CLAIMS

1. A signal coding method, wherein the method comprises:

obtaining a frequency domain signal according to an input signal;

allocating predetermined bits to the frequency domain signal according to a predetermined allocation rule;

adjusting the bit allocation for the frequency domain signal when a highest frequency of the frequency domain signal to which bits are allocated is greater than a predetermined value; and

coding the frequency domain signal according to the bit allocation for the frequency domain signal.

2. The method according to claim 1, wherein the adjusting the bit allocation for the frequency domain signal comprises: reducing the number of bits allocated to a frequency band to which more bits are allocated in the frequency domain signal, and increasing the number of bits allocated to the highest frequency to which bits are allocated and a frequency domain signal near the highest frequency.

3. The method according to claim 1 or 2, wherein the predetermined value is determined according to the number of the predetermined bits and a resolution of the frequency domain signal.

4. The method according to any one of claims 1 to 3, wherein the predetermined allocation rule is that: more bits in the predetermined bits are allocated to a low frequency band signal in the frequency domain signal, and rest bits in the predetermined bits are allocated to a frequency band with greater energy except the low frequency band signal.

5. The method according to any one of claims 1 to 4, further comprising:

if the highest frequency is less than the predetermined value, maintaining the bit allocation for the frequency domain signal that is performed according to the predetermined allocation rule.

6. A signal decoding method, wherein the method comprises:

obtaining, from a received bit stream, a frequency domain signal obtained by decoding;

when the frequency domain signal obtained by decoding meets a predetermined condition, predicting, according to the frequency domain signal obtained by decoding, a frequency domain signal that is not obtained by decoding; and

obtaining, according to the frequency domain signal obtained by decoding and the predicted frequency domain signal, a time domain signal that is finally outputted.

7. The method according to claim 6, wherein that the frequency domain signal obtained by decoding meets at least one of the following conditions:

a highest frequency of the frequency domain signal obtained by decoding is greater than a predetermined value; and

the frequency domain signal obtained by decoding comprises a time domain coding signal on which frequency domain transformation is performed and that contributes to an output signal.

8. The method according to claim 6 or 7, wherein the step of obtaining, from a received bit stream, a frequency domain signal obtained by decoding comprises:

performing frequency domain decoding on frequency domain information in the bit stream to obtain a first frequency domain signal;

determining, according to the first frequency domain signal, whether a time domain coding signal that contributes to the output signal exists in the bit stream; and

when it is determined that a time domain coding signal that contributes to the output signal exists in the bit stream, performing time domain decoding and frequency domain transformation on the time domain coding signal to obtain a second frequency domain signal, and synthesizing the first frequency domain signal and the second frequency domain signal to obtain the frequency domain signal obtained by decoding.

9. The method according to any one of claims 6 to 8, wherein the predetermined value is determined according to the number of predetermined bits used for frequency domain coding and a resolution of the frequency domain signal obtained by decoding.

10. The method according to any one of claims 6 to 9, wherein the predicting, according to the frequency domain signal obtained by decoding, a frequency domain signal that is not obtained by decoding comprises: selecting a frequency domain signal in a frequency band from the frequency domain signal obtained by decoding, and predicting, according to the selected frequency domain signal, the frequency domain signal that is not obtained by decoding.

11. The method according to any one of claims 6 to 10, wherein the predicting a frequency domain signal that is not obtained by decoding comprises: estimating a resonant peak location of the frequency domain signal according to a line spectral frequency (LSF) or an immittance spectral frequency (ISF), and when an amplitude of a predicted frequency domain coefficient near the resonant peak location is greater than a threshold, reducing the amplitude of the predicted frequency domain coefficient near the resonant peak location.

12. The method according to any one of claims 6 to 11, wherein when the frequency

domain signal obtained by decoding does not meet the predetermined condition, the frequency domain signal that is not obtained by decoding is predicted by using noise.

13. A signal coding device, wherein the device comprises:

a frequency domain transformation unit, configured to obtain a frequency domain signal according to an input signal;

a bit allocation unit, configured to allocate predetermined bits to the frequency domain signal according to a predetermined allocation rule; and

a bit adjustment unit, configured to adjust the bit allocation for the frequency domain signal when a highest frequency of the frequency domain signal to which bits are allocated is greater than or equal to a predetermined value; and

a frequency domain coding unit, configured to code the frequency domain signal according to the bit allocation for the frequency domain signal.

14. The device according to claim 13, wherein the bit adjustment unit configured to adjust the bit allocation for the frequency domain signal by reducing the number of bits allocated to a frequency band to which more bits are allocated in the frequency domain signal, and increasing the number of bits allocated to the highest frequency to which bits are allocated and a frequency domain signal near the highest frequency.

15. The device according to claim 13 or 14, wherein the predetermined value is determined according to the number of the predetermined bits and a resolution of the frequency domain signal.

16. The device according to any one of claims 13 to 15, wherein the predetermined allocation rule is that: more bits in the predetermined bits are allocated to a low frequency band signal in the frequency domain signal, and rest bits in the predetermined bits are allocated to a frequency band with greater energy except the low frequency band signal.

17. The device according to any one of claims 13 to 16, wherein when the highest frequency is less than the predetermined value, the bit adjustment unit configured to not adjust the bit allocation for the frequency domain signal, and the frequency domain coding unit codes the frequency domain signal according to the bit allocation that is performed by the bit allocation unit.

18. A signal decoding device, wherein the device comprises:

a decoding unit, configured to obtain, from a received bit stream, a frequency domain signal obtained by decoding;

a bandwidth extension unit, configured to predict, according to the frequency domain signal obtained by decoding, the frequency domain signal that is not obtained by decoding

when the frequency domain signal obtained by decoding meets a predetermined condition; and

an output unit, configured to obtain, according to the frequency domain signal obtained by decoding and the predicted frequency domain signal, a time domain signal that is finally outputted.

19. The device according to claim 18, wherein that the frequency domain signal obtained by decoding meets at least one of the following: a highest frequency of the frequency domain signal obtained by decoding is greater than a predetermined value, and the frequency domain signal obtained by decoding comprises a time domain coding signal on which frequency domain transformation is performed and that contributes to an output signal.

20. The device according to claim 18 or 19, wherein the decoding unit obtains, from the received bit stream by performing the following operations, the frequency domain signal obtained by decoding:

performing frequency domain decoding on frequency domain information in the bit stream to obtain a first frequency domain signal;

determining, according to the first frequency domain signal, whether a time domain coding signal that contributes to the output signal exists in the bit stream; and

when it is determined that a time domain coding signal that contributes to the output signal exists in the bit stream, performing time domain decoding and frequency domain transformation on the time domain coding signal to obtain a second frequency domain signal, and synthesizing the first frequency domain signal and the second frequency domain signal to obtain the frequency domain signal obtained by decoding.

21. The device according to any one of claims 18 to 20, wherein the predetermined value is determined according to the number of predetermined bits used for frequency domain coding and a resolution of the frequency domain signal obtained by decoding.

22. The device according to any one of claims 18 to 21, wherein when the frequency domain signal obtained by decoding meets the predetermined condition, the bandwidth extension unit selects a frequency domain signal in a frequency band from the frequency domain signal obtained by decoding, and predicts, according to the selected frequency domain signal, the frequency domain signal that is not obtained by decoding.

23. The device according to any one of claims 18 to 22, wherein after predicting, according to the frequency domain signal obtained by decoding, the frequency domain signal that is not obtained by decoding, the bandwidth extension unit estimates a resonant peak location of the frequency domain signal according to a line spectral frequency (LSF) or an

immittance spectral frequency (ISF), and when an amplitude of a predicted frequency domain coefficient near the resonant peak location is greater than a threshold, reduces the amplitude of the predicted frequency domain coefficient near the resonant peak location.

24. The device according to any one of claims 18 to 23, wherein when the frequency domain signal obtained by decoding does not meet the predetermined condition, the bandwidth extension unit predicts, by using noise, the frequency domain signal that is not obtained by decoding.

25. A computer-readable storage medium having a program recorded thereon; where the program makes the computer execute method of any of claims 1 to 12.

CLAIMS:

1. A signal coding method performed by a network device comprising a processor to code an input audio signal, wherein the method comprises:

obtaining a frequency domain signal of a current frame of the input audio signal, wherein the frequency domain signal has multiple bands;

allocating available bits for coding the frequency domain signal to the bands of the frequency domain signal, wherein each band either has bits or has no bit allocated thereto;

adjusting numbers of bits allocated to respective bands of the frequency domain signal when a highest index of a band with bits allocated thereto is greater than a threshold; and

coding the frequency domain signal by using the adjusted bits allocation.

2. The method according to claim 1, wherein the adjusting comprises: decreasing the number of bits allocated to a band with more bits allocated, and increasing the number of bits allocated to the band with the highest index and a band near the band with the highest index, wherein a total number of bits decreased in the adjusting step is equal to a total number of bits increased in the adjusting step.

3. The method according to claim 1, wherein the threshold is determined according to the number of the available bits and a resolution of the frequency domain signal.

4. The method according to claim 1, wherein the available bits are allocated as following: more bits in the available bits are allocated to a band of the current frame with low index, and rest bits are allocated to a band of the current frame with greater energy except the low frequency band signal.

5. The method according to claim 1, further comprising:

maintaining the bits allocated to the bands when the highest index of the band is less than the threshold.

6. A signal coding device for coding an input audio signal, comprising:

a processor; and

a non-transitory computer readable storage medium storing computer executable instructions, the processor being configured to execute the computer executable instructions to:

obtain a frequency domain signal of a current frame of the input audio signal, wherein the frequency domain signal has multiple bands;

allocate available bits for coding the frequency domain signal to bands of the frequency domain signal, wherein each band either has bits or has no bit allocated thereto;

adjust numbers of bits allocated to respective bands of the frequency domain signal when a highest index of a band with bits allocated thereto is greater than a threshold; and

code the frequency domain signal by using the adjusted bits allocation.

7. The device according to claim 6, wherein the adjust comprises: decrease the number of bits allocated to a band with more bits allocated, and increase the number of bits allocated to the band with the highest index and a band near the band with the highest index, wherein the number of bits decreased is equal to the number of bits increased.

8. The device according to claim 6, wherein the threshold is determined according to the number of the available bits and a resolution of the frequency domain signal.

9. The device according to claim 6, wherein the available bits are allocated as following: more bits in the available bits are allocated to a band of the current frame with low index, and rest bits are allocated to a band of the current frame with greater energy except the low frequency band signal.

10. The device according to claim 6, further comprising:

maintain the bits allocated to the bands when the highest index of the band is less than the threshold.