CLAIMS

What is claimed is:

1. A decoding method, wherein the method is applied to bidirectional inter prediction, and the method comprises:

parsing a bitstream to obtain a first identifier and a first motion vector difference of a current picture block;

when a value of the first identifier is a first preset value, determining a second motion vector difference of the current picture block based on the first motion vector difference, wherein the first motion vector difference belongs to motion information of the current picture block in a first direction, and the second motion vector difference belongs to motion information of the current picture block in a second direction; and

when the value of the first identifier is a second preset value, parsing the bitstream to obtain the second motion vector difference.

2. The method according to claim 1, wherein the determining the second motion vector difference of the current picture block based on the first motion vector difference comprises:

obtaining the second motion vector difference according to the following formula:

$$mvd_lY = -mvd_lX$$

wherein mvd_lY represents the second motion vector difference, and mvd_lX represents the first motion vector difference.

3. The method according to claim 1 or 2, wherein the method further comprises:

obtaining a first predicted motion vector and a second predicted motion vector;

determining a first motion vector based on the first predicted motion vector and the first motion vector difference;

determining a second motion vector based on the second predicted motion vector and the second motion vector difference; and

determining prediction samples of the current picture block based on the first motion vector and the second motion vector; wherein

the first predicted motion vector and the first motion vector correspond to the first direction, and the second predicted motion vector and the second motion vector correspond to the second direction.

4. The method according to claim 3, wherein the current picture block comprises a first reference frame list in the first direction and a second reference frame list in the second direction, and the determining the prediction samples of the current picture block based on the first motion vector and the second motion vector comprises:

obtaining a reference frame index of the first reference frame list and a reference frame index of the second reference frame list;

determining a first reference picture block based on the reference frame index of the first reference frame list, the first motion vector, and the first reference frame list;

determining a second reference picture block based on the reference frame index of the second reference frame list, the second motion vector, and the second reference frame list; and

determining the prediction samples of the current picture block based on the first reference picture block and the second reference picture block.

5. The method according to any one of claims 1 to 4, wherein before the obtaining the first identifier, the method further comprises: determining that a sequence number of a current frame in which the current picture block is located satisfies a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

6. The method according to claim 1, wherein before the obtaining of the first identifier, the method further comprises: determining that the sequence number of the current frame in which the current picture block is located does not satisfy the preset condition, wherein the preset condition comprises the condition that the sequence number of the current frame is between the sequence number of the first reference frame and the sequence number of the second reference frame, the first reference frame

belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

7. A bidirectional inter prediction apparatus, comprising:

an obtaining unit, configured to: parse a bitstream to obtain a first identifier, and a first motion vector difference of a current picture block; and

a determining unit, configured to: when a value of the first identifier is a first preset value, determine a second motion vector difference of the current picture block based on the first motion vector difference, wherein the first motion vector difference belongs to motion information of the current picture block in a first direction, and the second motion vector difference belongs to motion information of the current picture block in a second direction;

when the value of the first identifier is a second preset value, parsing the bitstream to obtain the second motion vector difference.

8. The apparatus according to claim 7, wherein the determining unit is configured to obtain the second motion vector difference according to the following formula:

$$mvd_lY = -mvd_lX$$

wherein mvd_lY represents the second motion vector difference, and mvd_lX represents the first motion vector difference.

9. The apparatus according to claim 7 or 8, wherein the obtaining unit is configured to obtain a first predicted motion vector and a second predicted motion vector; and the determining unit is configured to: determine a first motion vector based on the first predicted motion vector and the first motion vector difference, determine a second motion vector based on the second predicted motion vector and the second motion vector difference, and determine prediction samples of the current picture block based on the first motion vector and the second motion vector, wherein the first predicted motion vector and the first motion vector correspond to the first direction, and the second predicted motion vector and the second motion vector correspond to the second direction.

10. The apparatus according to claim 9, wherein the current picture block comprises a first reference frame list in the first direction and a second reference frame

list in the second direction; the obtaining unit is configured to obtain a reference frame index of the first reference frame list and a reference frame index of the second reference frame list; and the determining unit is configured to: determine a first reference picture block based on the reference frame index of the first reference frame list, the first motion vector, and the first reference frame list, determine a second reference picture block based on the reference frame index of the second reference frame list, the second motion vector, and the second reference frame list, and determine the prediction samples of the current picture block based on the first reference picture block and the second reference picture block.

11. The apparatus according to any one of claims 7 to 10, wherein the obtaining unit is further configured to: before obtaining the first identifier, determine that a sequence number of a current frame in which the current picture block is located satisfies a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

12. An encoding method, wherein the method is applied to bidirectional inter prediction, and the method comprises:

determining a first motion vector difference of a current picture block;

determining a first identifier, wherein when a value of the first identifier is a first preset value, the first identifier is used to indicate that a second motion vector difference of the current picture block is determined based on the first motion vector difference, wherein the first motion vector difference belongs to motion information of the current picture block in a first direction, and the second motion vector difference belongs to motion information of the current picture block in a second direction;

encoding the first identifier and the first motion vector difference into a bitstream; and

encoding the second motion vector difference into the bitstream when the value of the first identifier is a second preset value.

13. The method according to claim 12, wherein that a second motion vector difference of the current picture block is determined based on the first motion vector difference comprises: obtaining the second motion vector difference according to the following formula:

$$mvd_lY = -mvd_lX$$

wherein mvd_lY represents the second motion vector difference, and mvd_lX represents the first motion vector difference.

14. The method according to claim 12 or 13, wherein the determining the first motion vector difference of a current picture block comprises:

determining a first motion vector, and obtaining a first predicted motion vector; and

determining the first motion vector difference based on the first motion vector and the first predicted motion vector.

15. The method according to claim 14, wherein the method further comprises:

obtaining a second predicted motion vector;

determining a second motion vector based on the second predicted motion vector and the second motion vector difference; and

determining prediction samples of the current picture block based on the first motion vector and the second motion vector; wherein

the first predicted motion vector and the first motion vector correspond to the first direction, and the second predicted motion vector and the second motion vector correspond to the second direction.

16. The method according to claim 15, wherein the current picture block comprises a first reference frame list in the first direction and a second reference frame list in the second direction, and the determining the prediction samples of the current picture block based on the first motion vector and the second motion vector comprises:

obtaining a reference frame index of the first reference frame list and a reference frame index of the second reference frame list;

determining a first reference picture block based on the reference frame index of the first reference frame list, the first motion vector, and the first reference frame list;

determining a second reference picture block based on the reference frame index of the second reference frame list, the second motion vector, and the second reference frame list; and

determining the prediction samples of the current picture block based on the first reference picture block and the second reference picture block.

17. The method according to any one of claims 12 to 16, wherein before the encoding of the first identifier into a bitstream, the method further comprises: determining that a sequence number of a current frame in which the current picture block is located satisfies a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

18. The method according to any one of claims 12 to 16, wherein before the encoding the first identifier into a bitstream, the method further comprises: determining that a sequence number of a current frame in which the current picture block is located does not satisfy a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

19. A bidirectional inter prediction apparatus, comprising:

an obtaining unit, configured to determine a first motion vector difference of a current picture block;

a determining unit, configured to determine a first identifier, wherein when a value of the first identifier is a first preset value, the first identifier is used to indicate that a second motion vector difference of the current picture block is determined based on the first motion vector difference, wherein the first motion vector difference belongs to motion information of the current picture block in a first direction, and the second motion vector difference belongs to motion information of the current picture block in

a second direction; and

an encoding unit, configured to encode the first identifier and the first motion vector difference into a bitstream, and encode the second motion vector difference into the bitstream when the value of the first identifier is a second preset value.

20. The apparatus according to claim 19, wherein the determining unit is specifically configured to obtain the second motion vector difference according to the following formula:

$$\mathrm{mvd_lY} = -\mathrm{mvd_lX}$$

wherein mvd_lY represents the second motion vector difference, and mvd_lX represents the first motion vector difference.

21. The apparatus according to claim 19 or 20, wherein the obtaining unit is specifically configured to:

determine a first motion vector, and obtain a first predicted motion vector; and

determine the first motion vector difference based on the first motion vector and the first predicted motion vector.

22. The apparatus according to claim 21, wherein the obtaining unit is further configured to: obtain a second predicted motion vector, and determine a second motion vector based on the second predicted motion vector and the second motion vector difference; and

the apparatus further comprises a prediction unit, configured to determine prediction samples of the current picture block based on the first motion vector and the second motion vector; wherein

the first predicted motion vector and the first motion vector correspond to the first direction, and the second predicted motion vector and the second motion vector correspond to the second direction.

23. The apparatus according to claim 22, wherein the current picture block comprises a first reference frame list in the first direction and a second reference frame list in the second direction, and the prediction unit is configured to:

obtain a reference frame index of the first reference frame list and a reference frame index of the second reference frame list;

determine a first reference picture block based on the reference frame index of the first reference frame list, the first motion vector, and the first reference frame list;

determine a second reference picture block based on the reference frame index of the second reference frame list, the second motion vector, and the second reference frame list; and

determine the prediction samples of the current picture block based on the first reference picture block and the second reference picture block.

24. The apparatus according to any one of claims 19 to 23, wherein the apparatus comprises a judging unit, configured to: before the encoding unit encodes the first identifier into the bitstream, determine that a sequence number of a current frame in which the current picture block is located satisfies a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

25. The apparatus according to any one of claims 19 to 24, wherein the apparatus comprises a judging unit, configured to: before the encoding unit encodes the first identifier into the bitstream, determine that a sequence number of a current frame in which the current picture block is located does not satisfy a preset condition, wherein the preset condition comprises a condition that the sequence number of the current frame is between a sequence number of a first reference frame and a sequence number of a second reference frame, the first reference frame belongs to the first reference frame list, and the second reference frame belongs to the second reference frame list.

26. A storage medium, wherein the storage medium comprises the bitstream generated by using the method according to any one of claims 12 to 18 or the bitstream obtained through decoding by using the method according to any one of claims 1 to 6.

27. An image processing apparatus, comprising a processor, a memory, a communications interface, and a bus, wherein the processor is connected to the memory and the communications interface by using the bus;

the memory is configured to store an instruction; and

the processor is configured to execute the instruction, and when the processor executes the instruction stored in the memory, the processor is enabled to perform the encoding method according to any one of claims 12 to 18 or the decoding method according to any one of claims 1 to 6.