

CLAIMS

What is Claimed:

1. A method of video coding, comprising:
 - determining a temporal layer level of a current frame within a coding scheme;
 - selecting an adaptive loop filtering (ALF) procedure from a plurality of ALF procedures that vary in computational complexity based on the temporal layer level of the current frame within the coding scheme, wherein
 - on a condition that the temporal layer level is the highest within the coding scheme, a first ALF procedure for the current frame is selected, and on a condition that the temporal layer level is the lowest within the coding scheme, a second ALF procedure for the current frame is selected; and
 - performing the selected ALF procedure on the current frame.
2. The method of claim 1, wherein selecting the ALF procedure based on the temporal layer level of the current frame comprises:
 - determining that the temporal layer level of the current frame is the highest within the coding scheme and ALF is enabled for the current frame; and
 - selecting the first ALF procedure that has less computational complexity than the second ALF procedure.
3. The method of claim 1, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein the temporal layer level of the current frame is the highest within the coding scheme and the first ALF procedure is selected, and performing the selected ALF procedure on the current frame comprises:
 - selecting a subset of pixels from the plurality of pixels in the current block;
 - calculating a plurality of gradients for the current block using the selected subset of pixels; and
 - classifying the current block for ALF based on the calculated plurality of gradients.
4. The method of claim 3, wherein the subset of pixels is selected from the plurality of pixels in the current block by skipping at least one pixel in a vertical direction and at least one pixel in a horizontal direction of the plurality of pixels in the current block.

5. The method of claim 3, further comprising receiving at least one of a first indication that the subset of pixels is to be selected for calculating the plurality of gradients or a second indication of how the subset of pixels is to be selected.

6. The method of claim 1, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein, on a condition that the temporal layer level of the current frame is higher than the lowest level and lower than the highest level within the coding scheme, a third ALF procedure for the current frame is selected, and performing the selected ALF procedure for the current frame comprises:

- selecting a subset of pixels from the plurality of pixels in the current block of the current frame by skipping at least one pixel in one of vertical, horizontal, or diagonal directions of the plurality of pixels in the current block;

- calculating a plurality of gradients for the current block using the selected subset of pixels; and
- classifying the current block for ALF based on the calculated plurality of gradients.

7. The method of claim 1, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein the temporal layer level of the current frame is the lowest within the coding scheme and the second ALF procedure is selected, and performing the selected ALF procedure on the current frame comprises:

- calculating a plurality of gradients for the current block using each of the plurality of pixels in the current block; and

- classifying the current block for ALF based on the calculated plurality of gradients.

8. The method of claim 1, wherein the current frame comprises a current block, and performing the selected ALF procedure comprises:

- skipping block classification for the current block if the first ALF procedure is selected, and
- performing the block classification for current block if the second ALF procedure is selected.

9. The method of claim 1, wherein the current frame comprises a current block, the current block comprises a plurality of pixels, and performing the selected ALF procedure comprises:

- skipping calculation of a gradient in at least one of vertical, horizontal, or diagonal directions of the plurality of pixels of the current block if the first ALF procedure is selected; and

- calculating a plurality of gradients in each of the vertical, horizontal, and diagonal directions of the plurality of pixels of the current block if the second ALF procedure is selected.

10. The method of claim 1, wherein the current frame comprises a current block, the current block comprises a plurality of pixels, the method further comprising:
- calculating a plurality of gradients for the current block of the current frame using the plurality of pixels of the current block;
 - determining a sum of the plurality of gradients for the current block;
 - determining whether to disable ALF for the current block by comparing the sum of the plurality of gradients with a threshold;
 - on a condition that the sum of the plurality of gradients is less than the threshold, determining to disable ALF for the current block; and
 - reconstructing the current block with the ALF disabled.
11. A wireless transmit/receive unit (WTRU) comprising:
- a processor configured to:
 - determine a temporal layer level of a current frame within a coding scheme;
 - select an adaptive loop filtering (ALF) procedure from a plurality of ALF procedures that vary in computational complexity based on the temporal layer level of the current frame within the coding scheme, wherein
 - on a condition that the temporal layer level is the highest within the coding scheme, a first ALF procedure for the current frame is selected, and on a condition that the temporal layer level is the lowest within the coding scheme, a second ALF procedure for the current frame is selected; and
 - perform the selected ALF procedure on the current frame.
12. The WTRU of claim 11, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein the temporal layer level of the current frame is the highest within the coding scheme, and the processor is further configured to:
- select the first ALF procedure;
 - select a subset of pixels from the plurality of pixels in the current block;
 - calculate a plurality of gradients for the current block using the selected subset of pixels;
- and
- classify the current block for ALF based on the calculated plurality of gradients.

13. The WTRU of claim 12, wherein the subset of pixels is selected from the plurality of pixels in the current block by skipping at least one pixel in a vertical direction and at least one pixel in a horizontal direction of the plurality of pixels in the current block.
14. The WTRU of claim 11, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein, on a condition that the temporal layer level of the current frame is higher than the lowest level and lower than the highest level within the coding scheme, the processor is further configured to:
- select a third ALF procedure for the current frame;
 - select a subset of pixels from the plurality of pixels in the current block of the current frame by skipping at least one pixel in one of vertical, horizontal, or diagonal directions of the plurality of pixels in the current block;
 - calculate a plurality of gradients for the current block using the selected subset of pixels; and
 - classify the current block for ALF based on the calculated plurality of gradients.
15. The WTRU of claim 11, wherein the current frame comprises a current block, and the current block comprises a plurality of pixels, and wherein the temporal layer level of the current frame is the lowest within the coding scheme, wherein the processor is further configured to:
- select the second ALF procedure;
 - calculate a plurality of gradients for the current block using each of the plurality of pixels in the current block; and
 - classify the current block for ALF based on the calculated plurality of gradients.