Claims

1. An audio providing apparatus comprising:

an object renderer configured to render an object audio signal based on respective geometric information of one or more audio objects and an output layout;

a channel renderer configured to render an channel audio signal from a plurality of input channels having a first channel number to a plurality of output channels having a second channel number, based on the output layout; and

a mixer configured to mix the rendered object audio signal with the rendered channel audio signal,

wherein the channel renderer is configured to downmix the plurality of input channels into the plurality of output channels for rendering the channel audio signal, after aligning phases of correlated input channels.

2. The audio providing apparatus of claim 1, wherein the object renderer comprises:

a geometric information analyzer configured to convert the geometric information regarding the object audio signal into three-dimensional (3D) coordinate information;

a distance controller configured to generate distance control information, based on the 3D coordinate information;

a localizer configured to generate localization information for localizing the object audio signal, based on the 3D coordinate information; and

a renderer configured to render the object audio signal, based on the generated distance control information, and the generated localization information.

3. The audio providing apparatus of claim 2,

wherein the distance controller is configured to acquire a distance gain of the object audio signal.

4. The audio providing apparatus of claim 1, wherein the object renderer is configured to acquire a panning gain for localizing the object audio signal according to the output layout.

5. The audio providing apparatus of claim 1,

wherein the channel renderer is configured to, when a layout of the input channels having the first channel number is a 3D layout, down-mix the audio signal having the first channel number to the audio signal having the second channel number less than the first channel number.

6. The audio providing apparatus of claim 1,

wherein the channel audio signal comprises information for determining whether to perform virtual 3D rendering on a specific frame.

7. The audio providing apparatus of claim 1,

wherein the object audio signal comprises at least one of an identification (ID) and type information regarding the object audio signal.

8. The audio providing apparatus of claim 1,

wherein the respective geometric information of one or more audio objects includes at least one of azimuth information, elevation information, distance information and gain information.

9. The audio providing apparatus of claim 1,

wherein the object renderer is a 3D renderer when the output layout is a 3D layout.

10. The audio providing apparatus of claim 1,

wherein the channel renderer is a 3D renderer when the output layout is a 3D layout.

11. The audio providing apparatus of claim 1,

wherein the object renderer is a virtual 3D renderer when the output layout is a 2D layout.

12. The audio providing apparatus of claim 1,

wherein the channel renderer is a virtual 3D renderer when the output layout is a 2D layout.