CLAIMS

1. A filter (120, 220, 1018, 1118, 960) for use in a video encoding apparatus or a video decoding apparatus to process a current reconstructed block, the current reconstructed block comprising a plurality of pixels, wherein the filter (120, 220, 1018, 1118, 960) is configured to:

obtain an extended reconstructed block by extending the current reconstructed block to include one or more padding samples obtained based on at least one sample from the current reconstructed block;

load a current pixel of the extended reconstructed block and its neighboring pixels of the current pixel to a linear buffer according to a predefined scan template;

obtain spectrum components by performing a 1D transform for pixels in the linear buffer;

obtain filtered spectrum components based on the obtained spectrum components by using a lookup table;

obtain filtered pixels by performing an inverse 1D transform for the filtered spectrum components; and

generate a filtered reconstructed block based on the filtered pixels;

wherein the current reconstructed block is extended to include the one or more padding samples obtained based on the at least one sample from the neighboring reconstructed block when the neighboring reconstructed block is available and/or the current reconstructed block is extended to include a sample from the current reconstructed block when the neighboring reconstructed block is not available; and

wherein the filter (120, 220,1018, 1118, 960) is further configured to derive the availability for the neighboring reconstructed block as follows:

if one or more of the following conditions are true, the availability for the neighboring reconstructed block is determined as false:

- the neighboring reconstructed block is contained in a different tile than the current reconstructed block,

- a location of the neighboring reconstructed block is beyond a picture boundary,

- a variable indicating whether the neighboring reconstructed block has been reconstructed is equal to false;

otherwise, the availability for the neighboring reconstructed block is determined as true.

2. The filter (120, 220, 1018, 1118, 960) of claim 1, wherein the one or more padding samples are filtered samples from the neighboring reconstructed block, which is a previously reconstructed block adjacent to the current reconstructed block.

3. The filter (120, 220, 1018, 1118, 960) of claim 1 or 2, wherein the current reconstructed block is extended on left and top sides to include one or more padding samples obtained based on samples from neighboring reconstructed blocks on the left and top sides.

4. The filter (120, 220,1018, 1118, 960) of any of claims 1 to 3, wherein the filter (120, 220, 1018, 1118, 960) is configured to obtain the extended reconstructed block by extending the current reconstructed block to include on each side of the current reconstructed block:

- neighboring reconstructed samples from a neighboring reconstructed block adjacent to the current reconstructed block on said side, if said neighboring reconstructed block is available, or
- the closest samples from the current reconstructed block, otherwise.

5. The filter (120, 220,1018, 1118, 960) of any one of claims 1 to 4, wherein the lookup table is obtained based on a quantization parameter (Qp) of the current reconstructed block.

6. A method (300, 300', 500) for processing a current reconstructed block, wherein the current reconstructed block comprises a plurality of pixels, wherein the filtering method (300, 300', 500) comprises:

obtaining an extended reconstructed block by extending the current reconstructed block to include one or more padding samples obtained based on at least one sample from the current reconstructed block;

loading a current pixel of the extended reconstructed block and its neighboring pixels of the current pixel to a linear buffer according to a predefined scan template;

obtaining spectrum components by performing 1D transform for pixels in the linear buffer;

obtaining filtered spectrum components by multiplying each spectrum component with a gain coefficient or by using a lookup table, wherein the gain coefficient depends on a corresponding spectrum component and a filtering parameter;

obtaining filtered pixels by performing inverse 1D transform for filtered spectrum components; and

generating a filtered reconstructed block based on the filtered pixels

wherein the current reconstructed block is extended to include the one or more padding samples obtained based on the at least one sample from the neighboring reconstructed block when the neighboring reconstructed block is available, and/or the current reconstructed block is extended to include a sample from the current reconstructed block when the neighboring reconstructed block is not available

wherein the method further comprises deriving the availability for the neighboring reconstructed block as follows:

if one or more of the following conditions are true, the availability for the neighboring reconstructed block is determined as false:

- the neighboring reconstructed block is contained in a different tile than the current block,
- a location of the neighboring reconstructed block is beyond a picture boundary,
- a variable indicating whether the neighboring reconstructed block has been reconstructed is equal to false;

otherwise, the availability for the neighboring reconstructed block is determined as true.

7. The method (300, 300', 500) of claim 6, wherein the one or more padding samples are filtered samples from the neighboring reconstructed block, which is a previously reconstructed block adjacent to the current reconstructed block.

8. The method (300, 300', 500) of claim 6 or 7, wherein the current reconstructed block is extended on left and top sides to include samples obtained based on samples from previously reconstructed adjacent blocks on the left and top sides.

9. The method (300, 300', 500) of any of claims 6 to 8, wherein the obtaining of the extended reconstructed block includes extending the current reconstructed block to include on each side of the current reconstructed block:

- neighboring reconstructed samples from a neighboring reconstructed block adjacent to the current reconstructed block on said side, if said neighboring reconstructed block is available, or
- the closest samples from the current reconstructed block otherwise.

10. The method (300, 300', 500) of any of claims 6 to 9, wherein the lookup table is obtained based on a quantization parameter (Qp) of the current reconstructed block.

11. An encoding method for encoding a current block from an input video stream, wherein the encoding method comprises filtering a current reconstructed block of the current block according to any of claims 6 to 10.

12. A decoding method for decoding a current reconstructed block from a received bitstream, wherein the decoding method comprises the method for filtering according to any of claims 6 to 10.

13. An encoding apparatus (100) for encoding a current block from an input video stream, wherein the encoding apparatus (100) comprises the filter (120) for filtering a current reconstructed block of the current block according to any of claims 1 to 5.

14. A decoding apparatus (200) for decoding a current reconstructed block from a received bitstream, wherein the decoding apparatus (200) comprises a filter (220) according to any of claims 1 to 5.

15. A computer program product comprising program code for performing the method of any of claims 6 to 10 when executed on a computer or a processor.

16. A decoder, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing programming for execution by the processors, wherein the programming, when executed by the processors, configures the decoder to carry out the method according to any one of claims 6 to 10.

17. An encoder, comprising:
one or more processors; and
a non-transitory computer-readable storage medium coupled to the processors and storing programming for execution by the processors, wherein the programming, when executed by the processors, configures the encoder to carry out the method according to any one of claims 6 to 10.

18. A non-transitory computer-readable medium carrying a program code which, when executed by a computer device, causes the computer device to perform the method of any one of claims 6 to 10.