CLAIMS

1. An apparatus ~~for~~ of post-processing a reconstructed image, the apparatus comprising:

~~an inter prediction unit for generating a prediction block using a reference picture and a motion vector, wherein the prediction block generated by the inter prediction unit is added to a residual block to generate a reconstructed picture;~~

~~an intra prediction unit for recovering an intra prediction mode for a current prediction unit and generating a prediction block using the intra prediction mode, wherein the prediction block generated by the intra prediction unit is added to a residual block to generate a reconstructed picture; and~~

~~a post-processing unit for determining a boundary strength for each 4-sample edge which is a prediction edge or a transform edge and lies on 8X8 sample grid on the reconstructed picture, determining whether deblocking filtering is applied on the 4-sample edge or not using the boundary strength and a boundary quantization parameter, and filtering the 4-sample edge in order of vertical edges and horizontal edges if the deblocking filtering is applied on the 4-sample edge, and for generating an edge index of a current sample, and applying an edge offset corresponding to the edge index to the current sample,~~

~~wherein the edge index is generated using the following equation, edgeIdx=2+sign3(recPicture(x)-recPicture(x-1))+sign3(recPicture(x)-recPicture(x+1))~~

~~wherein the function sign3(y) is equal to 1 if the y is larger than 0, the function sign3(y) is equal to -1 if the y is smaller than 0, and the function sign3(y) is equal to 0 if the y is equal to 0,~~

~~wherein the variable recPicture(x) represents the current sample value, the variables recPicture(x-1) and recPicture(x+1) represent the two neighboring sample values,~~

~~wherein the boundary quantization parameter is an average of a quantization parameter of P block containing sample p0 and a quantization parameter of Q block containing sample q0,~~

~~wherein the quantization parameter of the P block is generated by adding a quantization parameter predictor and a differential quantization parameter of the P block, and the quantization parameter of the Q block is generated by adding a quantization parameter predictor and a differential quantization parameter of the Q block, and~~

~~wherein each of the quantization parameter predictors of the P block and Q block is set to an average of two available quantization parameters determined among a left quantization parameter, an above quantization parameter and a previous quantization parameter in order of the left quantization parameter, the above quantization parameter and the previous quantization parameter for each of the P block and Q block.~~a deblocking filter for determining a boundary strength for a 4-sample edge which is a prediction edge or a transform edge and lies on an 8×8 sample grid, determining whether deblocking filtering is applied on the 4-sample edge or not using the boundary strength and a boundary quantization parameter, and filtering the 4-sample edge if the deblocking filtering is applied on the 4-sample edge; and

a sample adaptive offset adder for, if a sample adaptive offset type indicates an edge offset, generating an edge index of a current sample, generating an edge offset corresponding to the edge index to the current sample, and adding the edge offset to the current sample,

wherein the edge index is generated using the following equation:

edgeIdx=2+sign3(recPicture(x)−recPicture(x−1))+sign3(recPicture(x)−recPicture(x+1)),

wherein the function sign3(y) is equal to 1 if the y is larger than 0, the function sign3(y) is equal to −1 if the y is smaller than 0, and the function sign3(y) is equal to 0 if the y is equal to 0,

wherein the variable recPicture(x) represents the current sample value, the variables recPicture(x−1) and recPicture(x+1) represent two neighboring sample values,

wherein the boundary quantization parameter is an average of a quantization parameter of a P block containing sample p0 and a quantization parameter of a Q block containing sample q0, the quantization parameter of the P block is generated by using a quantization parameter predictor and a differential quantization parameter of the P block, and if two or more quantization parameters are available among a left quantization parameter, an above quantization parameter and a previous quantization parameter of the P block, the quantization parameter predictor of the P block is generated using two available quantization parameters which are determined according to an order of the left quantization parameter, the above quantization parameter and the previous quantization parameter, and

wherein if only one quantization parameter is available among the left quantization parameter, the above quantization parameter and the previous quantization parameter of the P

block, the available quantization parameter is set as the quantization parameter predictor of the P block.

2. The apparatus of claim 1, wherein ~~when if the left quantization parameter and the above quantization parameter are unavailable, the quantization parameter predictor of the P block is set to the previous quantization parameter~~the two neighboring samples are determined by an edge offset type of a current area.

3. The apparatus of claim 1, wherein ~~the average is a value rounded off~~the edge offset is set as negative or positive based on the edge index.

4. The ~~method~~apparatus of claim ~~1~~3, wherein ~~the 4-sample edge is filtered with a deblocking filter which is selected using the boundary quantization parameter~~the edge offset is set as positive if the edge index is equal to 0 or 1.

5. The apparatus of claim ~~1~~3, wherein ~~the boundary strength is set equal to zero if the 4-sample edge is not the transform unit edge and the 4-sample edge is not the prediction unit edge~~the edge offset is set as negative if the edge index is equal to 3 or 4.

6. The apparatus of claim 1, wherein the edge offset is set to 0 if the edge index is equal to 2.

7. The apparatus of claim 1, wherein if one of the two neighboring samples belongs to another LCU, the edge offset is not applied to the current sample.

8. The apparatus of claim 1, wherein if one of the two neighboring samples belongs to another LCU, the neighboring sample belonging to another LCU is replaced with another sample within LCU.