CLAIMS

1. A picture enhancement method, comprising:

determining, for any one pixel within a current block that meets a first filtering condition, a first pixel value of the pixel after first filtering; and

performing, based on the first pixel value and a second pixel value of the pixel before the first filtering, enhancement on a pixel value of the pixel to obtain an enhanced third pixel value of the pixel;

wherein the performing, based on the first pixel value and the second pixel value of the pixel before the first filtering, the enhancement on the pixel value of the pixel comprises:

performing, based on a difference between the first pixel value and the second pixel value, the enhancement on the pixel value of the pixel;

wherein the performing, based on the difference between the first pixel value and the second pixel value, the enhancement on the pixel value of the pixel comprises:

performing, based on a result of comparing the difference with predetermined thresholds, the enhancement on the pixel value of the pixel;

wherein the performing, based on the result of comparing the difference with the predetermined thresholds, the enhancement on the pixel value of the pixel comprises:

performing, in a case that the difference is greater than a first enhancement filtering threshold, the enhancement on the pixel value of the pixel based on a first enhancement filtering offset; and

performing, in a case that the difference is smaller than a second enhancement filtering threshold, the enhancement on the pixel value of the pixel based on a second enhancement filtering offset,

wherein the second enhancement filtering threshold is smaller than the first enhancement filtering threshold.

2. The method according to claim 1, wherein the performing the enhancement on the pixel value of the pixel based on the first enhancement filtering offset comprises:

determining, based on the first pixel value and the second pixel value, a fourth pixel value; and performing the enhancement on the fourth pixel value based on the first enhancement filtering offset to obtain the third pixel value;

or

performing the enhancement on the first pixel value based on the first enhancement filtering offset to obtain the third pixel value.

3. The method according to claim 1, wherein the performing the enhancement on the pixel value of the pixel based on the second enhancement filtering offset comprises:

determining, based on the first pixel value and the second pixel value, a fourth pixel value; and performing the enhancement on the fourth pixel value based on the second enhancement filtering offset to obtain the third pixel value;

or

performing the enhancement on the first pixel value based on the second enhancement filtering offset to obtain the third pixel value.

4. The method according to any one of claims 1 to 3, wherein the performing, based on the result of comparing the difference with the predetermined thresholds, the enhancement on the pixel value of the pixel comprises:

determining, in a case that the difference is smaller than or equal to the first enhancement filtering threshold and greater than or equal to the second enhancement filtering threshold, the first pixel value as the third pixel value;

or

performing, in a case that the difference is smaller than or equal to the first enhancement filtering threshold and greater than or equal to the second enhancement filtering threshold, second filtering on the first pixel value to obtain the third pixel value.

5. The method according to any one of claims 1 to 4, further comprising at least one of:

the first enhancement filtering threshold is an opposite number of the second enhancement filtering threshold; or

the first enhancement filtering offset is an opposite number of the second enhancement filtering offset.

6. The method according to any one of claims 1 to 5, further comprising:

coding/decoding a threshold index, wherein the threshold index represents a position of the first enhancement filtering threshold or the second enhancement filtering threshold in a threshold candidate list; and

coding/decoding an offset index, wherein the offset index represents a position of the first enhancement filtering offset or the second enhancement filtering offset in an offset candidate list.

7. The method according to any one of claims 1 to 6, further comprising at least one of:

at least one of the first enhancement filtering threshold or the second enhancement filtering threshold is a fixed value; or

at least one of the first enhancement filtering offset or the second enhancement filtering offset is a fixed value.

8. The method according to any one of claims 1 to 7, wherein when the pixel value of the pixel has been performed the enhancement, the method further comprises:

setting, in response to determining that the third pixel value is greater than an upper limit of a predetermined value range, the third pixel value to the upper limit of the predetermined value range; and

setting, in response to determining that the third pixel value is smaller than a lower limit of the predetermined value range, the third pixel value to the lower limit of the predetermined value range.

9. The method according to claim 1, wherein the performing, based on the first pixel value and the second pixel value of the pixel before the first filtering, the enhancement on the pixel value of the pixel comprises:

determining the third pixel value by using machine learning or deep learning with the first pixel value and the second pixel value as input parameters.

10. The method according to any one of claims 1 to 9, wherein the performing, based on the first pixel value and the second pixel value of the pixel before the first filtering, the enhancement on the pixel value of the pixel comprises:

performing, in a case that enhancement filtering is enabled for the current block, the enhancement on the pixel value of the pixel based on the first pixel value and the second pixel value.

11. The method according to claim 10, wherein whether the enhancement filtering is enabled for the current block is identified with a designated syntax, and

a level of the designated syntax comprises at least one of a syntax at a Sequence Parameter Set (SPS) level, a syntax at a Picture Parameter Set (PPS) level, or a syntax at a Slice level; or

the level of the designated syntax comprises at least one of a syntax at the SPS level, a syntax at the PPS level, a syntax at a Coding Tree Unit (CTU) level, or a syntax at a Coding Unit (CU) level.

12. The method according to claim 11, further comprising:

determining, in a case that one or more candidate levels of the designated syntax comprise at least two levels, a level of the designated syntax based on a predetermined flag bit which indicates the level of the designated syntax, wherein a syntax level of the predetermined flag bit matches with a non-lowest level in the candidate levels of the designated syntax.

13. The method according to any one of claims 1 to 12, wherein the first filtering comprises at least one of vertical DeBlocking Filter (DBF) filtering, horizontal DBF filtering, Sample Adaptive Offset (SAO) filtering, or Adaptive Loop Filter (ALF) filtering.

14. The method according to any one of claims 1 to 12, wherein, in a case that the first filtering is a non-first-time filtering in a succession of filtering for the pixel, the second pixel value is a pixel value obtained by performing enhancement on a pixel value of the pixel on which previous filtering is performed.

15. The method according to claim 14, wherein the first filtering is horizontal DeBlocking Filter (DBF) filtering,

in a case that the pixel meets a vertical DBF filtering condition, the second pixel value is a pixel value of the pixel obtained from performing enhancement on a fifth pixel value of

the pixel, and the fifth pixel value is a pixel value obtained from performing vertical DBF filtering on the pixel.

16. The method according to any one of claims 1 to 12, wherein the first filtering is vertical DeBlocking Filter (DBF) filtering, and

when the pixel value of the pixel has been performed the enhancement, the method further comprises:

in a case that the pixel meets a horizontal DBF filtering condition, performing horizontal DBF filtering on the third pixel value to obtain a sixth pixel value of the pixel; and

performing enhancement on the pixel value of the pixel based on the third pixel value and the sixth pixel value to obtain an enhanced seventh pixel value of the pixel.

17. A picture enhancement apparatus, comprising a processor and a memory, wherein the memory stores a computer program and the processor is caused by the computer program to perform the method according to any one of claims 1 to 16.