Citation List

Patent Literature

[0008]

PTL 1: Japanese Unexamined Patent Application Publication No. 2007-095249

Summary of Invention

Technical Problem

[0009]

However, in the BD standard, a method describing how image data of a 3D image including a stereo image is recorded and reproduced is not defined.

[0010]

Even when the management information of image data defined by the existing BD standard is directly used, the data of a stereo image cannot be reproduced.

[0011]

Accordingly, embodiments of the present invention allows a reproducing apparatus to determine which one of a base stream and an enhancement stream obtained by encoding multi-view video data using a predetermined encoding method is a stream of a left image and which one is a stream of a right image.

Solution to Problem

[0012]

In a first aspect, there is provided a reproduction apparatus comprising: a reading unit which reads a basic stream and an expanded stream, which have been obtained by encoding movie data for a left eye and movie data for a right eye by H.264 AVC/MVC, from a recording medium and reads a PlayList file, in which one-bit viewing point information indicating whether the basic stream is a stream of the movie data for the left eye or a stream of the movie data for the right eye is described in AppInfoPlayList(), which manages reproduction of the basic stream and the expanded stream, from the

recording medium; a decoding unit which decodes the basic stream and the expanded stream; and an output unit which outputs first movie data, which has been obtained by decoding the basic stream, as one of the movie data for the left eye and the movie data for the right eye and outputs second movie data, which has been obtained by decoding the expanded stream, as the other movie data.

[0012a]

In a second aspect, there is provided a reproduction method comprising the steps of: reading a basic stream and an expanded stream, which have been obtained by encoding movie data for a left eye and movie data for a right eye by H.264 AVC/MVC, from a recording medium; reading a PlayList file, in which one-bit viewing point information indicating whether the basic stream is a stream of the movie data for the left eye or a stream of the movie data for the right eye is described in AppInfoPlayList(), which manages reproduction of the basic stream and the expanded stream, from the recording medium; decoding the basic stream and the expanded stream; and outputting first movie data, which has been obtained by decoding the basic stream, as one of the movie data for the left eye and the movie data for the right eye and outputting second movie data, which has been obtained by decoding the expanded stream, as the other movie data.

[0012b]

Disclosed herein is~~According to an aspect of the present invention,~~ an information processing apparatus including~~es~~ encoding means for

the enhancement stream.

[0016]

The generating means can generate identification information indicating whether information is used for controlling reproduction of a two-dimensional image or a three-dimensional image, generate first reproduction control information that includes the identification information indicating information used for controlling reproduction of a two-dimensional image and that controls reproduction of the base stream, and generate second reproduction control information that includes the identification information indicating information used for controlling reproduction of a three-dimensional image and that controls reproduction of the base stream and the enhancement stream.

[0017]

The generating means can set information regarding reproduction of the enhancement stream in an extended field of the second reproduction control information.

[0018]

Disclosed herein is~~According to an aspect of the present invention,~~ an information processing method including~~es~~ the steps of encoding multi-view video data using a predetermined encoding method and generating viewpoint information indicating which one of a base stream and an enhancement stream obtained through encoding performed by the encoding means is a stream of a

left image and which one is a stream of a right image.

[0019]

Disclosed herein is~~According to an aspect of the present invention,~~ a program including~~es~~ program code for causing a computer to perform a process including the steps of encoding multi-view video data using a predetermined encoding method and generating viewpoint information indicating which one of a base stream and an enhancement stream obtained through the encoding is a stream of a left image and which one is a stream of a right image.

[0020]

Disclosed herein is~~According to an aspect of the present invention,~~ a recording medium storing~~es~~ a base stream and an enhancement stream obtained by encoding multi-view video data using a predetermined encoding method and reproduction control information that includes viewpoint information indicating which one of a base stream and an enhancement stream is a stream of a left image and which one is a stream of a right image and that is used for controlling reproduction of the base stream and the enhancement stream.

[0021]

Disclosed herein is a~~According to an aspect of the present invention,~~ viewpoint information indicating which one of a base stream and an enhancement stream obtained through encoding performed by the encoding means is a stream of a left image

and which one is a stream of a right image is generated.

Advantageous Effects of Invention

[0022]

According to embodiments of the present invention, the information processing apparatus allows a reproducing apparatus to determine which one of a base stream and an enhancement stream obtained by encoding multi-view video data using a predetermined encoding method is a stream of a left image and which one is a stream of a right image.

Brief Description of Drawings

[0023]

[Fig. 1] Fig. 1 illustrates an example of the configuration of a reproducing system including a reproducing apparatus according to the present invention.

[Fig. 2] Fig. 2 illustrates an example of image capturing.

[Fig. 3] Fig. 3 is a block diagram illustrating an example of the configuration of an MVC encoder.

[Fig. 4] Fig. 4 illustrates an example of a reference image.

[Fig. 5] Fig. 5 illustrates an example of management of an AV stream.

[Fig. 6] Fig. 6 illustrates the structures of a Main Path and a Sub Path.

[Fig. 7] Fig. 7 illustrates an example of the

CLAIMS

[Claim 1]

An information processing apparatus comprising:

encoding means for encoding multi-view video data using a predetermined encoding method; and

generating means for generating viewpoint information indicating which one of a base stream and an enhancement stream obtained through encoding performed by the encoding means is a stream of a left image and which one is a stream of a right image.

[Claim 2]

The information processing apparatus according to Claim 1, further comprising:

recording means;

wherein the generating means generates reproduction control information that includes the viewpoint information and that is used for controlling reproduction of the base stream and the enhancement stream, and wherein the recording means records, on a recording medium, the reproduction control information generated by the generating means together with the base stream and the enhancement stream.

[Claim 3]

The information processing apparatus according to Claim 1, wherein the encoding means adds the viewpoint information to each picture included in at least one of the base stream

and the enhancement stream.

[Claim 4]

The information processing apparatus according to Claim 1, wherein the generating means generates transmission control information that includes the viewpoint information and that is used for controlling transmission of the base stream and the enhancement stream.

[Claim 5]

The information processing apparatus according to Claim 1, wherein the generating means generates identification information indicating whether information is used for controlling reproduction of a two-dimensional image or a three-dimensional image, generates first reproduction control information that includes the identification information indicating information used for controlling reproduction of a two-dimensional image and that controls reproduction of the base stream, and generates second reproduction control information that includes the identification information indicating information used for controlling reproduction of a three-dimensional image and that controls reproduction of the base stream and the enhancement stream.

[Claim 6]

The information processing apparatus according to Claim 5, wherein the generating means sets information regarding

reproduction of the enhancement stream in an extended field of the second reproduction control information.

[Claim 7]

An information processing method comprising the steps of:

encoding multi-view video data using a predetermined encoding method; and

generating viewpoint information indicating which one of a base stream and an enhancement stream obtained through the encoding is a stream of a left image and which one is a stream of a right image.

[Claim 8]

A program comprising:

program code for causing a computer to perform a process including the steps of encoding multi-view video data using a predetermined encoding method and generating viewpoint information indicating which one of a base stream and an enhancement stream obtained through the encoding is a stream of a left image and which one is a stream of a right image.

[Claim 9]

A recording medium storing:

a base stream and an enhancement stream obtained by encoding multi-view video data using a predetermined encoding method; and

reproduction control information that includes viewpoint information indicating which one of a base stream and an enhancement stream is a stream of a left image and which one is a stream of a right image and that is used for controlling reproduction of the base stream and the enhancement stream.

CLAIMS

1. A reproduction apparatus comprising:

a reading unit which reads a basic stream and an expanded stream, which have been obtained by encoding movie data for a left eye and movie data for a right eye by H.264 AVC/MVC, from a recording medium and reads a PlayList file, in which one-bit viewing point information indicating whether the basic stream is a stream of the movie data for the left eye or a stream of the movie data for the right eye is described in AppInfoPlayList(), which manages reproduction of the basic stream and the expanded stream, from the recording medium;

a decoding unit which decodes the basic stream and the expanded stream; and

an output unit which outputs first movie data, which has been obtained by decoding the basic stream, as one of the movie data for the left eye and the movie data for the right eye and outputs second movie data, which has been obtained by decoding the expanded stream, as the other movie data.

2. The reproduction apparatus according to Claim 1, further comprising:

a first buffer which records therein the basic stream read from the recording medium; and

a second buffer which records therein the expanded stream read from the recording medium,

wherein the decoding unit decodes the basic stream recorded in the first buffer and decodes the expanded stream recorded in the second buffer.

3. The reproduction apparatus according to Claim 2, further comprising:

a third buffer which records therein the first movie data obtained by decoding the basic stream and the second movie data obtained by decoding the expanded stream,

wherein the output unit outputs the first movie data recorded in the third buffer as the movie data for the left eye and outputs the second movie data as the movie data for the right eye when a value of the viewing point information is zero, and outputs the first movie data recorded in the third buffer as the movie data for the right eye and outputs the second movie data as the movie data for the left eye when the value of the viewing point information is one.

4. A reproduction method comprising the steps of:

reading a basic stream and an expanded stream, which have been obtained by encoding movie data for a left eye and movie data for a right eye by H.264 AVC/MVC, from a recording medium;

reading a PlayList file, in which one-bit viewing point information indicating whether the basic stream is a stream of the movie data for the left eye or a stream of the movie data for the right eye is described in AppInfoPlayList(), which manages reproduction of the basic stream and the expanded stream, from the recording medium;

decoding the basic stream and the expanded stream; and

outputting first movie data, which has been obtained by decoding the basic stream, as one of the movie data for the left eye and the movie data for the right eye and outputting second movie data, which has been obtained by decoding the expanded stream, as the other movie data.