a current block of a picture, the method comprising:
- obtaining a width and a height of the current block;
 - comparing the width with the height;
 - when the width is greater than the height, determining a DC value of the current block based on the width; and
 - 20 when the height is greater than the width, determining a DC value of the current block based on the height.

17. The method of claim 16, wherein when the width is greater than the height, the DC value is calculated by:

$$25 \quad DC = \left(\left(\sum_{i=0}^{W-1} p_i \right) + (W \gg 1) \right) \gg w,$$

$$w = \log_2(W)$$

wherein DC denotes the DC value, W denotes the width of the current block, and p_i denotes a reference sample of the current block.

18. The method of claim 16, wherein when the height is greater than the width, the DC value is calculated by:

$$DC = \left(\left(\sum_{i=0}^{H-1} p_i \right) + (H \gg 1) \right) \gg h,$$

$$h = \log_2(H),$$

- 5 wherein DC denotes the DC value, H denotes the height of the current block, and p_i denotes a reference sample of the current block.

19. A method for intra prediction of a current block of a picture, the method comprising:

- obtaining a width and a height of the current block;
 10 when the width is greater than a product of the height and a first threshold value, determining a DC value of the current block based on the width; and
 when the height is greater than a product of the width and a second threshold value, determining a DC value of the current block based on the height.

- 15 20. The method of claim 19, wherein the first threshold value is the same as the second threshold value.

21. The method of claim 19 or 20, wherein the first threshold value equals to 1.

- 20 22. The method of any one of claims 19-21, wherein when $W > f_{\text{THR}} \cdot H$, the DC value is determined as:

$$DC = \left(\left(\sum_{i=0}^{W-1} p_i \right) + (W \gg 1) \right) \gg w,$$

$$w = \log_2(W)$$

- wherein DC denotes the DC value, f_{THR} denotes the first threshold value, W denotes the
 25 width of the current block, H denotes the height of the current block, and p_i denotes a reference sample of the current block.

23. The method of any one of claims 19-21, wherein when $H > f_{\text{THR}} \cdot W$, the DC value is determined as:

$$DC = \left(\left(\sum_{i=0}^{H-1} p_i \right) + (H \gg 1) \right) \gg h,$$

$$h = \log_2(H),$$

- wherein DC denotes the DC value, f_{THR} denotes the second threshold value, W denotes the width of the current block, H denotes the height of the current block, and p_i denotes a reference sample of the current block..

24. An encoder (108; 200) comprising processing circuitry for carrying out the method according to any one of claims 1 to 15.
25. A decoder (116; 300) comprising processing circuitry for carrying out the method according to any one of claims 1 to 15.
26. A computer program product comprising a program code for performing the method according to any one of claims 1 to 15.
27. A decoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing programming for execution by the processors, wherein the programming, when executed by the processors, configures the decoder to carry out the method according to any one of claims 1 to 15.
28. An encoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing programming for execution by the processors, wherein the programming, when executed by the processors, configures the encoder to carry out the method according to any one of claims 1 to 15.
29. An encoder (108; 200) comprising processing circuitry for carrying out the method according to any one of claims 16 to 18.
30. A decoder (116; 300) comprising processing circuitry for carrying out the method according to any one of claims 16 to 18.

31. A computer program product comprising a program code for performing the method according to any one of claims 16 to 18.
- 5 32. A decoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing
programming for execution by the processors, wherein the programming, when executed by
the processors, configures the decoder to carry out the method according to any one of claims
10 16 to 18.
33. An encoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing
15 programming for execution by the processors, wherein the programming, when executed by
the processors, configures the encoder to carry out the method according to any one of claims
16 to 18.
34. An encoder (108; 200) comprising processing circuitry for carrying out the method
20 according to any one of claims 19 to 23.
35. A decoder (116; 300) comprising processing circuitry for carrying out the method according
to any one of claims 19 to 23.
- 25 36. A computer program product comprising a program code for performing the method
according to any one of claims 19 to 23
37. A decoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
30 a non-transitory computer-readable storage medium coupled to the processors and storing
programming for execution by the processors, wherein the programming, when executed by
the processors, configures the decoder to carry out the method according to any one of claims
19 to 23.
- 35 38. An encoder for boundary partition of a current block of a picture, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing

programming for execution by the processors, wherein the programming, when executed by the processors, configures the encoder to carry out the method according to any one of claims 19 to 23.