Furthermore, a method for receiving a video data stream having a video stored therein is provided. The method comprises decoding the video from the video data stream. Decoding the video is conducted depending on an indication indicating whether a picture of the video preceding a dependent random access picture shall be output or not.

Moreover, computer programs for implementing one of the above-described methods when being executed on a computer or signal processor are provided.

In accordance with an aspect of the invention, an apparatus for receiving one or more input video data streams is provided. Each of the one or more input video data streams has an input video encoded thereinto. The apparatus is configured to generate an output video data stream from the one or more input video data streams, the output video data stream encoding an output video, wherein the apparatus is configured to generate the output video data stream such that the output video is the input video being encoded within one of the one or more input video data streams, or such that the output video depends on the input video of at least one of the one or more input video data streams. Moreover, if a concatenation flag is set to a first value, the apparatus is configured to determine that coded picture buffer delay offset information is to be used for determining an access unit removal time of a current picture of a plurality of pictures of the output video from a coded picture buffer. If the concatenation flag is set to a second value, the apparatus is configured to determine that the coded picture buffer delay offset information is not to be used to determine the access unit removal time.

Furthermore, a video data stream is provided. The video data stream has a video encoded thereinto. The video data stream comprises coded picture buffer delay offset information.

In accordance with another aspect of the invention, a non-transitory digital storage medium storing a video data stream is provided. The video data stream has a video encoded thereinto. The video data stream comprises coded picture buffer delay offset information and a concatenation flag. A determination of whether or not to use the coded picture buffer delay offset information is used for determining a removal time of a picture from a coded picture buffer depends at least on the concatenation flag. If the concatenation flag is set to a first value then the concatenation flag indicates that the coded picture buffer delay offset information needs to be used to determine one or more removal times. If the concatenation flag is set to a second value being different from the first value then the concatenation flag indicates that the indicated offset is not used to determine the one or more removal times.

In accordance with another aspect of the invention, a video encoder is provided. The video encoder is configured to encode a video into a video data stream. The video encoder is configured to generate the video data stream such that the video data stream comprises coded picture buffer delay offset information. The video encoder is configured to determine whether or not to use the coded picture buffer delay offset information for determining a removal time of a picture from a coded picture buffer. if a concatenation flag is set to a first value, the coded picture buffer delay offset information is determined to be used for determining the removal time. If the concatenation flag is set to a second value, the coded picture buffer delay offset information is determined not to be used to determine the removal time.

In accordance with an aspect of the invention, a video decoder for receiving a video data stream a video stored therein is provided. The video decoder is configured to decode the video from the video data stream. Moreover, the video decoder is configured to decode the video depending on an access unit removal time of a current picture of a plurality of pictures of the video from a coded picture buffer. The video decoder is configured to decode the video depending at least on a concatenation flag indicating whether or not to use coded picture buffer delay offset information for determining the access unit removal time of the current picture from the coded picture buffer. If the concatenation flag is set to a first value then the video decoder is configured to use the coded picture buffer delay offset information to determine one or more removal times. If the concatenation flag is set to a second value being different from the first value then the video decoder is configured to not use the coded picture buffer delay offset information to determine the one or more removal times.

Moreover, a method for receiving one or more input video data streams is provided. Each of the one or more input video data streams has an input video encoded thereinto. The method comprises generating an output video data stream from the one or more input video

Claims

1. An apparatus for receiving one or more input video data streams, wherein each of the one or more input video data streams has an input video encoded thereinto,

wherein the apparatus is configured to generate an output video data stream from the one or more input video data streams, the output video data stream encoding an output video, wherein the apparatus is configured to generate the output video data stream such that the output video is the input video being encoded within one of the one or more input video data streams, or such that the output video depends on the input video of at least one of the one or more input video data streams,

wherein, if a concatenation flag is set to a first value, the apparatus is configured to determine that coded picture buffer delay offset information is to be used for determining an access unit removal time of a current picture of a plurality of pictures of the output video from a coded picture buffer, and

if the concatenation flag is set to a second value, the apparatus is configured to determine that the coded picture buffer delay offset information is not to be used to determine the access unit removal time.

2. The apparatus according to claim 1,

wherein the apparatus is configured to drop a group of one or more pictures of the input video of a first video data stream of the one or more input video data streams to generate the output video data stream,

wherein the apparatus is configured to determine an access unit removal time for at least one of the plurality of pictures of the output video from the coded picture buffer depending on the coded picture buffer delay offset information.

3. The apparatus according to claim 1,

wherein a first video received by the apparatus is a preprocessed video which results from an original video from which a group of one or more pictures has been dropped to generate the preprocessed video,

wherein the apparatus is configured to determine an access unit removal time for at least one of the plurality of pictures of the output video from the coded picture buffer depending on the coded picture buffer delay offset information.

4. The apparatus according to claim 2, wherein the buffer delay offset information depends on a number of pictures of the input video that have been dropped.

5. The apparatus according to claim 2,

wherein the one or more input video data streams are two or more input video data streams, and

wherein the apparatus is configured to splice the processed video and the input video of a second video data stream of the two or more input video data streams to obtain the output video, and is configured to encode the output video into the output video data stream.

6. The apparatus according to claim 5,

wherein the apparatus is configured to determine whether or not to use coded picture buffer delay offset information for determining the access unit removal time of the current picture, depending on a location of the current picture within the output video, or

wherein the apparatus is configured to determine whether or not to set a coded picture buffer delay offset value of the coded picture buffer delay offset information to 0 for determining the access unit removal time of the current picture depending on the location of the current picture within the output video.

7. The apparatus according to claim 1, wherein the apparatus is configured to determine the access unit removal time of the current picture depending on a removal time of a preceding picture.

8. The apparatus according to claim 1, wherein the apparatus is configured to determine the access unit removal time of the current picture depending on initial coded picture buffer removal delay information.

9. The apparatus according to claim 8, wherein the apparatus is configured to update the initial coded picture buffer removal delay information depending on a clock tick to obtain temporary coded picture buffer removal delay information to determine the access unit removal time of the current picture.

10. The apparatus according to claim 1, wherein the apparatus is configured to signal to a video decoder, whether or not to use coded picture buffer delay offset information for determining the access unit removal time of the current picture from the coded picture buffer.

11. The apparatus according to claim 10, wherein the current picture is located at a splicing point of the output video, where two input videos have been spliced.

12. A non-transitory digital storage medium storing a video data stream,

wherein the video data stream has a video encoded thereinto,

wherein the video data stream comprises coded picture buffer delay offset information and a concatenation flag,

wherein a determination of whether or not to use the coded picture buffer delay offset information is used for determining a removal time of a picture from a coded picture buffer depends at least on the concatenation flag,

wherein if the concatenation flag is set to a first value then the concatenation flag indicates that the coded picture buffer delay offset information needs to be used to determine one or more removal times, and

wherein if the concatenation flag is set to a second value being different from the first value then the concatenation flag indicates that the indicated offset is not used to determine the one or more removal times.

13. The non-transitory digital storage medium storing a video data stream according to claim 12, wherein the video data stream comprises initial coded picture buffer removal delay information.

14. A video encoder,

wherein the video encoder is configured to encode a video into a video data stream, wherein the video encoder is configured to generate the video data stream such that the video data stream comprises coded picture buffer delay offset information,

wherein the video encoder is configured to determine whether or not to use the coded picture buffer delay offset information for determining a removal time of a picture from a coded picture buffer,

wherein, if a concatenation flag is set to a first value, the coded picture buffer delay offset information is determined to be used for determining the removal time, and

if the concatenation flag is set to a second value, the coded picture buffer delay offset information is determined not to be used to determine the removal time.

15. The video encoder according to claim 14, wherein the video encoder is configured to generate the video data stream such that the video data stream comprises initial coded picture buffer delay offset information.

16. A video decoder for receiving a video data stream a video stored therein,

wherein the video decoder is configured to decode the video from the video data stream,

wherein the video decoder is configured to decode the video depending on an access unit removal time of a current picture of a plurality of pictures of the video from a coded picture buffer,

wherein the video decoder is configured to decode the video depending at least on a concatenation flag indicating whether or not to use coded picture buffer delay offset

information for determining the access unit removal time of the current picture from the coded picture buffer,

wherein if the concatenation flag is set to a first value then the video decoder is configured to use the coded picture buffer delay offset information to determine one or more removal times, and

wherein if the concatenation flag is set to a second value being different from the first value then the video decoder is configured to not use the coded picture buffer delay offset information to determine the one or more removal times.

17. The video decoder according to claim 16, wherein the access unit removal time for at least one of the plurality of pictures of the video from the coded picture buffer depends on the coded picture buffer delay offset information.

18. The video decoder according to claim 16, wherein the video decoder is configured to decode the video depending on whether or not a coded picture buffer delay offset value of the coded picture buffer delay offset information is set to 0.

19. The video decoder according to claim 16,

wherein the video decoder is configured to determine the access unit removal time of the current picture depending on a removal time of a preceding picture.

20. The video decoder according to claim 16, wherein the video decoder is configured to determine the access unit removal time of the current picture depending on initial coded picture buffer removal delay information.

21. The video decoder according to claim 20, wherein the video decoder is configured to update the initial coded picture buffer removal delay information depending on a clock tick to obtain temporary coded picture buffer removal delay information to determine the access unit removal time of the current picture.