

CLAIMS

1. An image coding method for coding last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be coded, the coding method comprising:

binarizing the last position information to generate (i) a binary signal which includes a first signal having a length smaller than or equal to a predetermined maximum length and does not include a second signal or (ii) a binary signal which includes the first signal having the predetermined maximum length and the second signal;

a first coding step that arithmetically codes each of binary symbols included in the first signal, wherein the context used for coding a binary symbol depends on a bit position of the binary symbol; and

a second coding step that arithmetically codes the second signal using a fixed probability when the binary signal includes the second signal,

wherein, in the first coding step, a binary symbol at a last bit position of the first signal in sequence from the left is arithmetically coded using a context exclusive to the last bit position, when the first signal has the predetermined maximum length.

2. The image coding method according to Claim 1,

wherein the predetermined maximum length is determined according to a size of the current block.

3. The image coding method according to Claim 1, further comprising:

switching a coding process to either a first coding process compliant with a first standard or a second coding process compliant with a second standard; and

adding, to a bit stream, identification information indicating either the first standard or the second standard with which the coding process switched to is compliant,

wherein when the coding process is switched to the first coding process, the binarizing, the first coding, and the second coding are performed as the first coding process.

4. An image coding apparatus configured to code last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be coded, the coding apparatus comprising:

a binarizing unit configured to binarize the last position information to generate (i) a binary signal which includes a first signal having a length smaller than or equal to a predetermined maximum length and does not include a second signal or (ii) a binary signal which includes the first signal having the predetermined maximum length and the second signal;

a first coding unit configured to arithmetically code each of binary symbols included in the first signal, wherein the context used for coding a binary symbol depends on a bit position of the binary symbol; and

a second coding unit configured to arithmetically code the second signal using a fixed probability when the binary signal includes the second signal,

wherein the first coding unit is configured to arithmetically code a binary symbol at a last bit position of the first signal in sequence from the left using a context exclusive to the last bit position, when the first signal has the predetermined maximum length.

5. An image decoding method for decoding last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be decoded, the decoding method comprising:

a first decoding step that arithmetically decodes each of binary symbols included in a first signal, wherein the context used for decoding a binary symbol depends on a bit position of the binary symbol, the first signal being included in a binary signal of the last position information and having a length smaller than or equal to a predetermined maximum length; and

a second decoding step that arithmetically decodes the second signal using a fixed probability, when the binary signal of the last position information includes a second signal,

wherein, in the first decoding step, a binary symbol at a last bit position of the first signal in sequence from the left is arithmetically decoded using a context exclusive to the last bit position, when the first signal has the predetermined maximum length.

6. The image decoding method according to Claim 5,
wherein the predetermined maximum length is determined according to a size of the current block.

7. The image decoding method according to Claim 5, further comprising switching a decoding process to either a first decoding process compliant with a first standard or a second decoding process compliant with a second standard, according to identification information which is added to a bit stream and indicates either the first standard or the second standard,

wherein when the decoding process is switched to the first decoding process, the first decoding and the second decoding are performed as the first decoding process.

8. An image decoding apparatus configured to decode last position information indicating a position of a last non-zero coefficient so e

predetermined order in a current block to be decoded, the decoding apparatus comprising:

- a first decoding unit configured to arithmetically decode each of binary symbols included in a first signal, wherein the context used for decoding a binary symbol depends on a bit position of the binary symbol, the first signal being included in a binary signal of the last position information and having a length smaller than or equal to a predetermined maximum length; and

- a second decoding unit configured to, when the binary signal of the last position information includes a second signal, arithmetically decode the second signal using a fixed probability,

- wherein the first decoding unit is configured to arithmetically decode a binary symbol at a last bit position of the first signal in sequence from the left using a context exclusive to the last bit position, when the first signal has the predetermined maximum length.

9. An image coding and decoding apparatus comprising:

- an image coding apparatus according to claim 4; and
- the decoding apparatus according to Claim 8.

Claims:

1. A decoding method for decoding last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be decoded, the decoding method comprising:

first decoding for arithmetically decoding each of binary symbols included in a first signal using a context switched among a plurality of contexts according to a bit position of the binary symbol, the first signal being included in a binary signal of the last position information and having a length smaller than or equal to a predetermined maximum length; and

second decoding for, when the binary signal of the last position information includes a second signal, arithmetically decoding the second signal using a fixed probability,

wherein in the first decoding, a binary symbol at a last bit position of the first signal is arithmetically decoded using a context exclusive to the last bit position, when the first signal has the predetermined maximum length, and each of binary symbols at two or more bit positions other than the last bit position of the first signal is arithmetically decoded using a context common to the two or more bit positions.

2. A decoding apparatus that decodes last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be decoded, the decoding apparatus comprising:

a first decoding unit configured to arithmetically decode each of binary symbols included in a first signal using a context switched among a plurality of contexts according to a bit position of the binary symbol, the first signal being included in a binary signal of the last position information and having a length smaller than or equal to a predetermined maximum length; and

a second decoding unit configured to, when the binary signal of the last position information includes a second signal, arithmetically

decode the second signal using a fixed probability,

wherein the first decoding unit is configured to arithmetically decode a binary symbol at a last bit position of the first signal using a context exclusive to the last bit position, when the first signal has the predetermined maximum length, and each of binary symbols at two or more bit positions other than the last bit position of the first signal is arithmetically decoded using a context common to the two or more bit positions.

3. A decoding apparatus for decoding last position information indicating a position of a last non-zero coefficient in a predetermined order in a current block to be decoded, the decoding apparatus comprising:

processing circuitry; and

storage coupled to the processing circuitry,

wherein the processing circuitry performs the following using the storage:

arithmetically decoding each of binary symbols included in a first signal using a context switched among a plurality of contexts according to a bit position of the binary symbol, the first signal being included in a binary signal of the last position information and having a length smaller than or equal to a predetermined maximum length; and

arithmetically decoding the second signal using a fixed probability when the binary signal of the last position information includes a second signal,

wherein in the arithmetically decoding of each of binary symbols included in a first signal,

a binary symbol at a last bit position of the first signal is arithmetically decoded using a context exclusive to the last bit position, when the first signal has the predetermined maximum length, and

each of binary symbols at two or more bit positions other than the last bit position of the first signal is arithmetically decoded using a context common to the two or more bit positions.