CLAIMS

What is claimed is:

1. An inter prediction method, comprising:

parsing a bitstream to obtain motion information of a to-be-processed picture block;

performing motion compensation on the to-be-processed picture block based on the motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the reference sample has a preset spatial position relationship with the target sample.

2. The method according to claim 1, wherein the one or more reference samples comprise a reconstructed sample that has a same horizontal coordinate as the target sample and has a preset vertical coordinate difference to the target sample, or a reconstructed sample that has a same vertical coordinate as the target sample and has a preset horizontal coordinate difference to the target sample.

3. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + ((w1 + w2)/2)}{w1 + w2}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w3 * predP(xP, yP) + w4 * recon(xP, yN - M2) + ((w3 + w4)/2)}{w3 + w4}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w5 * predP(xP, yP) + w6 * recon(xN - M1, yP) + w7 * recon(xP, yN - M2) + ((w5 + w6 + w7)/2)}{w5 + w6 + w7}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of

the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$ and $recon(xP, yN-M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$ and $(xP, yN-M2)$, respectively, w1, w2, w3, w4, w5, and w6 are preset constants, and M1 and M2 are preset positive integers.

4. The method according to claim 3, wherein w1 + w2 = R1, w3 + w4 = R2, or w5 + w6 + w7 = R3, wherein R1, R2, and, R3 each are 2 raised to the power of n, and n is a non-negative integer.

5. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1*predP(xP,yP)+w2*recon(xN-M1,yP)+w3*recon(xN-M2,yP)+((w1+w2+w3)/2)}{w1+w2+w3}, & xN>0, \text{ and } yN=0 \\ \dfrac{w4*predP(xP,yP)+w5*recon(xP,yN-M3)+w6*recon(xP,yN-M4)+((w4+w5+w6)/2)}{w4+w5+w6}, & xN=0, \text{ and } yN>0 \\ \dfrac{w7*predP(xP,yP)+w8*recon(xN-M1,yP)+w9*recon(xN-M2,yP)+w10*recon(xP,yN-M3)+w11*recon(xP,yN-M4)+((w7+w8+w9+w10+w11)/2)}{w7+w8+w9+w10+w11}, & xN>0, \text{ and } yN>0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$, $recon(xN-M2, yP)$, $recon(xP, yN-M3)$, and $recon(xP, yN-M4)$ represent reconstructed values of the reference samples at coordinate

positions $(xN-M1, yP)$, $(xN-M2, yP)$, $(xP, yN-M3)$, and $(xP, yN-M4)$, respectively, w1, w2, w3, w4, w5, w6, w7, w8, w9, w10, and w11 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

6. The method according to claim 5, wherein w1 + w2 + w3 = S1, w4 + w5 + w6 = S2, or w7 + w8 + w9 + w10 + w11 = S3, wherein S1, S2, and S3 each are 2 raised to the power of n, and n is a non-negative integer.

7. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1*predP(xP, yP) + w2*recon(xN-M1, yP) + w3*recon(xP, yN-M2)}{w1+w2+w3}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$ and $recon(xP, yN-M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$ and $(xP, yN-M2)$, respectively, w1, w2, and w3 are preset constants, and M1 and M2 are preset positive integers.

8. The method according to claim 7, wherein w1 + w2 + w3 = R, wherein R is 2 raised to the power of n, and n is a non-negative integer.

9. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{\begin{array}{c} w1*predP(xP, yP) + w2*recon(xN-M1, yP) + \\ w3*recon(xN-M2, yP) + w4*recon(xP, yN-M3) + w5*recon(xP, yN-M4) \end{array}}{w1+w2+w3+w4+w5}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$, $recon(xN - M2, yP)$, $recon(xP, yN - M3)$, and $recon(xP, yN - M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$, $(xN - M2, yP)$, $(xP, yN - M3)$, and $(xP, yN - M4)$, respectively, w1, w2, w3, w4, and w5 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

10. The method according to claim 9, wherein w1 + w2 + w3 + w4 + w5 = S, wherein S is 2 raised to the power of n, and n is a non-negative integer.

11. The method according to claim 1, wherein the one or more reference samples comprise one or more of the following samples:

a reconstructed sample that has a same horizontal coordinate as the target sample and that is adjacent to a top side of the to-be-processed picture block,

a reconstructed sample that has a same vertical coordinate as the target sample and that is adjacent to a left side of the to-be-processed picture block,

a top-right reconstructed sample of the to-be-processed picture block,

a bottom-left reconstructed sample of the to-be-processed picture block, or

a top-left reconstructed sample of the to-be-processed picture block.

12. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predP1(xP, yP) + ((w1 + w2)/2))/(w1 + w2)

wherein predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + nTbW * nTbH) >> (Log2(nTbW) + Log2(nTbH) + 1), predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP+1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target

~~sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + ((w1 + w2 + w3)/2))/(w1 + w2 + w3)~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH) + nTbH/2) >> Log2(nTbH), predH(xP, yP) = ((nTbW − 1 − xP) *p (−1, yP) + (xP + 1) * p(nTbW, −1) + nTbW/2) >> Log2(nTbW), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (((w1 * predP(xP, yP)) << (Log2(nTbW) + Log2(nTbH) + 1)) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + (((w1 + w2 + w3)/2) << (Log2(nTbW) + Log2(nTbH) + 1)))/(((w1 + w2 + w3) << (Log2(nTbW) + Log2(nTbH) + 1)))~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.~~

~~13. The method according to claim 11, wherein the updating the prediction value of the target~~

sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * predP1(xP, yP)}{w1 + w2}$$

wherein $predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + 1) >> 1$,

$predV(xP, yP) = ((nTbH - 1 - (yP - yN)) * recon(xP, yN - 1) + (yP - yN + 1) * recon(xN - 1, yN + nTbH) + (nTbH >> 1)) >> Log2(nTbH)$,

$predH(xP, yP) = ((nTbW - 1 - (xP - xN)) * recon(xN - 1, yP) + (xP - xN + 1) * recon(xN + nTbW, yN - 1) + (nTbW >> 1)) >> Log2(nTbW)$,

coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN - 1)$, $recon(xN - 1, yN + nTbH)$, $recon(xN - 1, yP)$, and $recon(xN + nTbW, yN - 1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN - 1)$, $(xN - 1, yN + nTbH)$, $(xN - 1, yP)$, and $(xN + nTbW, yN - 1)$, respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

14. The method according to claim 12 or 13, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is a non-negative integer.

15. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP) * wL(xP) + refT(xP, yP) * wT(yP) - p(xN - 1, yN - 1) * wTL(xP, yP) + \\ (64 - wL(xP) - wT(yP) + wTL(xP, yP)) * predP(xP, yP) + 32 \end{array}\right) >> 6\right)$$

wherein

~~$refL(xP,yP)=recon(xN-1,yP), refT(xP,yP)=recon(xP,yN-1), wT(yP)=32>>((yP<<1)>>nScale),$~~

~~$wL(xP)=32>>((xP<<1)>>nScale)$~~, ~~$wTL(xP,yP)=((wL(xP)>>4)+(wT(yP)>>4))$~~,

~~$nScale=((Log2(nTbW)+Log2(nTbH)-2)>>2)$~~, coordinates of the target sample are ~~(xP,yP)~~, coordinates of a top-left sample of the to-be-processed picture block are ~~(xN,yN)~~, ~~$predP(xP,yP)$~~ represents the prediction value of the target sample before the updating, ~~$predQ(xP,yP)$~~ represents the updated prediction value of the target sample, ~~$recon(xP,yN-1)$~~, ~~$recon(xN-1,yP)$~~, and ~~$recon(xN-1,yN-1)$~~ represent reconstructed values of the reference samples at coordinate positions ~~$(xP,yN-1)$~~, ~~$(xN-1,yP)$~~, and ~~$(xN-1,yN-1)$~~, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

16. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP,yP)=clip1Cmp\left(\left(\frac{refL(xP,yP)*wL(xP)+refT(xP,yP)*wT(yP)+}{(64-wL(xP)-wT(yP))*predP(xP,yP)+32}\right)>>6\right)$$

wherein

~~$refL(xP,yP)=recon(xN-1,yP), refT(xP,yP)=recon(xP,yN-1), wT(yP)=32>>((yP<<1)>>nScale),$~~

~~$wL(xP)=32>>((xP<<1)>>nScale)$~~, ~~$nScale=((Log2(nTbW)+Log2(nTbH)-2)>>2)$~~, coordinates of the target sample are ~~(xP,yP)~~, coordinates of a top-left sample of the to-be-processed picture block are ~~(xN,yN)~~, ~~$predP(xP,yP)$~~ represents the prediction value of the target sample before the updating, ~~$predQ(xP,yP)$~~ represents the updated prediction value of the target sample, ~~$recon(xN-1,yP)$~~ and ~~$recon(xP,yN-1)$~~ represent reconstructed values of the reference samples at coordinate positions ~~$(xN-1,yP)$~~ and ~~$(xP,yN-1)$~~, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents

a clipping operation.

17. The method according to any one of claims 1 to 16, wherein the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample comprises:

when the reconstructed value of the reference sample is unavailable, determining, in a preset order, availability of samples adjacent to the top side and the left side of the to-be-processed picture block until a preset quantity of available reference samples are obtained; and

performing weighting calculation on a reconstructed value of the available reference sample and the prediction value of the target sample.

18. The method according to any one of claims 1 to 17, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample in the to-be-processed picture block, comprising:

when the reference sample is located above the to-be-processed picture block, performing weighting calculation on the reconstructed value of the reference sample and reconstructed values of a left neighboring sample and a right neighboring sample of the reference sample;

when the reference sample is located on the left of the to-be-processed picture block, performing weighting calculation on the reconstructed value of the reference sample and reconstructed values of a top neighboring sample and a bottom neighboring sample of the reference sample; and

updating the reconstructed value of the reference sample by using a result of the weighting calculation.

19. The method according to any one of claims 1 to 18, before the performing motion compensation on the to-be-processed picture block based on the motion information, further comprising:

initially updating the motion information by using a first preset algorithm; and

correspondingly, the performing motion compensation on the to-be-processed picture block based on the motion information comprises:

performing motion compensation on the to-be-processed picture block based on initially updated motion information.

20. The method according to any one of claims 1 to 19, wherein after the prediction block of the to-be-processed picture block is obtained, the method further comprises:

pre-updating the prediction block by using a second preset algorithm; and

correspondingly, the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample comprises:

performing weighting calculation on the one or more reconstructed values of the one or more reference samples and a pre-updated prediction value of the target sample.

21. The method according to any one of claims 1 to 19, after the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, further comprising:

updating the prediction value of the target sample by using a second preset algorithm.

22. The method according to any one of claims 1 to 21, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

parsing the bitstream to obtain a prediction mode corresponding to the to-be-processed picture block; and

determining that the prediction mode is a merge (merge) mode and/or an inter advanced motion vector prediction (inter AMVP) mode.

23. The method according to any one of claims 1 to 22, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

parsing the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determining that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

24. The method according to any one of claims 1 to 22, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

obtaining preset update determining indication information of the to-be-processed picture block; and

determining that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

25. An inter prediction apparatus, comprising:

a parsing module, configured to parse a bitstream to obtain motion information of a to-be-processed picture block;

a compensation module, configured to perform motion compensation on the to-be-processed picture block based on the motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

a calculation module, configured to perform weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the reference sample has a preset spatial position relationship with the target sample.

26. The apparatus according to claim 25, wherein the one or more reference samples comprise a reconstructed sample that has a same horizontal coordinate as the target sample and has a preset vertical coordinate difference to the target sample, or a reconstructed sample that has a same vertical coordinate as the target sample and has a preset horizontal coordinate difference to the target sample.

27. The apparatus according to claim 26, wherein the calculation module is specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + ((w1 + w2)/2)}{w1 + w2}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w3 * predP(xP, yP) + w4 * recon(xP, yN - M2) + ((w3 + w4)/2)}{w3 + w4}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w5 * predP(xP, yP) + w6 * recon(xN - M1, yP) + w7 * recon(xP, yN - M2) + ((w5 + w6 + w7)/2)}{w5 + w6 + w7}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of

the target sample, $recon(xN-M1, yP)$ and $recon(xP, yN-M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$ and $(xP, yN-M2)$, respectively, w1, w2, w3, w4, w5, and w6 are preset constants, and M1 and M2 are preset positive integers.

28. The apparatus according to claim 27, wherein w1 + w2 = R1, w3 + w4 = R2, or w5 + w6 + w7 = R3, wherein R1, R2, and, R3 each are 2 raised to the power of n, and n is a non-negative integer.

29. The apparatus according to claim 26, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1*predP(xP,yP)+w2*recon(xN-M1,yP)+w3*recon(xN-M2,yP)+((w1+w2+w3)/2)}{w1+w2+w3}, & xN>0, \text{ and } yN=0 \\ \dfrac{w4*predP(xP,yP)+w5*recon(xP,yN-M3)+w6*recon(xP,yN-M4)+((w4+w5+w6)/2)}{w4+w5+w6}, & xN=0, \text{ and } yN>0 \\ \dfrac{w7*predP(xP,yP)+w8*recon(xN-M1,yP)+w9*recon(xN-M2,yP)+w10*recon(xP,yN-M3)+w11*recon(xP,yN-M4)+((w7+w8+w9+w10+w11)/2)}{w7+w8+w9+w10+w11}, & xN>0, \text{ and } yN>0 \end{cases},$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$, $recon(xN-M2, yP)$, $recon(xP, yN-M3)$, and $recon(xP, yN-M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$, $(xN-M2, yP)$, $(xP, yN-M3)$, and $(xP, yN-M4)$, respectively,

w1, w2, w3, w4, w5, w6, w7, w8, w9, w10, and w11 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

30. The apparatus according to claim 29, wherein w1 + w2 + w3 = S1, w4 + w5 + w6 = S2, or w7 + w8 + w9 + w10 + w11 = S3, wherein S1, S2, and S3 each are 2 raised to the power of n, and n is a non-negative integer.

31. The apparatus according to claim 26, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + w3 * recon(xP, yN - M2)}{w1 + w2 + w3}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$ and $recon(xP, yN - M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$ and $(xP, yN - M2)$, respectively, w1, w2, and w3 are preset constants, and M1 and M2 are preset positive integers.

32. The apparatus according to claim 31, wherein w1 + w2 + w3 = R, wherein R is 2 raised to the power of n, and n is a non-negative integer.

33. The apparatus according to claim 26, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{\begin{array}{c} w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + \\ w3 * recon(xN - M2, yP) + w4 * recon(xP, yN - M3) + w5 * recon(xP, yN - M4) \end{array}}{w1 + w2 + w3 + w4 + w5}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the

to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$, $recon(xN - M2, yP)$, $recon(xP, yN - M3)$, and $recon(xP, yN - M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$, $(xN - M2, yP)$, $(xP, yN - M3)$, and $(xP, yN - M4)$, respectively, w1, w2, w3, w4, and w5 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

34. The apparatus according to claim 33, wherein w1 + w2 + w3 + w4 + w5 = S, wherein S is 2 raised to the power of n, and n is a non-negative integer.

35. The apparatus according to claim 25, wherein the one or more reference samples comprise one or more of the following samples:

a reconstructed sample that has a same horizontal coordinate as the target sample and that is adjacent to a top side of the to-be-processed picture block,

a reconstructed sample that has a same vertical coordinate as the target sample and that is adjacent to a left side of the to-be-processed picture block,

a top-right reconstructed sample of the to-be-processed picture block,

a bottom-left reconstructed sample of the to-be-processed picture block, or

a top-left reconstructed sample of the to-be-processed picture block.

36. The apparatus according to claim 35, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predP1(xP, yP) + ((w1 + w2)/2))/(w1 + w2)

wherein predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + nTbW * nTbH) >> (Log2(nTbW) + Log2(nTbH) + 1), predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP+1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target

~~sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + ((w1 + w2 + w3)/2))/(w1 + w2 + w3)~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH) + nTbH/2) >> Log2(nTbH), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1) + nTbW/2) >> Log2(nTbW), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (((w1 * predP(xP, yP)) << (Log2(nTbW) + Log2(nTbH) + 1)) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + (((w1 + w2 + w3)/2) << (Log2(nTbW) + Log2(nTbH) + 1)))/(((w1 + w2 + w3) << (Log2(nTbW) + Log2(nTbH) + 1)))~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.~~

~~37. The apparatus according to claim 35, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target~~

sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * predP1(xP, yP)}{w1 + w2}$$

wherein $predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + 1) >> 1$,

$predV(xP, yP) = ((nTbH - 1 - (yP - yN)) * recon(xP, yN - 1) + (yP - yN + 1) * recon(xN - 1, yN + nTbH) + (nTbH >> 1)) >> Log2(nTbH)$,

$predH(xP, yP) = ((nTbW - 1 - (xP - xN)) * recon(xN - 1, yP) + (xP - xN + 1) * recon(xN + nTbW, yN - 1) + (nTbW >> 1)) >> Log2(nTbW)$,

coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN - 1)$, $recon(xN - 1, yN + nTbH)$, $recon(xN - 1, yP)$, and $recon(xN + nTbW, yN - 1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN - 1)$, $(xN - 1, yN + nTbH)$, $(xN - 1, yP)$, and $(xN + nTbW, yN - 1)$, respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

38. The apparatus according to claim 36 or 37, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is a non-negative integer.

39. The apparatus according to claim 35, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP) * wL(xP) + refT(xP, yP) * wT(yP) - p(xN - 1, yN - 1) * wTL(xP, yP) + \\ (64 - wL(xP) - wT(yP) + wTL(xP, yP)) * predP(xP, yP) + 32 \end{array}\right) >> 6\right)$$

wherein

$refL(xP, yP) = recon(xN - 1, yP), refT(xP, yP) = recon(xP, yN - 1), wT(yP) = 32 >> ((yP << 1) >> nScale)$,

$wL(xP)=32>>((xP<<1)>>nScale)$, $wTL(xP,yP)=((wL(xP)>>4)+(wT(yP)>>4))$, $nScale=((Log2(nTbW)+Log2(nTbH)-2)>>2)$, coordinates of the target sample are (xP,yP), coordinates of a top-left sample of the to-be-processed picture block are (xN,yN), $predP(xP,yP)$ represents the prediction value of the target sample before the updating, $predQ(xP,yP)$ represents the updated prediction value of the target sample, $recon(xP,yN-1)$, $recon(xN-1,yP)$, and $recon(xN-1,yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xP,yN-1)$, $(xN-1,yP)$, and $(xN-1,yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

40. The apparatus according to claim 35, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP,yP)=clip1Cmp\left(\left(\begin{array}{l}refL(xP,yP)*wL(xP)+refT(xP,yP)*wT(yP)+\\((64-wL(xP)-wT(yP))*predP(xP,yP)+32\end{array}\right)>>6\right)$$

wherein

$refL(xP,yP)=recon(xN-1,yP)$, $refT(xP,yP)=recon(xP,yN-1)$, $wT(yP)=32>>((yP<<1)>>nScale)$, $wL(xP)=32>>((xP<<1)>>nScale)$, $nScale=((Log2(nTbW)+Log2(nTbH)-2)>>2)$, coordinates of the target sample are (xP,yP), coordinates of a top-left sample of the to-be-processed picture block are (xN,yN), $predP(xP,yP)$ represents the prediction value of the target sample before the updating, $predQ(xP,yP)$ represents the updated prediction value of the target sample, $recon(xN-1,yP)$ and $recon(xP,yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xN-1,yP)$ and $(xP,yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

41. The apparatus according to any one of claims 25 to 40, wherein

the calculation module is further configured to: when the reconstructed value of the reference sample is unavailable, determine, in a preset order, availability of samples adjacent to the top side and the left side of the to-be-processed picture block until a preset quantity of available reference samples are obtained; and perform weighting calculation on a reconstructed value of the available reference sample and the prediction value of the target sample.

42. The apparatus according to any one of claims 25 to 41, wherein the calculation module is further configured to:

when the reference sample is located above the to-be-processed picture block, perform weighting calculation on the reconstructed value of the reference sample and reconstructed values of a left neighboring sample and a right neighboring sample of the reference sample;

when the reference sample is located on the left of the to-be-processed picture block, perform weighting calculation on the reconstructed value of the reference sample and reconstructed values of a top neighboring sample and a bottom neighboring sample of the reference sample; and

update the reconstructed value of the reference sample by using a result of the weighting calculation.

43. The apparatus according to any one of claims 25 to 42, wherein the calculation module is further configured to initially update the motion information by using a first preset algorithm; and

correspondingly, the compensation module is specifically configured to:

perform motion compensation on the to-be-processed picture block based on initially updated motion information.

44. The apparatus according to any one of claims 25 to 43, wherein the calculation module is further configured to pre-update the prediction block by using a second preset algorithm; and

correspondingly, the calculation module is specifically configured to:

perform weighting calculation on the one or more reconstructed values of the one or more reference samples and a pre-updated prediction value of the target sample.

45. The apparatus according to any one of claims 25 to 43, wherein the calculation module is further configured to update the prediction value of the target sample by using a second preset algorithm.

46. The apparatus according to any one of claims 25 to 45, wherein the parsing module is further configured to:

parse the bitstream to obtain a prediction mode corresponding to the to-be-processed picture block; and

determine that the prediction mode is a merge (merge) mode and/or an inter advanced motion vector prediction (inter AMVP) mode.

47. The apparatus according to any one of claims 25 to 46, wherein the parsing module is further configured to:

parse the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determine that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

48. The apparatus according to any one of claims 25 to 46, wherein the calculation module is further configured to:

obtain preset update determining indication information of the to-be-processed picture block; and

determine that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

49. A computer storage medium, wherein the computer storage medium stores computer program code, and when the computer program code is run on a processor, the processor is enabled to perform the inter prediction method according to any one of claims 1 to 24.

~~CLAIMS~~

~~(received by the International Bureau on January 19, 2020 (2020-01-19))~~

~~What is claimed is:~~

~~1. An inter prediction method, comprising:~~

~~parsing a bitstream to obtain motion information of a to-be-processed picture block;~~

~~performing motion compensation on the to-be-processed picture block based on the motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and~~

~~performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the reference sample has a preset spatial position relationship with the target sample.~~

~~2. The method according to claim 1, wherein the one or more reference samples comprise a reconstructed sample that has a same horizontal coordinate as the target sample and has a preset vertical coordinate difference to the target sample, or a reconstructed sample that has a same vertical coordinate as the target sample and has a preset horizontal coordinate difference to the target sample.~~

~~3. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:~~

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + ((w1 + w2)/2)}{w1 + w2}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w3 * predP(xP, yP) + w4 * recon(xP, yN - M2) + ((w3 + w4)/2)}{w3 + w4}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w5 * predP(xP, yP) + w6 * recon(xN - M1, yP) + w7 * recon(xP, yN - M2) + ((w5 + w6 + w7)/2)}{w5 + w6 + w7}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$ and $recon(xP, yN - M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$ and $(xP, yN - M2)$, respectively, w1, w2, w3, w4, w5, and w6 are preset constants, and M1 and M2 are preset positive integers.

4. The method according to claim 3, wherein w1 + w2 = R1, w3 + w4 = R2, or w5 + w6 + w7 = R3, wherein R1, R2, and, R3 each are 2 raised to the power of n, and n is a non-negative integer.

5. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + w3 * recon(xN - M2, yP) + ((w1 + w2 + w3)/2)}{w1 + w2 + w3}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w4 * predP(xP, yP) + w5 * recon(xP, yN - M3) + w6 * recon(xP, yN - M4) + ((w4 + w5 + w6)/2)}{w4 + w5 + w6}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w7 * predP(xP, yP) + w8 * recon(xN - M1, yP) + w9 * recon(xN - M2, yP) + w10 * recon(xP, yN - M3) + w11 * recon(xP, yN - M4) + ((w7 + w8 + w9 + w10 + w11)/2)}{w7 + w8 + w9 + w10 + w11}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of

the target sample, $recon(xN-M1, yP)$, $recon(xN-M2, yP)$, $recon(xP, yN-M3)$, and $recon(xP, yN-M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$, $(xN-M2, yP)$, $(xP, yN-M3)$, and $(xP, yN-M4)$, respectively, w1, w2, w3, w4, w5, w6, w7, w8, w9, w10, and w11 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

6. The method according to claim 5, wherein w1 + w2 + w3 = S1, w4 + w5 + w6 = S2, or w7 + w8 + w9 + w10 + w11 = S3, wherein S1, S2, and S3 each are 2 raised to the power of n, and n is a non-negative integer.

7. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + w3 * recon(xP, yN - M2)}{w1 + w2 + w3}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$ and $recon(xP, yN-M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$ and $(xP, yN-M2)$, respectively, w1, w2, and w3 are preset constants, and M1 and M2 are preset positive integers.

8. The method according to claim 7, wherein w1 + w2 + w3 = R, wherein R is 2 raised to the power of n, and n is a non-negative integer.

9. The method according to claim 2, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + w3 * recon(xN - M2, yP) + w4 * recon(xP, yN - M3) + w5 * recon(xP, yN - M4)}{w1 + w2 + w3 + w4 + w5}$$

~~wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$, $recon(xN - M2, yP)$, $recon(xP, yN - M3)$, and $recon(xP, yN - M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$, $(xN - M2, yP)$, $(xP, yN - M3)$, and $(xP, yN - M4)$, respectively, w1, w2, w3, w4, and w5 are preset constants, and M1, M2, M3, and M4 are preset positive integers.~~

~~10. The method according to claim 9, wherein w1 + w2 + w3 + w4 + w5 = S, wherein S is 2 raised to the power of n, and n is a non-negative integer.~~

~~11. The method according to claim 1, wherein the one or more reference samples comprise one or more of the following samples:~~

~~a reconstructed sample that has a same horizontal coordinate as the target sample and that is adjacent to a top side of the to-be-processed picture block,~~

~~a reconstructed sample that has a same vertical coordinate as the target sample and that is adjacent to a left side of the to-be-processed picture block,~~

~~a top-right reconstructed sample of the to-be-processed picture block,~~

~~a bottom-left reconstructed sample of the to-be-processed picture block, or~~

~~a top-left reconstructed sample of the to-be-processed picture block.~~

~~12. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:~~

~~predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predP1(xP, yP) + ((w1 + w2)/2))/(w1 + w2)~~

~~wherein predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + nTbW * nTbH) >> (Log2(nTbW) + Log2(nTbH) + 1), predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP+1) * p(−1, nTbH)) <<~~

~~Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + ((w1 + w2 + w3)/2))/(w1 + w2 + w3)~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH) + nTbH/2) >> Log2(nTbH), predH(xP, yP) = ((nTbW − 1 − xP) *p (−1, yP) + (xP + 1) * p(nTbW, −1) + nTbW/2) >> Log2(nTbW), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (((w1 * predP(xP, yP)) << (Log2(nTbW) + Log2(nTbH) + 1)) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + (((w1 + w2 + w3)/2) << (Log2(nTbW) + Log2(nTbH) + 1)))/(((w1 + w2 + w3) << (Log2(nTbW) + Log2(nTbH) + 1)))~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the~~

reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

13. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * predP1(xP, yP)}{w1 + w2}$$

wherein $predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + 1) >> 1$,

$predV(xP, yP) = ((nTbH - 1 - (yP - yN)) * recon(xP, yN - 1) + (yP - yN + 1) * recon(xN - 1, yN + nTbH) + (nTbH >> 1)) >> Log2(nTbH)$,

$predH(xP, yP) = ((nTbW - 1 - (xP - xN)) * recon(xN - 1, yP) + (xP - xN + 1) * recon(xN + nTbW, yN - 1) + (nTbW >> 1)) >> Log2(nTbW)$,

coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN - 1)$, $recon(xN - 1, yN + nTbH)$, $recon(xN - 1, yP)$, and $recon(xN + nTbW, yN - 1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN - 1)$, $(xN - 1, yN + nTbH)$, $(xN - 1, yP)$, and $(xN + nTbW, yN - 1)$, respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

14. The method according to claim 12 or 13, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is a non-negative integer.

15. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP)*wL(xP) + refT(xP, yP)*wT(yP) - p(xN-1, yN-1)*wTL(xP, yP) + \\ (64 - wL(xP) - wT(yP) + wTL(xP, yP))* predP(xP, yP) + 32 \end{array}\right) >> 6\right)$$

wherein

$refL(xP, yP) = recon(xN-1, yP)$, $refT(xP, yP) = recon(xP, yN-1)$, $wT(yP) = 32 >> ((yP << 1) >> nScale)$, $wL(xP) = 32 >> ((xP << 1) >> nScale)$, $wTL(xP, yP) = ((wL(xP) >> 4) + (wT(yP) >> 4))$, $nScale = ((Log2(nTbW) + Log2(nTbH) - 2) >> 2)$, coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN-1)$, $recon(xN-1, yP)$, and $recon(xN-1, yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN-1)$, $(xN-1, yP)$, and $(xN-1, yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

16. The method according to claim 11, wherein the updating the prediction value of the target sample comprises: performing weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP)*wL(xP) + refT(xP, yP)*wT(yP) + \\ (64 - wL(xP) - wT(yP))* predP(xP, yP) + 32 \end{array}\right) >> 6\right)$$

wherein

$refL(xP, yP) = recon(xN-1, yP)$, $refT(xP, yP) = recon(xP, yN-1)$, $wT(yP) = 32 >> ((yP << 1) >> nScale)$, $wL(xP) = 32 >> ((xP << 1) >> nScale)$, $nScale = ((Log2(nTbW) + Log2(nTbH) - 2) >> 2)$, coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the

~~target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-1, yP)$ and $recon(xP, yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xN-1, yP)$ and $(xP, yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.~~

~~17. The method according to any one of claims 1 to 16, wherein the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample comprises:~~

~~when the reconstructed value of the reference sample is unavailable, determining, in a preset order, availability of samples adjacent to the top side and the left side of the to-be-processed picture block until a preset quantity of available reference samples are obtained; and~~

~~performing weighting calculation on a reconstructed value of the available reference sample and the prediction value of the target sample.~~

~~18. The method according to any one of claims 1 to 17, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample in the to-be-processed picture block, comprising:~~

~~when the reference sample is located above the to-be-processed picture block, performing weighting calculation on the reconstructed value of the reference sample and reconstructed values of a left neighboring sample and a right neighboring sample of the reference sample;~~

~~when the reference sample is located on the left of the to-be-processed picture block, performing weighting calculation on the reconstructed value of the reference sample and reconstructed values of a top neighboring sample and a bottom neighboring sample of the reference sample; and~~

~~updating the reconstructed value of the reference sample by using a result of the weighting calculation.~~

~~19. The method according to any one of claims 1 to 18, before the performing motion compensation on the to-be-processed picture block based on the motion information, further comprising:~~

~~initially updating the motion information by using a first preset algorithm; and~~

correspondingly, the performing motion compensation on the to-be-processed picture block based on the motion information comprises:

performing motion compensation on the to-be-processed picture block based on initially updated motion information.

20. The method according to any one of claims 1 to 19, wherein after the prediction block of the to-be-processed picture block is obtained, the method further comprises:

pre-updating the prediction block by using a second preset algorithm; and

correspondingly, the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample comprises:

performing weighting calculation on the one or more reconstructed values of the one or more reference samples and a pre-updated prediction value of the target sample.

21. The method according to any one of claims 1 to 19, after the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, further comprising:

updating the prediction value of the target sample by using a second preset algorithm.

22. The method according to any one of claims 1 to 21, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

parsing the bitstream to obtain a prediction mode corresponding to the to-be-processed picture block; and

determining that the prediction mode is a merge (merge) mode and/or an inter advanced motion vector prediction (inter AMVP) mode.

23. The method according to any one of claims 1 to 22, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

parsing the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determining that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

24. The method according to any one of claims 1 to 22, before the performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, further comprising:

obtaining preset update determining indication information of the to-be-processed picture block; and

determining that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

25. A prediction method, comprising:

obtaining a first prediction value of a target sample through inter prediction;

obtaining a second prediction value of the target sample through intra prediction; and

performing weighting calculation on the first prediction value and the second prediction value, to obtain an updated prediction value of the target sample, wherein a weighted coefficient of the first prediction value is different from a weighted coefficient of the second prediction value.

26. The method according to claim 25, wherein the second prediction value is obtained based on a spatial neighboring sample by using a planar (PLANAR) intra prediction mode.

27. The method according to claim 25, wherein the obtaining a first prediction value of a target sample through inter prediction comprises:

parsing a bitstream to obtain motion information of a to-be-processed picture block; and

performing motion compensation on the to-be-processed picture block based on the motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises the first prediction value of the target sample.

28. The method according to any one of claims 25 to 27, wherein the updated prediction value predQ(xP, yP) is obtained based on w1 * predP(xP, yP) and w2 * predP1(xP, yP), wherein

(xP, yP) represents coordinates of the target sample, predP(xP, yP) represents the first prediction value, predP1(xP, yP) represents the second prediction value, w1 represents the weighted coefficient of the first prediction value, w2 represents the weighted coefficient of the second prediction value, w1 and w2 are preset constants, and w1 is unequal to w2.

29. The method according to claim 28, wherein a weighted coefficient set (w1, w2) is (6, 2) or (5, 3).

30. The method according to claim 28, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is a non-negative integer.

31. An inter prediction apparatus, comprising:

a parsing module, configured to parse a bitstream to obtain motion information of a to-be-processed picture block;

a compensation module, configured to perform motion compensation on the to-be-processed picture block based on the motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

a calculation module, configured to perform weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the reference sample has a preset spatial position relationship with the target sample.

32. The apparatus according to claim 31, wherein the one or more reference samples comprise a reconstructed sample that has a same horizontal coordinate as the target sample and has a preset vertical coordinate difference to the target sample, or a reconstructed sample that has a same vertical coordinate as the target sample and has a preset horizontal coordinate difference to the target sample.

33. The apparatus according to claim 32, wherein the calculation module is specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + ((w1 + w2)/2)}{w1 + w2}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w3 * predP(xP, yP) + w4 * recon(xP, yN - M2) + ((w3 + w4)/2)}{w3 + w4}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w5 * predP(xP, yP) + w6 * recon(xN - M1, yP) + w7 * recon(xP, yN - M2) + ((w5 + w6 + w7)/2)}{w5 + w6 + w7}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the

to be processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$ and $recon(xP, yN - M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$ and $(xP, yN - M2)$, respectively, w1, w2, w3, w4, w5, and w6 are preset constants, and M1 and M2 are preset positive integers.

34. The apparatus according to claim 33, wherein w1 + w2 = R1, w3 + w4 = R2, or w5 + w6 + w7 = R3, wherein R1, R2, and, R3 each are 2 raised to the power of n, and n is a non-negative integer.

35. The apparatus according to claim 32, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \begin{cases} \dfrac{w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + w3 * recon(xN - M2, yP) + ((w1 + w2 + w3)/2)}{w1 + w2 + w3}, & xN > 0, \text{ and } yN = 0 \\ \dfrac{w4 * predP(xP, yP) + w5 * recon(xP, yN - M3) + w6 * recon(xP, yN - M4) + ((w4 + w5 + w6)/2)}{w4 + w5 + w6}, & xN = 0, \text{ and } yN > 0 \\ \dfrac{w7 * predP(xP, yP) + w8 * recon(xN - M1, yP) + w9 * recon(xN - M2, yP) + w10 * recon(xP, yN - M3) + w11 * recon(xP, yN - M4) + ((w7 + w8 + w9 + w10 + w11)/2)}{w7 + w8 + w9 + w10 + w11}, & xN > 0, \text{ and } yN > 0 \end{cases}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$, $recon(xN - M2, yP)$, $recon(xP, yN - M3)$, and

$recon(xP, yN-M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$, $(xN-M2, yP)$, $(xP, yN-M3)$, and $(xP, yN-M4)$, respectively, w1, w2, w3, w4, w5, w6, w7, w8, w9, w10, and w11 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

36. The apparatus according to claim 35, wherein w1 + w2 + w3 = S1, w4 + w5 + w6 = S2, or w7 + w8 + w9 + w10 + w11 = S3, wherein S1, S2, and S3 each are 2 raised to the power of n, and n is a non-negative integer.

37. The apparatus according to claim 32, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * recon(xN-M1, yP) + w3 * recon(xP, yN-M2)}{w1 + w2 + w3}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-M1, yP)$ and $recon(xP, yN-M2)$ represent reconstructed values of the reference samples at coordinate positions $(xN-M1, yP)$ and $(xP, yN-M2)$, respectively, w1, w2, and w3 are preset constants, and M1 and M2 are preset positive integers.

38. The apparatus according to claim 37, wherein w1 + w2 + w3 = R, wherein R is 2 raised to the power of n, and n is a non-negative integer.

39. The apparatus according to claim 32, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{\begin{array}{c} w1 * predP(xP, yP) + w2 * recon(xN - M1, yP) + \\ w3 * recon(xN - M2, yP) + w4 * recon(xP, yN - M3) + w5 * recon(xP, yN - M4) \end{array}}{w1 + w2 + w3 + w4 + w5}$$

wherein coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN - M1, yP)$, $recon(xN - M2, yP)$, $recon(xP, yN - M3)$, and $recon(xP, yN - M4)$ represent reconstructed values of the reference samples at coordinate positions $(xN - M1, yP)$, $(xN - M2, yP)$, $(xP, yN - M3)$, and $(xP, yN - M4)$, respectively, w1, w2, w3, w4, and w5 are preset constants, and M1, M2, M3, and M4 are preset positive integers.

40. The apparatus according to claim 39, wherein w1 + w2 + w3 + w4 + w5 = S, wherein S is 2 raised to the power of n, and n is a non-negative integer.

41. The apparatus according to claim 31, wherein the one or more reference samples comprise one or more of the following samples:

a reconstructed sample that has a same horizontal coordinate as the target sample and that is adjacent to a top side of the to-be-processed picture block,

a reconstructed sample that has a same vertical coordinate as the target sample and that is adjacent to a left side of the to-be-processed picture block,

a top-right reconstructed sample of the to-be-processed picture block,

a bottom-left reconstructed sample of the to-be-processed picture block, or

a top-left reconstructed sample of the to-be-processed picture block.

42. The apparatus according to claim 41, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predP1(xP, yP) + ((w1 + w2)/2))/(w1 + w2)

wherein predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + nTbW * nTbH) >> (Log2(nTbW) + Log2(nTbH) + 1), predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP+1) * p(−1, nTbH)) <<

~~Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (w1 * predP(xP, yP) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + ((w1 + w2 + w3)/2))/(w1 + w2 + w3)~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH) + nTbH/2) >> Log2(nTbH), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1) + nTbW/2) >> Log2(nTbW), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block; or~~

~~the prediction value of the target sample is updated according to the following formula:~~

~~predQ(xP, yP) = (((w1 * predP(xP, yP)) << (Log2(nTbW) + Log2(nTbH) + 1)) + w2 * predV(xP, yP) + w3 * predH(xP, yP) + (((w1 + w2 + w3)/2) << (Log2(nTbW) + Log2(nTbH) + 1)))/(((w1 + w2 + w3) << (Log2(nTbW) + Log2(nTbH) + 1)))~~

~~wherein predV(xP, yP) = ((nTbH − 1 − yP) * p(xP, −1) + (yP + 1) * p(−1, nTbH)) << Log2(nTbW), predH(xP, yP) = ((nTbW − 1 − xP) * p(−1, yP) + (xP + 1) * p(nTbW, −1)) << Log2(nTbH), coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (0, 0), predP(xP, yP) represents the prediction value of the target sample before the updating, predQ(xP, yP) represents the updated prediction value of the target sample, p(xP, −1), p(−1, nTbH), p(−1, yP), and p(nTbW, −1) represent reconstructed values of the~~

reference samples at coordinate positions (xP, −1), (−1, nTbH), (−1, yP), and (nTbW, −1), respectively, w1, w2, and w3 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

43. The apparatus according to claim 41, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{w1 * predP(xP, yP) + w2 * predP1(xP, yP)}{w1 + w2}$$

wherein $predP1(xP, yP) = (predV(xP, yP) + predH(xP, yP) + 1) >> 1$,

$predV(xP, yP) = ((nTbH - 1 - (yP - yN)) * recon(xP, yN - 1) + (yP - yN + 1) * recon(xN - 1, yN + nTbH) + (nTbH >> 1)) >> Log2(nTbH)$,

$predH(xP, yP) = ((nTbW - 1 - (xP - xN)) * recon(xN - 1, yP) + (xP - xN + 1) * recon(xN + nTbW, yN - 1) + (nTbW >> 1)) >> Log2(nTbW)$,

coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN - 1)$, $recon(xN - 1, yN + nTbH)$, $recon(xN - 1, yP)$, and $recon(xN + nTbW, yN - 1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN - 1)$, $(xN - 1, yN + nTbH)$, $(xN - 1, yP)$, and $(xN + nTbW, yN - 1)$, respectively, w1 and w2 are preset constants, and nTbW and nTbH represent a width and a height of the to-be-processed picture block.

44. The apparatus according to claim 42 or 43, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is a non-negative integer.

45. The apparatus according to claim 41, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target

sample is obtained according to the following formula:

$$predQ(xP, yP) = \frac{clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP)*wL(xP) + refT(xP, yP)*wT(yP) - p(xN-1, yN-1)*wTL(xP, yP) + \\ (64 - wL(xP) - wT(yP) + wTL(xP, yP))*predP(xP, yP) + 32 \end{array}\right) >> 6\right)}{}$$

wherein

$refL(xP, yP) = recon(xN-1, yP)$, $refT(xP, yP) = recon(xP, yN-1)$, $wT(yP) = 32 >> ((yP << 1) >> nScale)$, $wL(xP) = 32 >> ((xP << 1) >> nScale)$, $wTL(xP, yP) = ((wL(xP) >> 4) + (wT(yP) >> 4))$, $nScale = ((Log2(nTbW) + Log2(nTbH) - 2) >> 2)$, coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xP, yN-1)$, $recon(xN-1, yP)$, and $recon(xN-1, yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xP, yN-1)$, $(xN-1, yP)$, and $(xN-1, yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

46. The apparatus according to claim 41, wherein the calculation module is further specifically configured to perform weighting calculation based on the prediction value of the target sample before the updating and the reconstructed value of the reference sample, to obtain an updated prediction value of the target sample, wherein the updated prediction value of the target sample is obtained according to the following formula:

$$predQ(xP, yP) = clip1Cmp\left(\left(\begin{array}{l} refL(xP, yP)*wL(xP) + refT(xP, yP)*wT(yP) + \\ (64 - wL(xP) - wT(yP))*predP(xP, yP) + 32 \end{array}\right) >> 6\right)$$

wherein

$refL(xP, yP) = recon(xN-1, yP)$, $refT(xP, yP) = recon(xP, yN-1)$, $wT(yP) = 32 >> ((yP << 1) >> nScale)$, $wL(xP) = 32 >> ((xP << 1) >> nScale)$, $nScale = ((Log2(nTbW) + Log2(nTbH) - 2) >> 2)$, coordinates of the target sample are (xP, yP), coordinates of a top-left sample of the to-be-processed picture block are (xN, yN), $predP(xP, yP)$ represents the prediction value of the

target sample before the updating, $predQ(xP, yP)$ represents the updated prediction value of the target sample, $recon(xN-1, yP)$ and $recon(xP, yN-1)$ represent reconstructed values of the reference samples at coordinate positions $(xN-1, yP)$ and $(xP, yN-1)$, respectively, nTbW and nTbH represent a width and a height of the to-be-processed picture block, and clip1Cmp represents a clipping operation.

47. The apparatus according to any one of claims 31 to 46, wherein

the calculation module is further configured to: when the reconstructed value of the reference sample is unavailable, determine, in a preset order, availability of samples adjacent to the top side and the left side of the to-be-processed picture block until a preset quantity of available reference samples are obtained; and perform weighting calculation on a reconstructed value of the available reference sample and the prediction value of the target sample.

48. The apparatus according to any one of claims 31 to 47, wherein the calculation module is further configured to:

when the reference sample is located above the to-be-processed picture block, perform weighting calculation on the reconstructed value of the reference sample and reconstructed values of a left neighboring sample and a right neighboring sample of the reference sample;

when the reference sample is located on the left of the to-be-processed picture block, perform weighting calculation on the reconstructed value of the reference sample and reconstructed values of a top neighboring sample and a bottom neighboring sample of the reference sample; and

update the reconstructed value of the reference sample by using a result of the weighting calculation.

49. The apparatus according to any one of claims 31 to 48, wherein the calculation module is further configured to initially update the motion information by using a first preset algorithm; and

correspondingly, the compensation module is specifically configured to:

perform motion compensation on the to-be-processed picture block based on initially updated motion information.

50. The apparatus according to any one of claims 31 to 49, wherein the calculation module is further configured to pre-update the prediction block by using a second preset algorithm; and

correspondingly, the calculation module is specifically configured to:

perform weighting calculation on the one or more reconstructed values of the one or more reference samples and a pre-updated prediction value of the target sample.

51. The apparatus according to any one of claims 31 to 49, wherein the calculation module is further configured to update the prediction value of the target sample by using a second preset algorithm.

52. The apparatus according to any one of claims 31 to 51, wherein the parsing module is further configured to:

parse the bitstream to obtain a prediction mode corresponding to the to-be-processed picture block; and

determine that the prediction mode is a merge (merge) mode and/or an inter advanced motion vector prediction (inter AMVP) mode.

53. The apparatus according to any one of claims 31 to 52, wherein the parsing module is further configured to:

parse the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determine that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

54. The apparatus according to any one of claims 31 to 52, wherein the calculation module is further configured to:

obtain preset update determining indication information of the to-be-processed picture block; and

determine that the update determining indication information is used to indicate to update the prediction block of the to-be-processed picture block.

55. The apparatus according to any one of claims 31 to 54, wherein a weighted coefficient of the one or more reconstructed values of the one or more reference samples is different from a weighted coefficient of the prediction value of the target sample.

56. The apparatus according to any one of claims 31 to 55, wherein the one or more reconstructed values of the one or more reference samples are obtained based on a spatial neighboring sample by using a planar (PLANAR) intra prediction mode.

57. The apparatus according to any one of claims 31 to 56, wherein the updated prediction

~~value predQ(xP, yP) is obtained based on w1 * predP(xP, yP) and w2 * predP1(xP, yP), wherein~~

~~(xP, yP) represents coordinates of the target sample, predP(xP, yP) represents the prediction value of the target sample, predP1(xP, yP) represents the one or more reconstructed values of the one or more reference samples, w1 represents the weighted coefficient of the one or more reconstructed values of the one or more reference samples, w2 represents the weighted coefficient of the prediction value of the target sample, w1 and w2 are preset constants, and w1 is unequal to w2.~~

~~58. The apparatus according to claim 57, wherein a weighted coefficient set (w1, w2) is (6, 2) or (5, 3).~~

~~59. The apparatus according to claim 57, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is 2 or 3.~~

~~60. A computer storage medium, wherein the computer storage medium stores computer program code, and when the computer program code is run on a processor, the processor is enabled to perform the inter prediction method according to any one of claims 1 to 30.~~

1. A method of inter prediction in video coding, the method comprising:

parsing a bitstream to obtain motion information of a to-be-processed picture block;

performing motion compensation on the to-be-processed picture block based on the obtained motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the one or more reference samples have a preset spatial position relationship with the target sample.

2. The method according to claim 1,

further comprising: before performing the motion compensation on the to-be-processed picture block, initially updating the obtained motion information by using a first preset algorithm; and

wherein performing the motion compensation on the to-be-processed picture block comprises: performing motion compensation on the to-be-processed picture block based on the initially

updated motion information.

3. The method according to claim 1,

further comprising: after the prediction block of the to-be-processed picture block is obtained, pre-updating the prediction block by using a second preset algorithm to obtain a pre-updated prediction value of the target sample; and

wherein performing the weighting calculation on the one or more reconstructed values of the one or more reference samples and the prediction value of the target sample comprises: performing weighting calculation on the one or more reconstructed values of the one or more reference samples and the pre-updated prediction value of the target sample.

4. The method according to claim 1, further comprising: after performing the weighting calculation on the one or more reconstructed values of the one or more reference samples and the prediction value of the target sample, updating the prediction value of the target sample by using a second preset algorithm.

5. The method according to claim 1, further comprising: before performing the weighting calculation on the one or more reconstructed values of the one or more reference samples and the prediction value of the target sample,

parsing the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determining that the update determining indication information indicating to update the prediction block of the to-be-processed picture block.

6. An apparatus for inter prediction in video coding, the apparatus comprising:

one or more processors; and

a memory coupled to the one or more processors to store instructions, which when executed by the one or more processors, cause the one or more processors to:

parse a bitstream to obtain motion information of a to-be-processed picture block;

perform motion compensation on the to-be-processed picture block based on the obtained motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

perform weighting calculation on one or more reconstructed values of one or more reference

samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the one or more reference samples have a preset spatial position relationship with the target sample.

7. The apparatus according to claim 6, wherein the one or more reference samples comprise:

a reconstructed sample that has a same horizontal coordinate as the target sample and has a preset vertical coordinate different from the target sample, or

a reconstructed sample that has a same vertical coordinate as the target sample and has a preset horizontal coordinate different from the target sample, or

a reconstructed sample that has a same horizontal coordinate as the target sample and that is adjacent to a top side of the to-be-processed picture block, or

a reconstructed sample that has a same vertical coordinate as the target sample and that is adjacent to a left side of the to-be-processed picture block, or

a top-right reconstructed sample of the to-be-processed picture block, a bottom-left reconstructed sample of the to-be-processed picture block, or a top-left reconstructed sample of the to-be-processed picture block.

8. The apparatus according to claim 6, wherein the one or more processors is further configured to:

parse the bitstream to obtain update determining indication information of the to-be-processed picture block; and

determine that the update determining indication information indicating to update the prediction block of the to-be-processed picture block.

9. The apparatus according to claim 6, wherein a weighted coefficient of the one or more reconstructed values of the one or more reference samples is different from a weighted coefficient of the prediction value of the target sample.

10. The apparatus according to claim 6, wherein the one or more reconstructed values of the one or more reference samples are obtained based on a spatial neighboring sample by using a planar intra prediction mode.

11. The apparatus according to claim 9, wherein the updated prediction value is obtained based on w1 * predP(xP, yP) and w2 * predP1(xP, yP), wherein

(xP, yP) represents coordinates of the target sample, predP(xP, yP) represents the prediction

value of the target sample, predP1(xP, yP) represents the one or more reconstructed values of the one or more reference samples, w1 represents the weighted coefficient of the one or more reconstructed values of the one or more reference samples, w2 represents the weighted coefficient of the prediction value of the target sample, w1 and w2 are preset constants, and w1 is unequal to w2.

12. The apparatus according to claim 11, wherein a weighted coefficient set (w1, w2) is (6, 2) or (5, 3).

13. The apparatus according to claim 11, wherein a sum of w1 and w2 is 2 raised to the power of n, and n is 2 or 3.

14. A non-transitory computer-readable storage medium having instructions stored therein, which when executed by one or more processors, cause the one or more processors to perform operations, the operations comprising:

parsing a bitstream to obtain motion information of a to-be-processed picture block;

performing motion compensation on the to-be-processed picture block based on the obtained motion information, to obtain a prediction block of the to-be-processed picture block, wherein the prediction block of the to-be-processed picture block comprises a prediction value of a target sample; and

performing weighting calculation on one or more reconstructed values of one or more reference samples and the prediction value of the target sample, to update the prediction value of the target sample, wherein the one or more reference samples have a preset spatial position relationship with the target sample.