CLAIMS

1. An image processing method, performed by an electronic device comprising a processor, comprising:

obtaining a facial skin tone area in an original image;

filtering the original image to obtain a smooth image;

obtaining a high-frequency image based on the smooth image and the original image;

obtaining a facial skin tone high-frequency image based on the high-frequency image and a facial skin tone mask, wherein the facial skin tone mask is a mask for the facial skin tone area and indicates the facial skin tone area; and

superimposing a luma channel signal of the facial skin tone high-frequency image onto a luma channel signal of the original image to obtain a first image;

wherein the obtaining a facial skin tone area in an original image comprises:

obtaining the facial skin tone area in the original image based on a YCrCb optimized color video signal space, wherein the YCrCb optimized color video signal space comprises a luma channel, a chroma channel, and a saturation channel; and

the filtering the original image comprises: filtering the original image in the luma channel, wherein the method further comprises:

converting the first image to an RGB space;

adjusting color components in the first image based on the RGB space;

converting the first image that the color components have been adjusted to a Hue, Saturation, and Lightness (HSL) space, and

maintaining a luma value of the first image that the color components have been adjusted to be unchanged based on the HSL space, to obtain a second image.

2. The method according to claim 1, wherein the obtaining the facial skin tone area in the original image based on a YCrCb optimized color video signal space comprises:

determining a skin tone area in the original image based on a chroma value and a saturation value of the original image in the YCrCb optimized color video signal space;

obtaining a key point of a face of the original image by using a neural network; and

determining the facial skin tone area in the original image according to the key point of the face.

3. The method according to claim 1, wherein the filtering the original image in the luma channel comprises: performing box filtering on all pixel values in the luma channel of the original image based on a filter.

4. The method according to claim 1, wherein the obtaining a high-frequency image based on the smooth image and the original image comprises: subtracting, from all pixel values of the original image in the luma channel, pixel values at corresponding positions of the smooth image in the luma channel to obtain the high-frequency image.

5. The method according to claim 1, wherein the obtaining a facial skin tone high-frequency image based on the high-frequency image and a facial skin tone mask comprises: performing element multiplication on the high-frequency image and the facial skin tone mask based on preset first superimposition strength to obtain the facial skin tone high-frequency image.

6. The method according to claim 1, wherein before the superimposing a luma channel signal of the facial skin tone high-frequency image onto a luma channel signal of the original image, the method comprises:

obtaining the luma channel signal of the original image based on the luma channel of the YCrCb optimized color video signal space; and

obtaining the luma channel signal of the facial skin tone high-frequency image based on the luma channel of the YCrCb optimized color video signal space.

7. The method according to claim 1, wherein before the obtaining a facial skin tone area in the original image based on the YCrCb optimized color video signal space, the method further comprises: converting the original image to the YCrCb optimized color video signal space.

8. The method according to claim 1, wherein the adjusting color components in the first image based on the RGB space comprises: increasing cyan component and magenta component and reducing yellow component in the first image based on the RGB space.

9. The method according to claim 1, further comprising:

obtaining a shadow area on a face area in the first image based on values of luma and chroma in the YCrCb optimized color video signal space; and

increasing a luma value and a red component value in the shadow area to obtain a third image.

10. The method according to claim 9, wherein the increasing the luma value in the shadow area comprises:

obtaining a first luma superimposition map based on a dot product of all pixel values of the shadow area in the luma channel and a superimposition value of the first processed image in the luma channel;

obtaining a first luma dot product by performing a dot product operation on the first luma superimposition map and preset second superimposition strength; and

correspondingly superimposing the first luma dot product onto pixel values of the first image in the luma channel.

11. The method according to claim 9, wherein the increasing the red component value in the shadow area comprises:

obtaining a first chroma superimposition map based on a dot product of all pixel values of the shadow area in the chroma channel and a superimposition value of the first image in the chroma channel;

obtaining a first chroma dot product by performing a dot product operation on the first chroma superimposition map and the preset second superimposition strength; and

correspondingly superimposing the first chroma dot product onto pixel values of the first image in the chroma channel.

12. The method according to claim 9, further comprising:

converting the second image to the YCrCb optimized color video signal space;

obtaining a shadow area mask on a face area in the second image based on the values of luma and chroma in the YCrCb optimized color video signal space; and

increasing a luma value and a red component value in the shadow area mask to obtain a fourth image;

wherein the increasing a luma value in the shadow area comprises:

obtaining a second luma superimposition map based on a dot product of all pixel values of the shadow area in the luma channel and a superimposition value of the second image in the luma channel;

obtaining a second luma dot product by performing a dot product operation on the second luma superimposition map and preset second superimposition strength; and

correspondingly superimposing the second luma dot product onto pixel values of the second image in the luma channel;

wherein the increasing a red component value in the shadow area comprises:

obtaining a second chroma superimposition map based on a dot product of all pixel values of the shadow area mask in the chroma channel and a superimposition value of the second image in the chroma channel;

obtaining a second chroma dot product by performing a dot product operation on the second chroma superimposition map and the preset second superimposition strength; and

correspondingly superimposing the second chroma dot product onto pixel values of the second image in the chroma channel.

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

obtaining a lip area on a face area in the first image, the third image, or the fourth image according to the values of luma and chroma in the YCrCb optimized color video signal space; and

increasing a luma value and a red component value in the lip area to obtain a fifth image, a seventh image, or an eighth image.

14. The method according to claim 13, wherein the increasing the luma value in the lip area comprises:

respectively obtaining a third luma superimposition map, a fifth luma superimposition map, or a sixth luma superimposition map based on a dot product of all pixel values of the lip area in the luma channel and a superimposition value of the first image, the third image, or the fourth image in the luma channel;

correspondingly superimposing a dot product of the third luma superimposition map and preset third superimposition strength onto pixel values of the first image in the luma channel;

correspondingly superimposing a dot product of the fifth luma superimposition map and the preset third superimposition strength onto pixel values of the third image in the luma channel; and

correspondingly superimposing a dot product of the sixth luma superimposition map and the preset third superimposition strength onto pixel values of the fourth image in the luma channel.

15. The method according to claim 13, wherein the increasing the red component value in the lip area comprises:

respectively obtaining a third chroma superimposition map, a fifth chroma superimposition map, or a sixth chroma superimposition map by performing a dot product operation on all pixel values of the lip area in the chroma channel and a superimposition value of the first image, the third image, or the fourth image in the chroma channel;

correspondingly superimposing a dot product of the third chroma superimposition map and the preset third superimposition strength onto pixel values of the first image in the luma channel;

correspondingly superimposing a dot product of the fifth chroma superimposition map and the preset third superimposition strength onto pixel values of the third image in the luma channel; and

correspondingly superimposing a dot product of the sixth chroma superimposition map and the preset third superimposition strength onto pixel values of the fourth image in the luma channel.

16. The method according to claim 2, further comprising:

converting the second image to the YCrCb optimized color video signal space;

obtaining a lip area on a face area in the second image based on the values of luma and chroma in the YCrCb optimized color video signal space; and

increasing the luma value and the red component value in the lip area to obtain a sixth image;

wherein the increasing the luma value in the lip area comprises:

obtaining a fourth luma superimposition map based on a dot product of all pixel values of the lip area in the luma channel and a superimposition value of the second image in the luma channel; and

correspondingly superimposing a dot product of the fourth luma superimposition map and preset third superimposition strength onto pixel values of the second image in the luma channel;

wherein the increasing the red component value in the lip area comprises:

obtaining a fourth chroma superimposition map by performing a dot product operation on all pixel values of the lip area in the chroma channel and a superimposition value of the second image in the chroma channel; and

correspondingly superimposing a dot product of the fourth chroma superimposition map and the preset third superimposition strength onto pixel values of the second image in the luma channel.

17. An electronic device, comprising:

a processor; and

memory for storing instructions executable by the processor;

wherein execution of the instructions by the processor causes the processor to perform:

obtaining a facial skin tone area in an original image;

filtering the original image to obtain a smooth image;

obtaining a high-frequency image based on the smooth image and the original image;

obtaining a facial skin tone high-frequency image based on the high-frequency image and a facial skin tone mask, wherein the facial skin tone mask is a mask for the facial skin tone area and indicates the facial skin tone area; and

superimposing a luma channel signal of the facial skin tone high-frequency image onto a luma channel signal of the original image to obtain a first image;

wherein the obtaining a facial skin tone area in an original image comprises:

obtaining the facial skin tone area in the original image based on a YCrCb optimized color video signal space, wherein the YCrCb optimized color video signal space comprises a luma channel, a chroma channel, and a saturation channel; and

the filtering the original image comprises: filtering the original image in the luma channel, wherein the method further comprises:

converting the first image to an RGB space;

adjusting color components in the first image based on the RGB space;

converting the first image that the color components have been adjusted to a Hue, Saturation, and Lightness (HSL) space, and

maintaining a luma value of the first image that the color components have been adjusted to be unchanged based on the HSL space, to obtain a second image.

18. A non-transitory computer storage medium, configured to store computer readable instructions, wherein execution of the instructions by the processor causes the processor to perform:

obtaining a facial skin tone area in an original image;

filtering the original to obtain a smooth image;

obtaining a high-frequency image based on the smooth image and the original image;

obtaining a facial skin tone high-frequency image based on the high-frequency image and a facial skin tone mask, wherein the facial skin tone mask is a mask for the facial skin tone area and indicates the facial skin tone area; and

superimposing a luma channel signal of the facial skin tone high-frequency image onto a luma channel signal of original image to obtain a first image;

wherein the obtaining a facial skin tone area in an original image comprises:

obtaining the facial skin tone area in the original image based on a YCrCb optimized color video signal space, wherein the YCrCb optimized color video signal space comprises a luma channel, a chroma channel, and a saturation channel; and

the filtering the original image comprises: filtering the original image in the luma channel, wherein the method further comprises:

converting the first image to an RGB space;

adjusting color components in the first image based on the RGB space;

converting the first image that the color components have been adjusted to a Hue, Saturation, and Lightness (HSL) space, and

maintaining a luma value of the first image that the color components have been adjusted to be unchanged based on the HSL space, to obtain a second image.