

Claims

1. Device for generating a processed signal ~~while~~ using a plurality of audio objects, each audio object of the plurality of audio objects ~~including~~comprising an audio object signal and audio object metadata, the audio object metadata ~~including~~comprising a position of the audio object and a gain parameter of the audio object, the device comprising:

an interface for specification of at least one effect parameter of a processing-object group of audio objects ~~on the part of~~by a user, the processing-object group of audio objects ~~including~~comprising two or more audio objects of the plurality of audio objects, and

a processor unit configured to generate the processed signal using the audio object signals and the audio object metadata comprising the positions and the gain parameters of the plurality of audio objects, such that the at least one effect parameter specified by means of the interface is applied to the audio object signal or to the audio object metadata of each of the audio objects of the processing-object group of audio objects.

2. Device as claimed in claim 1,

wherein one or more audio objects of the plurality of audio objects do not belong to the processing-object group of audio objects, and wherein the processor unit is configured not to apply the at least one effect parameter specified by means of the interface to any audio object signal and any audio object metadata of the one or more audio objects which do not belong to the processing-object group of audio objects.

3. Device as claimed in claim 2,

wherein the processor unit is configured to generate the processed signal such that the at least one effect parameter specified by means of the interface is applied to the audio object signal of each of the audio objects of the processing-object group of audio objects,

wherein the processor unit is configured not to apply the at least one effect parameter specified by means of the interface to any audio object signal of the one or more audio objects of the plurality of audio objects that do not belong to the processing-object group of audio objects.

5

4. Device as claimed in claim 2 or 3,

wherein the processor unit is configured to generate the processed signal such that the at least one effect parameter specified by means of the interface is applied to the gain parameter of the metadata of each of the audio objects of the processing-object group of audio objects,

10

wherein the processor unit is configured not to apply the at least one effect parameter specified by means of the interface to any gain parameter of the audio object metadata of the one or more audio objects of the plurality of audio objects that do not belong to the processing-object group of audio objects.

15

5. Device as claimed in any of claims 2 to 4,

wherein the processor unit is configured to generate the processed signal such that the at least one effect parameter specified by means of the interface is applied to the position of the metadata of each of the audio objects of the processing-object group of audio objects,

20

wherein the processor unit is configured not to apply the at least one effect parameter specified by means of the interface to any position of the audio object metadata of the one or more audio objects of the plurality of audio objects that do not belong to the processing-object group of audio objects.

25

- 30 6. Device as claimed in any of the previous claims,

wherein the interface is configured to specify at least one definition parameter of the processing-object group of audio objects by the user,

wherein the processor unit is configured to determine, in dependence on the at least one definition parameter of the processing-object group of audio objects specified

35

by means of the interface, which audio objects of the plurality of audio objects belong to the processing-object group of audio objects.

7. Device as claimed in claim 6,

5

wherein the at least one definition parameter of the processing-object group of audio objects comprises at least one position of a area of interest associated with the processing-object group of audio objects, and

10

wherein the processor unit is configured to determine, depending on the position of the audio object metadata of that audio object and depending on the position of the area of interest, for each audio object of the plurality of audio objects whether said audio object belongs to the processing-object group of audio objects,

15

8. Device as claimed in claim 7,

wherein the at least one definition parameter of the processing-object group of audio objects further comprises a radius of the area of interest that is associated with the processing-object group of audio objects, and

20

wherein the processor unit is configured to decide, for each audio object of the plurality of audio objects, depending on the position of the audio object metadata of that audio object and depending on the position of the area of interest and depending on the radius of the area of interest, whether that audio object belongs to the processing-object group of audio objects.

25

9. Device as claimed in claim 7 or 8,

30

wherein the processor unit is configured to determine a weighting factor for each of the audio objects of the processing-object group of audio objects depending on a distance between the position of the audio object metadata of that audio object and the position of the area of interest, and

35

wherein the processor unit is configured to apply, for each of the audio objects of the processing-object group of audio objects, the weighting factor of this audio object together with the at least one effect parameter specified by means of the interface

to the audio object signal or to the gain parameter of the audio object metadata of this audio object.

10. Device as claimed in claim 6,

5

wherein the at least one definition parameter of the processing-object group of audio objects comprises at least one angle specifying a direction from a defined user position in which there is an area of interest associated with the processing-object group of audio objects, and

10

wherein the processor unit is configured to determine, depending on the position of the metadata of the audio object and depending on the angle specifying the direction from the defined user position in which the area of interest is located, for each audio object of the plurality of audio objects, whether the audio object belongs to the processing-object group of audio objects, depending on the position of the metadata of the audio object and depending on the angle specifying the direction from the defined user position in which the area of interest is located.

15

11. Device as claimed in claim 10,

20

wherein the processor unit is configured to determine for each of the audio objects of the processing-object group of audio objects, a weighting factor which depends on a difference of a first angle and a further angle, wherein the first angle is the angle specifying the direction from the defined user position in which the area of interest is located, and wherein the further angle depends on the defined user position and on the position of the metadata of this audio object,

25

wherein the processor unit is configured to apply, for each of the audio objects of the processing-object group of audio objects, the weighting factor of this audio object together with the at least one effect parameter specified by means of the interface to the audio object signal or to the gain parameter of the audio object metadata of this audio object.

30

12. Device as claimed in any of the previous claims,

35

5 wherein the processing-object group of audio objects is a first processing-object group of audio objects, wherein there also exist one or more further processing-object groups of audio objects, wherein each processing-object group of the one or more further processing-object groups of audio objects includes one or more audio objects of the plurality of audio objects, wherein at least one audio object of a processing-object group of the one or more further processing-object groups of audio objects is not an audio object of the first processing-object group of audio objects,

10 wherein the interface is configured, for each processing-object group of the one or more further processing-object groups of audio objects, for specification of at least one further effect parameter for that processing-object group of audio objects on the part of the user,

15 wherein the processor unit is configured to generate the processed signal such that for each processing-object group of the one or more further processing-object groups of audio objects, the at least one further effect parameter of this processing-object group that was specified by means of the interface is applied to the audio object signal or to the audio object metadata of each of the one or more audio objects of this processing-object group, wherein one or more audio objects of the plurality of audio objects do not belong to this processing-object group, and wherein the processor unit is configured not to apply the at least one further effect parameter of this processing-object group specified by means of the interface to any audio object signal and any audio object metadata of the one or more audio objects which do not belong to this processing-object group.

25

13. Device as claimed in claim 12,

30 wherein the interface is configured, in addition to the first processing-object group of audio objects, for specification of the one or more further processing-object groups of one or more audio objects on the part of the user, in that the interface is configured, for each processing-object group of the one or more further processing-object groups of one or more audio objects, for specification of at least one definition parameter of that processing-object group on the part of the user,

35 wherein the processor unit is configured to determine for each processing-object group of the one or more further processing-object groups of one or more audio

objects, in dependence on the at least one definition parameter of this processing-object group specified by means of the interface, which audio objects belong to the plurality of audio objects of this processing-object group.

5 14. Device as claimed in any of the previous claims,

the device being an encoder, wherein the processor unit is configured to generate a downmix signal while using the audio object signals of the plurality of audio objects, and wherein the processor unit is configured to generate a metadata signal while
10 using the audio object metadata of the plurality of audio objects,

wherein the processor unit is configured to generate the downmix signal as the processed signal, at least one modified object signal being mixed, in the downmix signal, for each audio object of the processing-object group of audio objects, the processor unit being configured to generate, for each audio object of the processing-object group of audio objects, the modified object signal of this audio object by applying the at least one effect parameter specified by means of the interface to the audio object signal of this audio object, or
15

wherein the processor unit is configured to generate the metadata signal as the processed signal, the metadata signal including at least one modified position for each audio object of the processing-object group of audio objects, wherein the processor unit is configured to generate, for each audio object of the processing-object group of audio objects, the modified position of this audio object by applying the at least one effect parameter specified by means of the interface to the position of this audio object, or
20
25

the processor unit is configured to generate the metadata signal as the processed signal, the metadata signal including at least one modified gain parameter for each audio object of the processing-object group of audio objects, the processor unit is configured to generate, for each audio object of the processing-object group of audio objects, the modified gain parameter of this audio object by applying the at least one effect parameter specified by means of the interface to the gain parameter of this audio object.
30

35

15. Device as claimed in any of claims 1 to 13,

the device being a decoder, the device being configured to receive a downmix signal in which the plurality of audio object signals of the plurality of audio objects are mixed, the device further being configured to receive a metadata signal, the metadata signal including, for each audio object of the plurality of audio objects, the audio object metadata of that audio object,

wherein the processor unit is configured to reconstruct the plurality of audio object signals of the plurality of audio objects on the basis of a downmix signal,

wherein the processor unit is configured to generate, as the processed signal, an audio output signal comprising one or more audio output channels,

wherein the processor unit is configured to apply the at least one effect parameter specified by means of the interface to the audio object signal of each of the audio objects of the processing-object group of audio objects to generate the processed signal, or to apply the at least one effect parameter specified by means of the interface to the position or to the gain parameter of the audio object metadata of each of the audio objects of the processing-object group of audio objects to generate the processed signal.

16. Device as claimed in claim 15,

wherein the interface is further adapted for specification of one or more rendering parameters on the part of the user,

and wherein the processor unit is configured to generate the processed signal while using the one or more rendering parameters as a function of the position of each audio object of the processing-object group of audio objects.

17. System including

an encoder for generating a downmix signal on the basis of audio object signals of a plurality of audio objects and for generating a metadata signal on the basis of audio object metadata of the plurality of audio objects, wherein the audio object metadata includes a position of the audio object and a gain parameter of the audio object, and

a decoder for generating an audio output signal including one or more audio output channels on the basis of the downmix signal and on the basis of the metadata signal,

5 wherein the encoder is a device as claimed in claim 14, or

wherein the decoder is a device as claimed in claim 15 or 16, or

10 wherein the encoder is a device as claimed in claim 14 and the decoder is a device as claimed in claim 15 or 16.

18. Method of generating a processed signal ~~while~~ using a plurality of audio objects, each audio object of the plurality of audio objects ~~including~~comprising an audio object signal and audio object metadata, the audio object metadata ~~including~~comprising a position of the audio object and a gain parameter of the audio object, the method ~~including~~comprising:

specifying at least one effect parameter of a processing-object group of audio objects ~~on the part of~~by a user by means of an interface, wherein the processing-object group of audio objects comprises two or more audio objects of the plurality of audio objects, and

generating the processed signal by a processor unit using the audio object signals and the audio object metadata comprising the positions and the gain parameters of the plurality of audio objects, such that the at least one effect parameter specified by means of the interface is applied to the audio object signal or to the audio object metadata of each of the audio objects of the processing-object group of audio objects.

30 19. Computer program comprising a program code for performing the method as claimed in claim 18.