Claims

1. Audio decoder comprising

a time-domain decoder;

a frequency-domain decoder;

an associator configured to associate each of consecutive frames of a data stream, each of which represents a corresponding one of consecutive portions of an audio signal, with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain decoder is configured to decode frames having one of a first subset of one or more of the plurality of frame coding modes associated therewith, and the frequency-domain decoder is configured to decode frames having one of a second subset of one or more of the plurality of frame coding modes associated therewith, the first and second subsets being disjoint to each other;

wherein the associator is configured to perform the association dependent on a frame mode syntax element associated with the frames in the data stream, and operate in an active one of a plurality of operating modes with selecting the active operating mode out of the plurality of operating modes depending on the data stream and/or an external control signal, and changing the dependency of the performance of the association depending on the active operating mode,

wherein the time-domain decoder is a code-excited linear-prediction decoder.

2. Audio decoder according to claim 1, wherein the associator is configured such that if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset, and

if the active operating mode is a second operating mode, the mode dependent set of the plurality of frame coding modes overlaps with the first and second subsets.

3. ~~Audio decoder according to claim 1 or 2,~~ Audio decoder comprising

a time-domain decoder;

a frequency-domain decoder;

an associator configured to associate each of consecutive frames of a data stream, each of which represents a corresponding one of consecutive portions of an audio signal, with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain decoder is configured to decode frames having one of a first subset of one or more of the plurality of frame coding modes associated therewith, and the frequency-domain decoder is configured to decode frames having one of a second subset of one or more of the plurality of frame coding modes associated therewith, the first and second subsets being disjoint to each other;

wherein the associator is configured to perform the association dependent on a frame mode syntax element associated with the frames in the data stream, and operate in an active one of a plurality of operating modes with selecting the active operating mode out of the plurality of operating modes depending on the data stream and/or an external control signal, and changing the dependency of the performance of the association depending on the active operating mode,

wherein the frame mode syntax element is coded into the data stream so that a number of differentiable possible values for the frame mode syntax element relating to each frame is independent from the active operating mode being the first or second operating mode.

4. Audio decoder according to claim 3, wherein the number of differentiable possible values is two and the associator is configured such that, if the active operating mode is the first operating mode, the mode dependent set comprises a first and a second frame coding mode of the second subset of one or more frame coding modes, and the frequency-domain decoder is configured to use different time-frequency resolutions in decoding frames having the first and second frame coding mode associated therewith.

~~5. Audio decoder according to any of the previous claims, wherein the time-domain decoder is a code-excited linear-prediction decoder.~~

65. Audio decoder according to any of the previous claims, wherein the frequency-domain decoder is a transform decoder configured to decode the frames having one of the second subset of one or more of the frame coding modes associated therewith, based on transform coefficient levels encoded therein.

~~76. Audio decoder according to any of the previous claims,~~ Audio decoder comprising

a time-domain decoder;

a frequency-domain decoder;

an associator configured to associate each of consecutive frames of a data stream, each of which represents a corresponding one of consecutive portions of an audio signal, with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain decoder is configured to decode frames having one of a first subset of one or more of the plurality of frame coding modes associated therewith, and the frequency-domain decoder is configured to decode frames having one of a second subset of one or more of the plurality of frame coding modes associated therewith, the first and second subsets being disjoint to each other;

wherein the associator is configured to perform the association dependent on a frame mode syntax element associated with the frames in the data stream, and operate in an active one of a plurality of operating modes with selecting the active operating mode out of the plurality of operating modes depending on the data stream and/or an external control signal, and changing the dependency of the performance of the association depending on the active operating mode,

wherein the time-domain decoder and the frequency-domain decoder are LP based decoders configured to obtain linear prediction filter coefficients for each frame from the data stream, wherein the time-domain decoder is configured to reconstruct the portions of the audio signal corresponding to the frames having

one of the first subset of one or more of the frame coding modes associated therewith by applying an LP synthesis filter depending on the LPC filter coefficients for the frames having one of the first subset of one or more of the plurality of frame coding modes associated therewith, onto an excitation signal constructed using codebook indices in the frames having one of the first subset of one or more of the plurality of frame coding modes associated therewith, and the frequency-domain decoder is configured to reconstruct the portions of the audio signal corresponding to the frames having one of the second subset of one or more of the frame coding modes associated therewith by shaping an excitation spectrum defined by transform coefficient levels in the frames having one of the second subset associated therewith, in accordance with the LPC filter coefficients for the frames having one of the second subset associated therewith, and retransforming the shaped excitation spectrum.

78. Audio encoder comprising

a time-domain encoder;

a frequency-domain encoder; and

an associator configured to associate each of consecutive portions of an audio signal with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain encoder is configured to encode portions having one of a first subset of one or more of the plurality of frame coding modes associated wherewith, into a corresponding frame of a data stream, and wherein the frequency-domain encoder is configured to encode portions having one of a second subset of one or more of the plurality of encoding modes associated therewith, into a corresponding frame of the data stream,

wherein the associator is configured to operate in an active one of a plurality of operating modes such that, if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset and if the active operating mode is a second operating mode, the mode dependent set of the plurality of encoding modes overlaps with the first and second subset,

wherein the time-domain encoder is a code-excited linear-prediction encoder.

~~98~~. Audio encoder according to claim ~~87~~, wherein the associator is configured to encode a frame mode syntax element into the data stream so as to indicate, for each portion, as to which frame coding mode of the plurality of frame coding modes the respective portion is associated with.

9. Audio encoder according to claim 8, wherein the associator is configured such that if the active operating mode is the first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset, and

if the active operating mode is a second operating mode, the mode dependent set of the plurality of frame coding modes overlaps with the first and second subsets.

10. ~~Audio encoder according to claim 9,~~ Audio encoder comprising

a time-domain encoder;

a frequency-domain encoder; and

an associator configured to associate each of consecutive portions of an audio signal with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain encoder is configured to encode portions having one of a first subset of one or more of the plurality of frame coding modes associated wherewith, into a corresponding frame of a data stream, and wherein the frequency-domain encoder is configured to encode portions having one of a second subset of one or more of the plurality of encoding modes associated therewith, into a corresponding frame of the data stream,

wherein the associator is configured to operate in an active one of a plurality of operating modes such that, if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset and if the active operating mode is a second operating mode, the mode dependent set of the plurality of encoding modes overlaps with the first and second subset,

wherein the associator is configured to encode a frame mode syntax element into the data stream so as to indicate, for each portion, as to which frame coding mode of the plurality of frame coding modes the respective portion is associated with,

wherein the associator is configured to encode the frame mode syntax element into the data stream using a bijective mapping between a set of possible values of the frame mode syntax element associated with a respective portion on the one hand, and the mode dependent set of the frame coding modes on the other hand, which bijective mapping changes depending on the active operating mode.

~~11. Audio encoder according to claim 9, wherein the associator is configured such that if the active operating mode is the first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset, and~~

~~if the active operating mode is a second operating mode, the mode dependent set of the plurality of frame coding modes overlaps with the first and second subsets.~~

~~12~~11. ~~Audio encoder according to claim 11,~~ Audio encoder comprising

a time-domain encoder;

a frequency-domain encoder; and

an associator configured to associate each of consecutive portions of an audio signal with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain encoder is configured to encode portions having one of a first subset of one or more of the plurality of frame coding modes associated wherewith, into a corresponding frame of a data stream, and wherein the frequency-domain encoder is configured to encode portions having one of a second subset of one or more of the plurality of encoding modes associated therewith, into a corresponding frame of the data stream,

wherein the associator is configured to operate in an active one of a plurality of operating modes such that, if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset and if the active operating mode

is a second operating mode, the mode dependent set of the plurality of encoding modes overlaps with the first and second subset,

wherein the associator is configured to encode a frame mode syntax element into the data stream so as to indicate, for each portion, as to which frame coding mode of the plurality of frame coding modes the respective portion is associated with,

wherein the associator is configured such that if the active operating mode is the first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset, and

if the active operating mode is a second operating mode, the mode dependent set of the plurality of frame coding modes overlaps with the first and second subsets,

wherein a number of possible values in the set of possible values is two and the associator is configured such that, if the active operating mode is the first operating mode, the mode dependent set comprises a first and a second frame coding mode of the second set of one or more frame coding modes, and the frequency-domain encoder is configured to use different time-frequency resolutions in encoding portions having the first and second frame coding mode associated therewith.

~~13. Audio encoder according to any of claims 8 to 12, wherein the time-domain encoder is a code-excited linear-prediction encoder.~~

14. Audio encoder according to any of claims ~~8~~ 7 to ~~13~~ 11, wherein the frequency-domain encoder is a transform encoder configured to encode the portions having one of the second subset of one or more of the frame coding modes associated therewith, using transform coefficient levels and encode same into the corresponding frames of the data stream.

15. ~~Audio encoder according to any of claims 8 to 14,~~ Audio encoder comprising

a time-domain encoder;

a frequency-domain encoder; and

an associator configured to associate each of consecutive portions of an audio signal with one out of a mode dependent set of a plurality of frame coding modes,

wherein the time-domain encoder is configured to encode portions having one of a first subset of one or more of the plurality of frame coding modes associated wherewith, into a corresponding frame of a data stream, and wherein the frequency-domain encoder is configured to encode portions having one of a second subset of one or more of the plurality of encoding modes associated therewith, into a corresponding frame of the data stream,

wherein the associator is configured to operate in an active one of a plurality of operating modes such that, if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset and if the active operating mode is a second operating mode, the mode dependent set of the plurality of encoding modes overlaps with the first and second subset,

wherein the time-domain decoder and the frequency-domain decoder are LP based encoders configured to signal LPC-filter coefficients for each portion of the audio signal, wherein the time-domain encoder is configured to apply an LP analysis filter depending on the LPC filter coefficients onto the portions of the audio signal having one of the first subset of one or more of the frame coding modes associated therewith so as to obtain an excitation signal, and to approximate the excitation signal by use of codebook indices and insert same into the corresponding frames, wherein the frequency-domain encoder is configured to transform the portions of the audio signal having one of the second subset of one or more of the frame coding modes associated therewith, so as to obtain a spectrum, and shaping the spectrum in accordance with the LPC filter coefficients for the portions having one of the second subset associated therewith, so as to obtain an excitation spectrum, quantize the excitation spectrum into transform coefficient levels in the frames having one of the second subset associated therewith, and insert the quantized excitation spectrum into the corresponding frames.

~~16~~14. Audio decoding method using a time-domain decoder, and a frequency-domain decoder, the method comprising:

associating each of consecutive frames of a data stream, each of which represents a corresponding one of consecutive portions of an audio signal, with one out of a mode dependent set of a plurality of frame coding modes,

decoding frames having one of a first subset of one or more of the plurality of frame coding modes associated therewith, by the time-domain decoder,

decoding frames having one of a second subset of one or more of the plurality of frame coding modes associated therewith, by the frequency-domain decoder, the first and second subsets being disjoint to each other;

wherein the association is dependent on a frame mode syntax element associated with the frames in the data stream,

and wherein the association is performed in an active one of a plurality of operating modes with selecting the active operating mode out of the plurality of operating modes depending on the data stream and/or an an external control signal, such that the dependency of the performance of the association changes depending on the active operating mode,

wherein the time-domain decoder is a code-excited linear-prediction decoder.

~~17~~15. Audio encoding method using a time-domain encoder and a frequency-domain encoder, the method comprising

associating each of consecutive portions of an audio signal with one out of a mode dependent set of a plurality of frame coding modes;

encoding portions having one of a first subset of one or more of the plurality of frame coding modes associated wherewith, into a corresponding frame of a data stream by the time-domain encoder;

encoding portions having one of a second subset of one or more of the plurality of encoding modes associated therewith, into a corresponding frame of the data stream by the frequency-domain encoder,

wherein the association is performed in an active one of a plurality of operating modes such that, if the active operating mode is a first operating mode, the mode dependent set of the plurality of frame coding modes is disjoint to the first subset and overlaps with the second subset and if the active operating mode is a second

operating mode, the mode dependent set of the plurality of encoding modes overlaps with the first and second subset,.

wherein the time-domain encoder is a code-excited linear-prediction encoder.

~~18~~16. Computer program having a program code for performing, when running on a computer, a method according to claim ~~16~~ 14 or ~~17~~15.