

CLAIMS

1. A method performed by at least one processor to decode a sub-bitstream of a coded video stream, the coded video stream including a coded version of a first sub-picture and a second sub-picture of a picture, the method comprising:

receiving the sub-bitstream; and

decoding the first sub-picture of the picture, independently from the second sub-picture, using sub-picture, tile group, and tile partitioning, wherein

(i) the first sub-picture is a first rectangular region of the picture and the second sub-picture is a second rectangular region of the picture, the second rectangular region being different from the first rectangular region,

(ii) the first sub-picture includes a first plurality of tiles, and the second sub-picture includes at least one tile,

(iii) the first sub-picture and the second sub-picture do not share a common tile,

(iv) the first plurality of tiles of the first sub-picture are grouped into at least two first tile groups, and

(v) the first sub-picture is decoded in accordance with a decoding technology wherein loop filtering control at a boundary between the at least two first tile groups is only allowed where each of the at least two first tile groups is rectangular.

2. The method of claim 1, further comprising:

decoding the second sub-picture of the picture, independently from the first sub-picture, using the sub-picture, tile group, and tile partitioning, wherein

the at least one tile of the second sub-picture is a second plurality of tiles.

3. The method of claim 2, wherein

the decoding of the first sub-picture is performed with a different tile scan order than the decoding of the second sub-picture.

4. The method of claim 2, wherein

the decoding of the first sub-picture and the decoding of the second sub-picture is performed using the sub-picture, tile group, and tile partitioning, wherein:

the second plurality of tiles of the second sub-picture are grouped into at least one second tile group, and

no tiles of the at least two first tile groups are located in the at least one second tile group.

5. The method of claim 4, wherein one of the at least two first tile groups is a non-rectangular tile group.

6. The method of claim 1, wherein

the receiving the sub-bitstream includes receiving the coded video stream, the coded video stream including a sequence parameter set (SPS) that includes information on how to partition sub-pictures of the picture, including the first sub-picture and the second sub-picture with their respective identifiers.

7. The method of claim 6, wherein

the coded video stream received includes a picture parameter set (PPS) that includes information on how to partition, arrange, or relocate tiles of the picture, including the at least one tile of the first sub-picture and the at least one tile of the second sub-picture.

8. The method of claim 7, wherein

the coded video stream received includes an active parameter set (APS) that signals adaptive loop filter (ALF) coefficients of the first sub-picture.

9. A decoder for decoding a sub-bitstream of a coded video stream, the coded video stream including a coded version of a first sub-picture and a second sub-picture of a picture, the decoder comprising:

memory configured to store computer program code; and

at least one processor configured to receive the sub-bitstream, access the computer program code, and operate as instructed by the computer program code, the computer program code including:

decoding code configured to cause the at least one processor to perform the method of any one of claims 1 to 8.

10. A non-transitory computer-readable medium storing computer instructions that, when executed by at least one processor, cause the at least one processor to perform the method of any one of claims 1 to 8.