

CLAIMS

What is claimed is:

1. A method for image coding through inter prediction, comprising:

determining prediction motion information of a first coding block, wherein the prediction motion information comprises a motion vector predictor and prediction reference image information, and the prediction reference image information is used to represent a prediction reference image block;

performing bidirectional prediction on the first coding block based on the prediction motion information to obtain an initial coding prediction block of the first coding block, and obtaining a first coding prediction block of the first coding block based on the initial coding prediction block;

performing motion search of a first precision on the prediction reference image block to obtain at least one second coding prediction block, wherein a search location of the motion search is determined by using the motion vector predictor and the first precision;

calculating a difference between the first coding prediction block and each second coding prediction block, and using a motion vector predictor between the first coding block and a second coding prediction block with a smallest difference as a target motion vector predictor of the first coding block;

performing bidirectional prediction on the first coding block based on the target motion vector predictor to obtain a third coding prediction block of the first coding block; and

obtaining a target coding prediction block of the first coding block based on the third coding prediction block, and coding the first coding block based on the target coding prediction block.

2. The method according to claim 1, wherein the prediction motion information comprises forward prediction motion information and backward prediction motion information, the motion vector predictor comprises a forward motion vector predictor and a backward motion vector predictor, and the prediction reference image block comprises a forward prediction reference image block and a backward prediction reference image block.

3. The method according to claim 2, wherein the initial coding prediction block comprises a forward initial coding prediction block and a backward initial coding prediction block, and the performing bidirectional prediction on the first coding block based on the prediction motion information to obtain an initial coding prediction block of the first coding block comprises:

performing forward prediction on the first coding block based on the forward prediction motion information to obtain the forward initial coding prediction block of the first coding block; and

performing backward prediction on the first coding block based on the backward prediction motion information to obtain the backward initial coding prediction block of the first coding block.

4. The method according to claim 3, wherein the obtaining a first coding prediction block of the first coding block based on the initial coding prediction block comprises:

5 performing weighted summation on the forward initial coding prediction block and the backward initial coding prediction block to obtain the first coding prediction block of the first coding block; or

using the forward initial coding prediction block as the first coding prediction block of the first coding block; or

10 using the backward initial coding prediction block as the first coding prediction block of the first coding block.

5. The method according to claim 4, wherein the second coding prediction block comprises a forward second coding prediction block and a backward second coding prediction block, and the performing motion search of the first precision on the prediction reference image block to obtain at least one second coding prediction block comprises:

performing motion search of the first precision on the forward prediction reference image block based on the forward motion vector predictor, and using each found forward coding prediction block as the forward second coding prediction block to obtain the at least one second coding prediction block; and

20 performing motion search of the first precision on the backward prediction reference image block based on the backward motion vector predictor, and using each found backward coding prediction block as the backward second coding prediction block to obtain the at least one second coding prediction block, wherein

the first precision comprises integer pixel precision, 1/2 pixel precision, 1/4 pixel precision, or 1/8 pixel precision.

6. The method according to claim 5, wherein the target motion vector predictor comprises a target forward motion vector predictor and a target backward motion vector predictor, and the calculating a difference between the first coding prediction block and each second coding prediction block, and using a motion vector predictor between the first coding block and a second coding prediction block with a smallest difference as a target motion vector predictor of the first coding block comprises:

comparing differences between the forward second coding prediction blocks and the first coding prediction block, and using a target forward motion vector predictor between the first coding block and a forward second coding prediction block with a smallest difference as the target motion

vector predictor; and/or

comparing differences between the backward second coding prediction blocks and the first coding prediction block, and using a target backward motion vector predictor between the first coding block and a backward second coding prediction block with a smallest difference as the target motion vector predictor.

7. The method according to claim 6, wherein the third coding prediction block of the first coding block comprises a forward third coding prediction block and a backward third coding prediction block, and the performing bidirectional prediction on the first coding block based on the target motion vector predictor to obtain a third coding prediction block of the first coding block comprises:

performing forward prediction on the first coding block based on the target forward motion vector predictor to obtain the forward third coding prediction block of the first coding block; and

performing backward prediction on the first coding block based on the target backward motion vector predictor to obtain the backward third coding prediction block of the first coding block.

8. The method according to claim 7, wherein the obtaining a target coding prediction block of the first coding block based on the third coding prediction block comprises:

performing weighted summation on the forward third coding prediction block and the backward third coding prediction block to obtain the target coding prediction block of the first coding block; or

using the forward third coding prediction block as the target coding prediction block of the first coding block; or

using the backward third coding prediction block as the target coding prediction block of the first coding block.

9. A method for image decoding through inter prediction, comprising:

determining prediction motion information of a first decoding block, wherein the prediction motion information comprises a motion vector predictor and prediction reference image information, and the prediction reference image information is used to represent a prediction reference image block;

performing bidirectional prediction on the first decoding block based on the prediction motion information to obtain an initial decoding prediction block of the first decoding block, and obtaining a first decoding prediction block of the first decoding block based on the initial decoding prediction block;

performing motion search of a first precision on the prediction reference image block to obtain at least one second decoding prediction block, wherein a search location of the motion search is

determined by using the motion vector predictor and the first precision;

calculating a difference between the first decoding prediction block and each second decoding prediction block, and using a motion vector predictor between the first decoding block and a second decoding prediction block with a smallest difference as a target motion vector predictor of the first

5 decoding block;

performing bidirectional prediction on the first decoding block based on the target motion vector predictor to obtain a third decoding prediction block of the first decoding block; and

obtaining a target decoding prediction block of the first decoding block based on the third decoding prediction block, and decoding the first decoding block based on the target decoding prediction block.

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10. The method according to claim 9, wherein the prediction motion information comprises forward prediction motion information and backward prediction motion information, the motion vector predictor comprises a forward motion vector predictor and a backward motion vector predictor, and the prediction reference image block comprises a forward prediction reference image block and a backward prediction reference image block.

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11. The method according to claim 10, wherein the initial decoding prediction block comprises a forward initial decoding prediction block and a backward initial decoding prediction block, and the performing bidirectional prediction on the first decoding block based on the prediction motion information to obtain an initial decoding prediction block of the first decoding block comprises:

performing forward prediction on the first decoding block based on the forward prediction motion information to obtain the forward initial decoding prediction block of the first decoding block; and

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performing backward prediction on the first decoding block based on the backward prediction motion information to obtain the backward initial decoding prediction block of the first decoding block.

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12. The method according to claim 11, wherein the obtaining a first decoding prediction block of the first decoding block based on the initial decoding prediction block comprises:

performing weighted summation on the forward initial decoding prediction block and the backward initial decoding prediction block to obtain the first decoding prediction block of the first decoding block; or

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using the forward initial decoding prediction block as the first decoding prediction block of the first decoding block; or

using the backward initial decoding prediction block as the first decoding prediction block of the first decoding block.

13. The method according to claim 12, wherein the second decoding prediction block comprises a forward second decoding prediction block and a backward second decoding prediction block, and the performing motion search of the first precision on the prediction reference image block to obtain at least one second decoding prediction block comprises:

5 performing motion search of the first precision on the forward prediction reference image block based on the forward motion vector predictor, and using each found forward decoding prediction block as the forward second decoding prediction block to obtain the at least one second decoding prediction block; and

10 performing motion search of the first precision on the backward prediction reference image block based on the backward motion vector predictor, and using each found backward decoding prediction block as the backward second decoding prediction block to obtain the at least one second decoding prediction block, wherein

the first precision comprises integer pixel precision, $1/2$ pixel precision, $1/4$ pixel precision, or $1/8$ pixel precision.

14. The method according to claim 13, wherein the target motion vector predictor comprises a target forward motion vector predictor and a target backward motion vector predictor, and the calculating a difference between the first decoding prediction block and each second decoding prediction block, and using a motion vector predictor between the first decoding block and a second decoding prediction block with a smallest difference as a target motion vector predictor of the first decoding block comprises:

comparing differences between the forward second decoding prediction blocks and the first decoding prediction block, and using a target forward motion vector predictor between the first decoding block and a forward second decoding prediction block with a smallest difference as the target motion vector predictor; and/or

25 comparing differences between the backward second decoding prediction blocks and the first decoding prediction block, and using a target backward motion vector predictor between the first decoding block and a backward second decoding prediction block with a smallest difference as the target motion vector predictor.

15. The method according to claim 14, wherein the third decoding prediction block of the first decoding block comprises a forward third decoding prediction block and a backward third decoding prediction block, and the performing bidirectional prediction on the first decoding block based on the target motion vector predictor to obtain a third decoding prediction block of the first decoding block comprises:

performing forward prediction on the first decoding block based on the target forward motion

vector predictor to obtain the forward third decoding prediction block of the first decoding block;
and

performing backward prediction on the first decoding block based on the target backward
motion vector predictor to obtain the backward third decoding prediction block of the first decoding
5 block.

16. The method according to claim 15, wherein the obtaining a target decoding prediction
block of the first decoding block based on the third decoding prediction block comprises:

performing weighted summation on the forward third decoding prediction block and the
backward third decoding prediction block to obtain the target decoding prediction block of the first
10 decoding block; or

using the forward third decoding prediction block as the target decoding prediction block of
the first decoding block; or

using the backward third decoding prediction block as the target decoding prediction block of
the first decoding block.

17. An apparatus for image coding through inter prediction, comprising:

a determining unit, configured to determine prediction motion information of a first coding
block, wherein the prediction motion information comprises a motion vector predictor and
prediction reference image information, and the prediction reference image information is used to
represent a prediction reference image block;

a processing unit, configured to: perform bidirectional prediction on the first coding block
based on the prediction motion information to obtain an initial coding prediction block of the first
coding block, and obtain a first coding prediction block of the first coding block based on the initial
coding prediction block; perform motion search of a first precision on the prediction reference
image block to obtain at least one second coding prediction block, wherein a search location of the
25 motion search is determined by using the motion vector predictor and the first precision; calculate a
difference between the first coding prediction block and each second coding prediction block, and
use a motion vector predictor between the first coding block and a second coding prediction block
with a smallest difference as a target motion vector predictor of the first coding block; and perform
bidirectional prediction on the first coding block based on the target motion vector predictor to
30 obtain a third coding prediction block of the first coding block; and

a coding unit, configured to: obtain a target coding prediction block of the first coding block
based on the third coding prediction block, and code the first coding block based on the target
coding prediction block.

18. The apparatus according to claim 17, wherein the prediction motion information comprises

forward prediction motion information and backward prediction motion information, the motion vector predictor comprises a forward motion vector predictor and a backward motion vector predictor, and the prediction reference image block comprises a forward prediction reference image block and a backward prediction reference image block.

5 19. The apparatus according to claim 18, wherein the initial coding prediction block comprises a forward initial coding prediction block and a backward initial coding prediction block, and when performing bidirectional prediction on the first coding block based on the prediction motion information to obtain the initial coding prediction block of the first coding block, the processing unit is specifically configured to:

10 perform forward prediction on the first coding block based on the forward prediction motion information to obtain the forward initial coding prediction block of the first coding block; and

 perform backward prediction on the first coding block based on the backward prediction motion information to obtain the backward initial coding prediction block of the first coding block.

15 20. The apparatus according to claim 19, wherein when obtaining the first coding prediction block of the first coding block based on the initial coding prediction block, the processing unit is specifically configured to:

 perform weighted summation on the forward initial coding prediction block and the backward initial coding prediction block to obtain the first coding prediction block of the first coding block; or

20 use the forward initial coding prediction block as the first coding prediction block of the first coding block; or

 use the backward initial coding prediction block as the first coding prediction block of the first coding block.

25 21. The apparatus according to claim 20, wherein the second coding prediction block comprises a forward second coding prediction block and a backward second coding prediction block, and when performing motion search of the first precision on the prediction reference image block based on the motion vector predictor to obtain the at least one second coding prediction block, the processing unit is specifically configured to:

30 perform motion search of the first precision on the forward prediction reference image block based on the forward motion vector predictor, and use each found forward coding prediction block as the forward second coding prediction block to obtain the at least one second coding prediction block; and

 perform motion search of the first precision on the backward prediction reference image block based on the backward motion vector predictor, and use each found backward coding prediction block as the backward second coding prediction block to obtain the at least one second coding

prediction block, wherein

the first precision comprises integer pixel precision, 1/2 pixel precision, 1/4 pixel precision, or 1/8 pixel precision.

22. The apparatus according to claim 21, wherein the target motion vector predictor comprises a target forward motion vector predictor and a target backward motion vector predictor, and when calculating the difference between the first coding prediction block and each second coding prediction block, and using the motion vector predictor between the first coding block and the second coding prediction block with a smallest difference as the target motion vector predictor of the first coding block, the processing unit is specifically configured to:

compare differences between the forward second coding prediction blocks and the first coding prediction block, and use a target forward motion vector predictor between the first coding block and a forward second coding prediction block with a smallest difference as the target motion vector predictor; and/or

compare differences between the backward second coding prediction blocks and the first coding prediction block, and use a target backward motion vector predictor between the first coding block and a backward second coding prediction block with a smallest difference as the target motion vector predictor.

23. The apparatus according to claim 22, wherein the third coding prediction block of the first coding block comprises a forward third coding prediction block and a backward third coding prediction block, and when performing bidirectional prediction on the first coding block based on the target motion vector predictor to obtain the third coding prediction block of the first coding block, the processing unit is specifically configured to:

perform forward prediction on the first coding block based on the target forward motion vector predictor to obtain the forward third coding prediction block of the first coding block; and

perform backward prediction on the first coding block based on the target backward motion vector predictor to obtain the backward third coding prediction block of the first coding block.

24. The apparatus according to claim 23, wherein when obtaining the target coding prediction block of the first coding block based on the third coding prediction block, the processing unit is specifically configured to:

perform weighted summation on the forward third coding prediction block and the backward third coding prediction block to obtain the target coding prediction block of the first coding block; or

use the forward third coding prediction block as the target coding prediction block of the first coding block; or

use the backward third coding prediction block as the target coding prediction block of the first coding block.

25. An apparatus for image decoding through inter prediction, comprising:

a determining unit, configured to determine prediction motion information of a first decoding block, wherein the prediction motion information comprises a motion vector predictor and prediction reference image information, and the prediction reference image information is used to represent a prediction reference image block;

a processing unit, configured to: perform bidirectional prediction on the first decoding block based on the prediction motion information to obtain an initial decoding prediction block of the first decoding block, and obtain a first decoding prediction block of the first decoding block based on the initial decoding prediction block; perform motion search of a first precision on the prediction reference image block to obtain at least one second decoding prediction block, wherein a search location of the motion search is determined by using the motion vector predictor and the first precision; calculate a difference between the first decoding prediction block and each second decoding prediction block, and use a motion vector predictor between the first decoding block and a second decoding prediction block with a smallest difference as a target motion vector predictor of the first decoding block; and perform bidirectional prediction on the first decoding block based on the target motion vector predictor to obtain a third decoding prediction block of the first decoding block; and

a decoding unit, configured to: obtain a target decoding prediction block of the first decoding block based on the third decoding prediction block, and decode the first decoding block based on the target decoding prediction block.

26. The apparatus according to claim 25, wherein the prediction motion information comprises forward prediction motion information and backward prediction motion information, the motion vector predictor comprises a forward motion vector predictor and a backward motion vector predictor, and the prediction reference image block comprises a forward prediction reference image block and a backward prediction reference image block.

27. The apparatus according to claim 26, wherein the initial decoding prediction block comprises a forward initial decoding prediction block and a backward initial decoding prediction block, and when performing bidirectional prediction on the first decoding block based on the prediction motion information to obtain the initial decoding prediction block of the first decoding block, the processing unit is specifically configured to:

perform forward prediction on the first decoding block based on the forward prediction motion information to obtain the forward initial decoding prediction block of the first decoding block; and

perform backward prediction on the first decoding block based on the backward prediction motion information to obtain the backward initial decoding prediction block of the first decoding block.

28. The apparatus according to claim 27, wherein when obtaining the first decoding prediction block of the first decoding block based on the initial decoding prediction block, the processing unit is specifically configured to:

perform weighted summation on the forward initial decoding prediction block and the backward initial decoding prediction block to obtain the first decoding prediction block of the first decoding block; or

10 use the forward initial decoding prediction block as the first decoding prediction block of the first decoding block; or

use the backward initial decoding prediction block as the first decoding prediction block of the first decoding block.

29. The apparatus according to claim 28, wherein the second decoding prediction block 15 comprises a forward second decoding prediction block and a backward second decoding prediction block, and when performing motion search of the first precision on the prediction reference image block based on the motion vector predictor to obtain the at least one second decoding prediction block, the processing unit is specifically configured to:

perform motion search of the first precision on the forward prediction reference image block 20 based on the forward motion vector predictor, and use each found forward decoding prediction block as the forward second decoding prediction block to obtain the at least one second decoding prediction block; and

perform motion search of the first precision on the backward prediction reference image block based on the backward motion vector predictor, and use each found backward decoding prediction 25 block as the backward second decoding prediction block to obtain the at least one second decoding prediction block, wherein

the first precision comprises integer pixel precision, 1/2 pixel precision, 1/4 pixel precision, or 1/8 pixel precision.

30. The apparatus according to claim 29, wherein the target motion vector predictor comprises 30 a target forward motion vector predictor and a target backward motion vector predictor, and when calculating the difference between the first decoding prediction block and each second decoding prediction block, and using the motion vector predictor between the first decoding block and the second decoding prediction block with a smallest difference as the target motion vector predictor of the first decoding block, the processing unit is specifically configured to:

compare differences between the forward second decoding prediction blocks and the first decoding prediction block, and use a target forward motion vector predictor between the first decoding block and a forward second decoding prediction block with a smallest difference as the target motion vector predictor; or

5 compare differences between the backward second decoding prediction blocks and the first decoding prediction block, and use a target backward motion vector predictor between the first decoding block and a backward second decoding prediction block with a smallest difference as the target motion vector predictor.

10 31. The apparatus according to claim 30, wherein the third decoding prediction block of the first decoding block comprises a forward third decoding prediction block and a backward third decoding prediction block, and when performing bidirectional prediction on the first decoding block based on the target motion vector predictor to obtain the third decoding prediction block of the first decoding block, the processing unit is specifically configured to:

15 perform forward prediction on the first decoding block based on the target forward motion vector predictor to obtain the forward third decoding prediction block of the first decoding block; and

perform backward prediction on the first decoding block based on the target backward motion vector predictor to obtain the backward third decoding prediction block of the first decoding block.

20 32. The apparatus according to claim 31, wherein when obtaining the target decoding prediction block of the first decoding block based on the third decoding prediction block, the processing unit is specifically configured to:

perform weighted summation on the forward third decoding prediction block and the backward third decoding prediction block to obtain the target decoding prediction block of the first decoding block; or

25 use the forward third decoding prediction block as the target decoding prediction block of the first decoding block; or

use the backward third decoding prediction block as the target decoding prediction block of the first decoding block.