

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0017]

As described above, according to HEVC standards, no restriction is set to motion vectors in inter prediction. In this case, a decoded image of a different tile at a different time can be used as a reference image. Accordingly, independent encoding and decoding in the time direction for each tile is not allowed.

[0018]

Embodiments of the present invention provide a technique capable of performing encoding and decoding in the time direction independently for each tile.

SOLUTIONS TO PROBLEMS

[0018a]

According to a first aspect of the present invention, there is provided an encoding device, including: circuitry configured to: generate a prediction image by performing motion compensation to a reference image within a co-located tile based on a motion vector detected within the tiles as a condition that a tile split information is maintained within a sequence when a picture of a current image is split into tiles; and encode the current image using the prediction image generated by performing the motion compensation.

[0018b]

According to a second aspect of the present invention, there is provided an encoding method, including: generating a prediction image by performing motion compensation to a reference image within a co-located tile based on a motion vector detected within the tiles as a condition that a tile split information is maintained within a sequence when a picture of a current image is split into tiles; and encoding the current image using the prediction image generated by

performing the motion compensation.

[0019]

Disclosed herein is a decoding device, including: a motion compensation unit generating a prediction image by performing, for each of tiles, motion compensation of a reference image within a co-located tile based on tile splittable information indicating that decoding is allowed for each of the tiles and motion vector information representing a motion vector used for generating encoded data of a decoding target current image when a picture of the current image is split into the tiles and decoded; and a decoding unit decoding the encoded data using the prediction image generated by the motion compensation unit.

[0020]

A decoding method disclosed herein corresponds to the above disclosed decoding device.

[0021]

According to the above disclosure, a prediction image is generated by performing, for each of tiles, motion compensation of a reference image within a co-located tile based on tile splittable information indicating that decoding is allowed for each of the tiles and motion vector information representing a motion vector used for generating encoded data of a decoding target current image when a picture of the current image is split into the tiles and decoded. The encoded data is decoded using the prediction image.

[0022]

Disclosed herein is an encoding device, including: a motion compensation unit generating a prediction image by performing motion compensation of a reference image at a time different from the time of an encoding target current image based on a motion vector detected within a tile when a picture of the current image is split into the tiles and encoded; an

encoding unit encoding the current image and generating encoded data using the prediction image generated by the motion compensation unit; a setting unit setting tile splittable information indicating that decoding is allowed for each unit of the tiles; and a transmission unit transmitting the encoded data generated by the encoding unit, and the tile splittable information set by the setting unit.

[0023]

An encoding method disclosed herein corresponds to the above disclosed encoding device.

[0024]

According to the above disclosure, a prediction image is generated by performing motion compensation of a reference image at a time different from the time of an encoding target current image based on a motion vector detected within a tile when a picture of the current image is split into the tiles and encoded. Encoded data is generated by encoding the current image using the prediction image. Tile splittable information indicating that decoding is allowed for each unit of the tiles is set. The encoded data and the tile splittable information are transmitted.

[0025]

Further, the decoding device disclosed herein and the encoding device of the first aspect can be realized by making a computer execute a program.

[0026]

Moreover, the program executed by the computer for realizing the decoding device disclosed herein and the encoding device of the first aspect can be provided by transmitting the program via a transmission medium, or by recording the program on a recording medium.

[0027]

In addition, the decoding device disclosed herein and the encoding device of the first aspect may be separate devices,

or may be inside blocks constituting one device.

EFFECTS OF THE INVENTION

[0028]

According to embodiments of the present invention, independent decoding in the time direction for each tile is allowed.

[0029]

Moreover, according to embodiments of the present invention, independent encoding in the time direction for each tile is allowed.

BRIEF DESCRIPTION OF DRAWINGS

[0030]

Fig. 1 is a diagram describing a reference image for conventional inter prediction.

Fig. 2 is a block diagram showing a constitution example of a conventional decoding device.

Fig. 3 is a block diagram showing a constitution example of an encoding device to which the present technique is applied according to a first embodiment.

Fig. 4 is a block diagram showing a constitution example of an encoding unit in Fig. 3.

Fig. 5 is a diagram describing tiles.

Fig. 6 is a diagram describing a restriction set when a motion vector is detected.

Fig. 7 is a diagram describing a reference image for inter prediction.

Fig. 8 is a diagram showing an example of syntax of SPS.

Fig. 9 is a diagram showing an example of syntax of