CLAIMS

1. A method of obtaining a plurality of higher order ambisonic (HOA) coefficients representative of a soundfield, the method comprising:

obtaining, by an audio decoder and from a bitstream data indicative of a plurality of weight values that represent a vector, each of the weight values corresponding to a respective one of a plurality of weights in a weighted sum of code vectors used to represent the vector, the vector defined in a spherical harmonic domain, and representative of a directional component of an corresponding audio object present in the soundfield represented by the plurality of HOA coefficients;

obtaining, from the bitstream and by the audio decoder, data indicative of which of a plurality of code vectors to use for reconstructing the vector;

selecting, by the audio decoder, a subset of the code vectors based on the data indicative of which of the plurality of code vectors to use for reconstructing the vector;

reconstructing, by the audio decoder, the vector based on the weight values, and the selected subset of the code vectors; and

rendering, by the audio decoder and based on the reconstructed vector, loudspeaker feeds for playback by loudspeakers to reproduce the soundfield.

2. The method of claim 1, wherein reconstructing the vector comprises determining a weighted sum of the selected subset of the code vectors where the selected subset of the code vectors are weighted by the weight values.

3. The method of claim 1, wherein reconstructing the vector comprises:

for each of the weight values, multiplying the weight value by a respective one of the selected subset of the code vectors to generate a respective weighted code vector included in a plurality of weighted code vectors; and

summing the plurality of weighted code vectors to determine the vector.

4. The method of claim 1, wherein reconstructing the vector comprises:

for each of the weight values, multiplying the weight value by a respective one of the code vectors in the subset of code vectors to generate a respective one of a plurality of weighted code vectors; and

summing the plurality of weighted code vectors to reconstruct the vector.

5. The method of claim 1, wherein the set of code vectors comprises at least one of a set of directional vectors, a set of orthogonal directional vectors, a set of orthonormal directional vectors, a set of pseudo-orthonormal directional vectors, a set of pseudo-orthogonal directional vectors, a set of directional basis vectors, a set of orthogonal vectors, a set of orthonormal vectors, a set of pseudo-orthonormal vectors, a set of pseudo-orthogonal vectors, and a set of basis vectors.

6. The method of claim 1, wherein the vector comprises at least one of a V-vector obtained from singular value decomposition of the HOA coefficients and a right-singular value vector obtained from singular value decomposition of the HOA coefficients.

7. The method of claim 1, wherein the audio decoder is included within a device that also includes the loudspeakers and the audio decoder is coupled to the loudspeakers.

8. The method of claim **1**, further comprising reconstructing the HOA coefficients based on the reconstructed vector,

wherein rendering the loudspeaker feeds comprises rendering, based on the reconstructed HOA coefficients, the loudspeaker feeds for playback by the loudspeakers to reproduce the soundfield.

9. A device configured to obtain a plurality of higher order ambisonic (HOA) coefficients representative of a soundfield, the device comprising:

one or more processors configured to:

obtain from a bitstream data indicative of a plurality of weight values that represent a vector, each of the weight values corresponding to a respective one of a plurality of weights in a weighted sum of code vectors used to represent the vector, the vector defined in a spherical harmonic domain, and representative of a directional component of an corresponding audio object present in the soundfield represented by the plurality of HOA coefficients;

obtain, from the bitstream, data indicative of which of a plurality of code vectors to use for reconstructing the vector;

select a subset of the code vectors based on the data indicative of which of a plurality of code vectors to use for reconstructing the vector;

reconstruct the vector based on the weight values, and the selected subset of the code vectors; and

render, based on the reconstructed vector, loudspeaker feeds for playback by loudspeakers to reproduce the soundfield; and

a memory coupled to the one or more processors, and configured to store the reconstructed vector.

10. The device of claim **9**, wherein the one or more processors are further configured to determine a weighted sum of the selected subset of the code vectors where the selected subset of the code vectors are weighted by the weight values.

11. The device of claim **9**, wherein the one or more processors are further configured to:

for each of the weight values, multiply the weight value by a respective one of the selected subset of the code vectors to generate a respective weighted code vector included in a plurality of weighted code vectors; and

sum the plurality of weighted code vectors to determine the vector.

12. The device of claim **9**, wherein the one or more processors are further configured to:

for each of the weight values, multiply the weight value by a respective one of the code vectors in the subset of code vectors to generate a respective one of a plurality of weighted code vectors; and

sum the plurality of weighted code vectors to reconstruct the vector.

13. The device of claim **9**, wherein the one or more processor are further configured to obtain from the bitstream the data indicative of a plurality of weight values that represent the vector that is included in the decomposed version of the plurality of HOA coefficients, each of the weight values corresponding to the respective one of the plurality of weights in the weighted sum of code vectors that represents the vector and that includes the selected subset of code vectors, the set of code vectors comprising at least one of a set of directional vectors, a set of orthogonal directional

vectors, a set of orthonormal directional vectors, a set of pseudo-orthonormal directional vectors, a set of pseudo-orthogonal directional vectors, a set of directional basis vectors, a set of orthogonal vectors, a set of orthonormal vectors, a set of pseudo-orthonormal vectors, a set of pseudo-orthogonal vectors, and a set of basis vectors.

14. The device of claim **9**, wherein the vector comprises at least one of a V-vector obtained from singular value decomposition of the HOA coefficients and a right-singular value vector obtained from singular value decomposition of the HOA coefficients.

15. The device of claim **9**, further comprising the loudspeakers driven by the loudspeaker feeds to reproduce the soundfield, the loudspeakers coupled to the one or more processors.

16. The device of claim **9**, further comprising the loudspeakers, wherein the one or more processors are coupled to the loudspeakers.

17. The device of claim **9**,

wherein the one or more processors are further configured to reconstruct the HOA coefficients based on the reconstructed vector, and

wherein the one or more processors are configured to render, based on the reconstructed HOA coefficients, the loudspeaker feeds for playback by the loudspeakers to reproduce the soundfield.

18. A device configured to obtain a plurality of higher order ambisonic (HOA) coefficients, the device comprising:

means for obtaining from a bitstream, data indicative of a plurality of weight values that represent a vector, each of the weight values corresponding to a respective one of a plurality of weights in a weighted sum of code

vectors used to represent the vector, the vector defined in a spherical harmonic domain, and representative of a directional component of an corresponding audio object present in the soundfield represented by the plurality of HOA coefficients;

means for obtaining, from the bitstream, data indicative of which of a plurality of code vectors to use for reconstructing the vector;

means for selecting a subset of the code vectors based on the data indicative of which of the plurality of code vectors to use for reconstructing the vector;

means for reconstructing the vector based on the weight values, and the selected subset of the code vectors; and

means for rendering, based on the reconstructed vector, loudspeaker feeds for playback by loudspeakers to reproduce the soundfield.

19. The device of claim **18**, wherein the means for reconstructing the vector comprises means for determining a weighted sum of the selected subset of the code vectors where the selected subset of the code vectors are weighted by the weight values.

20. The device of claim **18**, wherein reconstructing the vector comprises:

for each of the weight values, multiplying the weight value by a respective one of the selected subset of the code vectors to generate a respective weighted code vector included in a plurality of weighted code vectors; and

summing the plurality of weighted code vectors to determine the vector.

21. The device of claim **18**, wherein the means for reconstructing the vector comprises:

means for multiplying, for each of the weight values, the weight value by a respective one of the code vectors in the subset of code vectors to generate a respective one of a plurality of weighted code vectors; and

means for summing the plurality of weighted code vectors to reconstruct the vector.