CLAIMS

1. An image processing device (501, 601, 701, 801) for use in an image encoder (600) and/or an image decoder (700), for deblocking a horizontal block edge (~~904, 905, 1201,~~ 1303) between a first coding block (~~901,~~ 1301) and a second coding block (~~902,~~ 1302) of an image (~~900, 1200,~~ 1300~~) ,~~),

- the image (1300) including a plurality of coding tree units, CTUs, arranged in a matrix of CTUs, the matrix consisting of multiple rows of CTUs and multiple columns of CTUs, wherein the plurality of CTUs are processed by the image processing device (501, 601, 701, 801) starting from a top-left CTU and ending at a bottom-right CTU of the matrix, wherein each row of CTUs is processed sequentially one after another and within each row of CTUs the CTUs are processed sequentially from the leftmost CTU of that row to the rightmost CTU of that row,
- wherein the first coding block (~~901,~~ 1301) ~~has~~is a lowermost coding block of a first CTU(17) among the plurality of CTUs, the first coding block (1301) having a block size of S_A samples perpendicular to the horizontal block edge (~~904, 905, 1201,~~ 1303~~),~~) by N samples parallel to the horizontal block edge (1303), wherein N = 8,
- wherein the second coding block (~~902,~~ 1302) ~~has~~is an uppermost coding block of a second CTU(25) among the plurality of CTUs, the second coding block (1302) having a block size of S_B samples perpendicular to the horizontal block edge (~~904, 905, 1201,~~ 1303~~),~~) by N samples parallel to the horizontal block edge(1303), wherein N = 8,

  wherein a row of CTUs of the matrix in which the second CTU is located is a row following consecutively a row in which the first CTU is located,
- wherein the horizontal block edge (1303) overlaps with a coding tree unit, CTU, block edge (1201) between the first CTU(17) and the second CTU(25) among the plurality of CTUs,

  wherein the image processing device (501, 601, 701, 801) comprises a filter (502, 602, 702, 802) for filtering the horizontal block edge (~~904, 905, 1201,~~ 1303), ~~configured to~~
  - wherein the filter (502, 602, 702, 802) is configured to:
    - modify values of at most M_A samples of the first coding block (~~901,~~ 1301) as first filter output values, wherein the at most M_A

samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303);

- ~~———~~modify values of at most M_B samples of the second coding block (~~902,~~ 1302) as second filter output values, wherein the at most M_B samples are in a line perpendicular to and adjacent to the horizontal block edge~~(904, 905, 1201,~~ (1303);
- ~~———~~use values of at most ~~a number~~ I_A ~~of sample values~~samples of the first coding block (~~901,~~ 1301) as first filter input values, for calculating the first filter output values and/or the second filter output values, wherein the at most -I_A samples are in a line perpendicular to and adjacent to the horizontal block edge~~(904, 905, 1201,~~ (1303); and
- ~~———~~use values of at most I_B samples of the second coding block (~~902,~~ 1302) as second filter input values, for calculating the first filter output values and/or the second filter output values, wherein the at most I_B samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303); wherein $I_A \neq I_B$ and $M_A \neq M_B$, $S_A \neq S_B$; $I_A = 4$, and $M_A = 3$.

~~wherein IA ≠ IB and MA ≠ MB.~~

~~2. The image processing device (501, 601, 701, 801) of claim 1, wherein SA ≠ SB.~~

~~3~~2. The image processing device (501, 601, 701, 801) of claim ~~2~~1,
wherein the image processing device (501, 601, 701, 801) comprises a determiner (803), configured to determine if the horizontal block edge (~~904, 905, 1201,~~ 1303) is to be filtered and/or if a strong filtering or a weak filtering is to be performed, based upon:

- ~~———~~values of at most D_A samples of the first coding block (~~901,~~ 1301) as first filter decision values, wherein the D_A samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303), and
- ~~———~~values of at most D_B samples of the second coding block (~~902,~~ 1302) as second filter decision values, wherein the D_B samples are in a line perpendicular to and adjacent to the horizontal block edge(~~904, 905,~~ 1201, 1303).

~~4~~3. The image processing device (501, 601, 701, 801) of claim ~~3,~~

2, wherein the first filter input values are identical to the first filter decision values, and

wherein the second filter input values are identical to the second filter decision values.

~~5. The image processing device (501, 601, 701, 801) of any of the claims 2 to 3, wherein if SA = 4, the filter (502, 602, 702, 802) is configured to set~~

~~- lA to 3, and~~

~~- MA to 1.~~

~~6. The image processing device (501, 601, 701, 801) of any of the claims 2 to 5, wherein if SB = 8, the filter (502, 602, 702, 802) is configured to set~~

~~- lB to 4, and~~

~~- MB to 3 or 4.~~

~~7. The image processing device (501, 601, 701, 801) of any of the claims 2 to 5, wherein if SB > 4, the filter (502, 602, 702, 802) is configured to set~~

~~- lB to SB/2, and~~

~~- MB to SB/2 or SB/2 - 1.~~

~~8. The image processing device (501, 601, 701, 801) of any of the claims 2 to 4, wherein if SA = 8, the filter (502, 602, 702, 802) is configured to set~~

~~- lA to SA/2, and~~

~~- MA to SA/2 or SA/2 - 1.~~

~~9. The image processing device (501, 601, 701, 801) of claim 8, wherein if SB > 8, the filter (502, 602, 702, 802) is configured to set~~

~~- lB to SB/2, and~~

~~- MB to SB/2 or SB/2 - 1.~~

~~10. The image processing device (501, 601, 701, 801) of any of claims 1 to 9, wherein~~

~~- if the block edge (1201) is a horizontal block edge (1201), and~~

~~- if the block edge (1201) overlaps with a coding tree unit, CTU, block edge of the image (1200), and~~

- if the second coding block is a current block and the first coding block is a neighboring block of said current block, the filter (502, 602, 702, 802) is configured to set

- IA to 4, and

- MA to 3 or 4.

11. The image processing device (501, 601, 701, 801) of claim 10, wherein SA > 16.

12. An image processing device (501, 601, 701, 801) for use in an image encoder (600) and/or an image decoder (700), for deblocking a block edge (904, 905, 1201, 1303) between a first coding block (901, 1301) and a second coding block (902, 1302) of an image (900, 1200, 1300),

wherein the first coding block (901, 1301) has a block size S_A perpendicular to the block edge (904, 905, 1201, 1303),

wherein the second coding block (902, 1302) has a block size S_B perpendicular to the block edge (904, 905, 1201, 1303),

wherein the image processing device (501, 601, 701, 801) comprises a filter (502, 602, 702, 802) for filtering the block edge (904, 905, 1201, 1303), configured to:

- modify values of at most M_A samples of the first coding block as first filter output values, wherein the at most M_A samples are in a line perpendicular to and adjacent to the block edge;
- modify values of at most M_B samples of the second coding block as second filter output values, wherein the at most M_B samples are in a line perpendicular to and adjacent to the block edge;
- use values of at most I_A samples of the first coding block (901, 1301) as first filter input values, for calculating the first filter output values or the second filter output values, wherein the at most I_A samples are in a line perpendicular to and adjacent to the block edge;
- use values of at most I_B samples of the second coding block (902, 1302) as second filter input values, for calculating the first filter output values or the second filter output values, wherein the at most I_B samples are in a line perpendicular to and adjacent to the block edge;

wherein IA = IB and MA = MB.

~~13. The image processing device (501, 601, 701, 801) of claim 12, wherein S_A=S_B=4.~~

~~14. The image processing device (501, 601, 701, 801) of claim 13,~~
~~wherein~~
~~- if the block size of the second coding block and the first coding block is four, the filter (502, 602, 702, 802) is further configured to set~~
~~- M_A' to 1, and~~
~~- M_B' to 1.~~

~~15. The image processing device (501, 601, 701, 801) of any of any of claims 12 to 14,~~ ~~wherein~~
~~- if the block size of the second coding block and the first coding block is four, the filter (502, 602, 702, 802) is further configured to set~~
~~- IA' to 2, and~~
~~- IB' to 2.~~

~~16~~4. An encoder for encoding an image (900, 1300), comprising ~~a~~an image processing device (501, 601, 701, 801) of any of the claims 1 to ~~15~~3.

~~17~~5. A decoder for decoding an image (900, 1300), comprising ~~a~~an image processing device (501, 601, 701, 801) of any of the claims 1 to ~~15~~3.

~~18~~6. A deblocking method, for deblocking a horizontal block edge (~~904, 905, 1201,~~ 1303) between a first coding block (~~901,~~ 1301) and a second coding block (~~902,~~ 1302) of an image (~~900, 1200,~~ 1300~~) ,~~),

- the image (1300) including a plurality of coding tree units, CTUs, arranged in ~~an image encoding and/or an image decoding (1400),~~ a matrix of CTUs, the matrix consisting of multiple rows of CTUs and multiple columns of CTUs, wherein the plurality of CTUs are processed by the image processing device (501, 601, 701, 801) starting from a top-left CTU and ending at a bottom-right CTU of the matrix, wherein each row of CTUs is processed sequentially one after another and within each row of CTUs the CTUs are processed sequentially from the leftmost CTU of that row to the rightmost CTU of that row,
- wherein the first coding block (~~901,~~ 1301) ~~has a block size~~ is a lowermost coding block of a first CTU among the plurality of CTUs, the first coding block (1301) having a block size of S_A samples perpendicular to the horizontal block edge

(~~904, 905, 1201, 1303~~),) by N samples parallel to the horizontal block edge (1303), wherein N = 8,

- wherein the second coding block (~~902,~~ 1302) ~~has a~~ is an uppermost coding block ~~size~~of a second CTU among the plurality of CTUs, the second coding block (1302) having a block size of S_B samples perpendicular to the horizontal block edge (~~904, 905, 1201, 1303~~),) by N samples parallel to the horizontal block edge(1303), wherein N = 8,
- ~~wherein the decoding~~wherein a row of CTUs of the matrix in which the second CTU is located is a row following consecutively a row in which the first CTU is located,
- wherein the horizontal block edge (1303) overlaps with a coding tree unit, CTU, block edge(1201) between the first CTU(17) and the second CTU(25) among the plurality of CTUs,

wherein the deblocking comprises a filtering, the filtering comprising the method steps of:

- - modifying (1403) values of at most M_A samples of the first coding block (~~901,~~ 1301) as first filter output values, wherein the at most M_A samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303),
- ~~-~~modifying (1404) values of at most M_B samples of the second coding block (~~902,~~ 1302) as second filter output values, wherein the at most ~~–~~M_B samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303),
- - using (1401) values of at most I_A samples of the first coding block (~~901,~~ 1301) as first filter input values, for calculating the first filter output values and/or the second filter output values, wherein the at most I_A samples are in a line perpendicular to and adjacent to the horizontal block edge (~~904, 905, 1201,~~ 1303); and
- - using (1402) values of at most I_B samples of the second coding block (~~902,~~ 1302) as second filter input values, for calculating the first filter output values and/or the second filter output values, wherein the at most I_B samples are in a line perpendicular to and adjacent to the horizontal block edge (904, 905, 1201, 1303); wherein $I_A \neq I_B$ and $M_A \neq M_B$, $S_A \neq S_B$; $I_A = 4$, and $M_A=3$.

~~wherein IA ≠ IB and MA ≠ MB.~~

19. A deblocking method, for deblocking a block edge (904, 905, 1201, 1303) between a first coding block (901, 1301) and a second coding block (902, 1302) of an image (900, 1200, 1300), in an image encoding or an image decoding (1400),

wherein the first coding block (901, 1301) has a block size S_A perpendicular to the block edge (904, 905, 1201, 1303),

wherein the second coding block (902, 1302) has a block size S_B perpendicular to the block edge (904, 905, 1201, 1303),

wherein the decoding comprises a filtering process, comprising:

- modifying values of at most M_A' samples of the first coding block as first filter output values, wherein the at most M_A' samples are in a line perpendicular to and adjacent to the block edge;
- modifying values of at most M_B' samples of the second coding block as second filter output values, wherein the at most M_B' samples are in a line perpendicular to and adjacent to the block edge;
- using values of at most I_A' samples of the first coding block (901, 1301) as first filter input values, for calculating the first filter output values or the second filter output values, wherein the at most I_A' samples are in a line perpendicular to and adjacent to the block edge; and
- using values of at most I_B' samples of the second coding block (902, 1302) as second filter input values, for calculating the first filter output values or the second filter output values, wherein the at most I_B' samples are in a line perpendicular to and adjacent to the block edge;

wherein SA =SB, IA' = IB' and MA' = MB'.

20. The method of claim 19,

wherein

- if the block size of the second coding block and the first coding block is four,
- M_A' is set to 1, and
- M_B' is set to 1.

21. The method of any of claims 18 to 20,

wherein

- if the block size of the second coding block and the first coding block is four,
- IA' is set to 2, and
- IB' is set to 2.

~~22~~7. A non-transitory computer-readable medium carrying a program code for performing the method according to any of the claim~~s 18 to 21~~6 when the computer program runs on a computer.