

CLAIMS

1. An entropy decoding method of a video, the method comprising:
determining a transformation unit included in a coding unit and used to
5 inversely transform the coding unit;
obtaining a transformation unit significant coefficient flag indicating whether a
non-zero transformation coefficient exists in the transformation unit, from a bitstream;
if the number of times the coding unit is split to determine the transformation
unit is referred to as a transformation depth of the transformation unit, determining a
10 context model for arithmetically decoding the transformation unit significant coefficient
flag, based on the transformation depth of the transformation unit; and
arithmetically decoding the transformation unit significant coefficient flag based
on the determined context model.
- 15 2. The method of claim 1, wherein the determining of the transformation
unit comprises:
obtaining a split transformation flag indicating whether the coding unit is split
into the transformation unit, from the bitstream;
deciding whether to split the coding unit in horizontal and vertical directions into
20 four pieces, based on the split transformation flag; and
determining the transformation unit included in the coding unit, by splitting the
coding unit into four pieces or not splitting the coding unit according to the decision.
- 25 3. The method of claim 1, wherein the determining of the context model
comprises:
determining a first context model if a size of the transformation unit is equal to
the size of the coding unit; and
determining a second context model if the size of the transformation unit is less
than the size of the coding unit, and
30 wherein the first and second context models are based on different probability
distribution models.
4. The method of claim 1, wherein the determining of the context model
comprises:

obtaining a context increase parameter for determining the context model,
based on the transformation depth of the transformation unit; and
determining a context index indicating one of a plurality of preset context
models, based on the context increase parameter.

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5. The method of claim 4, wherein, if the transformation depth of the
transformation unit is 0 and a size of the transformation unit is equal to the size of the
coding unit, the context increase parameter has a value of 1, and

wherein, if the transformation depth of the transformation unit is not 0 and the
size of the transformation unit is less than the size of the coding unit, the context
increase parameter has a value of 0.

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6. The method of claim 4, wherein the context index is determined by
summing the obtained context increase parameter and a predetermined context
index offset.

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7. The method of claim 1, wherein the arithmetically decoding of the
transformation unit significant coefficient flag comprises performing binary arithmetic
decoding on the transformation unit significant coefficient flag based on information
about a most probable symbol (MPS) and a least probable symbol (LPS), and a
probability value of at least one of the MPS and the LPS, which are included in the
determined context model.

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8. An entropy decoding apparatus of a video, the apparatus comprising:
a parser for obtaining a transformation unit significant coefficient flag indicating
whether a non-zero transformation coefficient exists in a transformation unit included
in a coding unit and used to inversely transform the coding unit, from a bitstream;

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a context modeler for, if the number of times the coding unit is split to
determine the transformation unit is referred to as a transformation depth of the
transformation unit, determining a context model for arithmetically decoding the
transformation unit significant coefficient flag, based on the transformation depth of
the transformation unit; and

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an arithmetic decoder for arithmetically decoding the transformation unit
significant coefficient flag based on the determined context model.

9. An entropy encoding method of a video, the method comprising:
obtaining data of a coding unit transformed based on a transformation unit;
if the number of times the coding unit is split to determine the transformation
5 unit is referred to as a transformation depth of the transformation unit, determining a
context model for arithmetically encoding a transformation unit significant coefficient
flag indicating whether a non-zero transformation coefficient exists in the
transformation unit, based on the transformation depth of the transformation unit; and
arithmetically encoding the transformation unit significant coefficient flag based
10 on the determined context model.

10. The method of claim 9, wherein the
deciding whether the coding unit split in horizontal and vertical directions into
four pieces and thus is split into the transformation unit included in the coding unit;
15 and
setting a split transformation flag indicating whether the coding unit is split into
the transformation unit, based on the decision; and
arithmetically encoding the set split transformation flag.

20 11. The method of claim 9, wherein the determining of the context model
comprises:
determining a first context model if a size of the transformation unit is equal to
the size of the coding unit; and
determining a second context model if the size of the transformation unit is less
25 than the size of the coding unit, and
wherein the first and second context models are based on different probability
distribution models.

30 12. The method of claim 9, wherein the determining of the context model
comprises:
obtaining a context increasement parameter for determining the context model,
based on the transformation depth of the transformation unit; and
determining a context index indicating one of a plurality of preset context
models, based on the context increasement parameter.

13. The method of claim 12, wherein, if the transformation depth of the transformation unit is 0 and a size of the transformation unit is equal to the size of the coding unit, the context increase parameter has a value of 1, and

5 wherein, if the transformation depth of the transformation unit is not 0 and the size of the transformation unit is less than the size of the coding unit, the context increase parameter has a value of 0.

14. The method of claim 12, wherein the context index is determined by
10 summing the obtained context increase parameter and a predetermined context index offset.

15. An entropy encoding apparatus of a video, the apparatus comprising:
a context modeler for obtaining data of a coding unit transformed based on a
15 transformation unit and, if the number of times the coding unit is split to determine the transformation unit is referred to as a transformation depth of the transformation unit, determining a context model for arithmetically encoding a transformation unit significant coefficient flag indicating whether a non-zero transformation coefficient exists in the transformation unit, based on the transformation depth of the
20 transformation unit; and

an arithmetic encoder for arithmetically encoding the transformation unit significant coefficient flag based on the determined context model.

CLAIMS

1. An apparatus of decoding video, the apparatus comprising:
 - a parser which obtains, from a bitstream, a split transformation flag for a current depth, and when the split transformation flag indicates non-split for the current depth, determines a transformation depth is equal to the current depth;
 - a context modeler which determines a context increasement parameter for determining a context index based on whether the transformation depth is equal to a predetermined value without using a size of a transformation unit, and obtains a context model for arithmetic decoding a transformation unit significant coefficient flag using the context index obtained by adding the context increasement parameter and a context offset; and
 - an arithmetic decoder which arithmetic decodes the transformation unit significant coefficient flag based on the context model, and determines whether at least one non-zero transformation coefficient exists in the transformation unit of the transformation depth, based on the transformation unit significant coefficient flag,
 - wherein the transformation depth indicates a number of times a height and a width of a coding unit are split to obtain the transformation unit,
 - wherein the predetermined value is zero, and
 - wherein, when the split transformation flag indicates split for the current depth, a transformation unit of the current depth is split into one or more transformation units of a next depth, and a split transformation flag for the next depth is obtained from the bitstream.