CLAIMS

1. A video generation method, comprising:

acquiring a source image;

generating a plurality of sketch images according to the source image, wherein the plurality of sketch images respectively correspond to sketch images of the source image at different color depths;

generating a plurality of subgraphs of a target sketch image based on the target sketch image, wherein the plurality of subgraphs respectively correspond to sketch images of the target sketch image at different drawing completion degrees, and the target sketch image is any one of the plurality of sketch images; and

taking respective subgraphs of respective sketch images in the plurality of sketch images as video frames of a sketch drawing video, setting an order of the video frames according to an order of color depth from light to dark and an order of drawing completion degrees from low to high, and generating the sketch drawing video;

wherein the generating the plurality of subgraphs of a target sketch image based on the target sketch image comprises:

determining an increase order of mask values of pixels in a first mask, wherein initial mask values of the pixels in the first mask are 0, an increase of the pixels in the first mask is used to indicate that the mask values of the pixels are changed from 0 to 1, and the first mask is used for gradually transforming a background of the target sketch image into the target sketch image according to the increase order; and

generating the plurality of subgraphs according to the increase order, the target sketch image and the background of the target sketch image, wherein each increase in the increase order and a subgraph in the plurality of subgraphs are in a one-to-one correspondence.

2. The method according to claim 1, wherein the generating the plurality of subgraphs according to the increase order, the target sketch image and the background of the target sketch image comprises:

for each increase in the increase order, determining a first pixel set corresponding to the increase from the first mask;

determining a second pixel set from the target sketch image and a third pixel set from the background according to the first pixel set, wherein a pixel in the first pixel set, a pixel in the second pixel set and a pixel in the third pixel set are in a one-to-one correspondence;

determining a pixel value of a fourth pixel according to a mask value of a first pixel in the first pixel set, a pixel value of a second pixel in the second pixel set and a pixel value of a third pixel in the third pixel set, wherein the pixel value of the fourth pixel = the mask value of the first pixel × the pixel value of the second pixel+the pixel value of the third pixel × (1- the mask value of the first pixel); and

updating the third pixel in the background with the fourth pixel to obtain a subgraph corresponding to the increase.

3. The method according to claim 1 or 2, wherein,

when the target sketch image is not a lightest sketch image among the plurality of sketch images, the background is a sketch image adjacent to the target sketch image and located in front of the target sketch image among the plurality of sketch images; and

when the target sketch image is the lightest sketch image among the plurality of sketch images, the background is a white image with a same size as the target sketch image.

4. The method according to any one of claims 1 to 3, wherein the source image contains a person, and the increase order comprises an increase order of face contour of the person in the source image, and the determining the increase order of mask values of pixels in the first mask comprises:

extracting key points of a face in the source image to obtain a key point set;

determining a second mask of a hair area of the person in the source image according to the source image;

determining a first convex hull area of the face of the person according to the key points set;

determining a second convex hull area from the second mask according to an intersection of the first convex hull area and the second mask; and

obtaining the increase order of the face contour of the person in the source image by sequentially connecting the key points of the face contour in the key point set on the second convex hull area according to a stroke speed, wherein the stroke speed is determined according to a duration of the video.

5. The method according to claim 4, wherein after the obtaining the increase order of the face contour of the person in the source image by sequentially connecting the key points of the face contour in the key point set on the second convex hull area according to the stroke speed, the method further comprises:

determining key points of different areas of the face from the key point set;

interpolating a respective area of the face according to a key point of the respective area; and

determining, according to interpolated area, an increase order of a corresponding area in the

face of the person in the source image on the second convex hull area according to the stroke speed.

6. The method according to claim 5, wherein the interpolating a respective area of the face according to a key point of the respective area comprises:

for an eyebrow area in the face, transversely interpolating a plurality of curves according to a key point of the eyebrow area;

for an eyeball area in the face, according to a key point of the eyeball area, interpolating the eyeball area according to a circular area; and

for a mouth area in the face, vertically interpolating a plurality of curves according to a key point of the mouth area.

7. The method according to any one of claims 1 to 6, wherein the generating the plurality of sketch images according to the source image comprises:

generating a gray image based on the source image;

determining a plurality of Gaussian kernels, wherein Gaussian kernels in the plurality of Gaussian kernels correspond to sketch images in the plurality of sketch images one by one, and a size of a Gaussian kernel corresponding to a sketch image with darker color is larger than a size of a Gaussian kernel corresponding to a sketch image with lighter color;

performing, according to the plurality of Gaussian kernels, Gaussian blur on the gray image respectively to obtain a Gaussian blur image corresponding to a respective Gaussian kernel in the plurality of Gaussian kernels; and

generating the plurality of sketch images according to the Gaussian blur image corresponding to the respective Gaussian kernel in the plurality of Gaussian kernels and the gray image.

8. A video generating apparatus, comprising:

an acquisition unit, configured to acquire a source image;

a first generation unit, configured to generate a plurality of sketch images according to the source image, wherein the plurality of sketch images respectively correspond to sketch images of the source image at different color depths;

a second generation unit, configured to generate a plurality of subgraphs of a target sketch image based on the target sketch image, wherein the plurality of subgraphs respectively correspond to sketch images of the target sketch image at different drawing completion degrees, and the target sketch image is any sketch image of the plurality of sketch images; and

a third generation unit, configured to take respective subgraphs of respective sketch images in the plurality of sketch images as video frames of a sketch drawing video, set an order of the video frames according to an order of color depth from light to dark and an order of drawing completion degrees from low to high, and generate the sketch drawing video;

wherein the second generation unit is further configured to:

determine an increase order of mask values of pixels in a first mask, wherein initial mask values of the pixels in the first mask are 0, an increase of the pixels in the first mask is used to indicate that the mask values of the pixels are changed from 0 to 1, and the first mask is used for gradually transforming a background of the target sketch image into the target sketch image according to the increase order; and

generate the plurality of subgraphs according to the increase order, the target sketch image and the background of the target sketch image, wherein each increase in the increase order and a subgraph in the plurality of subgraphs are in a one-to-one correspondence.

9. The video generating apparatus according to claim 8, wherein when generating the plurality of subgraphs according to the increase order, the target sketch image and the background of the target sketch image, the second generation unit is further configured to:

determine a first pixel set corresponding to the increase from the first mask for each increase in the increase order;

determine a second pixel set from the target sketch image and a third pixel set from the background according to the first pixel set, wherein a pixel in the first pixel set, a pixel in the second pixel set and a pixel in the third pixel set are in a one-to-one correspondence;

determine a pixel value of a fourth pixel according to a mask value of a first pixel in the first pixel set, a pixel value of a second pixel in the second pixel set and a pixel value of a third pixel in the third pixel set, wherein the pixel value of the fourth pixel = the mask value of the first pixel × the pixel value of the second pixel+the pixel value of the third pixel × (1- the mask value of the first pixel); and

update the third pixel in the background with the fourth pixel to obtain a subgraph corresponding to the increase.

10. The video generating apparatus according to claim 8, wherein when the target sketch image is not a lightest sketch image among the plurality of sketch images, the background is a sketch image adjacent to the target sketch image and located in front of the target sketch image among the plurality of sketch images; and when the target sketch image is the lightest sketch image among the plurality of sketch images, the background is a white image with a same size as the target sketch image.

11. The video generating apparatus according to any one of claims8 to 10, wherein the source image contains a person, and the increase order comprises an increase order of face contour of the person in the source image, and when determining an increase order of mask values of pixels in a first mask, the second generation unit is further configured to:

extract key points of a face in the source image to obtain a key point set;

determine a second mask of a hair area of the person in the source image according to the source image;

determine a first convex hull area of the face of the person according to the key points set;

determine a second convex hull area from the second mask according to an intersection of the first convex hull area and the second mask; and

obtain the increase order of the face contour of the person in the source image by sequentially connecting the key points of the face contour in the key point set on the second convex hull area according to a stroke speed, wherein the stroke speed is determined according to a duration of the video.

12. The video generating apparatus according to claim 11, wherein after obtaining the increase order of the face contour of the person in the source image by sequentially connecting the key points of the face contour in the key point set on the second convex hull area according to the stroke speed, the second generation unit is further configure to:

determine key points of different areas of the face from the key point set;

interpolate a respective area of the face according to a key point of the respective area; and

determine, according to interpolated area, an increase order of a corresponding areas in the face of the person in the source image on the second convex hull area according to the stroke speed.

13. The video generating apparatus according to claim 12, wherein when interpolating different areas of the face according to key points of the areas, the second generation unit transversely interpolates a plurality of curves according to a key point of the eyebrow area for an eyebrow area in the face;

for an eyeball area in the face area, according to a key point of the eyeball area, interpolates the eyeball area according to a circular area; and

for a mouth area in the face area, vertically interpolates a plurality of curves according to a key point of the mouth area.

14. The video generating apparatus according to any one of claims 8 to 13, wherein the first generation unit is further configured to:

generate a gray image based on the source image;

determine a plurality of Gaussian kernels, wherein Gaussian kernels in the plurality of Gaussian kernels correspond to sketch images in the plurality of sketch images one by one, and a size of a Gaussian kernel corresponding to a sketch image with darker color is larger than a size of a Gaussian kernel corresponding to a sketch image with lighter color;

perform, according to the plurality of Gaussian kernels, Gaussian blur on the gray image

respectively to obtain a Gaussian blur image corresponding to a respective Gaussian kernel in the plurality of Gaussian kernels; and

generate the plurality of sketch images according to the Gaussian blur image corresponding to the respective Gaussian kernel in the plurality of Gaussian kernels and the gray image.

15. An electronic device comprising: at least one processor and a memory;

the memory stores computer executable instructions; and

the at least one processor executes the computer executable instructions stored in the memory, enables the at least one processor to execute the video generation method according to any one of claims 1 to 7.

16. A computer readable storage medium, wherein the computer readable storage medium stores computer executable instructions, and when the computer executable instructions are executed by a processor, the video generation method according to any one of claims 1 to 7 is implemented.

17. A computer program product comprising a computer program which, when executed by a processor, the video generation method according to any one of claims 1 to 7 is implemented.