that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19; when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18; when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11; when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

[0014] With reference to the first aspect or the first possible implementation, in a fourth possible implementation, when the encoding mode includes the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, the correspondence between the encoding mode and the corresponding parameter value includes at least one of the following relationships: When the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.21; when the channel number indicates

BRIEF DESCRIPTION OF DRAWINGS

[0022] FIG. 1 is a schematic structural diagram of a stereo encoding and decoding system in time domain according to an embodiment of this application;

[0023] FIG. 2 is a schematic diagram of a mobile terminal according to an embodiment of this application;

[0024] FIG. 3 is a schematic diagram of a network element according to an embodiment of this application;

[0025] FIG. 4 is a schematic flowchart of a method for determining a weighting factor during stereo signal encoding according to an embodiment of this application;

[0026] FIG. 5 is a schematic structural diagram of an apparatus for determining a weighting factor during stereo signal encoding according to an embodiment of this application; and

[0027] FIG. 6 is a schematic structural diagram of an apparatus for determining a weighting factor during stereo signal encoding according to another embodiment of this application.

DESCRIPTION OF EMBODIMENTS

[0028] The following describes technical solutions of this application with reference to accompanying drawings.

[0029] FIG. 1 is a schematic structural diagram of a stereo encoding and decoding system in time domain according to an embodiment of this application. The stereo encoding and decoding system includes an encoding component 110 and a decoding component 120.

[0030] It should be understood that a stereo signal in this application may be an original stereo signal, or may be a stereo signal formed by two channels of signals included in a multi-channel signal, or may be a stereo signal formed by two channels of signals jointly generated by a plurality of channels of signals included in a multi-channel signal.

[0031] The encoding component 110 is configured to encode a stereo signal in time domain. Optionally, the encoding component 110 may be implemented by software, or may be implemented by hardware, or may be implemented in a form of a combination of software and hardware. This is not limited in this embodiment of this application.

[0032] That the encoding component 110 encodes a stereo signal in time domain may include the following several steps.

[0033] (1) Perform time-domain preprocessing on an obtained stereo signal, to obtain a left channel signal obtained after time-domain preprocessing and a right channel signal obtained after time-domain preprocessing.

[0034] The stereo signal may be collected and sent to the encoding component 110 by a collection component. Optionally, the collection component and the encoding component 110 may be disposed in a same device, or may be disposed in different devices.

[0035] The left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing are two channels of signals in the preprocessed stereo signal.

[0036] Optionally, time-domain preprocessing may include at least one of high-pass filtering processing, pre-emphasis processing, sampling rate conversion, and channel conversion. This is not limited in this embodiment of this application.

[0037] (2) Perform delay estimation based on the left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing, to obtain an inter-channel time difference between the left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing.

[0038] For example, a cross-correlation function between a left channel signal and a right channel signal may be calculated based on the left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing. Then, a maximum value of the cross-correlation function is searched for, and the maximum value is used as the inter-channel delay difference between the left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing.

[0039] For another example, a cross-correlation function between a left channel signal and a right channel signal may be calculated based on the left channel signal obtained after time-domain preprocessing and the right channel signal obtained after time-domain preprocessing. Then, long-term smoothing is performed on a cross-correlation function between a left channel signal and a right channel signal of a current frame based on cross-correlation functions between left channel signals and right channel signals of previous L frames (L is an integer greater than or equal to 1) of the current frame, to obtain a smoothed cross-correlation function. Then, a maximum value of a smoothed cross-correlation function is searched for, and an index value corresponding to the maximum value is used as an inter-channel delay difference between a left channel signal obtained

component 141 is connected to the decoding component 120, and the decoding component 120 is connected to the channel decoding component 142.

[0064] After collecting a stereo signal by using the collection component 131, the mobile terminal 130 encodes the stereo signal by using the encoding component 110, to obtain a stereo encoded bitstream, and then encodes the stereo encoded bitstream by using the channel encoding component 132, to obtain a transmit signal.

[0065] The mobile terminal 130 sends the transmit signal to the mobile terminal 140 by using a wireless or wired network.

[0066] After receiving the transmit signal, the mobile terminal 140 decodes the transmit signal by using the channel decoding component 142 to obtain the stereo encoded bitstream, decodes the stereo encoded bitstream by using the decoding component 110 to obtain the stereo signal, and plays the stereo signal by using the audio playing component 141.

[0067] For example, as shown in FIG. 3, an example is used for description in which the encoding component 110 and the decoding component 120 are disposed in a same network element 150 that has an audio signal processing capability in a core network or wireless network.

[0068] Optionally, the network element 150 includes a channel decoding component 151, the decoding component 120, the encoding component 110, and a channel encoding component 152. The channel decoding component 151 is connected to the decoding component 120, the decoding component 120 is connected to the encoding component 110, and the encoding component 110 is connected to the channel encoding component 152.

[0069] After receiving a transmit signal sent by another device, the channel decoding component 151 decodes the transmit signal to obtain a first stereo encoded bitstream; the decoding component 120 decodes the first stereo encoded bitstream to obtain a stereo signal; the encoding component 110 encodes the stereo signal to obtain a second stereo encoded bitstream; and the channel encoding component 152 encodes the second stereo encoded bitstream to obtain a transmit signal.

[0070] The another device may be a mobile terminal that has an audio signal processing capability, or may be another network element that has an audio signal processing capability. This is not limited in this embodiment of this application.

[0071] Optionally, the encoding component 110 and the decoding component 120 in the network element may transcode a stereo encoded bitstream sent by a mobile terminal.

[0102] It should be further understood that, in this embodiment of this application, a sequence of the encoding rates and the parameter values corresponding to the encoding rates in Table 1 to Table 6 is not limited. Positions of the encoding rates and the parameter values corresponding to the encoding rates in Table 1 to Table 6 may be mutually adjusted or randomly shuffled. This is not limited in this embodiment of this application.

[0103] In S420, when the weighting factor is calculated based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and the energy spectrum of the linear prediction filter that is corresponding to the original LSF parameter of the to-be-encoded signal, the weighting factor may be calculated based on the energy spectrum of the linear prediction filter that is corresponding to the original LSF parameter of the to-be-encoded signal, where the weighting factor w_i satisfies the following:

$$w_i = \left\| A\left(LSF(i)\right) \right\|^{-p}$$

where $A(\cdot)$ represents the power spectrum of a linear prediction filter corresponding to the original LSF parameter of the to-be-encoded signal; LSF represents a vector of the original LSF parameter of the to-be-encoded signal; i represents an index of the vector, where i=1, …, M, and M is a linear prediction order; and $\left\| \cdot \right\|^{-p}$ represents solving a 2-norm, which is of the vector, to the power of −p, where p represents a parameter value.

In the formula, p may be a number greater than 0 and less than 1. Generally, a value range of p may be [0.1, 0.25].

After the foregoing formula is expanded, the weighting factor satisfies the following:

$$w_i = \left\{ \left[1 + \sum_{i=1}^{M} b_i \cdot \cos\left(2\pi \cdot LSF(i) / FS\right) \right]^2 + \left[\sum_{i=1}^{M} b_i \cdot \sin\left(2\pi \cdot LSF(i) / FS\right) \right]^2 \right\}^{-p}$$

where b_i represents an ith coefficient of linear prediction coefficients corresponding to the original LSF parameter of the to-be-encoded signal, where i=1, …, M, and M is a linear prediction order; $LSF(i)$ is an ith vector of the original LSF parameter; and FS is a sampling rate for encoding.

[0104] It should be understood that the foregoing formula is merely an example, and any variation, modification, or change of the foregoing formula also falls within the scope of this embodiment of this application.

CLAIMS

1. A method for determining a weighting factor used for calculating a distance between an original line spectral frequency parameter and a target line spectral frequency parameter of a to-be-encoded signal in a stereo signal during stereo signal encoding, comprising:

determining a parameter value corresponding to an encoding mode of the to-be-encoded signal in the stereo signal, based on the encoding mode of the to-be-encoded signal and a correspondence between the encoding mode and the parameter value, wherein the encoding mode comprises at least one of:

an encoding rate,

an encoding bandwidth,

a channel number, or

a manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal, wherein the manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal comprises at least one of:

obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal or

obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction; and

calculating the weighting factor based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and an energy spectrum of a linear prediction filter corresponding to the original line spectral frequency parameter of the to-be-encoded signal, wherein the weighting factor is calculated based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and the energy spectrum of the linear prediction filter by using the following:

$w_i = \left\| A\left(LSF\,(i)\right) \right\|^{-p}$, wherein

w_i represents the weighting factor;

$A(\cdot)$ represents the energy spectrum of the linear prediction filter;

LSF represents a vector of the original line spectral frequency parameter;

i represents an index of the vector, wherein $1 \le i \le M$, and M is a linear prediction order;

p represents the parameter value corresponding to the encoding mode of the to-be-encoded signal; and

$\|\cdot\|^{-p}$ represents solving a 2-norm, which is of the vector, to a power of −p, wherein p is a number greater than 0 and less than 1.

2. The method according to claim 1, wherein the encoding mode comprises the encoding rate and the channel number, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

3. The method according to claim 1, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding

rate is less than or equal to 14 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.10;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

4. The method according to claim 1, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.21;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.15;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line

spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16; or

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17.

5. An apparatus for determining a weighting factor used for calculating a distance between an original line spectral frequency parameter and a target line spectral frequency parameter of a

to-be-encoded signal in a stereo signal during stereo signal encoding, comprising:

at least one processor; and

a memory storing computer executable instructions that, when executed by the at least one processor, instruct the at least one processor to:

determine a parameter value corresponding to an encoding mode of the to-be-encoded signal in the stereo signal, based on the encoding mode of the to-be-encoded signal and a correspondence between the encoding mode and the parameter value, wherein the encoding mode comprises at least one of:

an encoding rate, an encoding bandwidth,

a channel number, or

a manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal, wherein the manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal comprises at least one of:

obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, or

obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction; and

calculate the weighting factor based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and an energy spectrum of a linear prediction filter corresponding to the original line spectral frequency parameter of the to-be-encoded signal, wherein the weighting factor is calculated based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and the energy spectrum of the linear prediction filter by using the following:

$w_i = \left\| A\left(LSF\,(i)\right) \right\|^{-p}$, wherein

w_i represents the weighting factor;

$A(\cdot)$ represents the energy spectrum of the linear prediction filter;

LSF represents a vector of the original line spectral frequency parameter;

i represents an index of the vector, wherein $1 \le i \le M$, and M is a linear prediction order;

p represents the parameter value corresponding to the encoding mode of the to-be-

encoded signal; and

$\|\cdot\|^{-p}$ represents solving a 2-norm, which is of the vector, to a power of −p, wherein p is a number greater than 0 and less than 1.

6. The apparatus according to claim 5, wherein the encoding mode comprises the encoding rate and the channel number, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

7. The apparatus according to claim 5, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter,

and the correspondence comprises at least one of the following relationships:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel

signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.10;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target

line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

8. The apparatus according to claim 5, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.21;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.15;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per

second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16; or

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17.

9. A non-transitory computer-readable storage medium storing computer instructions that, when executed by one or more processors, cause the one or more processors to perform operations for determining a weighting factor used for calculating a distance between an original line spectral frequency parameter and a target line spectral frequency parameter of a to-be-encoded signal in a

stereo signal, the operations comprising:

determining a parameter value corresponding to an encoding mode of the to-be-encoded signal in a stereo signal, based on the encoding mode of the to-be-encoded signal and a correspondence between the encoding mode and the parameter value, wherein the encoding mode comprises at least one of:

an encoding rate, an encoding bandwidth,

a channel number, or

a manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal, wherein the manner of obtaining the target line spectral frequency parameter of the to-be-encoded signal comprises at least one of:

obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, or

obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction; and

calculating the weighting factor based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and an energy spectrum of a linear prediction filter that is corresponding to the original line spectral frequency parameter of the to-be-encoded signal, wherein the weighting factor is calculated based on the parameter value corresponding to the encoding mode of the to-be-encoded signal and the energy spectrum of the linear prediction filter by using the following:

$w_i = \left\| A\left(LSF\ (i)\right) \right\|^{-p}$, wherein

w_i represents the weighting factor;

$A(\cdot)$ represents the energy spectrum of the linear prediction filter;

LSF represents a vector of the original line spectral frequency parameter;

i represents an index of the vector, wherein $1 \le i \le M$, and M is a linear prediction order;

p represents the parameter value corresponding to the encoding mode of the to-be-encoded signal; and

$\left\| \cdot \right\|^{-p}$ represents solving a 2-norm, which is of the vector, to a power of −p, wherein p is a number greater than 0 and less than 1.

10. The non-transitory computer-readable storage medium according to claim 9, wherein the encoding mode comprises the encoding rate and the channel number, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

11. The non-transitory computer-readable storage medium according to claim 9, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.17;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target

line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.10;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.19;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.11;

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line

spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.17; or

when the channel number indicates that the to-be-encoded signal is a secondary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.24.

12. The non-transitory computer-readable storage medium according to claim 9, wherein the encoding mode comprises the encoding rate, the channel number, and the manner of obtaining the target line spectral frequency parameter, and the correspondence comprises at least one of the following:

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.21;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.15;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is equal to 26 kilobits per

second, the parameter value is 0.18;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal by quantizing the original line spectral frequency parameter of the to-be-encoded signal, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.20;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is less than or equal to 14 kilobits per second, the parameter value is 0.25;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 18 kilobits per second, the parameter value is 0.22;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 22 kilobits per second, the parameter value is 0.16;

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is equal to 26 kilobits per second, the parameter value is 0.16; or

when the channel number indicates that the to-be-encoded signal is a primary channel signal, the manner of obtaining the target line spectral frequency parameter is obtaining the target line spectral frequency parameter of the to-be-encoded signal through prediction, and the encoding rate is greater than or equal to 34 kilobits per second, the parameter value is 0.17.