Claims

1. Apparatus for generating an enhanced signal from an input signal ~~(600)~~, wherein the enhanced signal has spectral values for an enhancement spectral region, the spectral values for the enhancement spectral region not being contained in the input signal ~~(600)~~, comprising:

a mapper ~~(602)~~ for mapping a source spectral region of the input signal to a target region in the enhancement spectral region; and

a noise filler ~~(604)~~ configured for generating first noise values for a noise-filling region ~~(302)~~ in the source spectral region of the input signal and for generating second noise values for a noise region in the target region, wherein the second noise values are decorrelated from the first noise values or for generating second noise values for a noise region in the target region, wherein the second noise values are decorrelated from first noise values in the source region, wherein the first noise values in the source region do not result from a noise filling operation,

wherein the noise filler ~~(604)~~ is configured to identify noise positions using an identification vector ~~(706)~~ having entries for spectral positions in the source spectral region only, or having entries for spectral positions in the source spectral region and in the target spectral region,

wherein the noise filler ~~(604)~~ is configured for calculating an energy information on noise values indicated by the identification vector ~~(706)~~,

wherein the noise filler ~~(604)~~ is configured to calculate an energy information on inserted random values intended for the target region,

wherein the noise filler is configured to calculate a gain factor for scaling the inserted random values using the energy information on noise values indicated by the identification vector ~~(706)~~ and using the energy information on inserted random values intended for the target region, and

wherein the noise filler is configured to apply the gain factor to the inserted random values.

2. Apparatus of claim 1,

wherein the input signal is an encoded signal comprising noise-filling parameters for the source spectral region of the input signal,

wherein the noise filler is configured for generating the first noise values using the noise-filling parameters and for generating the second noise values using an energy information on the first noise values.

3. Apparatus of claim 1 or 2,

wherein the noise filler is configured to calculate a gain factor for scaling the random values using energy information on noise in the source range and the energy information on the random values intended for the target region.

4. Apparatus of one of the preceding claims,

wherein the noise filler ~~(604)~~ is configured for generating the second noise value subsequent to an operation of the mapper ~~(602)~~ or for generating ~~(604)~~ the first and the second noise values subsequent to an operation of the mapper ~~(602)~~.

5. Apparatus of one of the preceding claims,

wherein the mapper ~~(602)~~ is configured to map the source spectral region to the target region, and

wherein the noise filler ~~(604)~~ is configured to perform noise-filling in spectral regions by generating the first noise values using noise-filling and noise-filling parameters transmitted in the input signal as side information, and to perform noise-filling in the target region to generate the second spectral values using energy information on the first noise values.

6. Apparatus of one of the preceding claims, further comprising:

an envelope adjuster for adjusting ~~(1202)~~ the second noise values in the enhancement spectral region using spectral envelope information included in the input signal as side information.

7. Apparatus of one of the preceding claims,

wherein the noise filler ~~(604)~~ is configured to only use side information of the input signal to identify spectral positions for noise-filling, or

wherein the noise filler ~~(604)~~ is configured to analyze a time or spectral characteristic of the input signal with or without spectral values in the noise-filling region to identify spectral positions for noise-filling.

8. Apparatus of one of the preceding claims,

wherein the mapper ~~(602)~~ is configured to perform a gap filling operation for generating the target spectral region, the apparatus comprising:

a spectral domain audio decoder ~~(112)~~ for generating a first decoded representation of a first set of first spectral portions, the decoded representation having a first spectral resolution;

a parametric decoder ~~(114)~~ for generating a second decoded representation of a second set of second spectral portions having a second spectral resolution being lower than the first spectral resolution;

a frequency regenerator ~~(116)~~ for regenerating a reconstructed second spectral portion having the first spectral resolution using a first spectral portion and spectral envelope information for the second spectral portion; and

a spectrum time converter ~~(118)~~ for converting the first decoded representation in the reconstructed second spectral portion into a time representation,

wherein the mapper ~~(602)~~ and the noise filler ~~(604)~~ are at least partly included in the frequency regenerator ~~(116)~~.

9. Apparatus of claim 8,

wherein the spectral domain audio decoder is configured to output a sequence of decoded frames of spectral values, a decoded frame being the first decoded representation, wherein the frame comprises spectral values for the first set of spectral portions and zero indications for the second set of second spectral portions,

wherein the apparatus for decoding further comprises a combiner ~~(208)~~ for combining spectral values generated by the frequency regenerator for the second set of second spectral portions and spectral values of the first set of first spectral portions in a reconstruction band to obtain a reconstructed spectral frame comprising spectral values for the first set of the first spectral portions and the second set of second spectral portions; and

wherein the spectrum-time converter ~~(118)~~ is configured to convert the reconstructed spectral frame into the time representation.

10. Apparatus of one of the preceding claims, further comprising:

for each target frequency range, a source region identification, and

wherein the mapper ~~(602)~~ is configured for selecting the source region using the source region identification and for mapping the selected source region to the target region.

11. Method of generating an enhanced signal from an input signal ~~(600)~~, wherein the enhanced signal has spectral values for an enhancement spectral region, the spectral values for the enhancement spectral region not being contained in the input signal ~~(600)~~, comprising:

mapping ~~(602)~~ a source spectral region of the input signal to a target region in the enhancement spectral region; and

generating ~~(604)~~ first noise values for a noise-filling region ~~(302)~~ in the source spectral region of the input signal and for generating second noise values for a

noise region in the target region, wherein the second noise values are decorrelated from the first noise values, or for generating second noise values for a noise region in the target region, wherein the second noise values are decorrelated from first noise values in the source region, wherein the first noise values in the source region do not result from a noise filling operation,

wherein the generating ~~(604)~~ comprises:

identifying noise positions using an identification vector ~~(706)~~ having entries for spectral positions in the source spectral region only, or having entries for spectral positions in the source spectral region and in the target spectral region,

calculating an energy information on noise values indicated by the identification vector ~~(706)~~,

calculating an energy information on inserted random values intended for the target region,

calculating a gain factor for scaling the inserted random values using the energy information on noise values indicated by the identification vector ~~(706)~~ and using the energy information on inserted random values intended for the target region, and

applying the gain factor to the inserted random values.

12. Method of claim 11, wherein the generating ~~(604)~~ comprises calculating a gain factor for scaling the random values using energy information on noise in the source range and the energy information on the random values intended for the target region.

13. System for processing an audio signal, comprising:

an encoder for generating an encoded signal; and

the apparatus for generating an enhanced signal in accordance with any one of claims 1 to 10, wherein the encoded signal is subjected to a processing ~~(700)~~ in order to generate an input signal ~~(600)~~ into the apparatus for generating the enhanced signal.

14. Method for processing an audio signal, comprising:

generating an encoded signal from the audio signal; and

a method of generating an enhanced signal in accordance with claim 11, wherein the encoded signal is subjected to a predefined processing ~~(700)~~ in order to generate an input signal ~~(600)~~ into the method of generating the enhanced signal.

15. Computer program for performing, when running on a computer, the method of claim 11 or claim 14.