

WHAT IS CLAIMED IS:

1. A method for video decoding in a video decoder, comprising:
reconstructing blocks of an image from a coded video bitstream;
performing post-processing on one of a plurality of regions of first two neighboring reconstructed blocks of the reconstructed blocks with at least one post-processing neural network (NN), the first two neighboring reconstructed blocks having a first shared boundary and including a boundary region having samples on both sides of the first shared boundary, the plurality of regions of the first two neighboring reconstructed blocks including the boundary region and non-boundary regions that are outside the boundary region; and
replacing the one of the plurality of regions with the post-processed one of the plurality of regions of the first two neighboring reconstructed blocks.
2. The method of claim 1, wherein
the one of the plurality regions is the boundary region,
the at least one post-processing NN includes at least one deblocking NN,
the performing the post-processing includes performing deblocking on the boundary region with the at least one deblocking NN, and
the replacing includes replacing the boundary region with the deblocked boundary region.
3. The method of claim 2, wherein
the boundary region further includes samples on both sides of a second shared boundary between second two neighboring reconstructed blocks of the reconstructed blocks, and
the first two neighboring reconstructed blocks are different from the second two neighboring reconstructed blocks.
4. The method of claim 2, wherein
the at least one deblocking NN are based on multiple deblocking models, respectively, and
the performing deblocking further includes:
determining which of the multiple deblocking models to apply to the boundary region, and

performing deblocking on the boundary region with the determined deblocking model.

5. The method of claim 4, wherein the determining which of the multiple deblocking models to apply is performed by a classification NN.

6. The method of claim 1, wherein
the at least one post-processing NN includes at least one enhancement NN,
the performing the post-processing includes enhancing one of the non-boundary regions with the at least one enhancement NN, and
the replacing includes replacing the one of the non-boundary regions with the enhanced one of the non-boundary regions.

7. The method of claim 6, wherein
the at least one enhancement NN are based on multiple enhancement models, respectively, and
the enhancing further includes:
determining which of the multiple enhancement models to apply to the one of the non-boundary regions, and
enhancing the one of the non-boundary regions with the determined enhancement model.

8. The method of claim 1, wherein
the performing includes
performing deblocking on the boundary region, and
enhancing the non-boundary regions, and
the replacing includes
replacing the boundary region with the deblocked boundary region, and
replacing the non-boundary regions with the enhanced non-boundary regions, respectively.

9. The method of claim 2, wherein
a shared sample is located in the boundary region and one of the non-boundary regions,

the at least one post-processing NN further includes at least one enhancement NN,

the performing the post-processing further includes enhancing the one of the non-boundary regions with the at least one enhancement NN, and

the replacing further includes replacing the one of the non-boundary regions with the enhanced one of the non-boundary regions, a value of the shared sample being replaced with a weighted average of a value of the shared sample in the deblocked boundary region and a value of the shared sample in the enhanced one of the non-boundary regions.

10. The method of claim 1, wherein

the method further includes decoding neural network update information in the coded video bitstream, the neural network update information corresponding to one of the blocks and indicating a replacement parameter corresponding to a pretrained parameter in a neural network in the video decoder; and

the reconstructing the blocks includes reconstructing the one of the blocks based on the neural network updated with the replacement parameter.

11. An apparatus for video decoding, comprising:

processing circuitry configured to:

reconstruct blocks of an image from a coded video bitstream;

perform post-processing on one of a plurality of regions of first two neighboring reconstructed blocks of the reconstructed blocks with at least one post-processing neural network (NN), the first two neighboring reconstructed blocks having a first shared boundary and including a boundary region having samples on both sides of the first shared boundary, the plurality of regions of the first two neighboring reconstructed blocks including the boundary region and non-boundary regions that are outside the boundary region; and

replace the one of the plurality of regions with the post-processed one of the plurality of regions of the first two neighboring reconstructed blocks.

12. The apparatus of claim 11, wherein

the one of the plurality regions is the boundary region,

the at least one post-processing NN includes at least one deblocking NN, and

the processing circuitry is configured to:
perform deblocking on the boundary region with the at least one deblocking NN, and
replace the boundary region with the deblocked boundary region.

13. The apparatus of claim 12, wherein
the boundary region further includes samples on both sides of a second shared boundary between second two neighboring reconstructed blocks of the reconstructed blocks, and
the first two neighboring reconstructed blocks are different from the second two neighboring reconstructed blocks.

14. The apparatus of claim 12, wherein
the at least one deblocking NN are based on multiple deblocking models, respectively, and
the processing circuitry is configured to:
determine which of the multiple deblocking models to apply to the boundary region, and
perform deblocking on the boundary region with the determined deblocking model.

15. The apparatus of claim 11, wherein
the at least one post-processing NN includes at least one enhancement NN, and
the processing circuitry is configured to:
enhance one of the non-boundary regions with the at least one enhancement NN, and
replace the one of the non-boundary regions with the enhanced one of the non-boundary regions.

16. The apparatus of claim 15, wherein
the at least one enhancement NN are based on multiple enhancement models, respectively, and
the processing circuitry is configured to:

determine which of the multiple enhancement models to apply to the one of the non-boundary regions, and

enhance the one of the non-boundary regions with the determined enhancement model.

17. The apparatus of claim 11, wherein the processing circuitry is configured to:
perform deblocking on the boundary region,
enhance the non-boundary regions,
replace the boundary region with the deblocked boundary region, and
replace the non-boundary regions with the enhanced non-boundary regions,
respectively.

18. The apparatus of claim 12, wherein
a shared sample is located in the boundary region and one of the non-boundary regions,

the at least one post-processing NN further includes at least one enhancement NN, and

the processing circuitry is configured to:

enhance the one of the non-boundary regions with the at least one enhancement NN, and

replace the one of the non-boundary regions with the enhanced one of the non-boundary regions, a value of the shared sample being replaced with a weighted average of a value of the shared sample in the deblocked boundary region and a value of the shared sample in the enhanced one of the non-boundary regions.

19. The apparatus of claim 11, wherein the processing circuitry is configured to:
decode neural network update information in the coded video bitstream, the neural network update information corresponding to one of the blocks and indicating a replacement parameter corresponding to a pretrained parameter in a neural network in the video decoder; and

reconstruct the one of the blocks based on the neural network updated with the replacement parameter.

20. A non-transitory computer-readable storage medium storing a program executable by at least one processor to perform:

reconstructing blocks of an image from a coded video bitstream;

performing post-processing on one of a plurality of regions of first two neighboring reconstructed blocks of the reconstructed blocks with at least one post-processing neural network (NN), the first two neighboring reconstructed blocks having a first shared boundary and including a boundary region having samples on both sides of the first shared boundary, the plurality of regions of the first two neighboring reconstructed blocks including the boundary region and non-boundary regions that are outside the boundary region; and

replacing the one of the plurality of regions with the post-processed one of the plurality of regions of the first two neighboring reconstructed blocks.