【CLAIMS】

【Claim 1】

An apparatus for encoding an image in intra prediction, comprising:

an intra prediction unit generating a prediction block using an intra prediction mode;

a transform unit transforming residual signals generated using an original block and the prediction block to generate a transformed block;

a quantization unit determining a quantization parameter and quantizing the transformed block using a quantization matrix and the quantization parameter to generate a quantized block;

a scanning unit determining a scan pattern and applying the scan pattern to the quantized block to generate one-dimensional coefficient information; and

an entropy coding unit entropy-coding the one-dimensional coefficient information and the intra prediction mode,

wherein the residual signals are transformed in transform unit, DST-based integer transforms are used for transforming the residual signals if the size of the transform unit is smaller than a predetermined size, and DCT-based transforms are used if the size of the transform unit is equal to or larger than the predetermined size,

wherein a differential quantization parameter is generated by subtracting a quantization parameter predictor from the quantization parameter, and is entropy-coded, and

wherein if two or more quantization parameters are available among a left quantization parameter, an above quantization parameter and a previous quantization parameter of a current coding unit, the quantization parameter predictor is generated using first two available quantization parameters among the left quantization parameter, the above quantization parameter and the previous quantization parameter, and if only one quantization parameter is available, the available quantization parameter is set as the quantization parameter predictor.

【Claim 2】

The apparatus of claim 1, wherein if the left and above quantization parameters are available, an average of the left and above quantization parameters is set as the quantization parameter predictor.

【Claim 3】

The apparatus of claim 1, wherein if only one of the left and above quantization parameters is available, the average of the available quantization parameter and the previous quantization parameter is set as the quantization parameter predictor.

【Claim 4】

The apparatus of claim 1, wherein the quantization parameter is generated per quantization unit, and a minimum size of the quantization unit is adjusted per picture.

【Claim 5】

The apparatus of claim 1, wherein if the size of the transform unit is equal to or smaller than 8×8, the scan pattern is determined among a diagonal scan, a vertical scan and a horizontal scan based on the intra prediction mode.

【Claim 6】

The apparatus of claim 1, wherein if the size of the transform unit is larger than 8×8, the scan pattern is a diagonal scan.

【Claim 7】

The apparatus of claim 1, wherein if the size of the transform unit is larger than a predetermined size, the quantized block is divided into plural subsets and the

scan pattern is applied to significant flags, coefficient signs and coefficient levels of each subset.

【Claim 8】

The apparatus of claim 7, wherein the subsets are scanned according to the scan pattern applied to the significant flags, the coefficient signs and the coefficient levels.