CLAIMS

1. An audio processing device including a subband processing unit configured to determine a synthesis subband signal from a first and a second analysis subband signal; wherein the first and the second analysis subband signal each comprise a plurality of complex valued analysis samples at different times, referred to as the first and second analysis samples, respectively, each analysis sample having a phase and a magnitude; wherein the first and second analysis subband signals are associated with respective frequency bands of an input audio signal; wherein the subband processing unit comprises

a first block extractor configured to repeatedly

derive a frame of L first input samples from the plurality of first analysis samples; the frame length L being greater than one; and

apply an input block stride to the plurality of first analysis samples, prior to deriving a next frame of L first input samples;

thereby generating a suite of frames of L first input samples;

a second block extractor configured to derive a suite of second input samples by applying the input block stride to the plurality of second analysis samples; wherein each second input sample corresponds to a frame of first input samples;

a nonlinear frame processing unit configured to determine a frame of processed samples from a frame of first input samples and from the corresponding second input sample, by determining for each processed sample of the frame:

the phase of the processed sample by offsetting the phase of the corresponding first input sample; and

the magnitude of the processed sample based on the magnitude of the corresponding first input sample and the magnitude of the corresponding second input sample; and

an overlap and add unit configured to determine the synthesis subband signal by overlapping and adding the samples of a suite of frames of processed samples; wherein the synthesis subband signal is associated with a frequency band of a signal which is time

stretched and/or frequency transposed with respect to the input audio signal, wherein the input block stride is equal to one sample.

2. The subband processing unit of claim 1, wherein the first block extractor is configured to downsample the plurality of complex valued first analysis samples by a subband transposition factor Q .

3. The subband processing unit of claim 1, wherein the first block extractor is configured to interpolate two or more complex valued first analysis samples to derive a first input sample.

4. The subband processing unit of claim 1, wherein the nonlinear frame processing unit is configured to determine the magnitude of the processed sample as a mean value of the magnitude of the corresponding first input sample and the magnitude of the corresponding second input sample.

5. The subband processing unit of claim 4, wherein the nonlinear frame processing unit is configured to determine the magnitude of the processed sample as the geometric mean value of the magnitude of the corresponding first input sample and the magnitude of the corresponding second input sample.

6. The subband processing unit of claim 5, wherein the geometric mean value is determined as the magnitude of the corresponding first input sample raised to the power of $(1-\rho)$, multiplied by the magnitude of the corresponding second input sample raised to the power of ρ, wherein the geometrical magnitude weighting parameter $\rho \in (0,1]$.

7. The subband processing unit of claim 6, wherein the geometrical magnitude weighting parameter ρ is a function of a subband transposition factor Q and a subband stretch factor S.

8. The subband processing unit of claim 7, wherein the geometrical magnitude weighting parameter $\rho = 1 - \frac{1}{QS}$.

9. The subband processing unit of claim 1, wherein the nonlinear frame processing unit is configured to determine the phase of the processed sample by offsetting the phase of the corresponding first input sample by a phase offset value which is based on the corresponding second input sample, a transposition factor Q and a subband stretch factor S.

10. The subband processing unit of claim 9, wherein the phase offset value is based on the corresponding second input sample multiplied by $(QS-1)$.

11. The subband processing unit of claim 10, wherein the phase offset value is given by the corresponding second input sample multiplied by $(QS-1)$ plus a phase correction parameter θ.

12. The subband processing unit of claim 11, wherein the phase correction parameter θ is determined experimentally for a plurality of input signals having particular acoustic properties.

13. The subband processing unit of claim 1, wherein the corresponding second input sample is the same for each processed sample of the frame.

14. The subband processing unit of claim 1, wherein the overlap and add unit applies a output block stride to succeeding frames of processed samples, the output block stride being equal to the input block stride multiplied by a subband stretch factor S.

15. The subband processing unit of claim 1, wherein the subband processing unit further comprises a windowing unit upstream of the overlap and add unit and configured to apply a window function to the frame of processed samples.

16. The subband processing unit of claim 1, wherein

the subband processing unit is configured to determine a plurality of synthesis subband signals from a plurality of analysis subband signals;

the plurality of analysis subband signals is associated with a plurality of frequency bands of the input audio signal; and

the plurality of synthesis subband signals is associated with a plurality of frequency bands of the signal which is time stretched and/or frequency transposed with respect to the input audio signal.

17. A method, performed by an audio processing device, for generating a synthesis subband signal that is associated with a frequency band of a signal which is time stretched and/or frequency transposed with respect to an input audio signal, the method comprising:

providing a first and a second analysis subband signal, which are associated with respective frequency bands of the input audio signal; wherein the first and the second analysis subband signal each comprise a plurality of complex valued analysis samples at different times, referred to as the first and second analysis samples, respectively, each analysis sample having a phase and a magnitude;

deriving a frame of L first input samples from the plurality of first analysis samples; the frame length L being greater than one;

applying an input block stride to the plurality of first analysis samples, prior to deriving a next frame of L first input samples; thereby generating a suite of frames of first input samples;

deriving a suite of second input samples by applying the input block stride to the plurality of second analysis samples; wherein each second input sample corresponds to a frame of first input samples;

determining a frame of processed samples from a frame of first input samples and from the corresponding second input sample, by determining for each processed sample of the frame:

the phase of the processed sample by offsetting the phase of the corresponding first input sample; and

the magnitude of the processed sample based on the magnitude of the corresponding first input sample and the magnitude of the corresponding second input sample; and

determining the synthesis subband signal by overlapping and adding the samples of a suite of frames of processed samples, wherein the input block stride is equal to one sample.

18. A non-transitory storage medium comprising a software program adapted for execution on a processor and for performing the method steps of claim 17 when carried out on an audio processing device.