CLAIMS

What is claimed is:

1. A method for decoding a prediction mode, wherein the method comprises:

acquiring enablement states of one or more to-be-traversed prediction modes, wherein the one or more to-be-traversed prediction modes comprise at least one candidate prediction mode available for predicting a current block other than a current candidate prediction mode;

decoding indication information of the current candidate prediction mode from a code stream in response to determining that a candidate prediction mode being allowed is present in to-be-traversed prediction modes, wherein the indication information is configured to indicate whether to enable the current candidate prediction mode for the current block; and

directly determining that the current candidate prediction mode is enabled for the current block without decoding the indication information of the current candidate prediction mode from the code stream in response to determining that none of the to-be-traversed prediction modes is allowed,

wherein the current candidate prediction mode and the at least one candidate prediction mode of the one or more to-be-traversed prediction modes are all merge modes at least comprising a regular merge mode, a merge mode with motion vector difference, a sub-block motion information based merge mode, a geometric partitioning mode with triangular partition (triangle prediction mode, TPM), or a combined inter-picture merge and intra-picture prediction mode,

wherein acquiring the enablement states of the to-be-traversed prediction modes comprises: determining that none of the to-be-traversed prediction modes is allowed in response to determining that the current block does not meet a mode restriction condition of each candidate prediction mode in the to-be-traversed prediction modes, wherein the mode restriction condition comprises a size restriction condition, a restriction condition of other modes, a frame type restriction condition, and a sequence level switch restriction condition, the enablement states of the to-be-traversed prediction modes referring to whether the candidate prediction mode is allowed for the current block in the to-be-traversed prediction modes, the to-be-traversed prediction modes referring to prediction modes, other than the current candidate prediction mode, of which the enablement condition for the current block has not been determined yet;

the size restriction condition corresponding to the regular merge mode is that an area of the current block is greater than or equal to 32, the restriction condition of other modes is none, the frame type restriction condition corresponding to the regular merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition is none;

the size restriction condition corresponding to the merge mode with motion vector difference is that the area of the current block is greater than or equal to 32, the regular merge mode is disabled, the frame type restriction condition corresponding to the merge mode with motion vector difference is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the merge mode with motion vector difference is that the sequence-level switch of the current block enables the merge mode with motion vector difference;

the size restriction condition corresponding to the subblock-based merge mode is that both the width and height of the current block are greater than or equal to 8, the regular merge mode and the merge mode with motion vector difference are disabled, the frame type restriction condition corresponding to the subblock-

based merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the subblock-based merge mode is that the sequence-level switch of the current block enables the affine merge mode or the SBTMVP mode;

the size restriction condition corresponding to the combined inter and intra prediction merge mode is that the area of the current block is greater than or equal to 64, and both the height and width are less than the size threshold CTU_SIZE, the regular merge mode, the merge mode with motion vector difference and the subblock-based merge mode are disabled, the frame type restriction condition corresponding to the combined inter and intra prediction merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the combined inter and intra prediction merge mode is that the sequence-level switch of the current block enables the combined inter and intra prediction merge mode;

the size restriction condition corresponding to the triangular prediction merge mode is that the area of the current block is greater than or equal to 64, the regular merge mode, the merge mode with motion vector difference, the subblock-based merge mode and the combined inter and intra prediction merge mode are disabled, the frame type restriction condition corresponding to the triangular prediction merge mode is that the current block is a B frame, and the sequence-level switch restriction condition corresponding to the triangular prediction merge mode is that the sequence-level switch of the current block enables the triangular prediction merge mode.

2. The method according to claim 1, wherein

in the case that the current candidate prediction mode is a combined inter-picture merge and intra-picture prediction mode, the method further comprises:

determining that the combined inter-picture merge and intra-picture prediction mode is allowed for the current block, in response to an enabled flag for the combined inter-picture merge and intra-picture prediction mode being in an enabled state, an area of the current block being greater than or equal to 64, and both a height and a width of the current block being less than the size threshold CTU_SIZE; otherwise, determining that the combined inter-picture merge and intra-picture prediction mode is not allowed for the current block;

in the case that the current candidate prediction mode is a combined inter-picture merge and intra-picture prediction mode, the method further comprises:

determining that the combined inter-picture merge and intra-picture prediction mode is disenabled for the current block and setting a value of a mode flag bit of the combined inter-picture merge and intra-picture prediction mode to 0 in response to determining that the combined inter-picture merge and intra-picture prediction mode is not allowed for the current block;

the method further comprises:

determining that the combined inter-picture merge and intra-picture prediction mode is not allowed for the current block, in response to a value of a sequence level enabled flag for the combined inter-picture merge and intra-picture prediction mode being 0, wherein the value of the sequence level enabled flag is present in a sequence parameter set; or

determining that the combined inter-picture merge and intra-picture prediction mode is not allowed for the current block, in response to a height or a width of the current block being equal to or greater than 128.

3. The method according to claim 1, further comprising:

directly setting a value of a mode flag bit of the current candidate prediction mode to 0 without decoding the mode flag bit of the current candidate prediction mode, in response to determining that the current candidate prediction mode is not allowed for the current block.

4. The method according to claim 1, further comprising:

determining that a combined inter-picture merge and intra-picture prediction mode is not allowed for the current block in response to the merge mode enabled for the current block belonging to a skip mode;

determining that a merge mode with motion vector difference is not allowed for the current block, in response to a value of a sequence level enabled flag for the merge mode with motion vector difference being 0, wherein the value of the sequence level enabled flag is present in a sequence parameter set;

determining that a sub-block motion information based merge mode is not allowed for the current block in response to a size of the current block being 4x8 or 8x4.

5. The method according to claim 1, wherein in the case that the current candidate prediction mode is a combined inter-picture merge and intra-picture prediction mode and the to-be-traversed prediction modes comprise a first candidate prediction mode, the method further comprises:

determining whether the combined inter-picture merge and intra-picture prediction mode is allowed for the current block; acquiring an enablement state of the current block for the first candidate prediction mode, in response to determining that the combined inter-picture merge and intra-picture prediction mode is allowed for the current block;

directly determining that the combined inter-picture merge and intra-picture prediction mode is enabled for the current block without decoding flag bit, in response to determining that the first candidate prediction mode is not allowed for the current block, wherein the first candidate prediction mode is configured to predict, based on motion information of the current block, two triangular sub-blocks acquired by dividing the current block according to a preset angle, the preset angle comprising 45º or 135º;

determining that the first candidate prediction mode is not allowed for the current block comprises:

determining that the first candidate prediction mode is not allowed for the current block in response to a value of a sequence level enabled flag for the first candidate prediction mode being 0, wherein the value of the sequence level enabled flag is present in a sequence parameter set; or

determining that the first candidate prediction mode is not allowed for the current block in response to a current frame where the current block is located is a P frame.

6. A method for coding a prediction mode, wherein the method comprises:

acquiring enablement states of to-be-traversed prediction modes, wherein the to-be-traversed prediction modes comprise at least one candidate prediction mode available for predicting a current block other than current candidate prediction mode;

coding indication information of the current candidate prediction mode into a code stream in response to determining that a candidate prediction mode being allowed is present in the to-be-traversed prediction

modes, wherein the indication information is configured to indicate whether to enable the current candidate prediction mode for the current block; and

not coding the indication information of the current candidate prediction mode into the code stream in response to determining that none of the to-be-traversed prediction modes is allowed, wherein the current candidate prediction mode is a merge mode at least comprising a regular merge mode, a merge mode with motion vector difference, a sub-block motion information based merge mode, a geometric partitioning mode with triangular partition (triangle prediction mode, TPM), or a combined inter-picture merge and intra-picture prediction mode;

acquiring the enablement states of the to-be-traversed prediction modes comprises:

determining that none of the to-be-traversed prediction modes is allowed in response to determining that the current block does not meet a mode restriction condition of each candidate prediction mode in the to-be-traversed prediction modes, wherein the mode restriction condition comprises a size restriction condition, a restriction condition of other modes, a frame type restriction condition, and a sequence level switch restriction condition;

determining that the current candidate prediction mode is disenabled for the current block in response to determining that the current candidate prediction mode is not allowed for the current block, wherein the current candidate prediction mode is not allowed for the current block in response determining that the current block does not meet a mode restriction condition of the current candidate prediction mode, wherein the mode restriction condition comprises a size restriction condition, a restriction condition of other modes, a frame type restriction condition, and a sequence level switch restriction condition;

in the case that the current candidate prediction mode is a combined inter-picture merge and intra-picture prediction mode, the method further comprises:

determining that the combined inter-picture merge and intra-picture prediction mode is allowed for the current block in response to an enabled flag for the combined inter-picture merge and intra-picture prediction mode being in an enabled state, an area of the current block being greater than or equal to 64, and both a height and a width of the current block being less than the size threshold CTU_SIZE; and otherwise, determining that the combined inter-picture merge and intra-picture prediction mode is not allowed for the current block, the enablement states of the to-be-traversed prediction modes refer to whether the candidate prediction mode is allowed for the current block in the to-be-traversed prediction modes, the to-be-traversed prediction modes refer to prediction modes, other than the current candidate prediction mode, of which the enablement condition for the current block has not been determined yet;

the size restriction condition corresponding to the regular merge mode is that an area of the current block is greater than or equal to 32, the restriction condition of other modes is none, the frame type restriction condition corresponding to the regular merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition is none;

the size restriction condition corresponding to the merge mode with motion vector difference is that the area of the current block is greater than or equal to 32, the regular merge mode is disabled, the frame type restriction condition corresponding to the merge mode with motion vector difference is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the merge mode with motion vector difference is that the sequence-level switch of the current block enables the merge mode with

motion vector difference;

the size restriction condition corresponding to the subblock-based merge mode is that both the width and height of the current block are greater than or equal to 8, the regular merge mode and the merge mode with motion vector difference are disabled, the frame type restriction condition corresponding to the subblock-based merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the subblock-based merge mode is that the sequence-level switch of the current block enables the affine merge mode or the SBTMVP mode;

the size restriction condition corresponding to the combined inter and intra prediction merge mode is that the area of the current block is greater than or equal to 64, and both the height and width are less than the size threshold CTU_SIZE, the regular merge mode, the merge mode with motion vector difference and the subblock-based merge mode are disabled, the frame type restriction condition corresponding to the combined inter and intra prediction merge mode is that the current block is a non-I frame, and the sequence-level switch restriction condition corresponding to the combined inter and intra prediction merge mode is that the sequence-level switch of the current block enables the combined inter and intra prediction merge mode;

the size restriction condition corresponding to the triangular prediction merge mode is that the area of the current block is greater than or equal to 64, the regular merge mode, the merge mode with motion vector difference, the subblock-based merge mode and the combined inter and intra prediction merge mode are disabled, the frame type restriction condition corresponding to the triangular prediction merge mode is that the current block is a B frame, and the sequence-level switch restriction condition corresponding to the triangular prediction merge mode is that the sequence-level switch of the current block enables the triangular prediction merge mode.

7. A decoding apparatus, the decoding apparatus is configured to perform the method for decoding the prediction mode as defined in any one of claims 1 to 5.

8. A coding apparatus, the coding apparatus is configured to perform the method for coding the prediction mode as defined in claim 6.

9. A decoding device, comprising:
a decoding apparatus as defined in claim 7; and
a memory configured to store one or more instructions executable by the decoding.

10. A coding device, comprising:
a coding apparatus as defined in claim 8; and
a memory configured to store one or more instructions executable by the coding apparatus.

11. A non-transitory computer-readable storage medium storing one or more instructions, wherein the one or more instructions, when loaded and executed by a processor of an electronic device, cause the electronic device to perform the method for decoding the prediction mode as defined in any one of claims 1 to 5 or the method for coding the prediction mode as defined in claim 6.