CLAIMS

What is claimed is:

1. A picture prediction method, comprising:

determining whether a merge mode is used for a current picture block;

when the merge mode is used for the current picture block, determining whether a level-1 merge mode is available;

when the level-1 merge mode is unavailable, and a high-layer syntax element corresponding to a first merge mode in a level-2 merge mode indicates that the first merge mode is forbidden to be used, determining a second merge mode in the level-2 merge mode as a target merge mode applicable to the current picture block, wherein the level-2 merge mode comprises the first merge mode and the second merge mode; and

predicting the current picture block based on the target merge mode.

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

when the level-1 merge mode is unavailable, and the high-layer syntax element corresponding to the first merge mode in the level-2 merge mode indicates that the first merge mode is allowed to be used, determining the target merge mode based on a high-layer syntax element corresponding to the second merge mode in the level-2 merge mode and/or available status information of the second merge mode, wherein the available status information of the second merge mode is used to indicate whether the second merge mode is used when the current picture block is predicted.

3. The method according to claim 2, wherein the determining the target merge mode based on a high-layer syntax element corresponding to the second merge mode and/or available status information of the second merge mode comprises:

when the high-layer syntax element corresponding to the second merge mode and/or the available status information of the second merge mode indicate/indicates that the second merge mode is forbidden to be used, determining the first merge mode as the target merge mode.

4. The method according to claim 2 or 3, wherein before the determining the target merge mode based on a high-layer syntax element corresponding to the second merge mode and/or available status information of the second merge mode, the method further comprises:

determining that the current picture block meets at least one of the following conditions:

a size of the current picture block meets a preset condition;

a skip mode is not used to predict the current picture block.

5. The method according to claim 4, wherein that a size of the current picture block meets a preset condition comprises:

the current picture block meets the following three conditions:

(cdWidth * cbHeight) ≥ 64;

cbWidth < 128; and

cbHeight < 128, wherein

cdWidth is a width of the current picture block, and cbHeight is a height of the current picture block.

6. The method according to any one of claims 1 to 5, wherein the first merge mode is a triangle partition mode TPM, and the second merge mode is a combined intra and inter prediction CIIP mode.

7. The method according to claim 6, wherein before the determining the target merge mode based on a high-layer syntax element corresponding to the second merge mode and/or available status information of the second merge mode, the method further comprises:

determining that a type of a slice or slice group in which the current picture block is located is B; and

determining that a maximum quantity of candidate TPM modes supported by the slice or slice group in which the current picture block is located is greater than or equal to 2.

8. The method according to claim 1, wherein the first merge mode is a TPM mode, the second merge mode is a CIIP mode, and the method further comprises:

when the level-1 merge mode is unavailable, and a high-layer syntax element corresponding to the TPM mode indicates that the TPM mode is allowed to be used, but the current picture block does not meet at least one of a condition A and a condition B, determining the CIIP mode as the target merge mode, wherein the condition A is that a type of a slice in which the current picture block is located is B, and the condition B is that a maximum quantity of candidate TPM modes supported by the slice or slice group in which the current picture block is located is greater than or equal to 2.

9. The method according to any one of claims 1 to 8, wherein the high-layer syntax element is a syntax element at at least one of a sequence level, a picture level, a slice level, and a slice group level.

10. The method according to any one of claims 1 to 9, wherein the level-1 merge mode comprises a regular merge mode, a merge with motion vector difference MMVD mode, and a subblock merge mode.

11. The method according to claim 1, wherein the method further comprises:

when the level-1 merge mode is unavailable, determining the target merge mode from the level-2 merge mode, wherein the level-2 merge mode comprises a TPM mode and a CIIP mode; and

when the CIIP mode is allowed to be used, and any one of the following conditions is not met, determining the CIIP mode as the target merge mode:

condition D: the TPM mode is allowed to be used;

condition E: a skip mode is not used to predict the current picture block;

condition F: (cbWidth * cbHeight) ≥ 64;

condition G: cbWidth < 128; and

condition H: cbHeight < 128, wherein

cbWidth is of the current picture block is a width of the current picture block, and cbHeight is a height of the current picture block.

12. The method according to any one of claims 1 to 11, wherein the prediction method is applied to an encoder side, to encode the current picture block.

13. The method according to any one of claims 1 to 11, wherein the prediction method is applied to a decoder side, to decode the current picture block.

14. A picture prediction method, comprising:

determining whether a merge mode is used for a current picture block;

when the merge mode is used for the current picture block, determining whether a level-1 merge mode is available;

when the level-1 merge mode is unavailable, determining a target merge mode from the level-2 merge mode, wherein the level-2 merge mode comprises a TPM mode and a CIIP mode; and

when the CIIP mode is allowed to be used, and any one of the following conditions is not met, determining the CIIP mode as the target merge mode:

condition 1: the TPM mode is allowed to be used;

condition 2: a type of a slice or slice group in which the current picture block is located is B;

condition 3: a maximum quantity of candidate TPM modes supported by the slice or the slice

group in which the current picture block is located is determined to be greater than or equal to 2;

condition 4: a size of the current picture block meets a preset condition; and

condition 5: a skip mode is not used to predict the current picture block.

15. The method according to claim 14, wherein the determining a target merge mode from the level-2 merge mode comprises:

when any one of the condition 1 to the condition 5 is not met, setting a value of available status information that indicates an available status of the CIIP mode to a first value, wherein when the value of the available status information that indicates the available status of the CIIP mode is the first value, the CIIP mode is used to perform picture prediction on the current picture block.

16. The method according to claim 14, wherein the determining a target merge mode from the level-2 merge mode comprises:

when all conditions from the condition 1 to the condition 5 are met, determining the target merge mode based on a high-layer syntax element corresponding to the CIIP mode and/or the available status information that indicates the available status of the CIIP mode, wherein the available status information that indicates the available status of the CIIP mode is used to indicate whether the CIIP mode is used when the current picture block is predicted.

17. The method according to claim 16, wherein the determining the target merge mode based on a high-layer syntax element corresponding to the CIIP mode and/or the available status information that indicates the available status of the CIIP mode comprises:

when the high-layer syntax element corresponding to the CIIP mode and/or the available status information that indicates the available status of the CIIP mode indicate/indicates that the CIIP mode is forbidden to be used, determining the TPM mode as the target merge mode.

18. The method according to claim 17, wherein when the high-layer syntax element corresponding to the CIIP mode and/or the available status information that indicates the available status of the CIIP mode indicate/indicates that the CIIP mode is forbidden to be used, the determining the TPM mode as the target merge mode comprises:

when the high-layer syntax element corresponding to the CIIP mode and/or the available status information that indicates the available status of the CIIP mode indicate/indicates that the CIIP mode is forbidden to be used, setting a value of available status information that indicates an available status of the TPM mode to a first value, wherein when the value of the available status information that indicates the available status of the TPM mode is the first value, the TPM mode

is used to perform picture prediction on the current picture block.

19. The method according to any one of claims 14 to 18, wherein the prediction method is applied to an encoder side, to encode the current picture block.

20. The method according to any one of claims 14 to 18, wherein the prediction method is applied to a decoder side, to decode the current picture block.

21. A picture prediction apparatus, wherein the picture prediction apparatus comprises a module configured to perform the method according to any one of claims 1 to 12 or claims 13 to 19.

22. A picture prediction apparatus, comprising:

a memory, configured to store a program; and

a processor, configured to execute the program stored in the memory, wherein when the program stored in the memory is executed by the processor, the processor performs the method according to any one of claims 1 to 13 or claims 14 to 20.

23. An encoding apparatus, wherein the encoding apparatus comprises the picture prediction apparatus according to claim 21 or 22.

24. A decoding apparatus, wherein the decoding apparatus comprises the picture prediction apparatus according to claim 21 or 22.

25. An electronic device, wherein the electronic device comprises the encoding apparatus according to claim 23 and/or the decoding apparatus according to claim 24.

26. A computer-readable storage medium, wherein the computer-readable storage medium stores a computer program that can be executed by a processor, and when the computer program is executed by the processor, the processor performs the method according to any one of claims 1 to 13 or 14 to 20.

27. A storage medium, wherein the storage medium stores a bitstream obtained by using the method according to any one of claims 1 to 13 or claims 14 to 20.

28. A program comprising program code for performing the method according to any one of claims 1 to 13 or claims 14 to 20 when executed on a computer or a processor.

29.A coder comprising processing circuitry for carrying out the method according to any of claims 1-13 or claims 14 to 20.