CLAIMS

1. A decoding method comprises:

obtaining a value of an Enhanced Temporal Motion Vector Prediction (ETMVP) mode flag and an ETMVP mode index value for a current coding unit (CU);

when the value of the ETMVP mode flag is a first value:

determining coordinate information of an initial matching CU of the current CU according to coordinate information of the current CU;

constructing an enhanced temporal candidate list based on the coordinate information of the initial matching CU;

obtaining a corresponding ETMVP mode number from the enhanced temporal candidate list according to the ETMVP mode index value, and determining coordinate information of a target matching CU corresponding to the ETMVP mode number;

determining motion information of the target matching CU according to the coordinate information of the target matching CU, wherein the motion information of the target matching CU comprises motion information of each subblock in the target matching CU, and determining motion information of a subblock at a corresponding position in the current CU according to the motion information of each subblock in the target matching CU;

wherein determining the motion information of the subblock at the corresponding position in the current CU according to the motion information of each subblock in the target matching CU, comprises:

for any subblock in the target matching CU:

when a current picture frame type is P picture:

if forward motion information of the subblock is available, the forward motion information of the subblock is scaled to a first frame of List0, and the scaled forward motion information is given to the subblock at the corresponding position in the current CU.

2. The method according to claim 1, wherein obtaining the value of the ETMVP mode flag for the current CU, comprises:

when the current CU satisfies a first parsing condition, parsing the value of the ETMVP mode flag from a bitstream;

otherwise, determining the value of the ETMVP mode flag as a second value;

wherein, if the value of the ETMVP mode flag is the first value, it indicates that the current CU enables an ETMVP mode;

if the value of the ETMVP mode flag is the second value, it indicates that the current CU disables the ETMVP mode.

3. The method according to claim 2, wherein the current CU satisfies the first parsing condition, comprises one or more of:

a prediction mode of the current CU is skip mode or direct mode;

the current CU has a size satisfying the preset size limit; wherein the current CU has a width and a height which both are greater than or equal to 8;

according to sequence-level high-level syntax, the current CU enables ETMVP techniques;

the current CU satisfies a condition for using Angular Weighted Prediction (AWP) or a condition for using Ultimate Motion Vector Expression (UMVE).

4. The method according to claim 3, wherein,

the current CU satisfies the condition for using AWP, comprising:

according to the sequence-level high-level syntax, the current CU enables AWP techniques;

the current CU has a width and a height which both are greater than or equal to N1 while less than or equal to N2; N1=8，N2=64;

a current picture frame type is B picture;

the current CU satisfies the condition for using UMVE, comprising:

according to the sequence-level high-level syntax, the current CU enables UMVE techniques.

5. The method according to claim 2, wherein the ETMVP mode flag is encoded by Context-based Adaptive Binary Arithmetic Coding (CABAC) with a context model.

6. The method according to claim 1, wherein, obtaining the ETMVP mode index value for the current CU, comprises:

when the current CU satisfies a second parsing condition, parsing the ETMVP mode index value from a bitstream.

7. The method according to claim 6, wherein the current CU satisfies the second parsing condition, comprises one or more of:

a prediction mode of the current CU is skip mode or direct mode;

the current CU enables the ETMVP mode.

8. The method according to claim 7, wherein an inverse binarization of the ETMVP mode index value is realized based on a Truncated Unary with a maximum value of 4, wherein the Truncated Unary uses a bin string of up to 4 bins and each of the bins adopts a separate context model, so there are four context models in total.

9. The method according to claim 1, wherein determining coordinate information of an initial matching CU of the current CU according to coordinate information of the current CU, comprises:

determining a temporal reference picture where the matching CU is located according to the current picture frame type; wherein if the current picture frame type is P picture, the temporal reference picture is in the reference picture list 0, and its reference frame index value is 0; if the current picture frame type is B picture, the temporal reference picture is in the reference picture list 1, and its reference frame index value is 0;

determining the coordinate information of the initial matching CU in the temporal reference picture according to the coordinate information of the current CU;

wherein constructing an enhanced temporal candidate list according to the coordinate information of the initial matching CU, comprises:

constructing the enhanced temporal candidate list according to the coordinate information of the initial matching CU in the temporal reference picture.

10. The method according to claim 9, wherein determining the coordinate information of the initial matching CU in the temporal reference picture according to the coordinate information of the current CU, comprises:

determining the coordinate information of the initial matching CU according to the upper-left corner coordinate of the current LCU, the LCU size, the current picture size, the current CU size, and the upper-left corner coordinate of the current CU in the picture.

11. The method according to claim 10, wherein determining the coordinate information of the initial matching CU according to the upper-left corner coordinate of the current LCU, the LCU size, the current picture size, the current CU size, and the upper-left corner coordinate of the current CU in the picture, comprises:

determining the initial matching CU’s abscissa according to the current LCU's upper-left corner abscissa in the picture, the LCU size, the width of the current CU, the width of the current picture, and the current CU’s upper-left corner abscissa in the picture;

determining the initial matching CU’s ordinate according to the current LCU's upper-left corner ordinate in the picture, the LCU size, the height of the current CU, the height of the current picture, and the current CU’s upper-left corner ordinate in the picture.

12. The method according to claim 1, wherein constructing an enhanced temporal candidate list based on the coordinate information of the initial matching CU, comprises:

determining at least one ETMVP mode number according to the coordinate information of the initial matching CU;

constructing an enhanced temporal candidate list, according to the at least one ETMVP mode number.

13. The method according to claim 12, wherein the coordinate information of the matching CU is the upper-left corner coordinate of the matching CU in the temporal reference picture;

constructing an enhanced temporal candidate list, according to the at least one ETMVP mode number, comprises:

adding the ETMVP mode number 0 to the enhanced temporal candidate list, and increasing the length of the enhanced temporal candidate list by 1;

if My+8 is less than or equal to the smaller values of y_ctb_pos+lcu_size-cu_height and vertical_size-cu_height, and the motion information of position A1 is different from the motion information of position C3 or the motion information of position A2 is different from the motion information of position C4, then adding the ETMVP mode number 1 to the enhanced temporal candidate list, and increasing the length of the enhanced temporal candidate list by 1;

if Mx+8 is less than or equal to the smaller values of x_ctb_pos+lcu_size-cu_width and horizontal_size-cu_width, and the motion information of position A1 is different from the motion information of position B2 or the motion information of position A3 is different from the motion information of position B4, then adding the ETMVP mode number 2 to the enhanced temporal candidate list, and increasing the length of the enhanced temporal candidate list by 1;

if My-8 is greater than or equal to y_ctb_pos, and the motion information of position A3 is different from the motion information of position C1 or the motion information of position A4 is different from the motion information of position C2, then adding the

ETMVP mode number 3 to the enhanced temporal candidate list and increasing the length of the enhanced temporal candidate list by 1;

if Mx-8 is greater than or equal to x_ctb_pos, and the motion information of position A2 is different from the motion information of position B1 or the motion information of position A4 is different from the motion information of position B3, then adding the ETMVP mode number 4 to the enhanced temporal candidate list and increasing the length of the enhanced temporal candidate list by 1;

wherein (Mx, My) is the coordinate information of the initial matching CU, (x_ctb_pos, y_ctb_pos) is the upper-left corner coordinate of the current LCU in the picture, lcu_size is the size of the LCU, the cu_width and cu_height are the width and height of the current CU, and the horizontal_size and vertical_size are the width and height of the current picture, respectively;

A1 is the 4*4 block in the upper-left corner of the initial matching CU, B1 is the 4*4 block directly to the left of A1, and C1 is the 4*4 block directly above A1; A2 is the 4*4 block in the upper-right corner of the initial matching CU, B2 is the 4*4 block directly to the right of A2, and C2 is the 4*4 block directly above A2; A3 is the 4*4 block in the lower-left corner of the initial matching CU, B3 is the 4*4 block directly to the left of A3, and C3 is the 4*4 block directly below A3; A4 is the 4*4 block in the lower-right corner of the initial matching CU, B4 is the 4*4 block directly to the right of A4, and C4 is the 4*4 block directly below A4.

14. The method according to claim 13, wherein constructing an enhanced temporal candidate list based on the coordinate information of the initial matching CU, also comprises:

when the length of the enhanced temporal candidate list is less than 5, performing the following operations in a loop until the length of the enhanced temporal candidate list equals to 5:

adding another number in the enhanced temporal candidate list that is the same as the last ETMVP mode number in the list, and increasing the length of the enhanced temporal candidate list by 1.

15. The method according to claim 1, wherein determining the motion information of the subblock at the corresponding position in the current CU according to the motion information of each subblock in the target matching CU further comprises:

for any subblock in the target matching CU:

when the current picture frame type is B picture:

if the forward motion information and backward motion information of the subblock are available, the forward motion information and backward motion information of the subblock are scaled respectively, pointing to the first frame of List0 and the first frame of List1, and the scaled forward motion information and backward motion information are respectively given to the subblock at the corresponding position in the current CU;

if the forward motion information of the subblock is available, but the backward motion information is unavailable, the forward motion information of the subblock is scaled pointing to the first frame of List0, and the scaled forward motion information is given to the subblock at the corresponding position in the current CU;

if the backward motion information of the subblock is available, but the forward motion information is unavailable, the backward motion information of the subblock is scaled pointing to the first frame of List1, and the scaled backward motion information is given to the subblock at the corresponding position in the current CU.

16. The method according to claim 1, wherein determining the motion information of the subblock at the corresponding position in the current CU according to the motion information of each subblock in the target matching CU further comprises:

for any subblock in the target matching CU:

when the current picture frame type is P picture:

if the forward motion information of the subblock is unavailable, when the forward motion information of the first surrounding block of the current CU is available, the forward motion information of the first surrounding block is scaled to the first frame of List0, and the scaled forward motion information is given to the subblock at the corresponding position in the current CU; when the forward motion information of the first surrounding block is unavailable, the zero motion information is given to the subblock at the corresponding position in the current CU;

when the current picture frame type is B picture:

if neither the forward motion information nor backward motion information of the subblock is available, when both the forward motion information and backward motion information of the first surrounding block of the current CU are available, the forward motion information and backward motion information of the first surrounding block are scaled to the first frame of List0 and the first frame of List1 respectively, and the scaled forward motion information and scaled backward motion information are given to the subblock at the corresponding position in the current CU respectively; when the forward motion information of the first surrounding block is available, but its backward motion information is unavailable, its forward motion information is scaled to the first frame of List0, and the scaled forward motion information is given to the subblock at the corresponding position in the current CU; when the backward motion information of the

first surrounding block is available, but its forward motion information is unavailable, its backward motion information is scaled to the first frame of List1, and the scaled backward motion information is given to the subblock at the corresponding position in the current CU; when neither the forward motion information nor the backward motion information of the first surrounding block is available, the zero motion information is given to the subblock at the corresponding position in the current CU;

wherein the first surrounding block comprises any decoded neighboring block of the current CU.

17. An encoding method comprises:

determining coordinate information of an initial matching coding unit (CU) of a current CU according to coordinate information of the current CU;

constructing an enhanced temporal candidate list based on the coordinate information of the initial matching CU;

determining coordinate information of a target matching CU corresponding to each Enhanced Temporal Motion Vector Prediction (ETMVP) mode number in the enhanced temporal candidate list by going through ETMVP mode numbers in the enhanced temporal candidate list sequentially;

determining motion information of the target matching CU according to the coordinate information of the target matching CU, wherein the motion information of the target matching CU comprises motion information of each subblock in the target matching CU, and determining motion information of a subblock at a corresponding position in the current CU according to the motion information of each subblock in the target matching CU;

performing motion compensation (MC) on each subblock in the current CU according to the motion information of the subblock in the current CU;

calculating a rate-distortion cost of each ETMVP mode, and comparing the rate-distortion cost with respective rate-distortion costs of other prediction modes to select a prediction mode corresponding to a smallest rate-distortion cost; and

recording an ETMVP mode flag and an ETMVP mode index value of the selected prediction modes into a bitstream to be transmitted to a decoding device;

wherein determining the motion information of the subblock at the corresponding position in the current CU according to the motion information of each subblock in the target matching CU, comprises:

for any subblock in the target matching CU:

when a current picture frame type is P picture:

if forward motion information of the subblock is available, the forward motion information of the subblock is scaled to a first frame of List0, and the scaled forward motion information is given to the subblock at the corresponding position in the current CU.

18. A decoding device comprising a processor and a machine-readable storage medium, wherein the machine-readable storage medium stores machine-executable instructions that can be executed by the processor, and the processor is configured to execute the machine-executable instructions to implement the method as described in any one of claims 1-16.

19. An encoding device comprising a processor and a machine-readable storage medium, wherein the machine-readable storage medium stores machine-executable instructions that can be executed by the processor, and the processor is configured to execute the machine-executable instructions to implement the method as described in claim 17.