ADAPTIVE CONTROL POINT SELECTION FOR AFFINE MOTION MODEL BASED VIDEO CODING

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent Application Nos. 62/691,770 filed on June 29, 2018, 62/734,728 filed on September 21, 2018, and 62/778,055 filed on December 11, 2018, the contents of which are hereby incorporated by reference herein.

BACKGROUND

[0002] Video coding systems may be used to compress digital video signals, e.g., to reduce the storage and/or transmission bandwidth needed for such signals. Video coding systems may include block-based, wavelet-based, and/or object-based systems. A block-based hybrid video coding system may be deployed. In a block-based video coding system, motion vectors associated with a sub-block of a video block may have values that may be out of a certain range. Using such values may result in unintended consequences.

SUMMARY

[0002A] According to a first aspect of the present disclosure, there is provided a method implemented by a video coding device for performing video coding, the method comprising:

determining that affine mode is enabled for a current video block, wherein the current video block comprises a plurality of sub-blocks;

determining a plurality of control point affine motion vectors associated with the video block;

deriving a sub-block motion vector associated with a sub-block of the plurality of sub-blocks based on at least one of the plurality of control point affine motion vectors;

clipping the sub-block motion vector based on a motion field range; and

predicting the sub-block using the clipped sub-block motion vector, wherein predicting the sub-block comprises using the clipped sub-block motion vector for motion compensation.

[0002B] According to a second aspect of the present disclosure, there is provided a video coding device comprising:

a processor configured to at least:

determine that affine mode is enabled for a current video block, wherein the current video block comprises a plurality of sub-blocks;

determine a plurality of control point affine motion vectors associated with the video block;

derive a sub-block motion vector associated with a sub-block of the plurality of sub-blocks based on at least one of the plurality of control point affine motion vectors;

clip the sub-block motion vector based on a motion field range; and

predict the sub-block using the clipped sub-block motion vector, wherein predicting the sub-block comprises using the clipped sub-block motion vector for motion compensation.

[0003] In some embodiments, ~~S~~systems, methods, and instrumentalities are disclosed for motion vector clipping when affine motion mode is enabled for a video block (e.g., a coding unit (CU)). A video coding device may determine that an affine mode for a video block (e.g., a current video block) is enabled. The video block may include a plurality of sub-blocks. The video coding device may determine a plurality of control point affine motion vectors associated with the video block. At least one of the control point affine motion vectors associated with the current video block may be determined using one or more control point affine motion vectors associated with one or more neighboring video blocks. The video coding device may clip the control point affine motion vectors associated with the current video block. For example, the control point affine motion vectors may be clipped based on a bit depth used for motion field storage. The video coding device may