CLAIMS

1. An image encoding device comprising:

an image compressor that quantizes transform coefficients of a difference image between an image and a prediction image, and outputs the transform coefficients quantized as compressed data;

a filter that carries out a filtering process on a decoded image which is a result of addition of the difference image decoded from the compressed data and the prediction image; and

an encoder that encodes the compressed data and a filter parameter used when the filtering process is carried out by the filter, and generates a bitstream,

wherein the filter determines a classification method of a class on a coding block having a largest size, carries out a classification on each pixel within the coding block having a largest size by using the classification method, calculates an offset value for each class for the coding block having a largest size, and carries out a pixel adaptive offset process by which the offset value is added to a pixel value of a pixel belonging to a corresponding class,

the encoder variable-length-encodes a parameter associated with a quantization matrix for generating a quantization matrix used when the transform coefficients are quantized by the image compressor, the quantization matrix comprising a scaling value for one of transform coefficients, and an index indicating the classification method of a class on each coding block having the largest size, the classification method being determined by the filter, and variable-length-encodes a parameter of the offset value for each class on a basis of a binarization process using a truncated unary code, and

a maximum of the offset value is determined by a bit depth of decoded image.

2. An image decoding device comprising:

a decoder that decodes compressed data, a filter parameter and a quantization matrix parameter from coded data multiplexed into a bitstream, the quantization matrix parameter being used for generating a quantization matrix

and the quantization matrix comprising a scaling value for one of transform coefficients to be obtained from the compressed data;

a difference image generator that inverse-quantizes the transform coefficients by using the quantization matrix parameter decoded by the decoder, and inverse-transforms the transform coefficients inverse-quantized to generate a difference image; and

a filter that carries out a filtering process on a decoded image which is decoded from the compressed data by using the filter parameter,

wherein the decoder decodes, as the filter parameter, an index indicating a classification method of a class on a coding block having a largest size from the coded data, and decodes a parameter about an offset value for each class on which a binarization process using a truncated unary code is performed,

the filter specifies the classification method of a class on each coding block having the largest size by using the index, carries out a classification on each pixel by using the classification method, calculates a offset value from the parameter about an offset value for each class, and carries out a pixel adaptive offset process by which the offset value is added to a pixel value of a pixel belonging to a corresponding class, and

a maximum of the offset value is determined by a bit depth of decoded image.