Claims

1. A method for decoding a bitstream encoded using Versatile Video Coding (VVC), the method comprising:

determining a bit depth of samples of a picture based on Sequence Parameter Set (SPS) syntax element sps_bitdepth_minus8, wherein a value of the SPS syntax element sps_bitdepth_minus8 is in a range of 0 to 8;

determining a size of a decoded picture buffer (DPB) based on a Video Parameter Set (VPS) syntax element vps_ols_dpb_bitdepth_minus8**,** wherein a value of the VPS syntax element vps_ols_dpb_bitdepth_minus8 is in a range of 0 to 8;

allocating a storage space with the determined size of the DPB;

obtaining and storing a decoded picture in the DPB by decoding the bitstream based on the determined bit depth; and

outputting the decoded picture,

wherein decoding the bitstream based on the determined bit depth comprises:

accessing a binary string representing a partition of the picture, the partition comprising a plurality of coding tree units (CTUs) forming one or more CTU rows;

for each CTU of the plurality of CTUs in the partition,

prior to decoding the CTU, determining that parallel coding is allowed and that the CTU is the first CTU of a current CTU row among the one or more CTU rows in the partition;

in response to determining that the parallel coding is allowed and that the CTU is the first CTU of the current CTU row in the partition,

setting a history counter for a color component for calculating Rice parameters to an initial value based on the determined bit depth;

decoding the CTU, comprising:

calculating the Rice parameters for transform units (TUs) in the CTU based on the history counter;

decoding the binary string corresponding to the TUs in the CTU into coefficient values of the TUs based on the calculated Rice parameters; and

determining pixel values for the TUs in the CTU from the coefficient values; and

outputting a decoded partition of the picture comprising the decoded plurality of CTUs in the partition.

2. The method of claim 1, wherein obtaining and storing the decoded picture in the DPB by decoding the bitstream comprises:

obtaining and storing a first set of pictures in the DPB by decoding a first portion of the bitstream; and

decoding a second portion of the bitstream into a second set of pictures by using the first set of pictures in the DPB as reference pictures.

3. The method of claim 1, further comprising:

reordering one or more decoded pictures in the DPB according to an output order; and

outputting the one or more decoded pictures according to the output order.

4. The method of claim 1, further comprising:

holding one or more decoded pictures in the DPB for a period of time; and

outputting the one or more decoded pictures after the period of time has passed.

5. A method for encoding using Versatile Video Coding (VVC), the method comprising:

determining a bit depth of samples of a picture to be encoded;

determining a value of a Sequence Parameter Set (SPS) syntax element sps_bitdepth_minus8, wherein the value of the SPS syntax element sps_bitdepth_minus8 is in a range of 0 to 8, and encoding the value of the SPS syntax element sps_bitdepth_minus8 into a bitstream;

determining a value of a Video Parameter Set (VPS) syntax element vps_ols_dpb_bitdepth_minus8, wherein the value of the VPS syntax element vps_ols_dpb_bitdepth_minus8 is in a range of 0 to 8, and encoding the value of the VPS syntax element vps_ols_dpb_bitdepth_minus8 into the bitstream;

determining a size of a decoded picture buffer (DPB) based on the VPS syntax element vps_ols_dpb_bitdepth_minus8;

allocating a storage space with the determined size of the DPB;

obtaining and storing a picture in the DPB; and

encoding the picture based on the determined bit depth,

wherein encoding the picture based on the determined bit depth comprises:

performing a partition of the picture, wherein the partition comprising a plurality of coding tree units (CTUs) forming one or more CTU rows;

for each CTU of the plurality of CTUs in the partition,

prior to encoding the CTU, determining that parallel coding is allowed and that the CTU is the first CTU of a current CTU row among the one or more CTU rows in the partition;

in response to determining that the parallel coding is allowed and that the CTU is the first CTU of the current CTU row in the partition,

setting a history counter for a color component for calculating Rice parameters to an initial value based on the determined bit depth;

encoding the CTU, comprising:

calculating the Rice parameters for transform units (TUs) in the CTU based on the history counter;

encoding coefficient values corresponding to the TUs in the CTU into a binary string based on the calculated Rice parameters; and

signalling the binary string of the TUs in the CTU into the bitstream.

6. The method of claim 5, wherein obtaining and storing the picture in the DPB (130) comprises:

obtaining and storing a first set of pictures in the DPB (130);

encoding the first set of pictures into a first portion of the bitstream; and

encoding a second set of pictures into a second portion of the bitstream by using the first set of pictures in the DPB (130) as reference pictures.

7. A non-transitory computer-readable medium storing a bitstream and a computer program which, when executed by a processor, causes the processor to execute the method of claim 5 or 6 to generate the bitstream.