

CLAIMS

1. A video encoding method having temporal scalability, the video encoding
5 method comprising:

splitting pictures included in a picture sequence into temporal sub-layers;

classifying a temporal layer access picture as a first temporal layer access
picture or a second temporal layer access picture based on whether a picture, which is
encoded after the temporal layer access picture and belongs to a same or upper
10 temporal sub-layer as or than the temporal layer access picture, is capable of referring
to a picture encoded before the temporal layer access picture; and

adding type syntax information for identifying the first temporal layer access
picture and the second temporal layer access picture to transmission unit data
comprising the temporal layer access picture.

15 2. The video encoding method of claim 1, wherein the classifying comprises:
classifying, as the first temporal layer access picture, the temporal layer access
picture that allows the picture, which is encoded after the temporal layer access picture
and belongs to the same or upper temporal sub-layer as or than the temporal layer
20 access picture, to refer to the picture encoded before the temporal layer access picture;
and

classifying, as the second temporal layer access picture, the temporal layer
access picture that does not allow the picture, which is encoded after the temporal layer
access picture and belongs to the same or upper temporal sub-layer as or than the
25 temporal layer access picture, to refer to the picture encoded before the temporal layer
access picture.

3. The video encoding method of claim 1, wherein the adding comprises
adding, to a header of the transmission unit data comprising the first temporal layer
30 access picture, first type syntax information indicating that the first temporal layer
access picture is included, and adding, to a header of the transmission unit data
comprising the second temporal layer access picture, second type syntax information
indicating that the second temporal layer access picture is included.

4. The video encoding method of claim 1, wherein the transmission unit data is data in a network adaptive layer (NAL) unit.

5. The video encoding method of claim 4, wherein the type syntax information is an identifier indicating a type of the NAL unit.

6. The video encoding method of claim 1, further comprising adding, to a header of transmission unit data comprising a picture that is unable to be encoded due to the temporal layer up-switching, type syntax information for identifying the picture that is unable to be encoded.

7. A video encoding apparatus having temporal scalability, the video encoding apparatus comprising:

a video encoder that splits pictures included in a picture sequence into temporal sub-layers; and

a multiplexer that classifies a temporal layer access picture as a first temporal layer access picture or a second temporal layer access picture based on whether a picture, which is encoded after the temporal layer access picture and belongs to a same or upper temporal sub-layer as or than the temporal layer access picture, is capable of referring to a picture encoded before the temporal layer access picture, and adds type syntax information for identifying the first temporal layer access picture and the second temporal layer access picture to transmission unit data comprising the temporal layer access picture.

8. A video decoding method having temporal scalability, the video decoding method comprising:

receiving transmission unit data obtained by splitting and encoding pictures included in a picture sequence into temporal sub-layers; and

identifying the transmission unit data comprising a temporal layer access picture accessed for temporal layer up-switching from a lower temporal sub-layer to an upper temporal sub-layer, by using type syntax information included in the transmission unit data,

wherein the temporal layer access picture is classified as a first temporal layer access picture or a second temporal layer access picture based on whether a picture,

which is decoded after the temporal layer access picture and belongs to a same or upper temporal sub-layer as or than the temporal layer access picture, is capable of referring to a picture decoded before the temporal layer access picture.

5 9. The video decoding method of claim 8, wherein the temporal layer access picture that allows the picture, which is decoded after the temporal layer access picture and belongs to the same or upper temporal sub-layer as or than the temporal layer access picture, to refer to the picture decoded before the temporal layer access picture is classified as the first temporal layer access picture, and

10 the temporal layer access picture that does not allow the picture, which is decoded after the temporal layer access picture and belongs to the same or upper temporal sub-layer as or than the temporal layer access picture, to refer to the picture decoded before the temporal layer access picture is classified as the second temporal layer access picture.

15 10. The video decoding method of claim 8, wherein a header of the transmission unit data comprising the first temporal layer access picture comprises first type syntax information indicating that the first temporal layer access picture is included, and a header of the transmission unit data comprising the second temporal layer access picture comprises second type syntax information indicating that the second temporal layer access picture is included.

20 11. The video decoding method of claim 8, wherein the transmission unit data is data in a network adaptive layer (NAL) unit.

25 12. The video decoding method of claim 11, wherein the type syntax information is an identifier indicating a type of the NAL unit.

30 13. The video decoding method of claim 8, wherein the transmission unit data comprises a picture that is unable to be decoded due to the temporal layer up-switching.

 14. A video decoding apparatus having temporal scalability, the video decoding apparatus comprising:

a receiver that receives transmission unit data obtained by splitting and encoding pictures included in a picture sequence into temporal sub-layers; and

an inverse multiplexer that identifies the transmission unit data comprising a temporal layer access picture accessed for temporal layer up-switching from a lower temporal sub-layer to an upper temporal sub-layer, by using type syntax information included in the transmission unit data,

wherein the temporal layer access picture is classified as a first temporal layer access picture or a second temporal layer access picture based on whether a picture, which is decoded after the temporal layer access picture and belongs to a same or upper temporal sub-layer as or than the temporal layer access picture, is capable of referring to a picture decoded before the temporal layer access picture.

Claims

1. A video decoding method having temporal scalability, the video decoding method comprising:
 - receiving transmission unit data including information about a current picture;
 - identifying whether the current picture is a first temporal layer access picture or a second temporal layer access picture base on a type syntax information included in the transmission unit data; and
 - decoding the identified current picture,
 - wherein, when the current picture is the first temporal layer access picture, a picture, which is decoded after the first temporal layer access picture and belongs to an upper temporal sub-layer than the first temporal layer access picture, is capable of referring to a picture decoded before the first temporal layer access picture, and
 - when the current picture is the second temporal layer access picture, a picture, which is decoded after the second temporal layer access picture and belongs to an upper temporal sub-layer than the second temporal layer access picture, is not capable of referring to a picture decoded before the second temporal layer access picture.
2. The video decoding method of claim 1, wherein a header of the transmission unit data comprising the first temporal layer access picture comprises first type syntax information indicating that the first temporal layer access picture is included, and a header of the transmission unit data comprising the second temporal layer access picture comprises second type syntax information indicating that the second temporal layer access picture is included.
3. The video decoding method of claim 1, wherein the transmission unit data is data in a network adaptive layer (NAL) unit.
4. The video decoding method of claim 3, wherein the type syntax information is an identifier indicating a type of the NAL unit.
5. The video decoding method of claim 1, wherein the transmission unit data comprises a picture that is unable to be decoded due to the temporal layer up-switching.