Claims

1. Video coder for predictive coding, into an encoded video bit stream, of an original block of an original frame based on a prediction block obtained from a reference frame, comprising:

- a buffer configured to store the original block,
- a buffer configured to store the prediction block, and
- an adaptive sharpening filter configured to apply a spatial adaptive sharpening filtering to the prediction block, wherein the adaptive sharpening filter is a non-linear filter configured to be controlled by a single adaptive parameter.

2. Video coder according to claim 1, wherein, for the predictive coding, into the encoded video bit stream, of a plurality of original blocks of the original frame based respectively on a plurality of prediction blocks obtained from the reference frame, the adaptive sharpening filter is configured to apply a different sharpening filtering to each of the plurality of prediction blocks.

3. Video coder according to claim 1 or 2 for inter layer predictive coding of scalable video content comprising a base layer and at least one enhancement layer,
wherein the original frame is a frame of an enhancement layer, and
the reference frame is a frame of a reconstructed base layer,
wherein the video coder comprises:
- an upsampling filter configured to upsample the reference frame, the prediction block being a block of the upsampled reference frame.

4. Video coder according to claim 1 or 2 for inter frame predictive coding of video content comprising subsequent frames,
wherein the original frame is one of the subsequent frames, and
the reference frame is one of reconstructed subsequent frames,
wherein the video coder comprises:
- a buffer configured to store a reference block of the reference frame,
- a motion estimation unit configured to obtain a motion vector reflecting motion between the reference block and the original block, and

- a motion compensation unit configured to generate the prediction block from the reference block based on the motion vector.

5. Video coder according to any one of the preceding claims, comprising:
- a control unit configured to control at least one of a selective bypass of the adaptive sharpening filter and a selective application of the adaptive sharpening filter, and
- an encoding unit configured to add to the encoded video bit stream sharpening filter information reflecting the at least one of the selective bypass and the selective application of the adaptive sharpening filter.

6. Video coder according to claim 5,
wherein the encoding unit is configured to encode the sharpening filter information using a context-adaptive binary arithmetic coding, CABAC,
wherein the video coder comprises:
- an edge strength estimation unit configured to estimate an edge strength in the prediction block or a reference block of the reference frame,
- a CABAC context switch configured to select a context of the CABAC depending on the estimated edge strength.

7. Video coder according to any one of the claims 5 to 6,
wherein the control unit is configured to control the at least one of the selective bypass and the selective application based on a minimization of a residual block, said residual block being the difference between the original block and the prediction block, or based on a cost criterion that is, for example, a rate distortion optimization.

8. Video coder according to any one of the preceding claims,
wherein the video coder comprises:
- a control unit configured to determine a parameter value of the adaptive parameter and supply the determined parameter value to the adaptive sharpening filter, and
- an encoding unit configured to add to the encoded video bit stream adaptive parameter information about the determined parameter value of the adaptive parameter.

9. Video coder according to claim 8,
wherein the control unit is configured to supply different parameter values for the adaptive parameter and to select one of the different parameter values based on a minimization of a residual block, said residual block being the difference between the original block and the prediction block, or based on a cost criterion such as, for example, a rate distortion optimization.

10. Video coder according to any one of the claims 8 to 9,
wherein the adaptive sharpening filter comprises:
- an edge map calculation unit adapted to generate an edge map of a source block, said source block being the prediction block or a reference block of the reference frame,
- a blurring filter adapted to blur the edge map of the source block,
- a high-pass filter adapted to generate, by high-pass filtering the blurred edge map, a derivative vector for each position of the source block,
- a scaling unit adapted to generate a displacement vector by scaling the derivative vector with the sharpening strength coefficient (K), and
- a warping unit adapted to warp the prediction block based on the displacement vector,
wherein the adaptive parameter includes the sharpening strength coefficient (K).

11. Video coder according to any one of claims 5 to 10,
wherein the adaptive parameter information and/or the sharpening filter information is added at a block level for each prediction block, for an arbitrary or regular region of the frame, at a frame level, at a GOP (group of pictures) level, at a PPS (picture parameter set) level or at an SPS (sequence parameter set) level.

12. Method for predictive coding, into an encoded video bit stream, of an original block of an original frame based on a prediction block obtained from a reference frame, comprising:
- storing the original block,
- storing the prediction block, and
- an adaptive sharpening filter step comprising applying a spatial adaptive sharpening filtering to the prediction block, wherein the adaptive sharpening filter step is

performed by a non-linear filter configured to be controlled by a single adaptive parameter.

13. Video decoder for decoding an encoded video bit stream obtained by predictive coding of an original block of an original frame based on a prediction block obtained from a reconstructed reference frame, comprising:
- a decoding unit configured to reconstruct the reference frame from the encoded video bit stream,
- a buffer configured to store the prediction block obtained from the reconstructed reference frame,
- an adaptive sharpening filter configured to apply a spatial adaptive sharpening filtering to the prediction block, wherein the adaptive sharpening filter is non-linear filter configured to be controlled by a single adaptive parameter.

14. Video decoder according to claim 13 for decoding the encoded video bit stream obtained by inter layer predictive coding of scalable video content comprising a base layer and at least one enhancement layer,
wherein the original frame is a frame of an enhancement layer, and
the reference frame is a frame of a reconstructed base layer,
wherein the video decoder comprises:
- an upsampling filter configured to upsample the reconstructed reference frame, the prediction block being a block of the upsampled reference frame.

15. Video decoder according to claim 13 for decoding the encoded video bit stream obtained by inter frame predictive coding of video content comprising subsequent frames,
wherein the original frame is one of the subsequent frames, and
the reference frame is one of reconstructed subsequent frames,
wherein the video decoder comprises:
- a buffer configured to store a reference block of the extracted reference frame,
- a decoding unit configured to extract, from the encoded video bit stream, a motion vector reflecting motion between the reference block and the original block, and
- a motion compensation unit configured to generate the prediction block from the reference block based on the motion vector.

16. Video decoder according to any one of the claims 13 to 15, comprising:
- a decoding unit configured to extract, from the encoded video bit stream, sharpening filter information reflecting at least one of a selective bypass of the adaptive sharpening filter and a selective application of the adaptive sharpening filter, and
- a control unit configured to control the at least one of the selective bypass and the selective application depending on the extracted sharpening filter information.

17. Video decoder according to claim 16,
wherein the decoding unit is configured to decode the sharpening filter information according to a context-adaptive binary arithmetic coding, CABAC,
wherein the video decoder comprises:
- an edge strength estimation unit configured to estimate an edge strength in the prediction block or a reference block of the reference frame,
- a CABAC context switch configured to select a context of the CABAC depending on the estimated edge strength.

18. Video decoder according to any one of the claims 13 to 17, wherein the video decoder comprises:
- a decoding unit configured to extract, from the encoded video bit stream, adaptive parameter information about a parameter value of the adaptive parameter, and
- a control unit configured to control the adaptive sharpening filter according to the extracted adaptive parameter information.

19. Video decoder according to claim 18, wherein the adaptive sharpening filter comprises:
- an edge map calculation unit adapted to generate an edge map of a source block, said source block being the prediction block or a reference block of the reference frame,
- a blurring filter adapted to blur the edge map of the source block,
- a high-pass filter adapted to generate, by high-pass filtering the blurred edge map, a derivative vector for each position of the source block,
- a scaling unit adapted to generate a displacement vector by scaling the derivative vector with the sharpening strength coefficient (K), and

- a warping unit adapted to warp the prediction block based on the displacement vector,

wherein the adaptive parameter includes the sharpening strength coefficient (K).

20. Video decoder according to any one of claims 16 to 19,

wherein the adaptive parameter information and/or the sharpening filter information is extracted at a block level for each prediction block, for an arbitrary or regular region of the frame, at a frame level, at a GOP (group of pictures) level, at a PPS (picture parameter set) level or at an SPS (sequence parameter set) level.

21. Method for decoding an encoded video bit stream obtained by predictive coding of an original block of an original frame based on a prediction block obtained from a reconstructed reference frame, comprising:

- a decoding step comprising reconstructing the reference frame from the encoded video bit stream,
- storing the prediction block obtained from the reconstructed reference frame,
- an adaptive sharpening filter step comprising applying a spatial adaptive sharpening filtering to the prediction block, wherein the adaptive sharpening filter step is performed by a non-linear filter configured to be controlled by single adaptive parameter.

22. Computer program having a program code for performing the method according to claim 12 or 21, when the computer program runs on a computing device.