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 regions 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, the source spectral region comprising a noise-filling region ~~(302)~~; and

a noise filler ~~(604)~~ configured for generating first noise values for the 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 noise filler ~~(604)~~ is configured for:

identifying the noise-filling region having the first noise values in the input signal;

copying ~~(902)~~ at least a region of the input signal to a source tile buffer, the region comprising the source spectral region;

replacing ~~(904)~~ the first noise values as identified by the independent noise values; and

wherein the mapper ~~(602)~~ is configured to map the source tile buffer having decorrelated noise values to the target region.

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,

wherein the noise filler ~~(604)~~ is configured to measure an energy information on the decorrelated noise values ~~(1102)~~ and an energy information on the first noise values ~~(1100)~~ and to scale ~~(906)~~ the decorrelated noise values using a scaling value derived from the energy information on the decorrelated noise values and the energy information on the first noise values.

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 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.

9. Apparatus of claim 1 or 3,

wherein the noise filler ~~(604)~~ is configured to copy, in the copying operation ~~(902)~~, a complete spectral portion of the input signal or a complete spectral portion of the input signal above a noise-filling border frequency generally usable by the mapper to the source tile buffer and to perform the replacing operation ~~(904)~~ on the full source tile buffer, or

wherein the noise filler ~~(604)~~ is configured to copy, in the copying operation ~~(902)~~, only a spectral region of the input signal identified by one or more specific source identifiers for a source region to be used by the mapper ~~(602)~~ for an identified target region, where an individual source tile buffer is used for each different individual mapping operation.

10. 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)~~.

11. Apparatus of claim 10,

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.

12. 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.

13. 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 regions 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, the source spectral region comprising a noise-filling region ~~(302)~~; and

generating ~~(604)~~ first noise values for the 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 generating ~~(604)~~ comprises:

identifying the noise-filling region having the first noise values in the input signal;

copying ~~(902)~~ at least a region of the input signal to a source tile buffer, the region comprising the source spectral region; and

replacing ~~(904)~~ the first noise values as identified by the independent noise values; and

wherein the mapping ~~(602)~~ comprises mapping the source tile buffer having decorrelated noise values to the target region.

14. 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 12, wherein the encoded signal is subjected to a processing ~~(700)~~ in order to generate the input signal ~~(600)~~ into the apparatus for generating the enhanced signal.

15. Method for processing an audio signal, comprising:

generating an encoded signal from an input signal; and

a method of generating an enhanced signal in accordance with claim 13, wherein the encoded signal is subjected to a predefined processing ~~(700)~~ in order to generate the input signal ~~(600)~~ into the apparatus for generating the enhanced signal.

16. Computer program for performing, when running on a computer, the method of claim 13 or claim 15.