the time of recording (see, for example, Patent Document 1).

CITATION LIST

PATENT DOCUMENT

[0005]

Patent Document 1: Japanese Patent Application Laid-Open No. 2021-100209

SUMMARY OF THE INVENTION

PROBLEMS TO BE SOLVED BY THE INVENTION

[0006]

Meanwhile, since directional characteristics (directivity) are different for each sound source, in a case where audio data of an object and directivity data of the object are provided as content, it is necessary to prepare directivity data for each type of sound source, that is, for each type of object. In addition, when it is attempted to provide information regarding directivity for more directions and frequencies, the data amount of the directivity data increases.

[0007]

Then, the amount of transmission of the directivity data to the distribution destination of the content increases, and there is a possibility that a transmission delay occurs or a transmission rate increases.

[0008]

Embodiments of the present invention reduce an amount of transmission of directivity data.

SOLUTIONS TO PROBLEMS

[0009]

An information processing device according to an aspect of the present invention includes an acquisition unit configured to acquire model data obtained by modeling directivity data indicating directivity of a sound source, and a calculator configured to calculate the directivity data on the basis of the model data, wherein the model data includes a model parameter constituting a mixture model, the model parameter being obtained by modeling the directivity data with the mixture model including one or more distributions, wherein the one or more distributions include at least any one of a vMF distribution or a Kent distribution.

[0010]

Disclosed herein is information processing method or a program according to the above aspect of the present invention that includes the steps of acquiring model data obtained by modeling directivity data indicating directivity of a sound source, and calculating the directivity data on the basis of the model data.

[0011]

In the above aspect of the present invention, model data obtained by modeling directivity data indicating directivity of a sound source is acquired, and the directivity data is calculated on the basis of the model data.

[0012]

Disclosed herein is an information processing

device including a modeling unit configured to model directivity data representing directivity of a sound source with a mixture model including a plurality of distributions, and a model data generation unit configured to generate model data including a model parameter constituting the mixture model, the model parameter being obtained by the

modeling.

[0013]

Disclosed herein is an information processing method or a program that includes the steps of modeling directivity data representing directivity of a sound source with a mixture model including a plurality of distributions, and generating model data including a model parameter constituting the mixture model, the model parameter being obtained by the modeling.

[0014]

BRIEF DESCRIPTION OF DRAWINGS

[0015]

Fig. 1 is a diagram for describing a mixed Gaussian distribution.

Fig. 2 is a diagram for describing a vMF distribution and a Kent distribution.

Fig. 3 is a diagram illustrating an example of directivity.

Fig. 4 is a diagram for describing data points.

Fig. 5 is a diagram illustrating an example of model data.

Fig. 6 is a diagram for describing a relationship between a band and a bin.

CLAIMS

1. An information processing device comprising:

an acquisition unit configured to acquire model data obtained by modeling directivity data representing directivity of a sound source; and

a calculator configured to calculate the directivity data on a basis of the model data,

wherein the model data includes a model parameter constituting a mixture model, the model parameter being obtained by modeling the directivity data with the mixture model including one or more distributions,

wherein the one or more distributions include at least any one of a vMF distribution or a Kent distribution.

2. The information processing device according to claim 1, wherein

the directivity data includes a directivity gain for each of a plurality of frequency bins, and

the model data includes the model parameter constituting the mixture model representing a distribution of the directivity gain for each band that is a frequency band including one or more of the frequency bins.

3. The information processing device according to claim 2, wherein

the model data includes a scale factor indicating a dynamic range of the directivity gain in the frequency bin and a minimum value of the directivity gain in the

frequency bin.

4. The information processing device according to any one of the preceding claims, wherein

the model data includes difference information indicating a difference between the directivity data before modeling and the directivity data after modeling, and

the information processing device further comprises an addition unit configured to add the difference information to the directivity data calculated by the calculator.

5. The information processing device according to claim 4, wherein

the difference information is Huffman encoded.

6. The information processing device according to any one of the preceding claims, wherein

the directivity data includes a directivity gain for each of a plurality of frequency bins, and

the information processing device further comprises an interpolation processing unit configured to calculate the directivity gain of the new frequency bin by performing an interpolation process on a basis of the directivity data calculated by the calculator.

7. The information processing device according to any one of the preceding claims, wherein

the directivity data includes a directivity gain at each of a plurality of data points, and

the information processing device further comprises an interpolation processing unit configured to calculate the directivity gain at the new data point by performing an interpolation process on a basis of the directivity data calculated by the calculator.

8. The information processing device according to any one of the preceding claims, further comprising:

a directivity convolution unit configured to convolve the directivity data and audio data.

9. The information processing device according to claim 8, further comprising:

an HRTF convolution unit configured to convolve the audio data in which the directivity data is convolved and an HRTF.

10. The information processing device according to claim 1, wherein

the one or more distributions include a complex Bingham distribution or a complex watson distribution.

11. The information processing device according to any one of the preceding claims, wherein

the model data includes a spherical harmonic coefficient obtained by modeling the directivity data by spherical harmonic function expansion as a model parameter.

12. The information processing device according to any one of the preceding claims, wherein

the model data includes a model parameter obtained by modeling the directivity data by one or more methods different from each other.

13. The information processing device according to claim 12, wherein

the methods include at least any one of a method of modeling with a mixture model including one or more distributions or a method of modeling by spherical harmonic function expansion.