Amended Set of Claims 1 to 33

1. A method of encoding video data, the method comprising:

signaling, in a bitstream, a syntax element that indicates that wavefront parallel processing (WPP) is used to encode a picture of a sequence of video pictures, wherein when the syntax element indicates that WPP is used to encode the picture, each coding tree block (CTB) row of the picture forms a single tile;

performing WPP to generate a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one of the CTB rows, wherein none of the sub-streams contains coded bits of more than one; and

generating a coded slice network abstraction layer (NAL) unit that includes the plurality of sub-streams.

2. The method of claim 1, wherein generating the coded slice NAL unit comprises generating a slice header of the coded slice NAL unit and slice data of the coded slice NAL unit, the slice data including the sub-streams, the slice header including a plurality of offset syntax elements from which entry points of the sub-streams are determinable.

3. The method of claim 2, wherein the syntax element is a first syntax element and the slice header includes a second syntax element and a third syntax element, the number of offset syntax elements in the plurality of offset syntax elements is determinable based on the second syntax element, and a length, in bits, of each of the offset syntax elements is determinable based on the third syntax element.

4. The method of claim 1, wherein signaling that WPP is used to encode the picture comprises generating a picture parameter set (PPS) that includes the syntax element that indicates that WPP is used to encode the picture.

5. The method of claim 1, wherein signaling that WPP is used to encode the picture comprises generating a sequence parameter set (SPS) that includes the syntax element that indicates that WPP is used to encode the picture.

Duration: 07.04.2014 23:15:40 - 07.04.2014 23:19:57. This page 17 of
Received at the EPO on Apr 07, 2014 23:19:57. Page 17 of 24

6. The method of claim 1, wherein performing WPP to generate the plurality of sub-streams comprises:

in response to determining that a first CTB is separated from a left boundary of the picture by a single CTB, storing context variables associated with the first CTB; and

entropy encoding, based at least in part on the context variables associated with the first CTB, one or more syntax elements of a second CTB, the second CTB being adjacent to the left boundary of the picture and one row of CTBs lower than the first CTB.

7. The method of claim 1, wherein the method is performed by a mobile computing device.

8. A computing device that comprises one or more processors configured to:

signal, in a bitstream, a syntax element that indicates that wavefront parallel processing (WPP) is used to encode a picture of a sequence of video pictures, wherein when the syntax element indicates that WPP is used to encode the picture, each coding tree block (CTB) row of the picture forms a single tile;

perform WPP to generate a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one of the CTB rows, wherein none of the sub-streams contains coded bits of more than one tile; and

generate a coded slice network abstraction layer (NAL) unit that includes the plurality of sub-streams.

9. The computing device of claim 8, wherein generating the coded slice NAL unit comprises generating a slice header of the coded slice NAL unit and slice data of the coded slice NAL unit, the slice data including the sub-streams, the slice header including a plurality of offset syntax elements from which entry points of the sub-streams are determinable.

10. The computing device of claim 9, wherein the syntax element is a first syntax element and the slice header further includes a second syntax element and a third syntax element, the number of offset syntax elements in the plurality of offset syntax elements is determinable based on the second syntax element, and a length, in bits, of each of the offset syntax elements is determinable based on the third syntax element.

11. The computing device of claim 8, wherein the one or more processors are configured to generate a picture parameter set (PPS) that includes the syntax element that indicates that WPP is used to encode the picture.

12. The computing device of claim 8, wherein the one or more processors are configured to generate a sequence parameter set (SPS) that includes the syntax element that indicates that WPP is used to encode the picture.

13. The computing device of claim 8, wherein the one or more processors are configured to:

store, in response to determining that a first CTB is separated from a left boundary of the picture by a single CTB, context variables associated with the first CTB; and

entropy encode, based at least in part on the context variables associated with the first CTB, one or more syntax elements of a second CTB, the second CTB being adjacent to the left boundary of the picture and one row of CTBs lower than the first CTB.

14. The computing device of claim 8, wherein the computing device is a mobile computing device.

15. A computing device that comprises:

means for signaling, in a bitstream, a syntax element that indicates that wavefront parallel processing (WPP) is used to encode a picture, wherein when the syntax element indicates that WPP is used to encode the picture, each coding tree block (CTB) row of the picture forms a single tile;

means for performing WPP to generate a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one of the CTB rows, wherein none of the sub-streams contains coded bits of more than one tile; and

means for generating a coded slice network abstraction layer (NAL) unit that includes the plurality of sub-streams.

16. A computer-readable storage medium that stores instructions that, when executed by one or more processors of a computing device, configure the computing device to:

signal, in a bitstream, a syntax element that indicates that wavefront parallel processing (WPP) is used to encode a picture, wherein when the syntax element indicates that WPP is used to encode the picture, each coding tree block (CTB) row of the picture forms a single tile;

perform WPP to generate a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one of the CTB rows, wherein none of the sub-streams contains coded bits of more than one tile; and

generate a coded slice network abstraction layer (NAL) unit that includes the plurality of sub-streams.

17. A method of decoding video data, the method comprising:

receiving a bitstream that includes a coded slice network abstraction layer (NAL) unit, the coded slice NAL unit including a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one row of coding tree blocks (CTBs) in a slice of a picture;

determining, based on a syntax element in the bitstream, that the slice is encoded using wavefront parallel processing (WPP), wherein when the syntax element indicates that WPP is used to encode the picture, each CTB row of the picture forms a single tile and none of the sub-streams contains coded bits of more than one tile; and

decoding the slice using WPP.

18. The method of claim 17, wherein the coded slice NAL unit includes a slice header and slice data, and the method further comprises determining, based at least in part on the syntax element that indicates that the slice is encoded using WPP, that the coded slice NAL unit includes a plurality of offset syntax elements that indicate positions within the slice data of the sub-streams.

19. The method of claim 18, wherein the syntax element is a first syntax element and the slice header includes a second syntax element and a third syntax element and the method further comprises:

determining, based on the second syntax element, how many offset syntax elements are in the plurality of offset syntax elements;

determining, based on the third syntax element, a length, in bits, of the offset syntax elements; and

parsing, based at least in part on how many offset syntax elements are in the plurality of offset syntax elements and the length, in bits, of the offset syntax elements, the offset syntax elements from the bitstream.

20. The method of claim 18, further comprising, determining, based at least in part on the offset syntax elements, positions in memory of the sub-streams.

21. The method of claim 17, wherein the bitstream includes a picture parameter set (PPS) that includes the syntax element that indicates that WPP is used to encode the picture.

22. The method of claim 17, wherein the bitstream includes a sequence parameter set (SPS) that includes the syntax element that indicates that WPP is used to encode the picture.

23. The method of claim 17, wherein decoding the slice using WPP comprises:

in response to determining that a first CTB is separated from a left boundary of the picture by a single CTB, storing context variables associated with the first CTB; and

entropy decoding, based at least in part on the context variables associated with the first CTB, one or more syntax elements of a second CTB, the second CTB being adjacent to the left boundary of the picture and one row of CTBs lower than the first CTB.

24. The method of claim 17, wherein the method is performed by a mobile computing device.

25. A computing device that comprises one or more processors configured to:

receive a bitstream that includes a coded slice network abstraction layer (NAL) unit, the coded slice NAL unit including a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one row of coding tree blocks (CTBs) in a slice of a picture;

determine, based on one or more syntax elements in the bitstream, that the slice is encoded using wavefront parallel processing (WPP), wherein when the syntax element indicates that WPP is used to encode the picture, each CTB row of the picture forms a single tile and none of the sub-streams contains coded bits of more than one tile; and

decode the slice using WPP.

26. The computing device of claim 25, wherein the coded slice NAL unit includes a slice header and slice data, and the one or more processors are further configured to determine, based at least in part on the syntax element that indicates that the slice is encoded using WPP, that the coded slice NAL unit includes a plurality of offset syntax elements that indicate positions within the slice data of the sub-streams.

27. The computing device of claim 26, wherein the syntax element is a first syntax element and the slice header includes a second syntax element and a third syntax element, the second syntax element indicating how many offset syntax elements are in the plurality of offset syntax elements, the third syntax element indicating a length, in bits, of the offset syntax elements; and

the one or more processors are configured to parse, based at least in part on the second and third syntax elements, the offset syntax elements from the bitstream.

28. The computing device of claim 25, wherein the bitstream includes a picture parameter set (PPS) that includes the syntax element that indicates that WPP is used to encode the picture.

29. The computing device of claim 25, wherein the bitstream includes a sequence parameter set (SPS that includes the syntax element that indicates that WPP is used to encode the picture.

Duration: 07.04.2014 23:15:40 - 07.04.2014 23:19:57. This page 22 of
Received at the EPO on Apr 07, 2014 23:19:57. Page 22 of 24

30. The computing device of claim 25, wherein one or more processors are configured to:

store, in response to determining that a first CTB is separated from a left boundary of the picture by a single CTB, context variables associated with the first CTB; and

entropy decode, based at least in part on the context variables associated with the first CTB, one or more syntax elements of a second CTB, the second CTB being adjacent to the left boundary of the picture and one row of CTBs lower than the first CTB.

31. The computing device of claim 25, wherein the computing device is a mobile computing device.

32. A computing device that comprises:

means for receiving a bitstream that includes a coded slice network abstraction layer (NAL) unit, the coded slice NAL unit including a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one row of coding tree blocks (CTBs) in a slice of a picture;

means for determining, based on one or more syntax elements in the bitstream, that the slice is encoded using wavefront parallel processing (WPP), wherein when the syntax element indicates that WPP is used to encode the picture, each CTB row of the picture forms a single tile and none of the sub-streams contains coded bits of more than one tile; and

means for decoding the slice using WPP.

33. A computer-readable storage medium that stores instructions that, when executed by one or more processors of a computing device, configure the computing device to:

receive a bitstream that includes a coded slice NAL unit, the coded slice network abstraction layer (NAL) unit including a plurality of sub-streams, each of the sub-streams including a consecutive series of bits that represents one row of coding tree blocks (CTBs) in a slice of a picture;

determine, based on one or more syntax elements in the bitstream, that the slice is encoded using wavefront parallel processing (WPP), wherein when the syntax element indicates that WPP is used to encode the picture, each CTB row of the picture forms a single tile and none of the sub-streams contains coded bits of more than one tile; and

decode the slice using WPP.

Duration: 07.04.2014 23:15:40 - 07.04.2014 23:19:57. This page 24 of
Received at the EPO on Apr 07, 2014 23:19:57. Page 24 of 24

CLAIMS

1. An invention not claimed in any divisional application.