

[00341] A size of a block 2065 inside the image boundary 2035, the block 2065 being generated by performing binary splitting on the current block 2055 based on the third split boundary 2060, is 16x32, and the image decoding apparatus 100 may additionally perform binary splitting on the block 2065. Therefore, unlike FIG. 20A, a size of a block determined as a coding unit may be small, and decoding efficiency may be relatively increased.

[00342] When the image decoding apparatus 100 determines a size of the current block 2000 or 2030 to be 128x128, determines an allowable split type of the current block 2000 or 2030 to be binary split, and determines an allowable split depth of the current block 2000 or 2030 to be 3, a method of splitting the current block 2000 or 2030 at a picture boundary is described above with reference to FIGS. 20A and 20B, but the disclosure is not limited thereto, and a current block located at a picture boundary may be split according to pseudocode.

[00343] [Pseudocode]

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bottom_boundary // indication of whether current block is bottom
                 boundary of picture (0 when located at boundary 0, 1
                 when not located)
right_boundary // indication of whether current block is right boundary of
                picture (0 when located at boundary 0, 1 when not
                located)
max_bt_size // maximum block size allowing binary-tree (and triple-tree)
min_bt_size // minimum block size
bt_depth // allowed binary-tree (and triple-tree) depth
wGth // width of current block
height // height of current block
abs(v) // indication of absolute value of v
log2(v) // value of log where base number of v is 2
            (part for checking whether binary-tree is allowed)
    = width > max_bt_size || height > max_bt_size ||
            (part for checking whether minimum block size is obtainable
            when allowed binary-tree is applied)
            abs(log2(width) - log2(min_bt_size)) > max_bt_depth ||
            abs(log2(height) - log2(min_bt_size)) > max_bt_size
if (!bottom_boundary || !right_boundary) && flag) (here abs() is
                                                    omissible)
split by using quad-tree (user-set particular size may be used, instead
                        of min_bt_size)
else if (!bottom_boundary)
    split by using binary-tree in horizontal direction
else if (!right_boundary)
    split by using binary-tree in vertical direction
else
    explicit determination of split mode

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[00344] For example, in a case where the image decoding apparatus 100 that follows pseudocode above recursively performs splitting based on an allowed split depth according to binary split with respect to a greater value of a height or a width of a current block, when a corresponding side becomes a particular size (or smaller) (here, the particular size may be a minimum block size, or a size that is set by a user), the image decoding apparatus 100 may recursively split (split based on a

binary tree) the current block according to binary split. Except for the aforementioned case, the image decoding apparatus 100 may split the current block according to quad split. In detail, in a case where an allowed binary split depth (bt_depth) is 3, only when a greater value from among a height and a width of the current block is equal to or smaller than a minimum size(min_bt_size)x2x2x2 (i.e., a minimum size x 8), the current block may be recursively split according to binary split.

[00345] With reference to FIGS. 20A and 20B, a method by which the image decoding apparatus 100 performs binary splitting or quad splitting, in consideration of a binary split depth, is described, but the disclosure is not limited thereto, and thus, one of ordinary skill in the art can easily understand that the image decoding apparatus 100 may binary split, tri split, or quad split a current block based on a binary (and tri) split depth, in a similar manner.

[00346] The disclosure has been particularly shown and described with reference to embodiments thereof. In this regard, it will be understood by one of ordinary skill in the art that various changes in form and details may be made therein without departing from the scope of the disclosure. Therefore, the embodiments should be considered in a descriptive sense only and not for purposes of limitation. The scope of the disclosure is defined not by the detailed descriptions of the disclosure but by the following claims, and all differences within the scope will be construed as being included in the disclosure.

[00347] Meanwhile, the aforescribed embodiments of the disclosure can be written as a program executable on a computer, and can be implemented in general-use digital computers that execute the program by using a computer-readable recording medium. Examples of the computer-readable recording medium include magnetic storage media (e.g., ROM, floppy disks, hard disks, etc.), optical recording media (e.g., CD-ROMs, or DVDs), or the like.

CLAIMS

1. An image decoding method comprising:
obtaining one or more luma coding units based on at least one of a split direction and a split type of a luma block;
decoding a luma image based on the obtained one or more luma coding units;
when an area of a chroma block is smaller than or equal to an area predetermined according to a first split type of the chroma block, determining not to allow splitting of the chroma block according to the first split type and obtaining one or more chroma coding units included in the chroma block based on a second split type of the chroma block; and
decoding a chroma image based on the obtained one or more chroma coding units, and
wherein the first split type of the chroma block indicates one of binary split and tri split.

2. An image decoding apparatus comprising:
at least one processor configured to:
obtain one or more luma coding units, based on at least one of a split direction and a split type of a luma block,
decode a luma image, based on the obtained one more luma coding units,
when an area of a chroma block is smaller than or equal to an area predetermined according to a first split type of the chroma block, determine not to allow splitting of the chroma block according to the first split type and obtain one or more chroma coding units included in the chroma block based on a second split type of the chroma block, and
decode a chroma image, based on the obtained one or more chroma coding units,
wherein the first split type of the chroma block indicates one of binary split and tri split.

3. An image encoding method comprising:
determining one or more luma coding units, based on at least one of a split direction and a split type of a luma block;
encoding a luma image, based on the determined one or more luma coding units;
when an area of a chroma block is smaller than or equal to an area predetermined according to a first split type of the chroma block, determining not to allow splitting of the chroma block according to the first split type and determining one or more chroma coding units included in the chroma block based on a second split type of the chroma block; and
encoding a chroma image, based on the determined one or more chroma coding units,
wherein the first split type of the chroma block indicates one of binary split and tri split.

4. A non-transitory computer-readable recording medium having recorded thereon a program for performing the image decoding method of claim 1.