Motion Model Signaling

[0001]

TECHNICAL FIELD

[0002] The disclosed embodiments relate to video coding in general and motion model signaling in particular.

BACKGROUND

[0003] Videos use a relatively large amount of data, so communication of videos uses a relatively large amount of bandwidth. However, many networks operate at or near their bandwidth capacities. In addition, customers demand high video quality, which requires using even more data. There is therefore a desire to both reduce the amount of data videos use and improve video quality. One solution is to compress videos during an encoding process and decompress the videos during a decoding process.

SUMMARY

[0004] A first aspect relates to a method of determining one or more candidate prediction modes, the method comprising deriving, by a processor, a first indicator by parsing a bitstream, wherein the first indicator specifies whether any affine model is a candidate motion model for an image block in a preset area; determining, by the processor, that the first indicator is set to 1; deriving, by the processor and based on the determination that the first indicator is set to 1, a second indicator by parsing the bitstream, wherein the second indicator specifies whether a 6-parameter affine model is a candidate motion model for the image block; and determining, by the processor, one or more candidate prediction modes for the image block based on the first indicator and the second indicator. The method provides for more efficient coding of affine models and for coding of the translation model.

[0088] FIG. 17 is a schematic diagram of an apparatus according to an embodiment of the disclosure.

[0089] FIG. 18 is a schematic diagram of a coding means.

DETAILED DESCRIPTION

[0090] It should be understood at the outset that, although an illustrative implementation of one or more embodiments are provided below, the disclosed systems and/or methods may be implemented using any number of techniques, whether currently known or in existence. The disclosure should in no way be limited to the illustrative implementations, drawings, and techniques illustrated below, including the exemplary designs and implementations illustrated and described herein, but may be modified within the scope of the appended claims along with their full scope of equivalents.

[0091] The following abbreviations apply:

ASIC: application-specific integrated circuit

CPU: central processing unit

DSP: digital signal processor

EO: electrical-to-optical

FPGA: field-programmable gate array

Idc: indicator

MVD: motion vector difference

OE: optical-to-electrical

PPS: picture parameter set

RAM: random-access memory

RBSP: raw byte sequence payload

RF: radio frequency

ROM: read-only memory

RX: receiver unit

SPS: sequence parameter set

SRAM: static RAM

TCAM: ternary content-addressable memory

TX: transmitter unit

VPS: video parameter set.

[0092] FIG. 1 is a schematic diagram of a coding system 100. The coding system 100 comprises a source device 110, a medium 150, and a destination device 160. The source device 110 and the destination device 160 are mobile phones, tablet computers, desktop

deriving the second indicator. 3. The method of any of claims 1-2, further comprising deriving, in response to an affine model being allowed to be the candidate motion model, a sixth indicator by parsing a picture/tile/tile group header of a group of image blocks in the sequence, wherein the sixth indicator specifies whether any affine model is allowed to be a candidate motion model for an image block in the group. 4. The method of any of claims 1-3, further comprising deriving, in response to the 6-parameter affine model being allowed to be the candidate motion model, a seventh indicator by parsing a picture / tile /tile group header of a group of image blocks in the sequence, wherein the seventh indicator specifies whether the 6-parameter affine model is a candidate prediction model for the image block in the group. 5. The method of any of claims 1-4, wherein the first indicator and/or second indicator is carried in a picture header of a group of image blocks. 6. The method of any of claims 1-5, further comprising deriving, in response to an affine model being allowed to be the candidate motion model, a third indicator by parsing the bitstream, wherein the third indicator specifies whether a prediction mode of the image block is an affine merge mode. 7. The method of any of claims 1-6, wherein, in response to an affine model being allowed to be the candidate motion model, the method further comprises: deriving a fourth indicator by parsing the bitstream; determining, in response to the fourth indicator being a second value, that a prediction mode of the image block is not an affine inter mode; and determining, in response to the fourth indicator being a first value, that the prediction mode is an affine inter mode, wherein the affine inter mode is a 6-parameter affine model mode or a 4-parameter affine model mode in response to the second indicator being a first value, or the affine inter mode is a 4-parameter affine model mode in response to the second indicator being a second value. 8. The method of any of claims 1-7, in response to the prediction mode being the affine inter mode and the second indicator indicates that the 6-parameter affine model is allowed to be a candidate motion model for the image block, the method further comprises: deriving a fifth indicator by parsing the bitstream; determining, in response to the fifth indicator being a first value, that the prediction mode is the 6-parameter affine model mode; and determining, in response to the fifth indicator being a second value, that the prediction mode is the 4-parameter affine model mode. 9. The method of any of claims 1-8, further comprising deriving, in response to a sum value being greater than 0, a first set of MVD information by parsing the bitstream, wherein the sum value is a sum of the value of the fourth indicator and the value of fifth indicator. 10. The method of any of claims 1-9, further comprising deriving, in response to the sum value being greater than 1, a second set of MVD information by parsing the bitstream, wherein the sum value is a sum of the value of the

CLAIMS

What is claimed is:

1. A method of determining one or more candidate prediction modes, the method comprising:

deriving, by a processor, a first indicator by parsing a bitstream, wherein the first indicator specifies whether any affine model is allowed to be a candidate motion model for an image block in a preset area;

deriving, by the processor, a second indicator by parsing the bitstream when the first indicator is equal to a first value which indicates an affine model is allowed to be a candidate motion model, wherein the second indicator specifies whether a 6-parameter affine model is allowed to be a candidate motion model for the image block in the preset area; and

determining, by the processor, one or more candidate prediction modes for the image block based on the first indicator and the second indicator.

2. The method of claim 1, wherein deriving the first indicator comprises parsing a sequence parameter set (SPS) of a sequence of the bitstream, wherein the preset area comprises the sequence, and wherein the deriving the second indicator comprises parsing the SPS for deriving the second indicator.

3. The method of any of claims 1-2, wherein the first indicator and/or second indicator is carried in a SPS raw byte sequence payload (RBSP).

4. The method of any of claims 1-3, further comprising deriving, in response to an affine model being allowed to be the candidate motion model, a third indicator by parsing the bitstream, wherein the third indicator specifies whether a prediction mode of the image block is an affine merge mode.

5. The method of any of claims 1-4, wherein, in response to an affine model being allowed to be the candidate motion model, the method further comprises:

deriving a fourth indicator by parsing the bitstream;

determining, in response to the fourth indicator being a second value, that a prediction mode of the image block is not an affine inter mode; and

determining, in response to the fourth indicator being a first value, that the prediction mode is an affine inter mode,

wherein the affine inter mode is a 6-parameter affine model mode or a 4-parameter affine model mode in response to the second indicator being a first value, or the affine inter mode is a 4-parameter affine model mode in response to the second indicator being a second value.

6. The method of any of claims 1-5, in response to the prediction mode being the affine inter mode and the second indicator indicates that the 6-parameter affine model is allowed to be a candidate motion model for the image block, the method further comprises:

deriving a fifth indicator by parsing the bitstream;

determining, in response to the fifth indicator being a first value, that the prediction mode is the 6-parameter affine model mode; and

determining, in response to the fifth indicator being a second value, that the prediction mode is the 4-parameter affine model mode.

7. The method of claim 6, further comprising deriving, in response to a sum value being greater than 0, a first set of motion vector difference (MVD) information by parsing the bitstream, wherein the sum value is a sum of the value of the fourth indicator and the value of fifth indicator.

8. The method of claim 6, further comprising deriving, in response to the sum value being greater than 1, a second set of MVD information by parsing the bitstream, wherein the sum value is a sum of the value of the fourth indicator and the value of fifth indicator.

9. An apparatus for determining one or more candidate prediction modes, the apparatus comprising:

a memory; and

a processor coupled to the memory and configured to perform any of claims 1-8.

10. A method implemented by a video encoder and comprising:

determining a second value for an affine inter flag;

encoding the second value for the affine inter flag into a bitstream;

determining a third value for an affine type flag;

encoding the third value for the affine type flag into the bitstream; and

determining a first value for a motion model indicator variable that specifies a motion model used to generate prediction samples of a current coding unit, wherein the motion model

is one of a translational model, a 4-parameter affine model, or a 6-parameter affine model, and the first value for the motion model indicator variable is determined by the sum of the second value for the affine inter flag and the third value for the affine type flag.

11. An encoding apparatus comprising:

a memory; and

a processor coupled to the memory and configured to perform claim 10.

12. A method implemented by a video decoder and comprising:

receiving a bitstream comprising an affine inter flag and an affine type flag;

determining, based on a first value of the affine inter flag and a second value of the affine type flag, a third value of a motion model indicator variable; and

determining, based on the third value, whether a motion model is a translational model, a 4-parameter affine model, or a 6-parameter affine model.

13. The method of claim 12, wherein the determining, based on a first value of the affine inter flag and a second value of the affine type flag, a third value of a motion model indicator variable comprises:

determining, based on the sum of the first value of the affine inter flag and the second value of the affine type flag, the third value of a motion model indicator variable.

14. A decoding apparatus comprising:

a memory; and

a processor coupled to the memory and configured to perform claim 12 or 13.

15. A computer program product comprising computer-executable instructions stored on a non-transitory medium that when executed by a processor cause an apparatus to perform any one of claims 1 to 8, 10, 12 and 13.