CLAIMS

1. A picture component prediction method, applied to a decoder, the method comprising:

determining a first picture component reference value set of a current block;

determining multiple first picture component reference values according to the first picture component reference value set, wherein the multiple first picture component reference values include four reference values corresponding to four preset sample positions, respectively;

performing first filtering processing on sample values of samples corresponding to the multiple first picture component reference values, respectively, to determine multiple filtered first picture reference sample values, wherein the first filtering processing is performed on the sample values of the samples corresponding to the multiple first picture component reference values to obtain a filtered reference value set, and wherein reference sample values in the filtered reference value set are compared, and wherein a set of greater first picture component reference values and a set of smaller first picture component reference values are determined based on the reference sample values, wherein the multiple filtered first picture reference sample values are determined by using multiple values from each of the set of greater first picture component reference values and the set of smaller first picture component reference values;

determining a parameter of a component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values, the to-be-predicted picture component being a picture component which is different from the first picture component, and the component linear model characterizing a linear mapping relationship for mapping a sample value of the first picture component to a sample value of the to-be-predicted picture component;

performing mapping processing on a reconstructed value of the first picture component of the current block according to the component linear model to obtain a mapped value; and

determining a predicted value of the to-be-predicted picture component of the current block according to the mapped value.

2. The method of claim 1, wherein determining the first picture component reference value set of a current block comprises:

determining one or more reference samples that locate outside of the current block, and determining the one or more reference samples as the first picture component reference value set,

wherein determining the one or more reference samples that locate outside of the current block comprises:

determining neighboring samples of the current block as one or more reference samples.

3. The method of claim 2, wherein the neighboring samples of the current block comprise at least one of: samples in one or more neighboring lines at a top side of the current block, or samples in one or more neighboring columns at a left side of the current block.

4. The method of claim 3, wherein determining the multiple first picture component reference values according to the first picture component reference value set comprises:

selecting two reference samples from the samples in the one or more neighboring lines at the top side of the current block according to a preset position, and selecting two reference samples from the samples in the one or more neighboring columns at the left side of the current block according to a preset position;

determining the multiple first picture component reference values according to the four selected samples.

5. The method of claim 1, wherein determining the multiple filtered first picture reference sample values based on the set of greater first picture component reference values and set of smaller first picture component reference values comprises:

performing mean processing on the set of greater first picture component reference values to obtain a filtered maximum first picture component reference value; and

performing mean processing on the set of smaller first picture component reference values to obtain a filtered minimum first picture component reference value.

6. The method of claim 5, further comprising:

determining a maximum to-be-predicted picture component reference value corresponding to the filtered maximum first picture component reference value and a minimum to-be-predicted picture component reference value corresponding to the filtered minimum first picture component reference value.

7. The method of claim 6, wherein determining the parameter of the component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values comprises:

determining the parameter of the component linear model according to the filtered maximum first picture component reference value, the maximum to-be-predicted picture component reference value, the filtered minimum first picture component reference value and the minimum to-be-predicted picture component reference value, the component linear model characterizing the linear mapping relationship for mapping the sample value of the first picture component to the sample value of the to-be-predicted picture component.

8. The method of claim 7, wherein determining the parameter of the component linear model according to the filtered maximum first picture component reference value, the maximum to-be-predicted picture component reference value, the filtered minimum first picture component reference value and the minimum to-be-predicted picture component reference value

comprises:

constructing a first sub component linear model by using the filtered maximum first picture component reference value, the maximum to-be-predicted picture component reference value and a preset initial linear model;

constructing a second sub component linear model by using the filtered minimum first picture component reference value, the minimum to-be-predicted picture component reference value and the preset initial linear model;

obtaining a model parameter based on the first sub component linear model and the second sub component linear model; and

constructing the component linear model by using the model parameter and the preset initial linear model.

9. The method of claim 7, wherein determining the parameter of the component linear model according to the filtered maximum first picture component reference value, the maximum to-be-predicted picture component reference value, the filtered minimum first picture component reference value and the minimum to-be-predicted picture component reference value comprises:

the parameter of the component linear model comprises a multiplicative factor and an additive offset;

calculating a first difference value between the maximum to-be-predicted picture component reference value and the minimum to-be-predicted picture component reference value;

calculating a second difference value between the maximum first picture component reference value and the minimum first picture component reference value;

setting the multiplicative factor to be a ratio of the first difference value to the second difference value; and

calculating a first product between the maximum first picture component reference value and the multiplicative factor and setting the additive offset to be a difference value between the maximum to-be-predicted picture component reference value and the first product; or calculating a second product between the minimum first picture component reference value and the multiplicative factor and setting the additive offset to be a difference value between the minimum to-be-predicted picture component reference value and the second product.

10. The method of claim 6, wherein determining the maximum to-be-predicted picture component reference value corresponding to the filtered maximum first picture component reference value and the minimum to-be-predicted picture component reference value corresponding to the filtered minimum first picture component reference value comprises:

acquiring to-be-predicted picture component reference values of the reference samples in the set of greater first picture component reference values and to-be-predicted picture component reference values of the reference samples in the set of smaller first picture component reference values;

performing meaning processing on the to-be-predicted picture component reference values of the reference samples in the set of greater first picture component reference values, and determining the maximum to-be-predicted picture component reference value; and

performing meaning processing on the to-be-predicted picture component reference values of the reference samples in the set of smaller first picture component reference values, and determining minimum to-be-predicted picture component reference value.

11. The method of claim 10, further comprising:

performing fourth filtering processing on the to-be-predicted picture component reference value to obtain a reconstructed value of the to-be-predicted picture component;

wherein fourth filtering processing is low-pass filtering.

12. The method of claim 10, further comprising:

converting a first picture component reference value sample position corresponding to the filtered maximum first picture component reference value into a first sample position;

setting the maximum to-be-predicted picture component reference value to be a reference value of the to-be-predicted picture component reference values which is at the first sample position;

converting a first picture component reference value sample position corresponding to the filtered minimum first picture component reference value into a second sample position; and

setting the minimum to-be-predicted picture component reference value to be a reference value of the to-be-predicted picture component reference values which is at the second sample position.

13. The method of claim 1, wherein a number of sample values in the set of greater first picture component reference values is an integer which is equal to or greater than 1, and a number of sample values in the set of smaller first picture component reference values is an integer which is equal to or greater than 1,

wherein the number of sample values in the set of greater first picture component reference values is 2, and a number of sample values in the set of smaller first picture component reference values is 2.

14. The method of claim 1, wherein performing mapping processing on the reconstructed value of the first picture component of the current block according to the component linear model to obtain the mapped value comprises:

performing second filtering processing on the reconstructed value of the first picture component to obtain a second filtered value of the reconstructed value of the first picture component; and

performing mapping processing on the second filtered value according to the component linear model to obtain the mapped value;

wherein second filtering processing is down-sampling filtering or low-pass filtering.

15. The method of claim 1, wherein determining the predicted value of the to-be-predicted picture component of the current block according to the mapped value comprises:

setting the mapped value as the predicted value of the to-be-predicted picture component of the current block.

16. The method of claim 1, wherein determining the predicted value of the to-be-predicted picture component of the current block according to the mapped value comprises:

performing third filtering processing on the mapped value to obtain a third filtered value of the mapped value; and

setting the third filtered value as the predicted value of the to-be-predicted picture component of the current block;

wherein third filtering processing is low-pass filtering.

17. The method of claim 1, wherein

the first picture component is a luma component, and the to-be-predicted picture component is a first or second chroma component; or

the first picture component is the first chroma component, and the to-be-predicted picture component is the luma component or the second chroma component; or

the first picture component is the second chroma component, and the to-be-predicted picture component is the luma component or the first chroma component; or

the first picture component is a first colour component, and the to-be-predicted picture

component is a second colour component or a third colour component; or

the first picture component is the second colour component, and the to-be-predicted picture component is the first colour component or the third colour component; or

the first picture component is the third colour component, and the to-be-predicted picture component is the second colour component or the first colour component,

wherein the first colour component is a red component, the second colour component is a green component, and the third colour component is a blue component.

18. The method of claim 1, wherein

first filtering processing is down-sampling filtering or low-pass filtering.

19. A picture component prediction method, applied to an encoder, the method comprising:

determining a first picture component reference value set of a current block;

determining multiple first picture component reference values according to the first picture component reference value set, wherein the multiple first picture component reference values include four reference values corresponding to four preset sample positions, respectively;

performing first filtering processing on sample values of samples corresponding to the multiple first picture component reference values, respectively, to determine multiple filtered first picture reference sample values, wherein the first filtering processing is performed on the sample values of the samples corresponding to the multiple first picture component reference values to obtain a filtered reference value set, and wherein reference sample values in the filtered reference value set are compared, and wherein a set of greater first picture component reference values and a set of smaller first picture component reference values are determined based on the reference sample values, and wherein the multiple filtered first picture reference sample values are determined by using multiple values from each of the set of greater first

picture component reference values and the set of smaller first picture component reference values;

determining a parameter of a component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values, the to-be-predicted picture component being a picture component which is different from the first picture component, and the component linear model characterizing a linear mapping relationship for mapping a sample value of the first picture component to a sample value of the to-be-predicted picture component;

performing mapping processing on a reconstructed value of the first picture component of the current block according to the component linear model to obtain a mapped value; and

determining a predicted value of the to-be-predicted picture component of the current block according to the mapped value.

20. A video component prediction device, applied to a decoder, the device comprising:

a memory for storing executable video component prediction instructions;

a processor for executing the executable video component prediction instructions stored in the memory to perform operations of:

determining a first picture component reference value set of a current block;

determining multiple first picture component reference values according to the first picture component reference value set, wherein the multiple first picture component reference values include four reference values corresponding to four preset sample positions, respectively;

performing first filtering processing on sample values of samples corresponding to the multiple first picture component reference values, respectively, to determine multiple filtered first picture reference sample values, wherein the first filtering processing is performed on the sample values of the samples corresponding to the multiple first picture component reference values to obtain a filtered reference value set, and wherein reference sample values in the

filtered reference value set are compared, and wherein a set of greater first picture component reference values and a set of smaller first picture component reference values are determined based on the reference sample values, and wherein the multiple filtered first picture reference sample values are determined by using multiple values from each of the set of greater first picture component reference values and the set of smaller first picture component reference values;

determining a parameter of a component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values, the to-be-predicted picture component being a picture component which is different from the first picture component, and the component linear model characterizing a linear mapping relationship for mapping a sample value of the first picture component to a sample value of the to-be-predicted picture component;

performing mapping processing on a reconstructed value of the first picture component of the current block according to the component linear model to obtain a mapped value; and

determining a predicted value of the to-be-predicted picture component of the current block according to the mapped value.

21. The device of claim 20, wherein determining the first picture component reference value set of a current block comprises:

determining one or more reference samples that locate outside of the current block, and determining the one or more reference samples as the first picture component reference value set.

22. The device of claim 21, wherein determining the one or more reference samples that locate outside of the current block comprises:

determining neighboring samples of the current block as one or more reference samples.

23. The device of claim 22, wherein determining the multiple first picture component reference values according to the first picture component reference value set comprises:

selecting two reference samples from the samples in the one or more neighboring lines at the top side of the current block according to a preset position, and selecting two reference samples from the samples in the one or more neighboring columns at the left side of the current block according to a preset position;

determining the multiple first picture component reference values according to the four selected samples.

24. The device of claim 20, wherein determining the multiple filtered first picture reference sample values based on the set of greater first picture component reference values and set of smaller first picture component reference values comprises:

performing mean processing on the set of greater first picture component reference values to obtain a filtered maximum first picture component reference value; and

performing mean processing on the set of smaller first picture component reference values to obtain a filtered minimum first picture component reference value.

25. The device of claim 24, further comprising:

determining a maximum to-be-predicted picture component reference value corresponding to the filtered maximum first picture component reference value and a minimum to-be-predicted picture component reference value corresponding to the filtered minimum first picture component reference value.

26. The device of claim 25, wherein determining the parameter of the component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values comprises:

determining the parameter of the component linear model according to the filtered maximum first picture component reference value, the maximum to-be-predicted picture component reference value, the filtered minimum first picture component reference value and the minimum to-be-predicted picture component reference value, the component linear model characterizing the linear mapping relationship for mapping the sample value of the first picture component to the sample value of the to-be-predicted picture component.

27. The device of claim 20, wherein a number of sample values in the set of greater first picture component reference values is an integer which is equal to or greater than 1, and a number of sample values in the set of smaller first picture component reference values is an integer which is equal to or greater than 1,

wherein the number of sample values in the set of greater first picture component reference values is 2, and a number of sample values in the set of smaller first picture component reference values is 2.

28. A video component prediction device, applied to a decoder, the device comprising:

a memory for storing executable video component prediction instructions;

a processor for executing the executable video component prediction instructions stored in the memory to perform operations of:

determining a first picture component reference value set of a current block;

determining multiple first picture component reference values according to the first picture component reference value set, wherein the multiple first picture component reference values include four reference values corresponding to four preset sample positions,

respectively;

performing first filtering processing on sample values of samples corresponding to the multiple first picture component reference values, respectively, to determine multiple filtered first picture reference sample values, wherein the first filtering processing is performed on the sample values of the samples corresponding to the multiple first picture component reference values to obtain a filtered reference value set, and wherein reference sample values in the filtered reference value set are compared, and wherein a set of greater first picture component reference values and a set of smaller first picture component reference values are determined based on the reference sample values, and wherein the multiple filtered first picture reference sample values are determined by using multiple values from each of the set of greater first picture component reference values and the set of smaller first picture component reference values;

determining a parameter of a component linear model according to the multiple filtered first picture reference sample values and a corresponding to-be-predicted picture component reference values, the to-be-predicted picture component being a picture component which is different from the first picture component, and the component linear model characterizing a linear mapping relationship for mapping a sample value of the first picture component to a sample value of the to-be-predicted picture component;

performing mapping processing on a reconstructed value of the first picture component of the current block according to the component linear model to obtain a mapped value; and

determining a predicted value of the to-be-predicted picture component of the current block according to the mapped value.