CLAIMS

1. A method of coding video data, the method comprising:

determining, at a slice level, a plurality of sets of adaptive loop filters applicable to a slice;

determining, at a block level, a set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for a block of a current picture, wherein the block of the current picture is a coding tree unit (CTU) of the slice, and wherein the set of adaptive loop filters includes a plurality of adaptive loop filters including one or more previous adaptive loop filters and further including a fixed adaptive loop filter; and

adaptive loop filtering the block of the current picture in accordance with the set of adaptive loop filters.

2. The method of claim 1, wherein determining the set of adaptive loop filters comprises:

coding a syntax element indicating the set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for the block of the current picture.

3. The method of claim 2, wherein the syntax element is an index to a list including the plurality of sets of adaptive loop filters.

4. The method of claim 1, further comprising:

coding a respective flag per block indicating if adaptive loop filtering is used for the respective block.

5. The method of claim 1, further comprising:

coding a respective flag per group of blocks of the current picture indicating if adaptive loop filtering is used for each block in the respective group of blocks of the current picture.

6. The method of claim 1, further comprising:

determining whether adaptive loop filtering is used for each block of the current picture, or for each block in a group of blocks of the current picture based on one or more of:

a number of blocks in a group of blocks having non-zero coded block flags (CBFs),

a number of non-zero transform coefficients,

a number of blocks in a group of blocks coded in a particular mode, and

a number of blocks in a group of blocks coded with skip mode.

7. The method of claim 1, wherein the set of adaptive loop filters further includes one or more of one or more current adaptive loop filters signaled for the current picture.

8. The method of claim 7, further comprising:

adding adaptive loop filters to the set of adaptive loop filters so that the one or more current adaptive loop filters signaled for the current picture are added first, the one or more previous adaptive loop filters are added second, and the fixed adaptive loop filter is added last.

9. The method of claim 8, wherein the one or more current adaptive loop filters signaled for the current picture have a lower index value in a filter set list relative to the one or more previous adaptive loop filters.

10. The method of claim 7, further comprising:

coding, for the current picture, one or more syntax elements indicating a current adaptive loop filter of the one or more current adaptive loop filters for the current picture.

11. The method of claim 1, wherein the set of adaptive loop filters include adaptive loop filters assigned to each class of a plurality of classes.

12. The method of claim 1, wherein determining the set of adaptive loop filters comprises coding, for a first block of video data, a first syntax element indicating a first set of adaptive loop filters from among the plurality of sets of adaptive loop filters, and coding, for a second block of video data, a second syntax element indicating a second set of adaptive loop filters from among

the plurality of sets of adaptive loop filters, wherein the second set of adaptive loop filters is different than the first set of adaptive loop filters, the method further comprising:

coding the first block of video data in the current picture to create a first reconstructed block of video data;

determining a first adaptive loop filter from the first set of adaptive loop filters for the first reconstructed block of video data;

applying the first adaptive loop filter to the first reconstructed block of video data;

coding the second block of video data in the current picture to create a second reconstructed block of video data;

determining a second adaptive loop filter from the second set of adaptive loop filters for the second reconstructed block of video data; and

applying the second adaptive loop filter to the second reconstructed block of video data.

13. The method of claim 1, wherein coding comprises encoding, the method further comprising:

capturing the current picture with a camera.

14. The method of claim 1, wherein coding comprises decoding, the method further comprising:

displaying the current picture.

15. The method of claim 1, wherein the block of the current picture is a first block of the current picture, the method further comprising:

adaptive loop filtering a second block of the current picture in accordance with the set of adaptive loop filters determined for the first block of the current picture.

16. An apparatus configured to code video data, the apparatus comprising:

a memory configured to store a current picture of video data; and

one or more processors in communication with the memory, the one or more processors configured to:

determine, at a slice level, a plurality of sets of adaptive loop filters applicable to a slice;

determine, at a block level, a set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for a block of the current picture, wherein the block of the current picture is a coding tree unit (CTU) of the slice, and wherein the set of adaptive loop filters includes a plurality of adaptive loop filters including one or more previous adaptive loop filters and further including a fixed adaptive loop filter; and

adaptive loop filter the block of the current picture in accordance with the set of adaptive loop filters.

17. The apparatus of claim 16, wherein to determine the set of adaptive loop filters, the one or more processors are further configured to:

code a syntax element indicating the set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for the block of the current picture.

18. The apparatus of claim 17, wherein the syntax element is an index to a list including the plurality of sets of adaptive loop filters.

19. The apparatus of claim 16, wherein the one or more processors are further configured to:

code a respective flag per block indicating if adaptive loop filtering is used for the respective block.

20. The apparatus of claim 16, wherein the one or more processors are further configured to:

code a respective flag per group of blocks of the current picture indicating if adaptive loop filtering is used for each block in the respective group of blocks of the current picture.

21. The apparatus of claim 16, wherein the one or more processors are further configured to:

determine whether adaptive loop filtering is used for each block of the current picture, or for each block in a group of blocks of the current picture based on one or more of:

a number of blocks in a group of blocks having non-zero coded block flags (CBFs),

a number of non-zero transform coefficients,

a number of blocks in a group of blocks coded in a particular mode, and

a number of blocks in a group of blocks coded with skip mode.

22. The apparatus of claim 16, wherein the set of adaptive loop filters further includes one or more of one or more current adaptive loop filters signaled for the current picture.

23. The apparatus of claim 22, wherein the one or more processors are further configured to:

add adaptive loop filters to the set of adaptive loop filters so that the one or more current adaptive loop filters signaled for the current picture are added first, the one or more previous adaptive loop filters are added second, and the fixed adaptive loop filter is added last.

24. The apparatus of claim 23, wherein the one or more current adaptive loop filters signaled for the current picture have a lower index value in a filter set list relative to the one or more previous adaptive loop filters.

25. The apparatus of claim 22, wherein the one or more processors are further configured to:

code, for the current picture, one or more syntax elements indicating a current adaptive loop filter of the one or more current adaptive loop filters for the current picture.

26. The apparatus of claim 16, wherein the set of adaptive loop filters include adaptive loop filters assigned to each class of a plurality of classes.

27. The apparatus of claim 16, wherein to determine the set of adaptive loop filters, the one or more processors are further configured to code, for a first block of video data, a first syntax element indicating a first set of adaptive loop filters from among the plurality of sets of adaptive loop filters, and code, for a second block of video data, a second syntax element indicating a second set of adaptive loop filters from among the plurality of sets of adaptive loop filters, wherein the second set of adaptive loop filters is different than the first set of adaptive loop filters, and wherein the one or more processors are further configured to:

code the first block of video data in the current picture to create a first reconstructed block of video data;

determine a first adaptive loop filter from the first set of adaptive loop filters for the first reconstructed block of video data;

apply the first adaptive loop filter to the first reconstructed block of video data;

code the second block of video data in the current picture to create a second reconstructed block of video data;

determine a second adaptive loop filter from the second set of adaptive loop filters for the second reconstructed block of video data; and

apply the second adaptive loop filter to the second reconstructed block of video data.

28. The apparatus of claim 16, wherein to code the one or more processors are configured to encode, the apparatus further comprising:

a camera configured to capture the current picture.

29. The apparatus of claim 16, wherein to code the one or more processors are configured to decode, the apparatus further comprising:

a display configured to display the current picture.

30. The apparatus of claim 16, wherein the block of the current picture is a first block of the current picture, and wherein the one or more processors are further configured to:

adaptive loop filter a second block of the current picture in accordance with the set of adaptive loop filters determined for the first block of the current picture.

31. An apparatus configured to code video data, the apparatus comprising:

means for determining, at a slice level, a plurality of sets of adaptive loop filters applicable to a slice;

means for determining, at a block level, a set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for a block of a current picture, wherein the block of the current picture is a coding tree unit (CTU) of the slice, and wherein the set of adaptive loop filters includes a plurality of adaptive loop filters including one or more previous adaptive loop filters and further including a fixed adaptive loop filter; and

means for adaptive loop filtering the block of the current picture in accordance with the set of adaptive loop filters.

32. The apparatus of claim 31, wherein the means for determining the set of adaptive loop filters comprises:

means for coding a flag for the block indicating if adaptive loop filtering is used for the block; and

means for coding, based on the flag for the block, a syntax element indicating the set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for the block of the current picture.

33. The apparatus of claim 31, wherein the set of adaptive loop filters further includes one or more of one or more current adaptive loop filters signaled for the current picture.

34. A non-transitory computer-readable storage medium storing instructions that, when executed, cause one or more processors to:

determine, at a slice level, a plurality of sets of adaptive loop filters applicable to a slice;

determine, at a block level, a set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for a block of a current picture, wherein the block of the current picture is a coding tree unit (CTU) of the slice, and wherein the set of adaptive loop filters includes a plurality of adaptive loop filters including one or more previous adaptive loop filters and further including a fixed adaptive loop filter; and

adaptive loop filter the block of the current picture in accordance with the set of adaptive loop filters.

35. The non-transitory computer-readable storage medium of claim 34, wherein to determine the respective sets of adaptive loop filters, the instructions further cause the one or more processors to:

code a flag for the block indicating if adaptive loop filtering is used for the block; and

code, based on the flag for the block, a syntax element indicating the set of adaptive loop filters, from among the plurality of sets of adaptive loop filters, for the block of the current picture.

36. The non-transitory computer-readable storage medium of claim 34, wherein the set of adaptive loop filters further includes one or more of one or more current adaptive loop filters signaled for the current picture.